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Rail specifications





MAINTENANCE



TRANSPORT FOR LONDON

Network Rail protective systems for new construction

Sherwin-Williams has a full range of products that are approved to the Network Rail standards which are suitable for its new construction specifications.

Item No.	Network Rail specified products	Item No.	Network Rail specified products
7.3.1	Acrolon C137V2	7.1.7	Macropoxy C402V2
-	Acrolon C750V2	7.2.2	Macropoxy C402V2
5.12.1	Epidek M153	7.1.4	Macropoxy C425V2
7.2.3	Macropoxy C123	7.2.2	Macropoxy K267
7.2.2	Macropoxy C267V3	7.1.2	Macropoxy L574
7.1.7	Macropoxy C401	7.1.2	Macropoxy L674
7.2.2	Macropoxy C401	7.2.3	Macropoxy M922
		7.1.3	Zinc Clad M501

Protective system reference		Preparation including metal coatings	Paint coats	ltem No.	Min DFT (µm)	Cert ref
XN90/ N1	Thermally Sprayed Metal/ Epoxy Protective System	Blast-clean to Sa3 Thermally Sprayed Metal Coating Zn or Al	Macropoxy L574 Macropoxy C402V2 Acrolon C137V2	7.1.2 7.2.2 7.3.1	25 150 50	XN90/N1/038
N2	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L574 Macropoxy M922 Acrolon C137V2	7.1.2 7.2.3 7.3.1	25 400 50	N2/003
N2	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L574 Macropoxy C123 Acrolon C137V2	7.1.2 7.2.3 7.3.1	25 400 50	N2/033
N2	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L674 Macropoxy C123 Acrolon C137V2	7.1.2 7.2.3 7.3.1	50 400 50	N2/038
XN90/ N2	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L574 Macropoxy C123 Acrolon C137V2	7.1.2 7.2.3 7.3.1	25 250 50	XN90/N2/070
XN90/ N2	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L674 Macropoxy C123 Acrolon C137V2	7.1.2 7.2.3 7.3.1	50 250 50	XN90/N2/074
N4	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L674 Macropoxy C401 Macropoxy C402V2 Acrolon C137V2	7.1.2 7.2.2 7.2.2 7.3.1	50 125 125 50	N4/088
XN90/ N4	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy C402V2 Macropoxy C401 Acrolon C137V2	7.1.5 7.1.7 7.3.1	100 125 50	XN90/N4/057
XN90/ N4	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Zinc Clad M501 Macropoxy C267V3 Macropoxy C267V3 Acrolon C137V2	7.1.3 7.2.2 7.2.2 7.3.1	50 125 125 50	XN90/N4/109
N9	Protective System for Galvanized Steel	Sweep blast-clean Surface profile 20-30µm	Macropoxy K267 Acrolon C137V2	7.2.2 7.3.1	125 50	N9/038
XN90/ N11.1	Thermally Sprayed Metal/ Epoxy MIO Protective System for Box Girder Interiors	Blast-clean to Sa3 Thermally Sprayed Metal Coating Zn or Al	Macropoxy L574 Macropoxy C401	7.1.2 7.2.2	25 150	XN90/ N11.1/067
N12.1	Epoxy MIO Protective System for Box Girder Internal Surfaces	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy C425V2 Macropoxy C401	7.1.4 7.2.2	100 125	N12.1/005
N13	Epoxy Protective System for Structural Steelwork for Interior Environments	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L674 Macropoxy C402V2 Acrolon C137V2	7.1.2 7.2.2 7.3.1	50 125 50	N13/008





Network Rail protective systems for new construction

I	Protective system reference	Preparation including metal coatings	Paint coats	Item No.	Min DFT (µm)	Cert ref
XO99	Deck Coating	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy C425V2 Epidek M153 Epidek Aggregate	7.1.4 5.12.1 5.12.3	100 2500 1-3mm	XO99/009
XO99	Deck Coating	Blast-clean to Sa3 Thermally Sprayed Metal Coating Zn or Al	Macropoxy L574 Epidek M153 Epidek Aggregate	7.1.2 5.12.1 5.12.3	25 2500 1-3mm	XO99/008
Isocya	nate free finish approved alt	ernatives				
XN90/ N1	Thermally Sprayed Metal/ Epoxy Protective System	Blast-clean to Sa3 Thermally Sprayed Metal Coating Zn or Al	Macropoxy L574 Macropoxy C402V2 Acrolon C750V2	7.1.2 7.2.2 -	25 125 50	XN90/N1/100
XN90/ N2	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L574 Macropoxy C123 Acrolon C750V2	7.1.2 7.2.3 -	25 400 50	XN90/N2/096
XN90/ N2	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L574 Macropoxy C123 Acrolon C750V2	7.1.2 7.2.3 -	25 250 50	XN90/N2/097
XN90/ N4	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L674 Macropoxy C401 Macropoxy C402V2 Acrolon C750V2	7.1.2 7.2.2 7.2.2 -	50 125 125 50	XN90/N4/102
XN90/ N4	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Zinc Clad M501 Macropoxy C267V3 Macropoxy C267V3 Acrolon C750V2	7.1.3 7.2.2 7.2.2 -	50 125 125 50	XN90/N4/109
XN90/ N4	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm	Zinc Clad M501 Macropoxy C267V3 Acrolon C750V2	7.1.3 7.2.2 -	50 125 50	XN90/N4/111
XN90/ N13	Epoxy Protective System for Structural Steelwork for Interior Environments	Blast-clean to Sa2½ Surface profile 70-100mm	Macropoxy L674 Macropoxy C402V2 Acrolon C750V2	7.1.2 7.2.2	50 125 50	XN90/ N13/103



Network Rail protective systems for maintenance

Sherwin-Williams has a full range of products that are approved to the Network Rail standards which are suitable for its maintenance specifications.

Item No.	Network Rail specified products	Item No.	Network Rail specified products
7.3.1	Acrolon C137V2	 7.2.2	Macropoxy K267
7.3.1	Acrolon C237	 7.2.2	Macropoxy L524
-	Acrolon C750V2	 7.1.2	Macropoxy L574
-	Dura-Plate 301W	 7.1.2	Macropoxy L674
7.2.6	Macropoxy C88	 7.1.5	Macropoxy M902
7.2.3	Macropoxy C123	7.1.7	Macropoxy M905
7.2.2	Macropoxy C267V3	7.2.2	Macropoxy M905
7.2.2	Macropoxy C401	 7.2.3	Macropoxy M922
7.1.5	Macropoxy C402V2 (Aluminium)	7.2.6	Macropoxy M922M
7.2.2	Macropoxy C402V2	7.1.3	Zinc Clad M501

	Protective system reference	Preparation including metal coatings	Paint coats	ltem No.	Min DFT (µm)	Cert ref
M20	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L674 Macropoxy C401 Macropoxy C402V2 Acrolon C137V2	7.1.2 7.2.2 7.2.2 7.3.1	50 125 125 50	M20/170
M20	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L674 Macropoxy C401 Macropoxy C402V2 Resistex K651	7.1.2 7.2.2 7.2.2 5.6.3	50 125 125 50	M20/189
M20	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Zinc Clad M501 Macropoxy C267V3 Macropoxy C267V3 Acrolon C137V2	7.1.3 7.2.2 7.2.2 7.3.1	50 125 125 50	M20/192
XM92/ M20	Epoxy MIO Protective System alternative to M20 using low temperature curing intermediate coats	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L674 Macropoxy M902 Macropoxy M905 Acrolon C137V2	7.1.2 7.1.5 7.2.2 7.3.1	50 100 125 50	XM92/ M20/083
XM92/ M20	Protective System for dry blast-cleaned steel	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy C402V2 Macropoxy C401 Acrolon C137V2	7.1.5 7.1.7 7.3.1	100 125 50	XM92/ M20/094
XM92/ M20	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L674 Macropoxy C402V2 (Brush Applied) Macropoxy C402V2 Macropoxy C401 Acrolon C137V2	7.1.2 7.2.2 7.2.2 7.1.7 7.3.1	50 50 100 125 50	XM92/ M20/111
XM92/ M20	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Zinc Clad M501 Macropoxy C267V3 Acrolon C137V2	7.1.3 7.2.2 7.3.1	50 125 50	XM92/ M20/202
M21	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L574 Macropoxy M922 Acrolon C137V2	7.1.2 7.2.3 7.3.1	25 400 50	M21/003
M21	Glass Flake Epoxy Protective System – Forth Rail Bridge	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L674 (Transgard TG223) Macropoxy M922 (Transgard TG123) Acrolon C137V2 (Transgard TG168)	7.1.2 7.2.3 7.3.1	60 400 50	M21/004
M21	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L574 Macropoxy C123 Acrolon C137V2	7.1.2 7.2.3 7.3.1	25 400 50	M21/032





Network Rail protective systems for maintenance

	Protective system reference	Preparation including metal coatings	Paint coats	ltem No.	Min DFT (µm)	Cert ref
M21	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L674 Macropoxy C123 Acrolon C137V2	7.1.2 7.2.3 7.3.1	50 400 50	M21/036
XM92/ M21	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L574 Macropoxy C123 Acrolon C137V2	7.1.2 7.2.3 7.3.1	25 250 50	XM92/M21/ 127
XM92/ M21	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L674 Macropoxy C123 Acrolon C137V2	7.1.2 7.2.3 7.3.1	50 250 50	XM92/M21/ 138
XM92/ M21	Glass Flake Epoxy Protective System	Bristle blast-clean to St3.	Macropoxy M902 Macropoxy M922 Acrolon C137V2	7.1.5 7.2.3 7.3.1	100 400 50	XM92/M21/ 160
M24	Surface Tolerant Epoxy Protective System	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wash down and abrade sound existing paintwork.	Macropoxy C402V2 (Aluminium) Macropoxy C402V2 Acrolon C137V2	7.1.5 7.1.7 7.3.1	100 100 50	M24/049
M24	Surface Tolerant Epoxy Protective System – Low Temperature Curing Alternative	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wash down and abrade sound existing paintwork.	Macropoxy M902 Macropoxy M905 Acrolon C137V2	7.1.5 7.1.7 7.3.1	100 100 50	M24/014
XM92/ M24	Protective System for wet blast-cleaned steel	Wet abrasive blast-clean to Sa2½	Macropoxy C402V2 (Aluminium) Macropoxy C401 Acrolon C137V2	7.1.5 7.1.7 7.3.1	100 125 50	XM92/M24/ 059
XM92/ M24	Surface Tolerant Epoxy Protective System – Low Temperature Curing	Bristle blast-clean to St3.	Macropoxy M902 Macropoxy M905 Acrolon C137V2	7.1.5 7.1.7 7.3.1	100 100 50	XM92/M24/ 161
XM92/ M24	Surface Tolerant Epoxy Protective System	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wet abrasive blast-cleaning SSPC -Vis 4 (1) NACE No.7	Dura-Plate 301W Dura-Plate 301W Acrolon C137V2 Or Acrolon C237	- - 7.3.1 7.3.1	100 100 50 50	XM92/M24/ 195
XM92/ M24	Surface Tolerant Epoxy Protective System	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wet abrasive blast-cleaning SSPC -Vis 4 (1) NACE No.7	Dura-Plate 301W Acrolon C137V2 Or Acrolon C237	- 7.3.1 7.3.1	200 50 50	XM92/M24/ 196
XM92/ M24	Surface Tolerant Epoxy Protective System	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wet abrasive blast-cleaning SSPC -Vis 4 (1) NACE No.7	Macropoxy C402V2 (Aluminium) Acrolon C137V2	7.1.5 7.3.1	200 50	XM92/M24/ 198
XM92/ M26.3	Pitch Free Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100µm.	Macropoxy L674 Macropoxy L524 Macropoxy L524	7.1.2 7.2.2 7.2.2	50 125 100	XM92/ M26.3/112
M 34	1 or 2 coat maintenance system for short possessions	Blast-clean to Sa2½ or hand/ power tool clean to St3.	Macropoxy M922M Acrolon C137V2 (Optional)	7.2.6 7.3.1	400 50	M34/002
XM92/ M34	1 or 2 coat maintenance system for short possessions	Blast-clean to Sa2½ or hand/ power tool clean to St3, or wet abrasive Blast-Clean	Macropoxy C88 Acrolon C137V2 (Optional) Or	7.2.6 7.3.1	300 50	XM92/ M34/181
XM92/ M34	1 or 2 coat maintenance system for short possessions	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wet abrasive blast-cleaning SSPC -Vis 4 (1) NACE No.7	Dura-Plate 301W	-	300	XM92/ M34/197
XM92/ M34	1 or 2 coat maintenance system for short possessions	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wet abrasive blast-cleaning SSPC -Vis 4 (1) NACE No.7	Dura-Plate 301W Acrolon C137V2 Or Acrolon C237	- 7.3.1 7.3.1	300 50 50	XM92/M34/ 200
XM92/ M34	1 or 2 coat maintenance system for short possessions	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wet abrasive blast-cleaning SSPC -Vis 4 (1) NACE No.7	Dura-Plate 301W Dura-Plate 301W Acrolon C137V2 Or Acrolon C237	- 7.3.1 7.3.1	150 150 50 50	XM92/M34/ 201









Network Rail protective systems for maintenance

	Protective system reference	Preparation including metal coatings	Paint coats Item No.	Min DFT (µm)		Cert ref
M20	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Zinc Clad M501 Macropoxy C267V3 Macropoxy C267V3 Acrolon C750V2	7.1.3 7.2.2 7.2.2	50 125 125 50	M20/192
XM92/ M20	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L674 Macropoxy C401 Macropoxy C402V2 Acrolon C750V2	7.1.2 7.2.2 7.2.2 -	50 125 125 50	XM92/M20/ 190
XM92/ M20	Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Zinc Clad M501 Macropoxy C267V3 Acrolon C750V2	7.1.3 7.2.2 -	50 125 50	XM92/M20/ 202
XM92/ M21	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L574 Macropoxy C123 Acrolon C750V2	7.1.2 7.2.3 -	25 400 50	XM92/M21/ 185
XM92/ M21	Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100mm.	Macropoxy L574 Macropoxy C123 Acrolon C750V2	7.1.2 7.2.3 -	25 250 50	XM92/M21/ 186
XM92/ M24	Surface Tolerant Epoxy Protective System	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wash down and abrade sound existing paintwork.	Macropoxy M902 Macropoxy M905 Acrolon C750V2	7.1.5 7.1.7 -	100 100 50	XM92/M24/ 182
XM92/ M24	Surface Tolerant Epoxy Protective System	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wet abrasive blast-cleaning SSPC -Vis 4 (1) NACE No.7	Dura-Plate 301W Dura-Plate 301W Acrolon C750V2		100 100 50	XM92/M24/ 195
XM92/ M24	Surface Tolerant Epoxy Protective System	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wet abrasive blast-cleaning SSPC -Vis 4 (1) NACE No.7	Dura-Plate 301W Acrolon C750V2	-	200 50	XM92/M24/ 196
XM92/ M24	Surface Tolerant Epoxy Protective System	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wash down and abrade sound existing paintwork.	Macropoxy C402V2 (Aluminium) Macropoxy C402V2 Acrolon C750V2	7.1.5 7.1.7 -	100 100 50	XM92/M24/ 191
XM92/ M34	1 or 2 coat maintenance system for short possessions	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wet abrasive blast-cleaning SSPC -Vis 4 (1) NACE No.7	Dura-Plate 301W Acrolon C750V2	-	300 50	XM92/M34/ 200
XM92/ M34	1 or 2 coat maintenance system for short possessions	Blast-clean to Sa2½ or hand/ power tool clean to St3. Wet abrasive blast-cleaning SSPC -Vis 4 (1) NACE No.7	Dura-Plate 301W Dura-Plate 301W Acrolon C750V2		150 150 50	XM92/M34/ 201



Transport for London specifications





MAINTENANCE

Transport for London protective systems for new construction

Sherwin-Williams has a full range of products that are approved to the Transport for London standards which are suitable for its new construction specifications.

Transport for London registered products	Transport for London registered products
Acrolon C137V2	Macropoxy K267
FIRETEX M71V3	Macropoxy L574
FIRETEX FX5060	Macropoxy L674
Macropoxy C123	Macropoxy M455V2
Macropoxy C400V3	Macropoxy M922
Macropoxy C401	Mordant Wash L703
Macropoxy C402V2	

Protective system Preparation including Paint coats reference metal coatings		Min DFT (µm)	Cert ref	
New Work – above ground				
Thermally Sprayed Metal/ Epoxy Protective System	Blast-clean to Sa3 Thermally Sprayed Metal Coating Zn or Al	Macropoxy L574 Macropoxy C402V2 Acrolon C137V2	20 150 50	285
Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100µm	Macropoxy L574 Macropoxy M922 Acrolon C137V2	25 400 50	283
Glass Flake Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100µm	Macropoxy L574 Macropoxy C123 Acrolon C137V2	25 400 50	283
Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100µm	Macropoxy L674 Macropoxy C401 Macropoxy C402V2 Acrolon C137V2	50 125 100 50	284
Protective System for Galvanized Steel	Sweep blast-clean Surface profile 20-30µm	Macropoxy K267 Acrolon C137V2	125 50	1649
Protective System for Galvanized Steel	Application of Mordant Wash L703 mordant wash solution	Mordant Wash L703 Macropoxy K267 Acrolon C137V2	- 125 50	1649
New Work – below ground				
Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100µm	Macropoxy C400V3 Acrolon C137V2	200 50	2051
Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100µm	Macropoxy M455V2 Acrolon C137V2 (optional for external)	125 50	1667
Epoxy Protective System	Blast-clean to Sa2½ Surface profile 70-100µm	Macropoxy C400V3 FIRETEX FX5060 FIRETEX M71V3	50 various 50	1999

N.B. Stripe Coats not included in this table. Please see relevant Method Statement for details.



Transport for London protective systems for maintenance

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Transport for London registered products	Transport for London registered products
Acrolon C137V2	Macropoxy C402V2
Acrolon C237	Macropoxy M902
Acrolon C750V2	Macropoxy M905
Macropoxy C401	Macropoxy 674

Protective system reference	Preparation including metal coatings	Paint coats	Min DFT (µm)	Cert ref
New Work – above ground				
Surface Tolerant Epoxy Protective System	Blast-clean to Sa2½ or hand/power tool clean to St3. Wash down and abrade sound	Macropoxy C402V2 (Aluminium) Macropoxy C402V2	100 100	287
	existing paintwork	ACTOIOTE CT37 V2	50	
Surface Tolerant Epoxy MIO Protective System	Blast-clean to Sa2½ or hand/power tool clean to St3. Wash down and abrade sound existing paintwork	Macropoxy C402V2 (Aluminium) Macropoxy C401 Acrolon C137V2	100 125 50	288
Epoxy MIO Protective System	Blast-clean to Sa2½ Surface profile 70-100µm	Macropoxy L674 Macropoxy M902 Macropoxy M905 Acrolon C137V2	50 125 100 50	289
Low temperature curing Surface Tolerant Epoxy Protective System	Blast-clean to Sa2½ or hand/power tool clean to St3	Dura-Plate 301W Dura-Plate 301W Acrolon C137V2 Or Acrolon C237 Or Acrolon C750V2	100 100 50 50 50	3458
New Work – below ground				
Surface Tolerant Epoxy Protective System - Low temperature curing alternative	Blast-clean to Sa2½ or hand/power tool clean to St3. Wash down and abrade sound existing paintwork	Macropoxy M902 Macropoxy M905 Acrolon C137V2	125 100 50	286

N.B. Stripe Coats not included in this table. Please see relevant Method Statement for details.









NETWORK RAIL STATIONS

Network Rail bridges track record

Bridge	Contractor	Date
Apperley Bridge - Leeds	Jack Tighe Ltd	2015
Braehead M8 Railway Bridge	Jack Tighe Ltd	2015
Calverly, Leeds - TJC3-32A	Pyeroy	2015
Kirkbridge Footbridge - South Elmsall	APB Construction	2015
Manchester Metro link gantries	Epic Coatings	2015
Midland Bridge	SCA	2015
Shipton - York EMC5-16	CSL	2015
Shipton - York EMC5-21	CSL	2015
Totnes Station Footbridge	TI Coatings	2015
Calder Rail Bridge	TI Coatings	2014
Spey Viaduct	TI Coatings	2014
Store St, Manchester	Pyeroy	2014
Western Approach Viaduct (WAS)	Severfield UK	2014
Barnsley Interchange	Pyeroy	2013
Blackpool Rail Bridge	APB Construction	2013
Bridge 88 - Blackpool	Pyeroy	2013
Brookhouse/Slade Hooton - Rotherham - BKS-27	Pyeroy	2013
Chapeltown - Sheffield	Pyeroy	2013
Cross Lane - Gateshead	Pyeroy	2013
Fortyfoot Bridge - Bridlington	Pyeroy	2013
Hemsworth	Pyeroy	2013
Huddersfield Canal - Marsden	Pyeroy	2013
Langley Moor	Pyeroy	2013
Leeds/Liverpool Canal - Shipley	Pyeroy	2013
Maple St - Hull	Pyeroy	2013
Newton Aycliffe - DAE1-9	Pyeroy	2013
Pitsmoor Rd - Sheffield	Pyeroy	2013

Network Rail bridges track record

Bridge	Contractor	Date
River Aire - Skipton	Pyeroy	2013
Southport Rail Bridge	APB Construction	2013
Thorpe Marsh Drain - Doncaster	Pyeroy	2013
Aromax Bridge	CSL	2012
Blackfriars Bridge	Pyeroy	2012
Dinting Vale Viaduct	TI Coatings	2012
East Croydon Footbridge	Jack Tighe Ltd	2012
Fishergate Railway Bridge - Preston	TI Coatings	2012
Great Lime Street	Story Rail/E&P	2012
Marlborough Bridge - Spondon	MSD	2012
Marykirk Viaduct	TI Coatings	2012
OCC Thompson Bridge	Murphy Group	2012
Royal Albert Bridge	TI Coatings	2012
Stillington Bridge	Story Rail/Pyeroy	2012
Arnside Viaduct	Fairfield Mabey	2011
Hampsons Green	TI Coatings	2011
Hampsons Lane	TI Coatings	2011
Mottram Viaduct	TI Coatings	2011
Tennison Rail Bridge	Severfield UK	2010
Weston Mill Viaduct	TI Coatings	2010
Burton-upon-Trent footbridges	ICS	2009
Rannoch Moor Viaduct	TI Coatings	2009
Roodee Viaduct - Chester	TI Coatings	2009
Wavertree Tech Park - Liverpool	TI Coatings	2009
Liskeard Viaduct	Jack Tighe Ltd	2008
Teignmouth Bridge	SWB	2008
Croxton Road footbridge	Coastground	2007

Network Rail bridges track record

Bridge	Contractor	Date
Elwy footbridge	Fairfield Mabey	2007
Leven Viaduct	Fairfield Mabey	2007
Kettering Station footbridge	Meldan Fabrications	2006
River Don Bridge - Sheffield	Fairfield Mabey	2006
Kilburn Bridge (LUL)	Strada	2005
Newcastle High Level Bridge	Pyeroy	2005
Swinegate Bridge - Leeds	Spencers	2003
Tay Rail Bridge	Palmers/TI Coatings	2003
Acton Grange Bridge	Jack Tighe Ltd	2002
Princess of Wales Bridge - Teeside	TNT Coatings	2002
Rockley Sands Viaduct	Dyer & Butler	2002
Forth Rail Bridge	Pyeroy/Palmers	2001





Network Rail stations track record

Station	Contractor	Date
Calverly Bridge	Pyeroy	2015
Birmingham New Street	MCL	2014
Manchester Victoria	Severfield UK	2014
Nottingham	Bagnalls	2013
Paddington - London	TI Coatings	2013
Waterloo Int. Station	Walker Construction	2013
Blackfriars Bridge	Pyeroy	2012
East Croydon	Watsons	2012
Farringdon Station	CLC	2012
Leicester	Bagnalls	2012
Preston	Bagnalls	2012
Barrow-in-Furness	ARM4	2011
Loughborough	Bagnalls	2011
Swindon	TI Coatings	2011
Workington	NSG	2011
Edinburgh Waverley	Palmers	2010
Huddersfield	CSL	2010
Kings Cross Suburban Station	DRH	2010
Marylebone Station	Wardle Painters	2010
Southfields - London	CLC	2009
Hatfield	CLC	2008
Selhurst Depot	Jack Tighe Ltd	2008
Earl's Court	CLC	2007
London St. Pancras	Sui Generis	2007
Witby	Meldan Fabrications	2007
Cleethorpes	Meldan Fabrications	2005
Waterloo Station	Mitie Lindsay	2005
Southport	Bagnalls	2004

Network Rail stations track record

Station	Contractor	Date		
Wemyss Bay	McLean & Spear	2004		
Doncaster	Meldan Fabrications	2003		
Railway lines (Scotland W.M.L) - Saltends	E&P	2003		
Sheffield	Meldan Fabrications	2003		
Canary Wharf	E&P	2002		
Durham	JD Painting	2002		
Newcastle	JD Painting	2002		
Blackburn	CSL	2001		
Bournmouth	Colebrand	2001		
York	J D Painting	2001		
Leeds	Manchester Blast	2000		





SHERWIN-WILLIAMS

Rail case studies

Protective & Marine Coatings

Sherwin-Williams has been involved in numerous projects both large and small. Each one presenting its own challenge where high performance coatings and innovative products have always been used.

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BLACKFRIARS RAIL BRIDGE STATION



ROYAL ALBERT BRIDGE



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ST PANCRAS INTERNATIONAL STATION



FORTH RAIL BRIDGE



TAY RAIL BRIDGE



Arnside Viaduct is a 51 span bridge that was originally built in 1856 and consisted of a single track rail line that connects Arnside with Cumbria over the Kent estuary near Morecambe Bay.

Subsequently this was widened to accommodate a second line and has undergone further maintenance over the years to strengthen the supports. The steelwork had deteriorated over the years to such an extent that the superstructure was in need of a complete replacement and had to be carried out during a 16 week closure to the line in the spring/summer of 2011.

The 477m long bridge is constructed of tubular cast iron piles which were subsequently encased in brickwork and concrete for additional protection and a superstructure that supported the Carnforth & Whitehaven line. which the project had to be completed, the superstructure was replaced with prefabricated deck girder units which were fabricated and painted at the Mabey Bridge facilities in Chepstow, South Wales and then transported to site in Cumbria for erection and installation.

Sherwin-Williams was asked to supply an anti-corrosion coating system that would protect the project for a minimum of 25 years in a saline environment (the project was only 7.9m above water level) Sherwin-Williams also provided an anti-slip deck coating for the superstructure modules which have proven track records in the North Sea offshore industry.

To help with the limited time frame in

Sherwin	-WILLIAMS Protective & Marine Coatings	
Bla	ckfriars rail	
bric	ige & station	
Requirements:	25 years protection against high humidity and salinity levels.	and
Specifications: Area coated:	Macropoxy L674, Macropoxy M922, Acrolon C137V2. 60,000 m ²	

As part of a five-year project, the task of protecting the existing Blackfriars rail bridge and the new station that runs along its length presented a specific challenge for Sherwin-Williams in that a common protective coating system for old and new steelwork was preferred.

With the River Thames below, inherent issues of dampness and humidity meant that the choice of coating would be of particular importance, because Network Rail specified a minimum service life of 25 years to first major maintenance.

The existing paintwork on the rail bridge was removed by abrasive blast-cleaning. A surface-tolerant epoxy coating system was used to meet the requirements of a C5M environment specification.

Anti-corrosion protective coatings of a higher build blast primer Macropoxy L674, an epoxy glass flake build coat Macropoxy M922 and an acrylic urethane finish Acrolon C137V2 as well as a stripe coat of epoxy glass flake were used on this project.

Earl's Court underground station

Requirements:15 years' life to first major maintenance for the structural steelwork.Specifications:Macropoxy M902, Macropoxy M905, Acrolon C137V2

The London Underground District Line first opened its tracks to Earls Court in 1869 and two years later, the first station was built. Numerous extensions had been made during the years, the last major project happening in 1960's.

In 2007, CLC Contractors Ltd. was asked to carry out a refurbishment of the roof structure, which entailed chemically stripping the exiting paint off the steelwork followed by mechanical preparation prior to reapplying a new paint system to provide 15 years life to first major maintenance.

This was complicated by the fact that there were around eight layers of old paint to remove, some of the exiting coatings contained lead, the station had to be kept open and the glazing had to be removed which meant that the ambient conditions would not be ideal for painting in the colder months.

Sherwin-Williams was asked to supply an anti-corrosion coating system for the project that would satisfy the TFL requirements and provide protection for a minimum period of 15 years to next major maintenance. The paint system would also have to be suitable for curing in cold temperatures during the winter months, exacerbated by the removal of the glazing.

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tective & Marine Coatings

Forth Rail Bridge

Requirements:	To provide 25 years protection in a highly corrosive environment.
Specifications:	Transgard TG223, Transgard TG123 and Acrolon C137V2.
Area coated:	230,000 m ²

An incredible 119 years old, the Forth Rail Bridge was constructed from 53,000 tonnes of steel. Standing 110m high and 2,467m in length, the structure requires enough protective coating to cover 230,000 square metres of steel.

Subject to coastal conditions with moderate to high salinity the steel of the Forth Rail Bridge needs to be protected against a very aggressive environment; including high winds and sea mists. Network Rail required a system that would provide a minimum of 25 years protection against corrosion.

After careful consideration and detailed discussions, Railtrack (now Network Rail) opted for a glass flake epoxy based system, which could be applied to a higher film build, resulting in a system comprising of three coats compared with the four coats of an epoxy MIO system.

The selected system consists of a higher build blast primer (Transgard TG223), an epoxy glass flake build coat (Transgard TG123) and an acrylic urethane finish (Acrolon C137V2), as well as a stripe coat of epoxy glass flake.

Sr C C		nche oria	este rai	r Sta	atio		
Red	quirements:	25 years' life to first i	major maintenance	e for the structural ste	eelwork.		
Are	ecifications: ea coated:	Macropoxy L574, Macropoxy L574	acropoxy C123, Ac	crolon C137V2.		A	

Manchester Victoria raliway station was first built in 1844 and was further developed in seven phases up to 1909. During 2013-2015, the station was redeveloped as part of a £44M overhaul to allow increased passenger use from 20,000 to the current 40,000 a day.

The project involved the repainting of some existing steelwork, but a large proportion of the project involved the painting and erection of new steelwork to form the futuristic new "glass bubble" roof, a new bridge and general structural steelwork. The new 8,500m² roof is constructed from 15 separate "ribs", the largest of which is 95 metres in length and weights over 80 tonnes. Sherwin-Williams was asked to supply an anti-corrosion coating system for the project that would satisfy the Network Rail specifications and provide protection for a minimum period of 25 years to next major maintenance. A high performance system is necessary on a structure such as the roof, as access for any maintenance would be awkward due to the logistics and operations of a fully functional railway station.



The Royal Albert Bridge is one of legendary engineer Isambard Kingdom Brunel's most famous creations.

A railway bridge spanning the River Tamar between Devon and Cornwall, it boasts a unique design featuring two 139m lenticular iron trusses positioned 30m above the water.

Completed in 1859 and opened by Prince Albert, it now stands as a monument to its creator and still carries trains between the two counties across its 666.8m span.

The bridge stands in an aggressive environment with relatively high levels of

humidity and salinity from the tidal river below. Network Rail required a 25 years' anti-corrosive paint protection system.

Based on the protection afforded on other major bridge protection schemes including the Forth and Tay Rail Bridges, Network Rail specified a glass flake epoxy system. The Principal Contractor, Taziker Industrial Limited from Horwich, Bolton, UK, selected Sherwin-Williams as its paint supplier.



Serving over 6.5M passengers each year, the undercroft area at St. Pancras International Station includes 680 cast iron columns, cross members and buckle plates, all of which require 60 minutes fire protection. These cast iron columns support the rail deck and platforms for the Eurostar trains, and house a number of shop units and cafés.

With St. Pancras replacing Waterloo Station as the London end of the Eurostar, the decision was taken to refurbish the Main Train Shed. The paint had to protect and decorate the 140 year old structure, matching the English Heritage's original colours.

The new 'train shed' was constructed to replace the existing one whilst the maintenance work was carried out. Now complete, the train shed will become the terminal set to serve trains from the North. This project required a coating specification to give at least 25 years anti-corrosion protection, 60 minutes passive fire protection to a preferable finish.



The Tay Rail Bridge spans the Firth of Tay, linking the city of Dundee to Fife. It plays a key role in the region by carrying the Great North Eastern Railway. It took just five years to build and set new engineering standards for bridge building at the time. When it opened in 1887 it brought increased travel and trade opportunities to the east coast of Scotland.

The bridge was built to replace an earlier structure, which was destroyed by a gale in 1879 in what was Britain's worst rail disaster. The current structure is 3,265 m in length and includes 85 cast iron piers that support a steel deck. Construction included 25,000 tons of cast iron and steel, 70,000 tons of concrete, ten million bricks and three million rivets.

The bridge stands in an aggressive environment with high levels of humidity and salinity from the tidal Firth below. Network Rail required 25 years anti-corrosion paint protection system. Based on the protection afforded on other major bridge protection schemes including the Forth Rail and Royal Albert Bridges.

	SHERWIN	-WILLIAMS. Protective & re- Middle East & Africa
		verley a
4	rail	station
	Requirements:	To provide anti-corrosion protection for a minimum period of 25 years.
	Specifications:	Principally Network Rail Protective System M24/049. Calton Road Footbridge was repainted with Network Rail Protective System M34. All new steelwork was coated with Network Rail Protective System N13/008.
	Area coated:	50,000 m ²

Edinburgh Waverley railway station is the main station in the Scottish capital. Covering an area of more than 101,000 m² (25 acres) in the centre of the city, it is the second-largest main line railway station in the United Kingdom in terms of area, and is both a terminal station and a through station, in contrast to most of the major London stations.

It is one of 19 stations managed by Network Rail and is the northern limit of the East Coast Main Line, although through-services operate to Glasgow, Dundee, Aberdeen, Perth and Inverness. Waverley is the second busiest railway station in Scotland after Glasgow Central and the 20th busiest in the United Kingdom.

The major challenge was to prepare and repaint all the iron work without inconveniencing passengers and disrupting the day to day running of this very busy railway station. Not all areas could be abrasive blast-cleaned so the contractor, Xervon Palmers, required a protective system that was suitable for blast-cleaned and mechanically prepared iron work. Also, it wasn't possible to spray apply the paint to all areas so a system that could be applied by brush and spray was required.

Highways infrastructure



SPECIFICATIONS



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CERTIFICATES



CASE STUDIES



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Highways specifications





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Highways Agency protective systems for new steelwork

Sherwin-Williams has a full range of products that are approved to the Highways Agency standards which are suitable for its new construction specifications.

Item No.	Approved Highways Agency products					
109	Zinc Clad M501	-				
110	Transgard TG110	-				
111	Transgard TG111V2	-				
112	Macropoxy C267V3	-				
121	Macropoxy K267	-				
123	Macropoxy M922 (Transgard TG123)	Macropoxy C123				
155	Mordant Wash L703	-				
167	Acrolon C750V2	-				
168	Acrolon C137V2 (Transgard TG168)	-				
169	Transgard TG169	-				

For details of systems for bearings, please contact Sherwin-Williams technical customer support.

Туре		Metal coating	1st Coat	2nd Coat	3rd Coat	4th Coat	Min total DFT of the paint system (µm)	
I	Item No		109	112	167, 168, 169		275	
	Min DFT per coat (µm)		50	125	50			
	Item No		111	112	167, 168, 169		300	
	Min DFT per coat (µm)		75	125	50			
Ш	Item No		109	112	112	167, 168, 169	400	
	Min DFT per coat (µm)		50	125	125	50		
	Item No		110	123	167, 168, 169		525	
	Min DFT per coat (µm)		25	400	50			
	Item No		111	112	112	167, 168, 169	425	
	Min DFT per coat (µm)		75	125	125	50		
ш	Item No		109	112			200	
	Min DFT per coat (µm)		50	125				
	Item No		111	112			225	
	Min DFT per coat (µm)		75	125				
IV	Item No	Hot dip galvanize	155 or sweep blast	55 or sweep 110, 112 or 121 blast		167, 168, 169	2nd Coat item 110: 225	
	Min DFT per coat (µm)			25 (item 110) or 125 (items 112 or 121)			2nd Coat items 112 or 121: 350	

Highways Agency protective systems for maintenance

Sherwin-Williams has a full range of products that are approved to the Highways Agency standards which are suitable for its maintenance specifications.

Item No.	Approved Highways Agency products					
112	Macropoxy C267V3	_				
115	Transgard TG115	Macropoxy M902				
116	Transgard TG116	Macropoxy M905				
121	Macropoxy K267	_				
155	Mordant Wash L703	-				
168	Acrolon C137V2 (Transgard TG168)	-				
169	Transgard TG169	_				

Туре	Substrate type	Surface preparation		1st Coat	2nd Coat	3rd Coat	Min total DFT of the paint system (µm)
I (M) – High	Steel	Clean, bright	Item No	115	116	168 or 169	300
(two-pack)/		quality steel	Min DFT (µm)	100		50	
Polyurethane (two-pack) finish	Aluminium	Bright or	Item No	115	116 or 112	168 or 169	
	metal spray, zinc metal spray	coating	Min DFT (µm)	100		50	300
	Existing paint coats	Sound finishing coat or last undercoat Other sound coats	Item No	Nil	Nil	168 or 169	50
			Min DFT (µm)	-	-	50	
			Item No	Nil	116 or 112	168 or 169	
			Min DFT (µm)	-	100	50	
III (M) –	Hot dip	Bright or	Item No	155	121	168 or 169	
Extended cure epoxy/ Polyurethanes	gaivanizing	sound metal coating	Min DFT (µm)		100	50	175/250
III (M)	Hot dip	Bright or	Item No	121	168 or 169		
(alternative) – Extended cure epoxy/ Polyurethanes	gaivanizing	coating	Min DFT (µm)	100	50		300





Highways track records





HIGHWAYS AGENCY BRIDGES

Highways Agency bridges track record

Bridge	Contractor	Date
Tamar Bridge - Maintenance	TI Coatings	2015
Salford Swingbridge	CSL	2014
Erskine Bridge	Gabriel Hughes	2013
Farringdon Bridge	Gabriel Hughes	2013
Hull Swingbridge	Qualter Hall	2013
Wilford Toll Bridge - Nottingham	John's of Nottingham	2013
A666 footbridges & gantries	Powerprep	2012
Blackfriars Bridge	Pyeroy	2012
London Cable car bridge	Severfield UK	2012
St. Asaph	Bagnalls	2011
Bascule Bridge, Liverpool	Bagnalls	2010
Finneston Bridge	MCL	2010
Sheepwash Bridge - Northumberland	Matatec	2009
Tower Bridge	Pyeroy	2009
A58(M) Flyover - Leeds	Superblast	2008
Bilston Wishbone Bridge A41/A4150	Hardyman & Co	2008
Newport SDR Usk Viaduct	Fairfield Mabey	2008
Sir Howey Bridge	Fairfield Mabey	2008
Ravenglass Viaduct	Superblast	2007
Swale Bridge - Isle of Sheppey	Fairfield Mabey	2006
Humber Bridge	Colas	2005
Darrington to Dishforth Relief Road	Fairfield Mabey	2004
A47 Hardwick Roundabout Bridge	Fairfield Mabey	2003
Cottingley Viaduct	Fairfield Mabey	2003
Foyle Bridge	Pyeroy	2003
Lesbury Bridge	Fairfield Mabey	2003
Tinsley Viaduct	Interserve Industrial Services	2003
Avonmouth Bridge	Interserve Industrial Services	2002



Highways Agency bridges track record

Bridge	Contractor	Date
Barton Bridge	Colebrand	2002
M6 Toll Road Bridges (46 bridges)	Fairfield Mabey	2002
Marlow Suspension Bridge	Southern Contracting Services	2002
A27 Adur Viaduct - Shoreham	Interserve Industrial Services	2001
Clifton Suspension Bridge	CSST & Ian Williams	2001
A1 to M1 link Bridges (8 bridges)	Cleveland Bridge	1999



Highways case studies

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Below are a selection of shortened overviews. Download the more indepth case studies here.









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SWALE CROSSING
SHERWIN-WILLIAMS Protective & Marine Coatings Europe, Middle East & Africa

M5 Avonmouth road bridge

Jan Barris		
Requirements:	20 years' external corrosion protection.	
Specifications:	Transgard TG111V2 (Zinc phosphate primer/buildcoat), Transgard TG112 (Epoxy MIO buildcoat), Transgard TG169 (Sheen acrylic urethane topcoat).	
Area coated:	110,000 m²	

Avonmouth Bridge is a twin box girder cantilever type bridge that spans the river Avon between junctions 18 and 19 of the M5 motorway and was opened to public traffic in 1974. Originally it was built as a three-lane highway with a cycle and footpath also attached.

The bridge is 1,388m long, 40m wide, 30m high and spans 174m over the river Avon estuary. There are eighteen spans in all, ten on the north side and eight on the south side.

The bridge was built so that traffic travelling to and from the south-west of England could bypass the city of Bristol. An increase in traffic necessitated widening and strengthening of the bridge in the 1990's to cope with the

extra load imposed on it. In 2002, a painting programme was undertaken to completely repaint the external surfaces of the bridge. Sherwin-Williams was asked to supply a Highways Agency compliant anti-corrosion coatings system for the project that would protect the steelwork for a minimum period of 20 years to first maintenance.

SHERWIN-WILLIAMS.

Requirements:

Specifications:

Area coated:

M6 Toll road bridges

25 years' external corrosion protection.

Transgard TG110, Transgard TG123, Acrolon C137V2.

The M6 toll road was opened in 2002 to allow traffic an alternative route to the very congested section of the M6 around Birmingham from junctions 3A to 11A, which is the busiest section of the M6.

The toll road is a 27 mile long stretch of a standard three lane motorway which incorporates ten junctions and as part of its construction required a total of 58 bridges to be fabricated to support the project. Forty six of these overbridges utilised structural steel elements that required the application of anticorrosive protective coatings.

46 Bridges in total.

The majority of the bridges span the toll road and were constructed from large I-section

girders and cross beams. The use of de-icing salt/grit on the roads during winter and the associated wet spray, creates an aggressive marine type micro-climate.

Sherwin-Williams recommended a nonstandard Highway Agency paint system based on glass flake epoxy, which has an excellent track record in the offshore industry, to protect the structures.

	Tinsley Viaduct	
Requirements:	20 years' external corrosion protection and anti-corrosive protection to the internal of the box girders.	
Requirements: Specifications:	20 years' external corrosion protection and anti-corrosive protection to the internal of the box girders. Transgard TG111V2 (Zinc phosphate primer/buildcoat), Transgard TG112 (Epoxy MIO buildcoat), Transgard TG169 (Sheen acrylic urethane topcoat).	

Tinsley Viaduct is a two-tier steel box girder road bridge which was the first of its kind in the UK. The bridge crosses the Don Valley between the split junction 34 of the M1 motorway. It spans the River Don, the Sheffield canal, as well as road and rail lines, with the upper tier carrying the M1 motorway and the lower tier the A631 road directly underneath.

The bridge is 1,033m long, approx 30m wide and 20m high from the top tier and includes a 50m span which is the longest of twenty.

SHERWIN-WILLIAMS. Protective & Marine Coatings Europe, Middle East & Africa

The bridge was built in 1968 and cost around £6 million to build. At that time, there had been some high-profile failures of bridges of this type of construction, so further strengthening work was carried out to reinforce the bridge in 1983. Due to new EU legislation regarding the carrying of 40-tonne vehicles, an additional strengthening and painting programme was undertaken in 2003. The bridge required a paint system that would last up to 20 years before another major maintenance would be required.

Sherwin-Williams was asked to supply anticorrosion coatings systems that complied with Highways Agency standards.

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Swale Crossing

			1
Requirements:	20 years' external corrosion protection to the structural steelwork.	A DESCRIPTION OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER	
Specifications:	TSA (thermally sprayed aluminium), Transgard TG159, Transgard TG111V2, Transgard TG112, Acrolon C137V2.		
Area coated:	Approximately 14,000 tonnes of structural steel.		

The Swale Crossing was built to connect the Kent mainland with the Isle of Sheppy in south east England, linking the M2 and M20 motorways with Sheppy via the A249.

The bridge is approximately 1,300m long, 21m wide, and its highest point stands 31m above ground level. The longest span is 92.5m as it crosses the Swale estuary, the old existing A249 and the local railway line.

The bridge is constructed from numerous I-section girders and cross beams and 15% of the steel came from recycled sources as this was an important aspect of the project. All of steelwork was fabricated and painted at the Mabey Bridge facilities in Chepstow, South Wales then transported to site in Kent for erection although minor repairs and field joint repairs were carried out at site.

Sherwin-Williams was asked to supply an anti-corrosion coating system for the project that would satisfy the Highways Agency specifications.



Tower Bridge has stood over the River Thames in London since 1894 and is one of the most recognisable landmarks in the world. It is the only bridge on the Thames which can be raised.

The original specification included total removal of the existing paintwork by abrasive blast-cleaning, this would have meant the bridge had to be closed for three months.

Transport for London wanted to keep the structure open to prevent disruption during the busy summer period and alternative ideas were explored.

Repainting from cradles could keep the structure open but blast-cleaning was not possible from cradles. After discussions,

a Network Rail approved system based on mechanical methods of surface preparation was agreed to remove all unsound existing paintwork.

A surface-tolerant epoxy coating system was used to meet the requirements of a C5M environmental specification.

Protective coatings for anti-corrosion of Macropoxy M902, Macropoxy M905 and Acrolon C137V2 were used in this project.

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Protective & Marine Coatings

DURA-PLATE[™] 301W SURFACE TOLERANT





PRODUCT INFORMATION

PRODUCT **D**ESCRIPTION

DURA-PLATE® 301W is a low temperature curing, surface and humidity tolerant two-pack modified epoxy. It can be applied without dew point restrictions and over wet steel surfaces. 301W shows good chemical and abrasion resistance and good edge-retentive properties. It can be applied over steel prepared by hydroblasting, grit blasting or mechanical tooling.

tooling. Excellent edge retention

- · No dew point or relative humidity restrictions
- Excellent anticorrosive properties
- · Can be applied over wet substrates
- Can be applied over medium flash rust
- · Excellent substrate and intercoat adhesion

ENDORSEMENTS

Dura-Plate 301W is approved for Network Rail maintenance specification.

Certificate No's XM92-M34-197, XM92-M34-200, XM92-M34-201.

P RODUCT C HARACTERISTICS	
Finish:	Semi-gloss
Colour:	Limited range
Volume Solids:	97 ± 3%
Weight Solids:	98 ± 2%
VOC (EPA Method 24):	<100 g/l; 0.83 lb/gl
Mix Ratio: Specific Weight:	7:3 by volume 1.3 kg/litre (may vary with shade).
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Theoretical Spreau	<u>ny kale per c</u>	<u>Ual.</u>
-	Minimum	Maximum
Wet microns (mils)	103 (4.1)	309 (12.3)
Dry microns (mils)	100 (4)	300 (12)
~Coverage m²/L (sq ft/gal)	9.7 (403)	3.3 (137)
This figure makes no allowance for	surface profile, u	uneven

application, overspray or losses in containers and equipment

Brush application may require mulitple coats to achieve maximum film thickness and uniformity of appearance.

	<u>Drying S</u>	<u>chedule</u>	
	@ 0°C/32°F	@ 10°C/50°F	@ 20°C/68°F
To touch:	21 hours	15 hours	4.5 hours
To recoat:			
minimum:	48 hours	24 hours	8 hours
maximum:	6 months	6 months	6 months
To handle:	48 hours	24 hours	20 hours
Pot life:	90 minutes	50 minutes	30 minutes

These figures are given as a guide only. Factors such as air movement and humidity must also be considered

Can be overcoated with Dura-Plate 301 Range for up to 6 months provided the surfaces to be coated have been suitably cleaned. For overcoating with polyurethane and epoxy topcoats, maximum recommended interval without abrasion is 28 days.

For overcoating with other products and/or outside of this window please contact Sherwin-Williams

Recommended Uses

DURA-PLATE 301W is an anticorrosive coating for long service life steel protection. It can be used for both immersion and above the waterline service in marine, offshore, construction and industrial applications.

It is suitable for new building, conversion, repair or maintenance applications. It provides superior performance protecting areas such as ballast tanks, void tanks, crude oil tanks, slop tanks, mud pits, wet spaces, bilges, decks, external hull and steel bridges.

Performance Characteristics

Test Name	Test Method	Results
	After application and curing	1740 - 2500 psi 12,0 - 17,2 MPa
Adhesion (Pull-off)	After 1000 hrs salt fog	1350 - 1550 psi 9,3 - 10,8 MPa
ASTM D4541	After 2000 hrs salt fog	1305 psi / 9,0 MPa
	After 1000 hrs condensation	1500 - 1800 psi 10,3 - 12,4 MPa
Atmospheric Exposure	12 months	Rust rating: 10 Blistering rating: 10 Scribe undercut: 1.0mm
Cathodic Disbonding	ASTM G8	Passes
Humidity Resistance	ASTM D4585, 1000 hrs. ASTM D4585, 2000 hrs.	ASTM D1654, Rating:10 No defects
Salt Fog Resistance	ASTM B117, 1000 hours ASTM B117, 2000 hours	D1654: Rating: 10 No defects
Shelf Life:	12 months, unopened Store indoors at 4.5° (100°F)	°C (40°F) to 38°C
Flash Point:	> 102°C (>212°F), mixed (A	STM D56)
Clean Up:	TH03	

	Recommended S	YSTEMS	
		Dry Film Th <u>Microns</u>	ickness / ct <u>(Mils)</u>
Immersion 1-2 cts.	on or Atmospheric DURA-PLATE 301W	100-300	(4-12)
1-3 cts.	DURA-PLATE 301W	100-150	(4-6)
Atmosph 1-2 cts. * 1-2 cts.	n eric DURA-PLATE 301W Topcoat	100-150 50-100	(4-6) (2-4)
* Polyureth	nane and Isocyanate free topcoats	s from the	

The systems listed above are representative of the product's use, other systems may be appropriate, please contact Sherwin-Williams.













www.sherwin-williams.com/protectiveEMEA

This Data Sheet is specifically subject to the disclaimer which can be found at http://protectiveemea.sherwin-williams.com/Home/Disclaimer"



DURA-PLATE[™] 301W SURFACE TOLERANT



NEW SPECS











Revised 08/2016 Issue 9 PRODUCT IN	FORMATION
Application Conditions	SURFACE PREPARATION
Ambient Temperature: Minimum: 0°C/32°F	Surface must be clean and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.
Substrate Temperature: Minimum: 0°C/32°F Maximum: 50°C/122°F	DURA-PLATE 301W is tolerant to hydroblasted, wet or dry abrasive blasted or mechanically prepared surfaces.
Relative humidity: No restrictions	Abrasive blasting: Sa 2 ISO 8501-1:2007
APPLICATION EQUIPMENT	Hydroblasting: WJ-2M (SSPC-SP0/NACE 3) WJ-2M (SSPC SP12 – VIS4(I)/NACE
Airless Spray - GRACO KING 56:1 OR SIMILAR - ALL FILTERS	Mechanical Prepared: ST3 JSO 8501-1:2007
REMOVED - MIN 3/8" HOSE DIAMETER	(SSPC-SP3)
Nozzle Size: 17-21 thou (0.43 – 0.54mm)	Additional Cleaning Options:
Fan Angle: 60° - 80°	tolerance of D301W allows for a clean water surface washing
Operating Pressure: 3500-3900 psi (246-274kg/cm ²)	to iron oxide allows the coating to be applied to a flash rusted
The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint emperature and job shape and size all have an effect on he spray tip and operating pressure chosen. However, the	surface (equivalent to M degree as described at SSPC VIS4 (I) / NACE N°7 standard). Recoating over old paints in good condition: D301W in most
perating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.	Adhesion to existing coating should be tested in a small area, before painting. Also, the adhesion of the old material should be verified. All loose materials should be removed. Please contact Sherwin-Williams to evaluate surface preparation alternatives. Acceptable cleaning and degreasing the surface is required.
Brush The material is suitable for brush application, as a stripe coat or for touch up of small areas @ 75µm dft maximum.	Abrading the old coating surface, to promote adhesion, is also recommended. Tolerant to application to surfaces which may be wet at the
Application of more than one coat will be necessary to give equivalent dry film thickness to a single spray applied coat.	time of application. An acceptable 'wet' surface is defined as a surface on which a thin, even film of moisture is present, but is free from running water, droplets or pooled water. An acceptable
Additional Notes	wet condition can be field tested by drawing a "V" the size of a hand in a vertical substrate. If this causes water to drip or run
Epoxy Coatings - Colour Stability: Variable colour stability is a feature of epoxy materials which end to yellow and darken with age whether used on internal or external areas. Therefore any areas touched-up and repaired	down the surface then the water load in the surface is too high ("saturated"). If not, it is considered "wet" and it is acceptable to apply Dura-Plate 301W".
with the same colour at a later date may be obvious due to this colour change.	Condition of ISO 8501-1 Swedish Std.
When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance	SurfaceBS/0/9:A1StopsoulSSPCNACEWhite MetalSa 3Sa 3SP 51Near White MetalSa 2.5Sa 2.5SP 102Commercial BlastSa 2Sa 2Sa 2SP 63Brush-Off BlastSa 1Sa 1Sa 1Sp 74Hand Tool CleaningRustedC St 2C St 2SP 2-
of the system.	Rusted C St 3 C St 3 SP 3 -
ORDERING INFORMATION 16 litre (20.8kg) kit: Part A: 11.2 litres in a 20 litre container	Power Tool Cleaning Pitted & Rusted D St 3 D St 3 SP3 -
Part B: 4.8 litres in a 5 litre container	Health and Safety
Part A: 2.8 litres in a 5 litre container Part B: 1.2 litres in a 2.5 litre container	Consult Product Health and Safety Data Sheet for information on safe stor- age, handling and application of this product.
WARRANTY	
Any person or company using the product without first making further enquiries as o the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or or any loss or damage arising out of such use.	
The information detailed in this Data Sheet is liable to modification from time to ime in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the atest issue.	
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EPIDEK[™] M153 **EPOXY DECK COATING**



SPECS

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NEW SPECS

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Revised 01/2016 Issue 19	

PRODUCT INFORMATION

	Average Drying Times
Aggregate dressed, ultra heavy duty, hard wearing, coal tar free, solvent-less epoxy anti-slip deck coating.	, @ 15°C @ 23°C
R ECOMMENDED USE	To recoat: 6 hours 5 hours
For the treatment of deck surfaces subject to the most	To handle: 20 hours 14 hours
extreme of operational conditions requiring a high degree of	Pot Life: 1½ hours 1 hour
impact and abrasion resistance; where a high level of anti-slip properties need to be retained under conditions of severe crude oil and hydrocarbon contamination.	These figures are given as a guide only. Factors such as air movement and humidity must also be considered.
Endorsements	Recommended Primers / Topcoats
Complies with NORSOK M501 (Rev.5) System 4	-
Recommended Application Methods	 Macropoxy C425V2 Zinc Phosphate Primer/Buildcoat Macropoxy L425 Zinc Phosphate Primer
Trowel(see overleaf)	Macropoxý M262 Hi-Build Finish
Recommended Cleanser/Thinner: No 5	Раскаде
P RODUCT C HARACTERISTICS	A two component package comprising Component 'A' and 'B'
Flash Point: Base : 14°C Additive : 14°C	Component A (20 litre pail): Containing 12.6 litres base screed
% Solids by Volume: 95 ± 2% (ASTM-D2697-91)	unit comprising epoxy resin base, curing agent and fine silica grit.
Colour Availability: Dark Grey and Green	Component B (nylon sack); Containing 25kg calcined bauxite
VOC	Deels Offers
42 gms/litre determined practically in accordance with UK Regu- lations PG6/23	- Pack Size: 12.0 litre unit when mixed
42 gms/litre calculated from formulation to satisfy EC Solvent	Mixing Ratio
Emissions Directive	Weight: 1.84 kg/litre (may vary with shade).
Solvent Emissions Directive	Shelf Life: 2 years from date of manufacture or
Recommended Thickness	- Ose by date where specified.
Dry film Wet film Theoretical	
3000 microns 3158 microns 0.32 m ² /ltr*	
*This figure makes no allowance for surface profile, uneven	
*This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equip- ment. Film thickness will vary depending on actual use and specification.	
*This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equip- ment. Film thickness will vary depending on actual use and specification. PRACTICAL APPLICATION RATES -	
*This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equip- ment. Film thickness will vary depending on actual use and specification. PRACTICAL APPLICATION RATES - MICRONS PER COAT	
*This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equip- ment. Film thickness will vary depending on actual use and specification.	
*This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equip- ment. Film thickness will vary depending on actual use and specification.	

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Protective & Marine **Coatings**

EPIDEK[™] M153 EPOXY DECK COATING



Revised 01/2016 Issue 19

PRODUCT INFORMATION

1

SURFACE PREPARATION

Material should be applied direct to blast cleaned steel prepared to a minimum standard of Sa21/2 BS EN ISO 8501-1:2007. Average surface profile in the range 50-100 microns.

Ensure surfaces to be coated are clean, dry and free from all surface contamination.

For application on other surfaces such as concrete, please consult Sherwin-Williams

APPLICATION EQUIPMENT

Trowel

Thoroughly mix contents of epoxy resin and curing agent containers of Component 'A' to a homogeneous consistency. The fine silica grit of Component 'A' must then be added and mixed using a suitable power stirrer until homogeneous. The mixed screed is applied and spread, using a trowel or float, after pouring onto the substrate, to an even wet film thickness of 3mm, using a wet film gauge to monitor the application. The

screed must be applied in one application. Within 10-20 minutes (depending on temperature) of applying the base screed Component 'A' it must be dressed using the contents of Component 'B'. The method is to scatter the dressing aggregate onto the screed until it is fully saturated to excess and no screed appears visible.

After 24 hours curing at a minimum temperature of 10°C, excess dressing aggregate is removed normally by sweeping using a stiff bristled yard brush. Provided it is dry and free from other contamination excess aggregate may be re-used.

APPLICATION CONDITIONS AND OVERCOATING

It is preferred that whenever practical Epidek M153 should be applied directly on to blast cleaned steel to Sa21/2. M153 may be applied over an approved high build epoxy primer.

If applied over Macropoxy Blast Primer the primer thickness must be carefully controlled. The target DFT is 25µm but the maximum DFT applied must not exceed 40µm. If a high build primer is required please use one of those recommended on the front of this data sheet.

This material should preferably be applied at temperatures in excess of 10°C. In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not recommended.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Additional Notes

Drying times, curing times and pot life should be considered as a quide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Calcined Bauxite Aggregate

Four sizes of aggregate are available depending on degree of anti-slip properties required and end use:-

- Light Aggregate (0.85 1.70mm) Medium Aggregate (1.40 2.00mm) Heavy Aggregate (1.40 2.80mm) 2. 3. 4.

 - Road Aggregate (3.00 5.00mm)

N.B. Consumption of aggregate will depending upon screed thickness, efficiency of excess aggregate recovery and recycling. For guidance on quantities of aggregate consult sheet entitled Epigrip M153 Supplementary Information.

Overcoating

If it is felt desirable to overcoat the surface of Epidek M153 Heavy Duty Deck Coating or to mark surfaces with a different colour this may be achieved by the application of a coat of Macropoxy M262 Hi-Build Finish. Numerical values quoted for physical data may vary slightly from batch to batch

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

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Protective & Marine Coatings Europe, Middle East & Africa

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Protective & Marine **Coatings**

MACROPOXY[™] C123 **EPOXY GLASS FLAKE**

Average Drying Times

@ 23°C

21/2 hours

21/2 hours

12 hours

These figures are at 250µm dry and are given as a guide

@ 15°C

4 hours

8 hours

18 hours

FORMERLY KNOWN AS EPIGRIP C123



Revised 02/2016 Issue 9

PRODUCT INFORMATION

To touch: To recoat:

To handle

P RODUCT D ESCRIPTION
A high solids 2-pack epoxy, pigmented with glass flake and
anti-corrosive
Recommended Use

Anti-corrosive protection of blast cleaned steel. Especially suitable for steel structures, bridges and infrastructure in aggressive atmospheric conditions

ENDORSEMENTS

Network Rail Item 7.2.3. Highways Agency Item No. 123

Recommended Application Methods

Airless Spray

Brush (for stripe coat and touch-up only)

Recommended Cleanser / Thinner: No 2

PRODUCT **C**HARACTERISTICS

Flash Point: Base: 40°C Additive: 41°C

% Solids by Volume: 83±4% (ASTM-D2697-91) Pot Life: 1hour at 23°C 30 mins at 35°C

Colour Availability: Limited range

voc

131 gms/litre determined practically in accordance with UK

Regulations PG6/23

161 gms/litre calculated from formulation to satisfy EC Solvent Emissions Directive

107 gms/kilo content by weight from formulation, to satisfy EC Solvent Emissions Directive

Recommended Thickness

Dry film thickness	Wet film thickness	Theoretical coverage
250 microns	301 microns	3.3m ² /ltr*
400 microns	482 microns	2.1m²/ltr*

Maximum sag tolerance typically 720µm wet (600µm dry) by

*This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification

PRACTICAL APPLICATION RATES - MICRONS PER COAT

	Airless Spray	Brush	
Dry	400*	250	
Wet	482	302	

only. Factors such as air movement and humidity must also be considered				
F	Recommended Primers			
Compatable with Epoxy primers an	Compatable with a wide range of Macropoxy, Zinc Clad Epoxy primers and buildcoats.			
R	ECOMMENDED TOPCOATS			
Indefinitely self o suitably cleaned. epoxy topcoats, ov atmospheric exp C137V2 within 7 the case of Acrol overcoating times at 23°C and will va the above parame Williams for advic	vercoatable provided the coating has beer For optimum intercoat adhesion with othe vercoating should occur within 14 days. Where osure is required, overcoat with Acrolor days at a minimum dft of 50 microns or ir on C750V2 overcoat within 4 days. These refer to achievement of optimum adhesion ary with temperature. For overcoating outside ters and with alkyd systems, consult Sherwin e			
	Package			
A two component material supplied in separate containers to be mixed prior to use. Pack Size: 20 litre and 5 litre units when mixed				
Mixing Ratio	4 parts base to 1 part additive by volume.			
Weight:	1.52 kg/litre (may vary with shade).			
Shelf Life: 2 years from date of manufacture or 'Use By' date where specified				

















Protective & Marine **Coatings**

MACROPOXY[™] C123 EPOXY GLASS FLAKE

FORMERLY KNOWN AS EPIGRIP C123

Revised 02/2016 Issue 9

PRODUCT INFORMATION

Protective & Marine Coatings

SURFACE PREPARATION

Blast clean to Sa21/2 (ISO 8501-1:2007). Average surface profile in the range 50-100 microns.

Ensure surfaces to be coated are clean, dry and free from all surface contamination

Macropoxy L574 or Macropoxy M111 should be specified where there is a requirement for a blast primer. Other blast primers should not be used without reference to Sherwin-Williams.

APPLICATION EQUIPMENT

Airless Spray	
Nozzle Size	: 0.48-0.58mm (17-23 thou)
Fan Fan Angle	: 40°

: 235kg/cm² (3360 psi) **Operating Pressure**

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

N.B. C123 is capable of being applied by brush at 250 microns dft as a stripecoat, or for touch up of small areas.

APPLICATION CONDITIONS AND OVERCOATING

In conditions of high relative humidity ie 80-85%, good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired

Application at ambient air temperatures below 5°C is not recommended

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing. If it is desired to overcoat outside the times stated on the data sheet. please seek advice of Sherwin-Williams

ADDITIONAL NOTES

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Epoxy Coatings – Colour Stability Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age whether used on internal or external areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change. When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use Epoxy paints at the time of mixing should not exceed a temperature of 35°C. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem.

The maximum air and substrate temperature for application is 50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc, can occur within the coating.

Numerical values guoted for physical data may vary slightly from batch to batch.

HEALTH & SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use

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Revised 01/2016 Issue 2

Protective & Marine Coatings

MACROPOXY[™] C267V3 **EPOXY UNDERCOAT/MIO**

FORMERLY KNOWN AS EPIGRIP C267V3 MIO

PRODUCT INFORMATION

	PRODUCT DE	SCRIPTIC	ON		Average	E D RYING	Times
A high solids 2-pa	ick epoxy, pigmer	nted with	micaceous iron		@ 15°C	@ 23°C	@ 35°C
	-			To touch:	1¼ hours	45 minutes	30 minutes
	RECOMMEN	DED U SE	Ξ	To recoat:	6 hours	4 hours	2 hours
As an undercoat i	n conjunction wit	ו high pe	erformance primers	To handle	10 hours	6 hours	3 hours
	Endorse	MENTS		These figures a	are given a	s a guide or	ly. Factors such as air
HA Item No 112				movemen			so be considered.
R есом	MENDED APPL	ICATION	Methods	Compatable with	RECOMM		IMERS
Airless Spray				primers and build	dcoats.	rige of Maci	ороху, иле стаб Ероху
Conventional Spra Brush Bollor	ay			I	Recomme	ENDED TOP	PCOATS
				Indefinitely over	coatable w	ith epoxy sy	stems provided the
Recommended Th Cleanser/Thinner N	No 5 (for thinning)			surfaces to be o	coated hav	e been suit	ably cleaned. Where a
Cleanser/Thinner N	No 9 or No13 (for c	leaning)		with Acrolon C13	37V2. Acro	lon C237. A	crolon 1850 and Acrolon
P	RODUCT C HAR	ACTERIS	STICS	7300 within 7 day	ys at a mini	mum dft of 5	0 microns or in the case
Flash Point: Ba	se : 32°C	Additive	e : 23°C	of Acrolon C750	V2 overco	at within 4 d	ays. These overcoating
% Solids by Volu	ime: 78 ± 3% (As	3TM-D269	97-91)	will vary with ter	nevement	or optimum	adhesion at 23 C and
Pot Life: 2hrs @1	5°C, 1½ hrs @ 23°0	C, 1hr @ 3	5°C		F	ACKAGE	
Colour Availabili	ty: Grey MIO, Da	Irk Grey N	AIO		•	ACNAGE	
voc				A two compone	ent material	I supplied in	separate containers
203 gms/litre determined practically in accordance with UK		To be mixed prior to use. Pack Size: 18 litre and 5 litre units when mixed					
250 gms/litre calc	ulated from form	lation to	satisfy EC Solvent		10 1110		
=missions Directi 120 gms/kilo cont Solvent Emission	ve ent by weight from s Directive	n formula	ation, to satisfy EC	Mixing Ratio	4 parts	s base to 1 p	art additive by volume
Solvent Emission		THICK	1500	weight.	2.00K	g/inte (may v	ary with shade)
	XECOMMENDED		1233	Shelf Life:	12 months from date of manufacture or 'Use By' date where specified		
Dry film thickness	Wet fil thickne	m	Theoretical coverage				
125 microns	s 160 micr	ons	6.24m²/ltr*				
*This figure mal application, ove ment. Film thic specification	kes no allowance rspray or losses kness will vary d	 for surfa in contai epending 	ace profile, uneven iners and equip- g on actual use and				
P RACTICAL A	PPLICATION R	ATES - N	ICRONS PER COAT				
Airless Sprav	Conventional Sprav	Brush	Roller				
Dry 125*	125	**98	59				
Wet 160	160	125	75				
 Maximum sag t (200µm dry) by 	olerance with ove airless spray	rlap typic	cally 256µm wet				
'* Maximum sag t (140μm dry) by	olerance with ove brush.	≆rlap typic	cally 179µm wet				

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Protective & Marine **Coatings**

MACROPOXY[™] C267V3 EPOXY UNDERCOAT/MIO

FORMERLY KNOWN AS EPIGRIP C267V3 MIO



Revised 01/2016 Issue 2

PRODUCT INFORMATION

Protective & Marine Coatings

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all surface contamination

APPLICATION EQUIPMENT

Airless Spray	
Nozzle Size	: 0.46mm (15-19 the
Fan Angle	: 40°
Operating Pressure	: 155kg/cm ² (2200 p

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray

Nozzle Size Atomising Pressure Fluid Pressure

1.27mm (50 thou) 3.5kg/cm² (50 psi) 0.7kg/cm² (10 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

For application by conventional spray, it may be necessary to thin the paint by the addition of up to 10% Cleanser Thinner No. 5. Where thinning has been carried out the wet film thickness must be adjusted accordingly.

N.B. Thinning will affect VOC compliance.

Brush and Roller

The material is suitable for brush and roller application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

APPLICATION CONDITIONS AND OVERCOATING

Epoxy paints should preferably be applied at temperatures in excess of 10°C. In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not recommended.

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing. If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

ADDITIONAL NOTES

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Epoxy Coatings - Tropical Use

Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately belied of 35 °C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem

The maximum air and substrate temperature for application is 50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating

Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH & **S**AFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use

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Protective & Marine Coatings

MACROPOXY[™] C400V3 EPOXY ZINC PHOSPHATE

FORMERLY KNOWN AS EPIGRIP C400V3



Revised 01/2016 Issue 9

PRODUCT INFORMATION

PRODUCT **D**ESCRIPTION

A multi-functional Epoxy Zinc Phosphate coating for the protection of carbon steel

RECOMMENDED **U**SE

Macropoxy C400V3 Multi-functional Epoxy Coating is suitable for the protection of steelwork in a range of exposure environments from C1 to C5 as defined in ISO12944, including buildings, car parks, petrochemical plants, breweries and power stations. Not for immersion service. Often specified for use as a primer for structural steel on blast cleaned steel for internal and external environments, it may also be used as a high build intermediate coat as well as the final coat where a low sheen industrial and functional finish is required.

All Epoxy products will lose gloss and colour when exposed in an external environment and so where good colour and gloss retention is required in an external environment, or a full decorative finish is required in an internal environment, one of our topcoats designed specifically for this role should be chosen. A selection of available topcoats is listed in this data sheet under Recommended Topcoats.

Macropoxy C400V3 may be applied between 75 and 275 microns DFT in one coat depending on specification requirement. As many projects will differ in terms of client requirements and exposure environments, detailed project specifications are available from Sherwin-Williams separately.

ENDORSEMENTS

BS476 Part 7 - Surface Spread of Flame

BS6853 Appendix D - Smoke Emissions - For details of substrate/ scheme, consult Sherwin Williams.

Recommended Application Methods

Airless Spray Conventional Spray Brush Ballor

Roller

Recommended Thinner: No 2 (for thinning) No 9 or No 13 (for cleaning)

PRODUCT CHARACTERISTICS

Flash Point: Base : 24°C Additive : 26°C

% Solids by Volume: 70 ± 3% (ASTM-D2697-91)

Pot Life: 2¹/₂ hours at 15°C 1¹/₂ hours at 23°C 1 hour at 35°C

Colour Availability: Limited range including MIO shades

voc

257 gms/litre determined practically in accordance with UK Regulations PG6/23

289 gms/litre calculated from formulation to satisfy EC Solvent Emissions Directive

190 gms/kilo content by weight from formulation, to satisfy EC Solvent Emissions Directive

Recommended Thickness				
Dry film thickness	Wet film thickness	Theoretical coverage		
75 microns	107 microns	9.33m²/ltr*		

The minimum specification for MIO shades is 100µm nominal dry film thickness. * This figure makes no allowance for surface profile, uneven

application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification

P RACTICAL A PPLICATION R ATES - MICRONS PER COAT						
	Airless Spray	Conventional Spray	Brush	Roller		
Dry	75*	75	65	60		
Wet1071079285* Maximum sag tolerance typically 571µ wet (400µm dry) by airless spray and 179µm wet (125µm dry) by brush.						
Average Drying Times						
	@ 15°	C @ 23°C	@ 35°C			

	@ 15 C	@ 23 C	@ 35 C
To touch:	1½ hours	1 hour	¾ hour
To recoat:	5 hours	3½ hours	2 hours
To handle:	15 hours	7 hours	4 hours
These figure	es are given as	s a guide only	. Factors such a

These figures are given as a guide only. Factors such as air movement and humidity must also be considered.

Recommended Topcoats

Indefinitely overcoatable with epoxy systems provided the surfaces to be coated have been suitably cleaned. Where a high degree of gloss and colour retention is required overcoat with Acrolon C137V2, Acrolon C237, Acrolon 1850 and Acrolon 7300 within 7 days at a minimum dft of 50 microns or in the case of Acrolon C750V2 overcoat within 4 days. These overcoating times refer to achievement of optimum adhesion @ 23°C and will vary with temperature. For overcoating with alkyd systems consult Sherwin-Williams for advice.

advice. Overcoatable with Sher-Cryl M770 Water Based Finish within 1 month @ 15°C

PACKAGE

A two component material supplied in separate containers to be mixed prior to use

Pack Size:	20 litre and 5 litre units when mixed
Mixing Ratio:	7 parts base to 1 part additive by volume
Weight:	1.57 kg/litre (may vary with shade).

Shelf Life: 2 years from date of manufacture or 'Use By' date where specified











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Protective & Marine Coatings

MACROPOXY[™] C400V3 EPOXY ZINC PHOSPHATE

FORMERLY KNOWN AS EPIGRIP C400V3

Revised 01/2016 Issue 9

PRODUCT INFORMATION

SURFACE PREPARATION

Blast clean to Sa21/2 BS EN ISO 8501-1:2007. Average surface profile in the range 50-75 microns.

Ensure surfaces to be coated are clean, dry and free from all surface contamination.

Manually prepared surfaces should be prepared to a minimum standard of St3 BS EN ISO 8501-1:2007 at the time of coating. Application to such surfaces should be by brush or roller where the mechanical action will aid adhesion.

APPLICATION EQUIPMENT

Airless Spray	For dft applications between 75-125µ	For dft applications between 125-300µ
Nozzle Size:	0.33mm (13 thou)	0.38mm (15 thou)
Fan Angle:	40°	40°
Operating Pressure:	155kg/cm² (2200 psi)	155kg/cm² (2200 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and substrate shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted. For MIO shades, use the 125-300µm recommendations.

Conventional Sprav

Nozzle Size :	1.27mm (50 thou)
Atomising Pressure:	2.8kg/cm ² (40 psi)
Fluid Pressure :	0.4kg/cm² (6 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

For application by conventional spray, it may be necessary to thin the paint by the addition of up to 10% Cleanser/Thinner No. 2. Where thinning has been carried out the wet film thickness must be adjusted accordingly.

Brush and Roller

The material is suitable for brush and roller application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

Application Conditions and Overcoating

This material should preferably be applied at temperatures in excess of 10°C. Relative humidity should not exceed 90% and in these conditions good ventilation is essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not recommended

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

ADDITIONAL NOTES

Drying times, curing times and pot life should be considered as a guide only. The curing reaction of epoxies commences immediately the

two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Epoxy Coatings - Colour Stability:

Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age whether used on internal or external areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change.

When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use

Epoxy points at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem. The maximum air and substrate temperature for application is

50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating.

Numerical values quoted for physical data may vary slightly from batch to batch

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue











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MAINTENANCE

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MACROPOXY[™] C401 **EPOXY UNDERCOAT/MIO**

FORMERLY KNOWN AS EPIGRIP C401

Revised 02/2016 Issue 17

PRODUCT INFORMATION

PR	ODUCT D ESCRIPT	ON		PRACTIC	AL A PF	PLICATIO	N RATES -	
A high solids 2-pack er	poxy, pigmented with	micaceous iron		I	MICRONS	S PER CO	DAT	
oxide				Airless	Conve	ntional		
<i>R</i>	ecommended Us	E	Drv	Spray 100*	Sp	o ray 00	Brush 75	65
As an undercoat in co primers.	onjunction with Epig	rip high performance	Wet	133	1:	33	100	87
Without topcoat, the r patchiness may be ex	material will quickly xaggerated due to fil	discolour and m thickness	* Maximum sa by airless sp	ag tolerance oray and 18	e with ove 7µm wet (erlap typic (140µm drj	ally 533µm we y) by brush.	t(400µm dry)
a single coat protectiv	ve epoxy nor will inte	ercoat adhesion be		Ave	RAGE L	DRYING	Times	
affected by any disco See reverse side for f	louration. further information o	n colour stability.			5°C	@ 23°C	@ 35°C	
	E NDORSEMENTS		To touch:	2 h	ours 1	$\frac{1}{2}$ hours	1 hour	
Network Rail Item No	o's 7.2.2 and 7.1.7		To recoat: To handle	6 ho : 16 h	ours	4 hours 8 hours	3 hours 5 hours	
Recommen	IDED APPLICATION	I METHODS	These figu	ires are gi	ven as a	guide or v must al	nly. Factors s	such as air ered
Airless Spray	Brush							
Conventional Spray	Roller		R	ECOMMEI	NDED P	RIMERS	/ I OPCOAT	ſS
Recommended Thinn	ner: No 5 (for thinning) No 9 or No 13 (for	cleaning)	Macropoxy Macropoxy Zinc Clad J9	C425V2 C400V3 984 ???				
Prod	UCT C HARACTERI	STICS	Macropoxy	C402V2				
Flash Point: Base 24	°C Additive: 51°C		Where a hig	h degree	of gloss	and cold	our retention	is re-
% Solids by Volume:	75 ± 3% (ASTM-D26	97-91)	quired, over Acolon 1850	coat with and Acro	Acrolon plon 730	C137V2 0 within	, Acrolon C23 7 days at a m	37, ninimum
Pot Life: 3 hours at 1	5°C 2 hours at 23°	C 1 hour at 35°C	d.f.t. of 50 m within 4 day	nicrons or s. These (in the ca overcoat	ase of Ac ting times	crolon C750V s refer to ach	2 overcoat
Colour Availability: ∟	ight Grey MIO, Dark	Grey MIO.	of optimum For overcoa	adhesion ting outsio	at 23°C de the al	and will bove par	vary with terr ameters and	perature. with alkyd
VOC 217 ams/litre determin	ed practically in acco	rdance with LIK			DAC		advice.	
Regulations PG6/23	d from formulation to							
Emissions Directive	ed from formulation to	satisfy EC Solvent	A two comp to be mixed	d prior to u	aterial su Use	ipplied in	i separate co	ntainers
134 gms/kilo content b Solvent Emissions Dire	by weight from formul ective	ation, to satisfy EC	Pack Size	20	litre and	5 litre ur	nits when mix	ed
Т	YPICAL THICKNES	S	Mixing Ra	tio: 4 pa	arts base	e to 1 par	t additive by v	olume
Dry film	Wet film	Theoretical	Weight:	1.8	9 kg/litre	e (may va	ary with shad	e).
thickness 100 microns	thickness 133 microns	coverage 7.5m²/ltr*	Shelf Life:	2 ye	ears fror	n date of	f manufacture	e or 'Use
* This figure makes r	no allowance for sur	face profile uneven		Бу		icic spec		
equipment. Film th use and specification	ray or losses in cont ickness will vary dep on.	ainers and bending on actual						







NE	W SOS	







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Protective & Marine **Coatings**

MACROPOXY[™] C401 EPOXY UNDERCOAT/MIO

FORMERLY KNOWN AS EPIGRIP C401



Revised 02/2016 Issue 17

PRODUCT INFORMATION

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all

surface contamination. **APPLICATION EQUIPMENT**

Airless Spray

Nozzle Size:	0.38mm (15 thou)
Fan Angle:	40°
Operating Pressure:	155kg/cm ² (2200 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray

Nozzle Size : 1.27mm (50 thou) Atomising Pressure : 2.8kg/cm² (40 psi) Fluid Pressure : 0.4kg/cm² (6 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical. For application by conventional spray, it may be necessary to thin the paint by the addition of up to 10% Cleanser Thinner No. 5. Where thinning has been carried out the wet film thickness must be adjusted accordingly.

N.B. Thinning will affect VOC compliance.

Brush and Roller: The material is suitable for brush and roller application.

APPLICATION CONDITIONS AND OVERCOATING

Epoxy paints should preferably be applied at temperatures in excess of 10°C. Relative humidity should not exceed 90% and in these conditions good ventilation is essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired. Application at ambient air temperatures below 5°C is not recommended. In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during

curing

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

ADDITIONAL NOTES Drying times, curing times and pot life should be considered

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and

Epoxy Coatings - Colour Stability:

tend to yellow and darken with age whether used on internal or external areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious

face chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use

Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem.

The maximum air and substrate temperature for application is 50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating.

Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue



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as a guide only.

doubled by a 10°C decrease in temperature.

Variable colour stability is a feature of epoxy materials which due to this colour change.

When epoxy materials are exposed to ultra-violet light a sur-



Protective & Marine Coatings

MACROPOXY[™] C402V2 **EPOXY ZINC PHOSPHATE**

FORMERLY KNOWN AS EPIGRIP C402V2

Revised 02/2016 Issue 12

PRODUCT INFORMATION

Prol	TYPICAL THICKNESS					
A high build 2-pack epox	y zinc phosphate primer/buildcoat.	Dry film		Wet film	Theo	retical
Re	COMMENDED USE	100 micro	S ne	thickness	COV	erage
Anti-corrosive protection of carbon steel surfaces prepared by abrasive blast cleaning. May be brush applied onto hand or mechanically prepared		* This figure m application, c equipment. I	akes no verspra Film thic	allowance for so y or losses in co kness will vary co	urface profile ntainers and lepending of	e, uneven 1 n actual
wetting and adhesion c	ngered surfaces, giving excellent haracteristics - see notes overleaf.	PR	ACTICA	AL APPLICATIO	N R ATES -	
Can be applied at thick dry to provide both prim	nesses between 75 and 250 microns her and buildcoat in a single coat. A		М	ICRONS PER CO	4 <i>T</i>	
top coat is only required	d for decorative purposes.		irless Spray	Conventional Spray	Brush	Roller
Without topcoat, the r patchiness may be ex	naterial will quickly discolour and aggerated due to film thickness	Dry Wet	100* 133	100 133	75 100	65 87
anti-corrosive protect epoxy nor will interco	etheless provide excellent ion as a single coat protective at adhesion be affected by any	* Maximum sag to by airless spray	olerance and 187µ	with overlap typicall ım wet (140µm dry)	y 533µm wet (by brush.	400µm dry)
discolouration. See root on colour stability.	everse side for further information		AVEF	RAGE D RYING	Times	
For use in internal/external	rnal exposed conditions, including , but not for fully immersed	To touch:	@ 1: 2 ho	5°C @ 23°C urs 1½ hours	@ 35°C 1 hour 3 hours	
E	NDORSEMENTS	To handle:	16 hc	ours 8 hours	5 hours	
Network Rail Item No. 7.1.5 (Aluminium only), 7.1.7, 7.2.2		These figures are given as a guide only. Factors such as air movement and humidity must also be considered.				
		Recommended Topcoats				
Recommend	ED APPLICATION METHODS	For overcoating	g with e	poxy products (ir	ncluding self	overcoat-
Airless Spray Conventional Spray	Brush Roller	 ing), the maximum recommended interval is 28 days at 23°C. For overcoating outside this interval, consult Sherwin-Williams technical support for advice. 				
Recommended Thinner	: No 5 (for thinning) No 9 or No 13 (for cleaning)	Where a high degree of gloss and colour retention is required, overcoat with Acrolon C137V2, Acrolon C237, Acrolon 1850 and Acrolon 7300 within 7 days at a minimum		is 237, ninimum		
Produ	CT CHARACTERISTICS	dft of 50 micror	ns or in These (the case of Acro	lon C750V2	overcoat
Flash Point: Base	24°C Additive: 26°C	of optimum adh	nesion a	at 23°C and will v	ary with tem	perature.
% Solids by Volume:	75 ± 3% (ASTM-D2697-91)	For overcoating systems, consi	g outsid ult Sher	e the above para win-Williams for	ameters and further advic	with alkyo e.
Pot Life:	2 hours at 5°C 1 hours at 23°C			P ACKAGE		
Colour Availability:	Limited range.	A two comport to be mixed p	ient mat rior to u	terial supplied in se	separate co	ntainers
VOC 217 gms/litre determined	practically in accordance with UK	Pack Size:	20 li	tre and 5 litre un	its when mix	ed
Degulations DC6/23		Mixing Ratio	: 4.71	parts base to 1 p	art additive b	y volume.













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Protective & Marine Coatings

MACROPOXY[™] C402V2 EPOXY ZINC PHOSPHATE

FORMERLY KNOWN AS EPIGRIP C402V2

Revised 02/2016 Issue 12

PRODUCT INFORMATION

SURFACE PREPARATION

Blast clean to Sa21/2 (ISO 8501-1:2007). Average surface profile in the range 50-75 microns.

Manually prepared surfaces should be prepared to a minimum standard of St3 ISO 8501-1:2007 at the time of coating. Application to such surfaces should be by brush or roller where the

mechanical action will aid adhesion. Ensure surfaces to be coated are clean, dry and free from all surface contamination.

APPLICATION EQUIPMENT

Airless Spray	For dft applications between 75-125µ	For dft applications between 125-250µ
Nozzle Size:	0.33mm (13 thou)	0.38mm (15 thou)
Fan Angle:	40°	40°
Operating Pressure:	155kg/cm ²	155kg/cm ²
Operating Pressure.	(2200 psi)	(2200psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray

Nozzle Size :	1.27mm (50 thou)
Atomising Pressure:	2.8kg/cm ² (40 psi)
Fluid Pressure :	0.4kg/cm ² (6 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal

or vertical. For application by conventional spray, it may be necessary to thin the paint by the addition of up to 10% Cleanser Thinner No. 5.

Where thinning has been carried out the wet film thickness must be adjusted accordingly. N.B. Thinning will affect VOC compliance.

Brush and Roller: The material is suitable for brush and roller application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

APPLICATION CONDITIONS AND OVERCOATING

Epoxy paints should preferably be applied at temperatures in excess of 10°C. Relative humidity should not exceed 90% and in these conditions good ventilation is essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C. At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired. Application at ambient air temperatures below 5°C is not recommended. In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing.

curing. If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Additional Notes

Drying times, curing times and pot life should be considered as a guide only. The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature. It is possible to apply Macropoxy C402V2 onto a damp substrate (no running water or pooled water) by brush application. Ensure that the paint fully displaces any water on the surface. Epoxy Coatings - Colour Stability: Variable colour stability

Epoxy Coatings - Colour Stability: Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age particularly when used on internal areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change

change. When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use: Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this The maximum air and substrate temperature for application is

50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating. Numerical values quoted for physical data may vary slightly

from batch to batch

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue



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Protective & Marine Coatings

MACROPOXY[™] C425V2 EPOXY ZINC PHOSPHATE

FORMERLY KNOWN AS EPIGRIP C425V2

Revised 02/2016 Issue 9

PRODUCT INFORMATION

P RODUCT	Description
-----------------	-------------

Dry film thickness Wet film thickness Theoretical coverage 100 microns 133 microns 7.5m²/ltr*

* This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification

P RACTICAL A PPLICATION R ATES - MICRONS PER COAT				
	Airless Spray	Conventional Spray	Brush	Roller
Dry	100*	100	75**	65
Wet	133	133	100	87

Maximum sag tolerance with overlap typically 533µm wet (400µm dry) by airless spray (500µ dry-White only)

** Maximum sag tolerance with overlap typically 187µm wet (140µ dry) by brush.

Average Drying Times

	@ 15°C	@ 23°C	@ 35°C	
To touch:	2 hours	1½ hour	1 hour	
To recoat:	6 hours	4 hours	3 hours	
To handle:	16 hours	8 hours	5 hours	
These figures are given as a guide only. Factors such a air movement and humidity must also be considered.				

RECOMMENDED **T**OPCOATS

Indefinitely overcoatable with epoxy systems provided the surfaces to be coated have been suitably cleaned. Where a high degree of gloss and colour retention is required, overcoat with Acrolon C137V2, Acrolon C237, Acrolon 1850 and Acrolon 7300 within 7 days at a minimum dft of 50 microns or in the case of Acrolon C750V2 overcoat within 4 days. These overcoating times refer to achievement of optimum adhesion at 23°C and will vary with temperature.

For overcoating outside the above parameters and with alkyd systems, consult Sherwin-Williams for advice.

Package

A two component material supplied in separate containers to be mixed prior to use.

- Pack Size: 20 litre and 5 litre units when mixed.
- Mixing Ratio:4 parts base to 1 part additive by volumeWeight:1.54 kg/litre (may vary with shade).Shelf Life:2 years from date of manufacture or
'Use By' date where specified.











A high build 2-pack epoxy zinc phosphate primer/buildcoat **Recommended Use**

Anti-corrosive protection of carbon steel surfaces prepared by abrasive blast cleaning.

Can be spray applied at thicknesses between 100 and 250 microns dry to provide both primer and buildcoat in a single coat. A top coat is only required for decorative purposes.

Without topcoat, the material will quickly discolour and patchiness may be exaggerated due to film thickness variation, but will nonetheless provide excellent anti-corrosive protection as a single coat protective epoxy nor will intercoat adhesion be affected by any discolouration. See reverse side for further information on colour stability.

For use in internal/external exposed conditions including offshore, petrochemical and sub-sea environments.

ENDORSEMENTS

Network Rail – Item No 7.1.4

Approved for use by MoD(N) as a gel coat over FRP/GRP surfaces

Complies with NORSOK M501 Rev. 5 System 1 and 7.

Recommended Application Methods

Airless Spray Conventional Spray Brush Roller

Recommended Thinner:

Cleanser/Thinner No. 5 (for thinning) Cleanser/Thinner No. 9 or No. 13 (for cleaning)

PRODUCT **C**HARACTERISTICS

Flash Point: Base : Base : 24°C Additive : 26°C % Solids by Volume: 75 ± 3% (ASTM-D2697-91)

Pot Life: 2¹/₂ hrs @15°C 1¹/₂ hrs @23°C ³/₄ hr @ 35°C

Colour Availability: Limited range

voc

186 gms/litre determined practically in accordance with UK Regulations PG6/23

249 gms/litre calculated from formulation to satisfy EC Solvent Emissions Directive 165 gms/kilo content by weight from formulation, to satisfy EC

Solvent Emissions Directive

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 and Acrolon 7300 within 7 day microns or in the case of Acr days. These overcoating time optimum adhesion at 23°C ar
 @ 35°C
 For overcoating outside the a

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Protective & Marine Coatings

MACROPOXY[™] C425V2 EPOXY ZINC PHOSPHATE

FORMERLY KNOWN AS EPIGRIP C425V2





Revised 02/2016 Issue 9

PRODUCT INFORMATION

SURFACE PREPARATION

Blast clean to Sa21/2 (ISO 8501-1:2007). Average surface profile in the range 50-75 microns.

Manually prepared surfaces should be prepared to a minimum standard of St3 (ISO 8501-1:2007) at the time of coating. Ensure surfaces to be coated are clean, dry and free from all surface contamination.

May also be applied over a wide range of pre-fabrication primers, including inorganic zinc silicate, poly-vinyl butyral and epoxy types.

APPLICATION EQUIPMENT

Airless Spray	For dft applications between 75-125µ	For dft applications between 125-250µ
Nozzle Size:	0.33mm (13 thou)	0.38mm (15 thou)
Fan Angle:	40°	40°
Operating Processor	155kg/cm ²	155kg/cm ²
Operating Pressure.	(2200 psi)	(2200 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Sprav

Nozzle Size	:	1.27mm (50 thou)
Atomising Pressure	:	2.8kg/cm ² (40 psi)
Fluid Pressure	:	0.4kg/cm² (6 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

For application by conventional spray, it may be necessary to thin the paint by the addition of up to 10% Cleanser Thinner No. 5. Where thinning has been carried out the wet film thickness must be adjusted accordingly.

N.B. Thinning will affect VOC compliance.

Brush and Roller :

The material is suitable for brush and roller application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

APPLICATION CONDITIONS AND OVERCOATING

Epoxy paints should preferably be applied at temperatures in excess of 10°C. Relative humidity should not exceed 90% and in these conditions good ventilation is essential.

Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired. Application at ambient air temperatures below 5°C is not recommended.

In order to achieve optimum water and chemical resistance temperature needs to be maintained above 10°C during curing

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams

Additional Notes

Drying times, curing times and pot life should be considered as a guide only. The curing reaction of epoxies commences immediately the two

components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Epoxy Coatings - Colour Stability: Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age whether used on internal or external areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change. When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem. The maximum air and substrate temperature for application is 50°C providing conditions allow satisfactory application and film formation If the air and substrate temperature for application is 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating. Numerical values quoted for physical data may vary slightly from batch to batch batch to batch.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue.













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Protective & Marine **Coatings**

MACROPOXY[™] L524 EPOXY BARRIER PRIMER

PRACTICAL **A**PPLICATION **R**ATES -MICRONS PER COAT

Brush

85

133

Average Drying Times

Maximum sag tolerance with overlap typically 352µm wet (225µm dry) by

@ 23°C

6 hour

12 hours

12 hours

These figures are given as a guide only. Factors such as air movement and humidity must also be considered. Forced ventilation may be required to achieve these overcoating times.

Recommended Primers

Macropoxy C400V3 Zinc Phosphate Primer (non immersed

RECOMMENDED **T**OPCOATS

Airless

Spray

125*

195

@ 15°C

8 hours

16 hours

16 hours

Macropoxy L425 Zinc Phosphate Primer.

FORMERLY KNOWN AS EPIGRIP L524

NEW



NEW







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PRODUCT INFORMATION

Dry

Wet

airless spray

To touch:

To recoat:

To handle:

areas only)

Protective & Marine Coatings

PRODUCT DESCRIPTION

A high build 2-pack modified epoxy coating

Revised 02/2016 Issue 27

RECOMMENDED **U**SE

Hard wearing abrasion resistant coating with excellent resistance to immersion in salt and fresh water and crude oil.

For the protection of ships bottoms and cargo tanks, and submerged and splash zone areas of marine structures, jetties etc.

For the external protection of buried and other pipelines.

Particularly useful where coal tar pitch containing materials are prohibited.

ENDORSEMENTS

Approved by Lloyds Register of Shipping

Network Rail - RT98 Item No. 7.2.2

Recommended Application Methods

Airless Spray Brush

Recommended Thinner: No 5 (for thinning) No 9 or No 13 (for cleaning)

PRODUCT CHARACTERISTICS

Flash Point: Base : 32°C Additive : 39°C

% Solids by Volume: 64 ± 3% (ASTM-D2697-91)

Pot Life: 8 hours at 15°C 6 hours at 23°C

Colour Availability: Limited range

voc

296 gms/litre determined practically in accordance with UK Regulations PG6/23 344 gms/litre calculated from formulation to satisfy EC Solvent

Emissions Directive 247gms/kilo content by weight from formulation, to satisfy EC

Solvent Emissions Directive

TYPICAL THICKNESS

Dry film thickness	Wet film thickness	Theoretical coverage
125 microns	195 microns	5.1m²/ltr*

* This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification

Indefinitely overcoatable with epoxy systems provided the surfaces to be coated have been suitably cleaned. Where a high degree of gloss and colour retention is required,

overcoat with Acrolon C137V2, Acrolon C237, Acrolon 1850 and Acrolon 7300 within 7 days at a minimum dft of 50 microns or in the case of C750V2 overcoat within 4 days. These overcoating times refer to achievement of optimum adhesion at 23°C and will vary with temperature.

For overcoating with alkyd systems, consult Sherwin-Williams for advice.

Раскаде		
A two component material supplied in separate containers to be mixed prior to use.		
Pack Size:	20 litre and 4 litre units when mixed.	
Mixing Ratio:	3 parts base to 1 part additive by volume.	
Weight:	1.35 kg/litre (may vary with shade).	
Shelf Life:	2 years from date of manufacture or 'Use By date where specified	





Protective & Marine Coatings

MACROPOXY[™] L524 EPOXY BARRIER PRIMER

FORMERLY KNOWN AS EPIGRIP L524

Revised 02/2016 Issue 27

PRODUCT INFORMATION

SURFACE PREPARATION

Epoxy Coatings - Colour Stability Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age particularly when used on internal areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change.

When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem.

The maximum air and substrate temperature for application is 50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating. Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

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MAINTENANCE SPECS

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Protective & Marine Coatings

Blast clean to Sa21/2 BS EN ISO8501-1:2007. Average surface profile in the range 50-75 microns. Ensure surfaces to be coated are clean, dry and free from all surface contamination

APPLICATION EQUIPMENT

Airless Spray

Nozzle Size:	0.38mm (15 thou)
Fan Angle:	80°
Operating Pressure:	155kg/cm² (2200 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Brush

The material is suitable for brush application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

Application Conditions and Overcoating

Epoxy paints should preferably be applied at temperatures in excess of 10°C. In conditions of high relative humidity, i.e. 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not recommended.

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

ADDITIONAL NOTES

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Due to the nature of this product, some variation in colour between batches of certain shades may be experienced, which is beyond our control. This colour difference does not in any way affect the performance of the material.



MACROPOXY[™] M455V2 **EPOXY PRIMER FINISH**

FORMERLY KNOWN AS EPIGRIP M455V2

Revised 01/2016 Issue 7

PRODUCT INFORMATION

P RODUCT D ESCRIPTION			Average D	RYING TIMES	
A high performance 2-p	ack epoxy protective finisl	ו		@ 15°C	@ 23°C
RE	COMMENDED USE		To touch:	2 hours	$1\frac{1}{2}$ hours
As a single coat shop	applied protective finish f	or structural	To recoat:	6 hours	4 hours
steel.		orotatat	To handle:	24 hours	16 hours
Suitable for use in mar onments, but not imm	rine, chemical or other ag	gressive envi-	Pot Life:	8 hours	6 hours
	Endorsements		I hese figures movemei	are given as a nt and humidity	guide only. Factors such as air must also be considered.
3S476 Part 6 : Fire Pro BS476 Part 7 : Surface	opagation e spread of flame			Recommend	ed T opcoats
3S6853 Annex B2 : To 3S6853 Annex D8.4 : Compliant with fire per Underground Standard For details of substrate	oxic Fire Smoke Density formance requirements i d 1-085 a / scheme, consult Sher	n London	Not normally red Macropoxy M45 materials, pleas	quired. If howe 5V2 may be ov e consult Sher	ever overcoating is necessary, vercoated with a wide range of win-Williams for advice.
Broowner				PAC	KAGE
Airless Spray Conventional Spray	DED APPLICATION IVIE	HODS	A two compone to be mixed pri	ent material su or to use	pplied in separate containers
Recommended Thinner	: No 5		Pack Size:	20 litre an	d 5 litre units when mixed
Produ	ICT CHARACTERISTICS	:	Mixing Rario:	4 parts bas	se to 1 part additive by volume
Flash Point: Base 23°	C Additive 26°C		Weight:	1.43 kg/lit	re (may vary with shade)
Colour Availability: Fu VOC 304 gms/litre determine Regulations PG6/23 327 gms/litre calculated Emissions Directive 228 gms/kilo content by Solvent Emissions Dire	Ill Colour Range ed practically in accordance f from formulation to satisf v weight from formulation, ctive	e with UK y EC Solvent to satisfy EC		-	
Reco	MMENDED THICKNESS				
Dry film thickness 125 microns * This figure makes n application, overspray ment. Film thickness specification	Wet filmTthickness192192 microns9192 microns9193 microns9193 microns9194 m	heoretical coverage 5.2 m²/ltr* profile, uneven and equip- actual use and			
PRACTICA	AL APPLICATION RATE	s -			
M	ICRONS PER COAT				
Airless Spray Dry 125* Wet 192	Conventional Spray 125 192				
* Maximum sag tolerance by airless spray	with overlap typically 346µm	wet (225µm dry)			



NEW











Protective & Marine Coatings

MACROPOXY[™] M455V2 EPOXY PRIMER FINISH

FORMERLY KNOWN AS EPIGRIP M455V2



Revised 01/2016 Issue 7

PRODUCT INFORMATION

Protective & Marine Coatings

SURFACE PREPARATION

Blast clean to Sa21/2 BS EN ISO 8501-1:2007. Average surface profile in the range 50-75 microns. Ensure surfaces to be coated are clean, dry and free from all surface contamination. May also be applied over a wide range of pre-fabrication primers.

APPLICATION EQUIPMENT

Airless Spray

Nozzle Size:	0.38mm (15 thou)
Fan Angle:	80°
Operating Pres	

Operating Pres-155kg/cm² (2200 psi) sure:

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Sprav

Nozzle Size:	1.27mm (50 thou)
Operating Pressure:	2.8kg/cm ² (40 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

Brush

The material is suitable for brush application to small areas and for touch up purposes. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

APPLICATION CONDITIONS AND OVERCOATING

Epoxy paints should preferably be applied at temperatures in excess of 10°C. In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not recommended.

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curina.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Additional Notes

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Epoxy Coatings - Colour Stability:

Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change. When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem.

The maximum air and substrate temperature for application is 50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating.

Numerical values quoted for physical data may vary slightly from batch to batch.

Coverage:

Red, Orange and Yellow shades may require additional coats for full coverage.

Health and Safety
Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.
WARRANTY
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Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use

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MAINTENANCE

SPECS











MACROPOXY[™] M905 **EPOXY UNDERCOAT/MIO**

FORMERLY KNOWN AS EPIGRIP M905



Revised 02/2016 Issue 28

PRODUCT INFORMATION

PRODUCT L	ESCRIPTION			Average	DRYING TIME	s
A Low temperature curing, two p	ack epoxy high	build undercoat,		@ 5°C	@ 15°C	@ 23°C
			To touch:	5.5 hours	3.5 hours	1.5 hours
For application onto suitably prim	NDED 03E	an undercoat for	To handle:	6.5 hours	5 hours	2.5 hours
use under suitable high performat temperature curing is required. Recommended for rapid overcoa	ance finishes, wating and faster	handling times.	These figures movemen	are given as a nt and humidit	a guide only. Fa y must also be	actors such as air considered.
Endors	SEMENTS	3		Recommen	Ided P rimer	s
Highways Agency Item No. 116 Network Rail Item Nos 7.1.7 and	7.2.2		Compatible with Macropoxy M90 (preferred prime	a wide range 2 Winterfast I	e of epoxy prim Hi-Build Brushi	ers ng Aluminium
Recommended Apr	PLICATION ME	THODS	(preferred prime	P ECOMMENT		70
Airless Spray						
Brush Roller			For overcoating overcoating), th	with epoxy pi e maximum re	roducts (includi ecommended i	ing seif nterval is 28 davs
Recommended Cleanser/Thinne Cleanser/Thinne	r No. 5 (for thin r No. 9 or No. 13	ning) 8 (for cleaning)	at 23°C. For ov Sherwin-William	ercoating out	side this interva upport for advic	al, consult e.
Product Ch	ARACTERISTIC	s	Where a high d	earee of aloss	s and colour re	tention is required
Flash Point: Base : Base : 47°C	C Additive : 24	4°C	overcoat with Ac	rolon C137V2	, Acrolon C237	Acrolon 1850 and
% Solids by Volume: 75 ± 4% (ASTM-D2697-9	1)	Acrolon 7300 w in the case of A	ithin 7 days a crolon C750V	t a minimum df 2 overcoat with	ft of 50 microns or hin 4 days. These
Pot Life: 8 hrs @ 5°C 3 h	nrs @15°C 11/	∕₂ hrs @ 23°C	adhesion at 23°	es refer to acr C and will var	y with tempera	ture.
Colour Availability: Limited ran	ge		For overcoating	with alkyd sy	stems consult	Sherwin-Williams
VOC 219 gms/litre determined practic	ally in accordan	ce with UK	for advice.	Pa	CKAGE	
246 gms/litre calculated from for	mulation to satis	sfy EC Solvent		1 4	CRACE	
Emissions Directive	rom formulation	to satisfy EC	A two compone	ent material si	upplied in sepa	rate containers
Solvent Emissions Directive			Pack Size:	15 litre a	nd 2.5 litre unit	s when mixed
Recommende	D THICKNES	S	Mixing Potio	2 norte b	and 2.0 little drift	ditivo by volumo
Dry film thickness Wet film thi	ckness Theor	etical coverage	Weight:	Off White	e 1.54 kg/litre (may vary with
125 microns 167 micr	rons	6.0m²/ltr*		2 vears f	rom date of ma	anufacture or
* This figure makes no allowand application, overspray or losses Film thickness will vary depend specification.	ce for surface pi s in containers a ing on actual us	rofile, uneven ind equipment. e and	Shelf Life:	'Use By'	date where sp	ecified
P RACTICAL A PPLICATION	Rates - micr	ONS PER COAT				
Airless Spray	Brush	Roller				
Dry 125*	125*	100				
Wet 166	166	133				
* Maximum sag tolerance typica	llv 233um wet (3	175um dry) by				

nce typically ι τ σμπι αιγ) δι airless spray.















Protective & Marine Coatings

MACROPOXY[™] M905 EPOXY UNDERCOAT/MIO

FORMERLY KNOWN AS EPIGRIP M905



Revised 02/2016 Issue 28

PRODUCT INFORMATION

Protective & Marine Coatings

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all surface contamination

APPLICATION EQUIPMENT

Airless Spray

Nozzle Size	:	0.38mm (15 thou)
Fan Angle	:	65° `
Operating Pressure	:	250kg/cm² (3550 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfac-tory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Nozzle Size

Environmental legislation now requires paint to contain less solvent. When using high solids coatings like Macropoxy M905 Winterfast Hi-Build Undercoat, painters must use finer spray tips than previously to compensate for the natural tendency towards over-application and to help achieve good wet film formation.

Brush The material is suitable for brush application.

Roller

The material is suitable for roller application.

Application Conditions and Overcoating In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

Application at ambient air temperatures below 5°C is not recommended where there is a risk of ice formation on the substrate

Due to the high solids content of this material, it is not normally possible to achieve at dry film thicknesses much less than 100 microns by brush application. Development of satisfactory physical properties including hardness and abrasion resistance will be obtained within 24-48 hours at a temperature of 5°C. Optimum water and chemical resistance will be achieved when the material is fully cured.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Additional Notes

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Compatibility - This product is fully compatible with Transgard TG116 (Item 116 standard temperature grade) and the two products may be interchanged within any specification requiring the use of Item 116, depending upon application conditions.

Epoxy Coatings - Colour Stability: Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age whether used on internal or external areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change.

When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

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MACROPOXY[™] M902 SURFACE TOLERANT PRIMER

FORMERLY KNOWN AS EPIGRIP M902

NEW

MAINTENANCE SPECS

NE	EW
SPE	ECS





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MAINTENANCE SPECS

Revised 07/2016 Issue 33

PRODUCT INFORMATION

ON	PR	ACTICAL A	PPLICATI	ON RATES -	
xy of curing down		MICRO Airless	ONS PER C Brush	COAT Roller	
E	Drv	5pray 125*	125	100	
nically prepared giving excellent aces overleaf. aces but not mical faces.	Wet * Maximum sag (175µm dry) b	167 g tolerance w by airless spr Averag	167 vith overlap ay. E Drying	133 typically 233μm wet TIMES	
iring is required or	To touch:	@ 5°C	@ 23°C		
	To recoat:	6 ¹ / ₂ hours	4 hours	5	
Material - for iams.	To handle: These figures movement an	16 hours are given as d humidity m	8 hours s a guide o nust also be	nly. Factors such as e considered.	; air
4.		Recomme	NDED B U	IILDCOAT	
	Macropoxy M9	05			
METHODS		Recomme	ENDED TO	PCOATS	
cleaning)	For overcoating overcoating), ti days at 23°C. Sherwin-Williar	g with epoxy ne maximum For overcoa ms technical	r products n recomme ting outsid support fo	(including self inded interval is 28 e this interval, consu or advice.	ult
STICS	required overce	oat with Acro	blon C137	/2, Acrolon C237,	
e : 30°C	dft of 50 micror	nd Acroion ns or in the d	case of Ac	rolon C750V2 overc	m coat
D2697-91) 1½ hours at 23°C	of optimum ad For overcoating	hesion at 23 g with alkyd	3°C and wi systems c	Il vary with temperat onsult Sherwin-Willia	ture. ams
		F	ACKAGE		
		- ent materia		n separate containe	
dance with UK	to be mixed p	rior to use.	i supplieu i		15
satisfy EC Solvent	Pack Size:	2 litre	and 5 litre	units when mixed.	
tion, to satisfy EC	Mixing Ratio	: 1 part	base to 1 p	art additive by volum	ie.
	Weight:	1.18 k	g/litre.		
S	Shelf Life:	2 year 1 lse F	s from dat	e of manufacture or	
Theoretical coverage 6.0 m2/ltr* ce profile, uneven ers and equipment. al use and		0001	, auto ini		
	SN (y) of curing down Image: Signal Stress Stress inically prepared piving excellent inotes overleaf. aces but not mical faces. ining is required or Vaterial - for wars. 4. METHODS STICS 2: 30°C D2697-91) 1½ hours at 23°C rdance with UK satisfy EC Solvent tion, to satisfy EC S Theoretical coverage 6.0 m2/ltr* ce profile, uneven ers and equipment. al use and	DN Presentation (y) of curing down Image: String is required or mical faces. Dry Waterial - for ams. To touch: To recoat: To handle: These figures movement an and. Methods Macropoxy M9 Strics Strics 11/2 hours at 23°C Sherwin-Willian Where a high Corectating for advice. Strics Strics 11/2 hours at 23°C Sherwin-Willian Where a high Corectating for advice. rdance with UK satisfy EC Solvent tion, to satisfy EC A two comport to be mixed p Pack Size: Mixing Ratio Weight: Shelf Life:	DN PRACTICAL A Syray Airless Spray Dry 125* mically prepared piving excellent Maximum sag tolerance w (175µm dry) by airless spr incally prepared piving excellent Maximum sag tolerance w (175µm dry) by airless spr faces. © 5°C ring is required or © 5°C Vaterial - for ams. To touch: 5½ hours To recoat: Matterial - for ams. Macropoxy M905 METHODS Recomme Accolon 1850 and Acrolon dft of 50 microns or in the or of optimum adhesion at 23°C STICS Sor Overcoating with epoxy overcoating), the maximum days at 23°C. 12 Anours at 23°C For overcoat with Acro Acrolon 1850 and Acrolon dft of 50 microns or in the or of optimum adhesion at 23°C Statisfy EC Solvent tion, to satisfy EC Mixing Ratio: 1 part Yeight: 1.18 k Shelf Life: 2 year Theoretical coverage 6.0 m2/ltr* Shelf Life: 2 year Shelf Life: 'Use E	DN PRACTICAL APPLICATIC MICRONS PER C y of curing down inically prepared plying excellent inceal verteaf: aces but not mical Dry 125* 125 Yet 167 167 167 * Maximum sag tolerance with overlap (175µm dry) by airless spray. AVERAGE DRYING Material - for ams. @ 5°C @ 23°C Vaterial - for ams. 16 hours 8 hours 4. Recommended But Material - for ams. These figures are given as a guide o movement and humidity must also b METHODS Recommended But Macropoxy M905 Strics For overcoating with epoxy products overcoating), the maximum recomme days at 23°C. For overcoating outsid Sherwin-Williams technical support for Where a high degree of gloss and co required overcoat with Acrolon C137' Acrolon 1850 and Acrolon 7300 within 4f of 50 microns or in the case of Ac within 4 days. These overcoating tim of optimum adhesion at 23°C and within 4 days. These overcoating tim of optimum adhesion at 23°C and within 4 days. These overcoating tim of optimum adhesion at 23°C and within 4 days. These overcoating tim of optimum adhesion at 23°C and within 4 days. These overcoating tim of optimum adhesion at 23°C and within 4 days. These overcoating tim of optimum adhesion at 23°C and within 4 days. These overcoating tim of optimum adhesion at 23°C and within 4 days. These overcoating tim of optimum adhesion at 23°C and within 4 days. These overcoating tim of optimum adhesion at 23°C and within 4 days. These overcoating tim of optimum adhesion at 23°C and within 4	DN Production Synaption PRACTICAL APPLICATION RATES - MICRONS PER COAT Synaption Airless Brush Roller Synaption Dry 125* 125 100 Wet 167 133 * Inically prepared pring excellent incles Maximum sag tolerance with overlap typically 233µm wet (175µm dry) by airless spray. Vaterial - for ams. * Maximum sag tolerance with overlap typically 233µm wet (175µm dry) by airless spray. Vaterial - for ams. © 5°C © 23°C To touch: 5'/ hours 3/ hours To recoat: 6/ hours 8 hours These figures are given as a guide only. Factors such as movement and humidity must also be considered. Macropoxy M905 Recommended interval is 28 days at 23°C. For overcoating with epoxy products (including self overcoating), the maximum recommended interval is 28 days at 23°C. For overcoating with adys at aminimu dft of 50 micronos or in the case of Acrolon C750V2 overcy within 4 days. These overcoating itmes refer to achieven of optimum adhesion at 23°C and will vary with temperai or overcoating with alkyd systems consult Sherwin-Willi for advice. D2697-91) 1½ hours at 23°C dance with UK satisfy EC Solvent tion, to satisfy EC A two component material supplied in separate containe to be mixed prior to use.



Protective & Marine **Coatings**

MACROPOXY[™] M902 SURFACE TOLERANT PRIMER

FORMERLY KNOWN AS EPIGRIP M902



Revised 07/2016 Issue 33

PRODUCT INFORMATION

SURFACE PREPARATION

Manually prepared surfaces should be prepared to a minimum standard of St3 BS EN ISO 8501-1 : 2007 at the time of coating. Application to such surfaces should be by brush or roller where the mechanical action will aid adhesion.

Ensure surfaces to be coated are clean and free from all surface contamination for application onto damp surfaces, see additional note below.

For spray application, it is recommended that surfaces should be blast cleaned to Sa21/2 BS EN ISO 8501-1 : 2007. Average surface profile in the range 50-75 microns.

APPLICATION EQUIPMENT

Airless Spray

Nozzle Size:	0.38mm (15 thou)
Fan Angle:	65°
Operating Pressure:	250kg/cm² (3550 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Nozzle Size

Environmental legislation now requires paint to contain less solvent. When using high solids coatings like Macropoxy M902 Winterfast

Hi-Build Brushing Aluminium, painters must use finer tips than previously to compensate for the natural tendency towards over-application and to help achieve good wet film formation.

Brush

The material is suitable for brush application.

Roller

The material is suitable for roller application.

Application Conditions and Overcoating

In conditions of high relative humidity, i.e. 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

Application at ambient air temperatures below 0°C is not recommended where there is a risk of ice formation on the substrate.

Development of satisfactory physical properties including hardness and abrasion resistance will be obtained within 24-48 hours at a temperature of 5°C. Optimum water and chemical resistance will be achieved when the material is fully cured.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Additional Notes

It is possible to apply Macropoxy M902 onto a damp substrate (no running water or pooled water) by brush application.

Ensure that the paint fully displaces any water on the substrate. For guidance please consult Sherwin-Williams. Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Compatibility - This product is fully compatible with Transgard TG115 (Item 115 standard temperature grade), and the two products may be interchanged within any specification requiring the use of Item 115, depending upon application conditions.

Epoxy Coatings - Colour Stability: Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age particularly when used on internal areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change.

When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue



MAINTENANCE

SPECS

NEW

MAINTENANCE

SPECS

NEW

SPECS



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Protective & Marine Coatings



MACROPOXY[™] M905 **EPOXY UNDERCOAT/MIO**

FORMERLY KNOWN AS EPIGRIP M905



Revised 02/2016 Issue 28

PRODUCT INFORMATION

P RODUCT I	Description			Average I	DRYING TIME	s
A Low temperature curing, two p	back epoxy high	build undercoat,		@ 5°C	@ 15°C	@ 23°C
			To touch:	5.5 hours	3.5 hours	1.5 hours
RECOMME	ENDED U SE		To recoat:	6.5 hours	5 hours	2.5 hours
For application onto suitably prir	ned surfaces, as	an undercoat for	To handle:	16 hours	12 hours	8 hours
use under suitable high perform temperature curing is required. Recommended for rapid overco	ance finishes, w ating and faster	handling times.	These figures movemen	are given as a nt and humidit	guide only. Fa y must also be	actors such as air considered.
Endor	SEMENTS			Recommen	IDED P RIMER	s
Highways Agency Item No. 116 Network Rail Item Nos 7.1.7 and	d 7.2.2		Compatible with Macropoxy M90 (preferred prime	a wide range 2 Winterfast H	of epoxy prim Hi-Build Brushi	ers ng Aluminium
Recommended Ap	PLICATION M	ETHODS				Te
Airless Spray				NECOMMENT	DED TOFCOA	13
Brush Roller			For overcoating overcoating), th	with epoxy pr e maximum re	oducts (includi ecommended i	ing self nterval is 28 days
Recommended Cleanser/Thinne Cleanser/Thinne	er No. 5 (for thir er No. 9 or No. 1	nning) 3(for cleaning)	at 23°C. For ov Sherwin-William	ercoating outs is technical su	side this interva apport for advic	al, consult ce.
Product Ch	ARACTERISTIC	cs	Where a high do	egree of gloss	and colour re	tention is required
Flash Point: Base : Base : 47°	C Additive : 2	4°C	overcoat with Ac	rolon C137V2	, Acrolon C237	, Acrolon 1850 and
% Solids by Volume: 75 ± 4%	(ASTM-D2697-9	91)	Acrolon 7300 w in the case of A	ithin 7 days at crolon C750V:	t a minimum df 2 overcoat with	ft of 50 microns or hin 4 days. These
Pot Life: 8 hrs @ 5°C 3	hrs @15°C 11	½ hrs @ 23°C	overcoating time adhesion at 23°	es refer to ach C and will var	ievement of op y with tempera	otimum ture.
Colour Availability: Limited rar	ige		For overcoating	with alkyd sy	stems consult	Sherwin-Williams
VOC			for advice.			
Regulations PG6/23	ally in accordar			PAG	CKAGE	
246 gms/litre calculated from for	mulation to sati	sfy EC Solvent	A thus a summary sum		un aliant in a surra	
Emissions Directive	from formulation	to satisfy FC	A two components	ent material st	applied in sepa	rate containers
Solvent Emissions Directive			Pack Size:	15 litre a	nd 2.5 litre unit	s when mixed
Recommend	ed T hicknes	S	Mixing Ratio:	2 parts ba	ase to 1 part ad	ditive by volume
Dry film thickness Wet film th	ickness Theo	retical coverage		Off White	a 1.54 kg/litre (may vary with
125 microns 167 mic	rons	6.0m²/ltr*	Weight:	shade).		
* This figure makes no allowar	nonio		Shelf Life:	2 years f	rom date of ma	anufacture or
application, overspray or losse Film thickness will vary depend specification.	s in containers a ling on actual us	and equipment. se and		Use by		
P RACTICAL A PPLICATION	RATES - MICF	RONS PER COAT				
Airless Spray	/ Brush	Roller				
Dry 125*	125*	100				
Wet 166	166	133				
* Maximum sag tolerance typica airless spray.	lly 233µm wet (175µm dry) by				





NE	EW
SPE	ECS









Protective & Marine **Coatings**

MACROPOXY[™] M905 EPOXY UNDERCOAT/MIO

FORMERLY KNOWN AS EPIGRIP M905



Revised 02/2016 Issue 28

PRODUCT INFORMATION

SURFACE PREPARATION

ADDITIONAL NOTES

as a guide only.

conditions.

10°C decrease in temperature.

Ensure surfaces to be coated are clean, dry and free from all surface contamination

APPLICATION EQUIPMENT

Airless Spray

Nozzle Size	:	0.38mm (15 thou)
Fan Angle	:	65° `
Operating Pressure	:	250kg/cm² (3550 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Nozzle Size

Environmental legislation now requires paint to contain less solvent. When using high solids coatings like Macropoxy M905 Winterfast Hi-Build Undercoat, painters must use finer spray tips than previously to compensate for the natural tendency towards over-application and to help achieve good wet film formation.

Brush The material is suitable for brush application.

Roller

The material is suitable for roller application.

APPLICATION CONDITIONS AND OVERCOATING

In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

Application at ambient air temperatures below 5°C is not recommended where there is a risk of ice formation on the substrate

Due to the high solids content of this material, it is not normally possible to achieve at dry film thicknesses much less than 100 microns by brush application. Development of satisfactory physical properties including hardness and abrasion resistance will be obtained within 24-48 hours at a temperature of 5°C. Optimum water and chemical resistance will be achieved when the material is fully cured.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Epoxy Coatings - Colour Stability: Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age whether used on internal or

Drying times, curing times and pot life should be considered

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on

temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a

Compatibility - This product is fully compatible with Transgard TG116 (Item 116 standard temperature grade) and the two

products may be interchanged within any specification requiring the use of Item 116, depending upon application

external areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change. When epoxy materials are exposed to ultra-violet light a surface

chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue













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Protective & Marine Coatings



MACROPOXY[™] M922 **EPOXY GLASS FLAKE**

FORMERLY KNOWN AS EPIGRIP M922

Revised	07/2016	Issue 31	
1.001000	01/2010	1000001	

PRODUCT INFORMATION

A high solids 2-pack epoxy containing micronised glass flake and anti-corrosive pigments. Airless Spray Brush Mairless Spray Brush Dry 400° 250 Wet 482 302 * Maximum sag tolerance typically 1200µm wet (1000µ by airless spray. Possess excellent abrasion resistance and has excellent resistance to immersion in sea water and a range of chemicals also compatible with cathodic protection. Averace Drying Times Aluminium Macropoxy M922M mastic version available for high build brushing maintenance specifications. To touch: 12 hours 6 hours 4 hours 3 hours To recoat: 6 hours 4 hours 3 hours Approved to Def Stan 80-97 Treatment of Fuel Tanks. These figures are given as a guide only. Factors s movement and humidity must also be conside Primers are optional. M922 can be applied directly of Macropoxy M111 Wet Blast Primer Macropoxy L574 Blast Primer Macropoxy L574 Blast Primer Macropoxy L574 Blast Primer Macropoxy L574 Blast Primer Materiat Sproptimum intercoat adhesion)µm dry)
Recommended Cleanser Thinner: No 9 Action Action<)µm dry)
Corrosion protection of blast cleaned steel and cathodically protected steel. * Maximum sag tolerance typically 1200µm wet (1000µby airless spray. Possess excellent abrasion resistance and has excellent resistance to immersion in sea water and a range of chemicals also compatible with cathodic protection. Average Drying Times Aluminium Macropoxy M922M mastic version available for high build brushing maintenance specifications. © 5°C @ 15°C @ 23°C To touch: 12 hours 6 hours 4 hours 3 hours To recoat: 6 hours 4 hours 3 hours To handle: 30 hours 16 hours 8 hours These figures are given as a guide only. Factors s. movement and humidity must also be conside Recommended for carriage of grain Complies with NORSOK M501 Rev. 5 System 7 Primers are optional. M922 can be applied directly of Macropoxy L574 Blast Primer Airless Spray Brush Recommended Cleanser Thinner: No 9 Recommended. For optimum intercoat adhesion)μm dry)
Possess excellent abrasion resistance and has excellent resistance to immersion in sea water and a range of chemicals also compatible with cathodic protection. Average Drying Times Aluminium Macropoxy M922M mastic version available for high build brushing maintenance specifications. © 5°C @ 15°C @ 23°C ENDORSEMENTS To touch: 12 hours 6 hours 4 hours Approved to Def Stan 80-97 Treatment of Fuel Tanks. 10 hours 16 hours 8 hours Highways Agency Item No. 123 Network Rail Item No. 7.2.3 Approved for carriage of grain Primers are optional. M922 can be applied directly of Macropoxy M111 Wet Blast Primer Recommended Cleanser Thinner: No 9 Recommended Cleanser Thinner: No 9 9	
Aluminium Macropoxy M922M mastic version available for high build brushing maintenance specifications.	
ENDORSEMENTS Approved to Def Stan 80-97 Treatment of Fuel Tanks. Highways Agency Item No. 123 Network Rail Item No. 7.2.3 Approved for carriage of grain Complies with NORSOK M501 Rev. 5 System 7 Recommended Application Methods Airless Spray Brush Recommended Cleanser Thinner: No 9	
Approved to Def Stan 80-97 Treatment of Fuel Tanks. Highways Agency Item No. 123 Network Rail Item No. 7.2.3 Approved for carriage of grain Complies with NORSOK M501 Rev. 5 System 7 Recommended Cleanser Thinner : No 9 These figures are given as a guide only. Factors is movement and humidity must also be considered Recommended Cleanser Thinner : No 9	
Approved to Der Stan 80-97 Treatment of Fuel Tanks. Highways Agency Item No. 123 Network Rail Item No. 7.2.3 Approved for carriage of grain Complies with NORSOK M501 Rev. 5 System 7 Recommended AppLication Methods Recommended Cleanser Thinner: No 9	such as air lered.
Approved for carriage of grain Complies with NORSOK M501 Rev. 5 System 7 Recommended Cleanser Thinner: No 9 Primers are optional. M922 can be applied directly of Macropoxy M111 Wet Blast Primer Macropoxy L574 Blast Primer Recommended Cleanser Thinner: No 9 Primers are optional. M922 can be applied directly of Macropoxy M111 Wet Blast Primer Macropoxy L574 Blast Primer Indefinitely self overcoatable provided the coating suitably cleaned. For optimum intercoat adhesion	
Recommended Cleanser Thinner: No 9 Macropoxy L574 Blast Primer Macropoxy L574 Blast Primer Recommended Cleanser Thinner: No 9	onto steel.
Airless Spray Brush Recommended Cleanser Thinner: No 9 Recommended Cleanser Thinner: N	
Brush Indefinitely self overcoatable provided the coating suitably cleaned. For optimum intercoat adhesion Recommended Cleanser Thinner: No 9 Suitably cleaned. For optimum intercoat adhesion	
Recommended Cleanser Thinner: No 9 Suitably cleaned. For optimum intercoat adnesion	g has beer
Leboxy topcoats overcoating should occur within 14 da	1 with othe
PRODUCT CHARACTERISTICS	th Acrolor
Flash Point: Base 9°C Additive 23°C C137V2, Acrolon C237, Acrolon 1850 and Acrolon 73 days at a minimum d ft of 50 minimum d ft of 50 minimum d ft	300 within 7
% Solids by Volume: 83 ± 4% (ASTM-D2697-91) C750V2 overcoat within 4 days.	e of Acroiol
Pot Life: 3hrs @5°C 1½hrs @ 15°C 1hr @ 23°C These overcoating times refer to achievement of op adhesion at 23°C and will vary with temperature	ptimum
Colour Availability: Limited Range	
VOC FACKAGE	
143 gms/litre determined practically in accordance with UK Regulations PG/23	ontainers
167 gms/litre calculated from formulation to satisfy EC Solvent	mixed
107 gms/kilo content by weight from formulation, to satisfy EC	
Solvent Emissions Directive Mixing Ratio: 3 parts base to 1 part additive by	y volume
KECOMMENDED I HICKNESS Weight: 1.59 kg/litre (may vary with sha	ano.
Shelf Life: 2 years from date of batch mar	
Dry film thickness Wet film thickness Theoretical coverage	nufacture
Dry film thickness Wet film thickness Theoretical coverage 400 microns 482 microns 2.1m ² /ltr*	inufacture
Dry film thickness Wet film thickness Theoretical coverage 400 microns 482 microns 2.1m²/ltr* * This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification. Second Secon	nufacture
Dry film thickness Wet film thickness Theoretical coverage 400 microns 482 microns 2.1m²/ltr* * This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification. Film thickness	inufacture









MAINTENANCE SPECS







Protective & Marine Coatings

MACROPOXY[™] M922 EPOXY GLASS FLAKE

FORMERLY KNOWN AS EPIGRIP M922



Revised 07/2016 Issue 31

PRODUCT INFORMATION

Protective & Marine Coatings

SURFACE PREPARATION

Blast clean to Sa2¹/₂ ISO 8501-1:2007 using angular grit. Average surface profile in the range 50-100 microns.

For agreed maintenance specifications, M922 may be applied onto manually prepared surfaces to a minimum standard of St3 ISO8501-1:2007 Part A1. Please consult Sherwin-Williams to confirm specification.

Ensure surfaces to be coated are clean, dry and free from all surface contamination

Macropoxy L574 should be specified where there is a requirement for a blast primer. Other blast primers should not be used without reference to Sherwin-Williams.

APPLICATION EQUIPMENT

Airless Spray

Nozzle Size	:	0.38-0.53mm (15-21 thou)
Fan Angle	:	65°
Operating Pressure	:	210kg/cm² (3000 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted

APPLICATION CONDITIONS AND OVERCOATING

In conditions of high relative humidity, ie. 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not recommended.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Additional Notes

Drying times, curing times and pot life should be considered as a quide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Material is not suitable for force drying above 50°C.

Epoxy Coatings - Colour Stability:

Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change.

When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem.

The maximum air and substrate temperature for application is 50° C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50° C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating.

Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue













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MACROPOXY[™] M922M SURFACE TOLERANT

FORMERLY KNOWN AS EPIGRIP M922M

Revised	07/2016	Issue 12	
10000	01/2010	10000012	

PRODUCT INFORMATION

PRODUCT DESCRIPTION	PRACTICAL APPLICATION RATES - MICRONS PER COAT
A high solids 2-pack epoxy brushing and spraying mastic, pigmented with micronised glass flake, aluminium and anti-corrosives.	Airless Spray Brush (see note overleaf)
Recommended Use	Dry 400 400*
Anti-corrosive protection of blast cleaned steel compatible with cathodic protection.	 Wet 482 482 * Maximum sag tolerance typically 2410μm wet (2000μm dry) by brush.
applicators to achieve full specified thickness in a single coat, even on sharp edges and difficult access areas.	Average Drying Times
For application onto hand or mechanically prepared surfaces and/or damp gingered blasted surfaces, giving excellent wetting and adhesion characteristics.	@ 5°C@ 15°C@ 23°CTo touch:12 hours6 hours4 hoursTo recoat:6 hours4 hours3 hoursTo handle:30 hours16 hours8 hours
	These figures are given as a guide only. Factors such as air
Network Rail Item 7.2.6	movement and numidity must also be considered.
R ECOMMENDED APPLICATION M ETHODS	Recommended Primers
Airless Spray Brush	Primers are optional. M922M can be applied directly onto steel. Macropoxy M111 Wet Blast Primer
Recommended Thinner: No 9	Macropoxy L574 Blast Primer
P RODUCT C HARACTERISTICS	R ECOMMENDED T OPCOATS
 Flash Point: Base : 32°C Additive : 23°C % Solids by Volume: 83 ± 4% (ASTM-D2697-91) Pot Life: 3 hours @ 5°C 1½ hours @ 23°C 1 hour @ 35°C (see notes on tropical use overleaf) Colour Availability: Aluminium 	Indefinitely self overcoatable provided the coating has been suitably cleaned. For optimum intercoat adhesion with other epoxy topcoats, overcoating should occur within 14 days. Where atmospheric exposure is required, overcoat with Acrolon C137V2, Acrolon C237, Acrolon 1850 and Acrolon 7300 within 7 days at a minimum dft of 50 microns or in the case of Acrolon C750V2 overcoat within 4 days. These overcoating times refer to achievement of optimum adhesion at 23°C and will vary with temperature.
146 gms/litre determined practically in accordance with UK	Раскаде
Regulations PG6/23 179 gms/litre calculated from formulation to satisfy EC Solvent Emissions Directive	A two component material supplied in separate containers to be mixed prior to use.
110 gms/kilo content by weight from formulation, to satisfy EC Solvent Emissions Directive	Pack Size: 1 litre and 4 litre units when mixed
Recommended Thickness	Mixing Ratio: 3 parts base to 1 part additive by volume
Drv film Wet film Theoretical	Weight: 1.50 kg/litre (may vary with shade).
thicknessthicknesscoverage400 microns482 microns2.1 m2/ltr** This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment.Film thickness will vary depending on actual use and specification.	Shelf Life: 2 years from date of manufacture or 'Use By' date where specified.
specification.	







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Protective & Marine **Coatings**

MACROPOXY[™] M922M SURFACE TOLERANT

FORMERLY KNOWN AS EPIGRIP M922M

Revised 07/2016 Issue 12

PRODUCT INFORMATION

Protective & Marine Coatings

SURFACE PREPARATION

Manually prepared surfaces should be prepared to a minimum standard of St3 BS EN ISO 8501-1:2007 at the time of coating. Application to such surfaces should be by brush where the mechanical action will aid adhesion.

Ensure surfaces to be coated are clean and free from all surface contamination.

For spray application it is recommended that surfaces should be blast cleaned to Sa2¹/₂ BS EN ISO 8501-1:2007 using angular grit. Quill/wet abrasive blast to produce surface equivalent to Sa2¹/₂. Light surface gingering (ie not removable by rubbing) is

permissible. UHP blasted surfaces must reveal an underlying surface equivalent of Sa2¹/₂. Light surface gingering is permissible as above.

Average surface profile in the range 50-100 microns.

APPLICATION EQUIPMENT

Airless Spray

Nozzle Size:	0.38-0.53mm (15-21 thou)
Fan Angle:	40°
Operating Dressure:	$210ka/am^2/2000$ noi)

Operating Pressure: 210kg/cm² (3000 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

N.B. Macropoxy M922M may be thinned up to 5% volume with Cleanser/Thinner No. 9 for airless spray application - adjust wft accordingly, sag tolerance may be affected if the product is thinned.

Application by roller is not recommended, as a stippled, uneven film may be achieved.

Brush

Macropoxy M922M is capable of being applied by brush at 400 microns dft.

It is possible to apply Macropoxy M922M onto a damp substrate (no running or pooled water) by brush application. Ensure that the paint fully displaces any water on the substrate.

Macropoxy M922M may be applied by brush onto hot surfaces up to 100°C. Multiple coats will be necessary to achieve required film build. Ensure good ventilation and adequate PPE due to rapid

vapourisation of solvent from the film at high temperatures.

APPLICATION CONDITIONS AND OVERCOATING

In conditions of high relative humidity, ie 80-85%, good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not recommended

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

ADDITIONAL NOTES

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Epoxy Coatings - Colour Stability: Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change.

When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem. The maximum air temperature for application is 50°C

providing conditions allow satisfactory application and film formation. If the air temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue.









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NEW







NEW SPECS





Protective R

FIRETEX[®] FX5060 WATER BASED INTUMESCENT



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SHERWIN VILLIAMS. Coatings	
Revised 01/2016 Issue 9 PRODUCT IN	
P RODUCT D ESCRIPTION	Average Drying Times
A water based TCEP free thin film intumescent coating	@ 15°C @ 23°C
Recommended Use	To touch:3 hours1½ hours
FIRETEX EX5060 is designed for application by airless spray	To recoat:6 hours4 hours
to provide fire resistance for periods of up to 60 minutes on structural steel.	To handle: This will depend on the total thickness of FIRETEX FX5060 to be applied.
For use in internal dry controlled environments without topcoat (C1 according to ISO12944-2:1998)	These figures are given as a guide only. Factors such as air movement and humidity must also be considered.
and external urban or uncontrolled internal environments (C3 according to ISO12944-2:1998) with topcoat	Recommended Primers
Endorsements	A range of primers have been fire tested and approved for use under FIRETEX FX5060.
Certifire Approved – Certificate CF842. This product has been assessed in accordance with the Criteria of Acceptability given in the ASFP/BCF "Industry Cuidance document"	Please consult Sherwin-Williams for detailed information. Must not be applied directly to galvanized steel and zinc rich primers.
Guidance document	Recommended Topcoats
This product has been tested and assessed in accordance with the ASFP fire testing protocol for cellular beam protection. See Section 6.3 from ASFP "Yellow Book" 4th Edition.	If it can be guaranteed that application and subsequent in-service conditions will be in a C1 environment as defined in ISO 12944-2:1998, then no topcoat is required.
Authorised for use on London Underground assets, product ID1999	Sherwin-Williams Customer Service Department for advice.
Recommended Application Methods	Sher-Cryl M770 FIRETEX M71V2,
Airless Spray	Acrolon C137V2 or Acrolon C237
Brush	The above products should be used for subsequent re-decoration.
Recommended Thinner: Water – Thinning will have an adverse effect on sag tolerance.	Раскаде
P RODUCT C HARACTERISTICS	A single component material
% Solids by Volume: 68 ± 3% (ASTM-D2697-91)	Pack Size: 20 litre units
Colour Availability: White	Weight: 1.34 kg/litre
VOC 63 gms/litre calculated from formulation to satisfy EC Solvent Emissions Directive 48 gms/kilo content by weight from formulation, to satisfy EC Solvent Emissions Directive 48 gms/kilo content	Shelf Life: 6 months from date of manufacture or 'Use By' date where specified. Protect from frost.
PRACTICAL APPLICATION RATES -	
MICRONS PER COAT	
Airless Spray Brush	
Dry 800* 300	

PRACTICAL APPLICATION RATES -			
	MICRONS PER COAT		
	Airless Spray	Brush	
Dry	800*	300	
Wet	1176	441	

* Maximum sag tolerance typically 1470µm wet (100µm dry) by airless spray.
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Protective & Marine **Coatings**

FIRETEX[®] FX5060 WATER BASED INTUMESCENT



Revised 01/2016 Issue 9

PRODUCT INFORMATION

Additional Notes

In common with other water based coatings, the drying of this material is retarded by high himidity conditions. Lack of air movement also slows down the drying process, and under such conditions it is advisable to introduce some method of circulating air over the coated surface in order to speed up the drying. A ventilated air speed for 2 metres per second is recommeded.

Numerical values quoted for physical data may vary slightly from batch to batch.

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all surface contamination

APPLICATION EQUIPMENT

Airless Spray

17 - 23 thou depending on application Nozzle Size: requirements

Operating Pressure: 175kg/cm² (2500 psi)

Petrol Unit:

Nozzle Size:	17 - 23 thou depending on application
	requirements

Operating Pressure: 175kg/cm² (2500 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicator's responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Use 3/8" ID fluid line where lengths in excess of 10 feet are required. In-line gun or pump filters should not normally be used.

Brush

The material is suitable for brush application but due to the nature of the material a ribbed appearance will result

Application of more than one coat may be necessary to give equivalent dry film thickness to a single applied coat.

Application Conditions and Overcoating

FIRETEX FX5060 must be applied in a dry internal environment. It must not be exposed to condensation, damp or wet conditions during or after application.

In conditions of high relative humidity good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

A minimum ambient air temperature of 5°C is required to ensure proper film formation.

Relative humidity should not exceed 80% to ensure proper film formation. Extended overcoating times may be required at low temperatures and/or high film thicknesses.

Occasionally impaired film formation such as cracking may occur on edges of flanges and external or internal angles of structural steel, depending on geometry, over-application and ambient conditions. This does not detrimentally affect the fire performance properties of the product. If it is desired to overcoat outside the times stated on the data

sheet, please seek advice of Sherwin-Williams.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product. Unlike many other water based intumescent coatings, FIRETEX FX5060 does not contain tris-chloro ethyl phosphate (TCEP). TCEP is a category 3 carcinogen, which would cause products to be classified as harmful. Since FIRETEX FX5060 is TCEP free, it is not classified as harmful by the Chemicals (Hazard) Information and Packaging for Supply Regulations 2002.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

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Protective & Marine Coatings

FIRETEX® M71V3 SHEEN TOPCOAT

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Revised 08/2016 Issue 6

PRODUCT **D**ESCRIPTION

FIRETEX M71V3 is a Sheen decorative topcoat for FIRETEX FX5120 and also provides protection when used in internal semicontrolled conditions where condensation may occur (Category C2 as defined in ISO 12944-2)

	P RODUCT C HARACTERISTICS	
Color:	Full Range	

Volume Solids: $50 \pm 2\%$ (ASTM-D2697-91)

VOC:

445 gms/litre determined practically in accordance with UK Regulations $\mathsf{PG6/23}$

452 gms/litre calculated from formulation to satisfy EC Solvent Emissions Directive

279 gms/kilo content by weight from formulation, to satisfy EC SED

Mix Ratio: Single Component Material

Recommended Application Methods: Airless Spray Brush

Conventional Spray Roller

Typical Thicknesses	
	Minimum
Dry microns (mils)	50 (2)
Wet microns (mils)	100 (4)
Theoretical Coverage m²/I (sq ft/gal)	10 (412.5)

* This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification.

Average Drying Times:						
	@ 15°C /59°F	@ 23C/73 °F	@ 35°C/94 °F			
To touch:	45 minutes	30 minutes	15 minutes			
To Recoat:	8 hours	6 hours	6 hours			
Shelf Life: 2 years from date of manufacture						
	or 'Us	or 'Use By' date where specified.				
Flash Point:	28°C/	28°C/82°F				
Thinner / Cle	an Up: Clean	Cleanser / Thinners No.5				

ENDORSEMENTS

Forumulated to meet the requirements of EC directive 2004/42/CE

PRACTICAL APPLICATION RATES MICRONS PER COAT (MILS)						
	Airless Spray	Conventional Spray	Brush	Roller		
Dry	50 (2)	50 (2)	25-50 (1-2)	25-50 (1-2		
Wet	100 (4)	100 (4)	50-100(2-4)	50-100(2-4		
Maximum sag tolerance typically 150µm dry by airless spray						
Drying time is temperature, humidity, and film thickness dependent						
APPLICATION EQUIPMENT						

The airless spray details given are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results.

Airless Spray

Protective & Marine Coatings

Nozzle Size:	0.33mm (13 thou)
Fan Angle:	40°
Operating Pressure:	155kg/cm² (2200 psi)

Conventional Spray

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

Brush

The material is suitable for brush application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.













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Protective & Marine Coatings Protective & Marine Coatings

FIRETEX® M71V3 SHEEN TOPCOAT



Revised 08/2016 Issue 6

Recommended Uses

Will provide protection for FIRETEX FX5120 for life of building in an internally dry controlled environment and up to 20 years in an internal semi-controlled environment. (Category C2 as defined in ISO 12944-2).

RECOMMENDED **T**OPCOATS

Not normally required, but indefinitely overcoatable with itself

ADDITIONAL NOTES

FIRETEX M71V3 must always be applied to a minimum dry film thickness of 50 microns to provide adequate protection to FIRETEX FX5120 in an internally semi-controlled environment where condensation may occur (Category C2 as defined in ISO 12944-2).

FIRETEX M71V3 is recommended for future re-decoration and maintenance. The use of any other coatings may reduce the systems fire resistance.

Certain shades, eg yellows and reds, may require additional coats to achieve full opacity.

Numerical values quoted for physical data may vary slightly from batch to batch.

Application at ambient air temperatures below 5°C is not recommended.

For further technical enquiries please consult Sherwin-Williams

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all surface contamination.

APPLICATION CONDITIONS

In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature should be at least 3°C above the dew point and always above 0°C.

ORDERING INFORMATION

Pack Size: 18 litre (4.7 US Gallons) and 5 litre (1.3 US Gallons) Weight: 1.62 kg/litre (13.5lb/US gallon) (may vary with shade)

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

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Marine		
SHERWIN Coatings WILLIAMS.	FORMERLY KNOWN	AS LEIGHS L703 (TRANSGARD TG155
Revised 02/2016 Issue 18 PRODUC	T INFORMATION	
P RODUCT D ESCRIPTION		PACKAGE
1ordant Wash - Blue Mordant Solution	Single compon	nent material
Recommended Use	Pack Size:	5 litre polythene bottle.
or application onto galvanized surfaces as a chemical re-treatment to improve the adhesion of subsequent pair	t Weight:	0.99 kg/litre.
urfaces black and this colour change can be used as an idicator that the chemical reaction has taken place and the urface is suitable for overcoating.	ne Shelf Life:	2 years from date of manufacture or 'Use By' date where specified.
Endorsements		
lighways Agency Item No.155.		
Recommended Application Methods		
Recommended Cleanser: Water - DO NOT THIN PRODUCT CHARACTERISTICS	_	
Flash Point: 24°C		
Colour Availability: Blue Solution		
807 gms/litre determined practically in accordance with UK Regulations PG6/23 807 gms/litre calculated from formulation to satisfy EC Solve Emissions Directive 801 gms/kilo content by weight from formulation, to satisfy E Solvent Emissions Directive	nt C	
PRACTICAL APPLICATION RATES - MICRONS PER COAT		
27.6 m2/litre		
Average Drying Times		
@ 15°C @ 23°C @35°C	_	
To touch: $1\frac{1}{2}$ hours1 hour45 minutesTo recoat:3 hours2 hours $1\frac{1}{2}$ hoursTo handle:3 hours2 hours $1\frac{1}{2}$ hours	s air	
These figures are given as a guide only. Factors such as movement and humidity must also be considered.		

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Protective & Marine **Coatings**

MORDANT WASH L703

FORMERLY KNOWN AS LEIGHS L703 (TRANSGARD TG155)



Revised 02/2016 Issue 18

PRODUCT INFORMATION

SURFACE PREPARATION

Degrease in accordance with SSPC-SP1 solvent cleaning using Envirogard W500 Degreaser. Weathered galvanizing should be abraded to remove the passivated surface. Where galvanizing has been exposed and zinc salt formation has occurred, the surface should be washed down with clean, fresh water to remove any soluble salts, then allowed to dry before application of this product.

APPLICATION EQUIPMENT

Apply an even, flowing coat by brush and allow to dry. If the zinc surface fails to turn black this indicates that the pre-treatment has not been effective. This may be due to the galvanized surface being contaminated with grease, flux or other contaminants or to the presence of anti-white rust or wet storage stain treatment.

Before re-applying mordant solution, it will be necessary to remove any unreacted mordant solution and contaminants by solvent washing and abrading the surface.

Over application of mordant solution must be avoided as this results in a dense black powdery surface and in ex-treme cases there is a possibility of metallic copper plating out on the surface which will adversely affect the adhesion of subsequent coatings. For this reason, methods of application in which the applied thickness may be difficult to control e.g. dip or spray, are not recommended. In any case if there is any possibility of excess L703 pooling on galvanized surfaces, this must be removed by fresh water washing.

The mordant pre-treated surface should be overcoated before any contamination can occur, and in exterior weather conditions within a maximum of 2 days.

ADDITIONAL NOTES

Drying times should be considered as a guide only.

The successful painting of galvanized surfaces is a specialised area and the choice of painting system over the mordant pre-treatment is critical. Please consult Sherwin-Williams for advice on the most appropriate paint systems for specific use.

Numerical values quoted for physical data may vary slightly from batch to batch

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

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WARRANTY

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The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before



ACROLON[™] C750V2 **ACRYLIC EPOXY FINISH**

FORMERLY KNOWN AS LEIGHS C750V2

Revised 02/2016 Issue 13

PRODUCT INFORMATION

PR	ODUCT D ESCRIPTIC	N	PRACTICAL APPLICATION RATES -			N RATES -	
Isocyanate free - two	oack finish based on a	crylic epoxy binder	MICRONS PER COAT			AT	
system.	ecommended Usi	E	Airles Spra	s Convention al Spray	¹⁻ Brus	sh#	
Finish coat for exterior is required, and the u undesirable.	exposed surfaces wh se of isocyanate proc	ere retention of gloss ducts is precluded or	Dry 50* Wet 94	50 94 olerance typica	-20 38-` الv 142u	40 75 m wet (75um drv) by	
Normally used in conju	unction with epoxy prin	ners and undercoats.	airless spray.	chose within the		range will depend	
	ENDORSEMENTS		on many variables including ambient conditions and opera			nditions and operator	
Network Rail approved Highways Agency No:	d as an Isocyanate fre 167	e finish.	expertise. To ensure full obliteration and maximum opacity, the appropriate undercoat or primer shade should be used.				
Recommen	IDED APPLICATION	Methods		AVERACE D	DVINC	TIMES	
Airless Spray Brush Conventional Spray			To touch:	@ 15°C @ 2 hours	23°C 1 hour	@ 35°C ½ hour	
Recommended Thinne	er: No 5		To recoat:	6 hours 3	hours	2 hours	
P RODUCT C HARACTERISTICS		These figures	are given as a	o nours <i>guide or</i>	4 nours		
Flash Point: Base :	34°C Additive : 33°	C	movemen	nt and humidity	Tmust al	so be considered.	
% Solids by Volume: 53 ± 3% (ASTM-D2697-91)		Recommended Primers					
Colour Availability: Full range Pot Life: 12hrs @15°C 8hrs @ 23°C 6hrs @ 35°C VOC		Compatible with a wide range of Macropoxy, Dura-plate, Zinc Clad Epoxy Primers and Buildcoats. Acrolon C750V2 must be applied over epoxy materials within 4 days at 23°C to ensure satisfactory intercoat adhesion.					
Regulations PG6/23	d from formulation to	satisfy EC Solvent	RECOMMENDED TOPCOATS				
Emissions Directive 309 gms/kilo content by weight from formulation, to satisfy EC			Not normally required but indefinitely overcoatable with itself and other high performance topcoats.				
		IESS		PAC	KAGE		
Dry film thickness 50 microns * This figure makes application, overs equipment. Film ti use and specificat	Wet film thickness 94 microns no allowance for surf pray or losses in cont nickness will vary dep tion.	Theoretical coverage 10.6 m²/ltr* face profile, uneven ainers and bending on actual	A two compone to be mixed pri Pack Size: Mixing Ratio Weight: Shelf Life:	ent material sup or to use 20 litre and 4 parts bas White 1.41 shade). 2 years fro 'Use By' da	oplied in 15 litre u e to 1 pa kg/litre m date o ate wher	separate containers units when mixed art additive by volume. (may vary with of manufacture or e specified.	



MAINTENANCE SPECS

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Protective & Marine Coatings

ACROLON[™] C750V2 ACRYLIC EPOXY FINISH

FORMERLY KNOWN AS LEIGHS C750V2



Revised 02/2016 Issue 13

PRODUCT INFORMATION

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all surface contamination.

APPLICATION EQUIPMENT

Airless Spray Nozzle Size Fan Angle Operating Pressure

: 0.33mm (13 thou)
: 65°
: 176kg/cm² (2500 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray

Nozzle Size Atomising Pressure Fluid Pressure : 1.27mm (50 thou) : 3.5kg/cm² (50 psi) : 0.7kg/cm² (10 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

Brush

The material is suitable for brush application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

APPLICATION CONDITIONS AND OVERCOATING

This material should preferably be applied at temperatures in excess of 10°C. In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not recommended.

Steelwork coated with Acrolon C750V2 Special Finish should be protected from weather for 48-72 hours after application, depending on conditions. Consult Sherwin-Williams if in doubt.

Additional Notes

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of the material commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Tropical Use

Acrolon C750V2 at the time of mixing should not exceed a temperature of 35°C. Use of this product outside its pot life may result in inferior adhesion properties even if the material appears fit for application. Thinning the mixed product will not alleviate this problem.

It is not advisable to apply this coating when the air and substrate temperatures exceed 45°C. These conditions can introduce paint film formation defects, such as dry spray, bubbling and pinholing etc.

Numerical values quoted for physical data may vary slightly from batch to batch.

Health and Safety

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

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Protective & Marine Coatings Europe, Middle East & Africa



Revised 02/2016 Issue 4

Protective & Marine Coatings

MACROPOXY[™] C88 **EPOXY PRIMER FINISH**



NEW SPECS











PRODUCT	INFORMATION

	Pro	DUCT D ESCRIPTION		Average Drying Times				
A high per	rformance 2-pa	ick multi purpose tolerant e	роху.	@ 10°C/50°F @ 23°C/74°F @ 35°C				
ENDORSEMENTS			To touch:	8 hours	4 hours	2 hours		
Computin		NDORSEMENTS		To handle:	24 hours	7 hours	4 hours	
 Complies with NORSOK M501 Rev. 5 System 1 as part of a three coat. Zinc Epoxy Scheme 			To recoat	24 hours	7 hours	4 hours		
Meets tNetwork	he requirement k Rail, Item No	ts of ISO12944 C5 High dur 7.2.6	ability.	If maximum re Drying time is	ecoat time is excee s temperature, hu	eded, abrade surfac midity, and film thic	e before recoating. kness dependent.	
	Recommend	DED APPLICATION METHO	DS	Pot Life:	3 hours	2 hours	1.5 hours	
					A PPLICAT	ION EQUIPMENT		
Airless S Conventi Brush	pray ional Spray			The following be needed for equipment be	is a guide. Cha r proper spray cl fore use with lis	nges in pressures haracteristics. Alw ted reducer. Any i	and tip sizes may ays purge spray reduction must be	
Thinner	/ Clean Up:	Sherwin-Williams Clean No. 5 (for thinning and cle	ser/Thinner eaning)	compliant with existing enviro	h existing VOC r onmental and ap	egulations and co oplication conditio	ompatible with the ns.	
	P rodu	CT CHARACTERISTICS		Airless Spray Nozzle Size:	y 0.:	33 - 0.45mm (15- ⁻	19 thou)	
Flash Po	oint:	Base: 32°C/90°F		Ean Angle:	40	0		
		Additive: 24°C/75°F		Operating Pressure:			osi)	
Color:		Full range		The airless spray details given above are intended as a guide only Details such as fluid hose length and diameter, paint temperature				
Volume \$	Solids:	79 ± 3% (ASTM-D2697-9	91)					
VOC: 186 gms/litre determined practically in accordance with UK Regulations PG6/23 203 gms/litre calculated from formulation to satisfy EC Solvent Emissions Directive 139 gms/kilo content by weight from formulation, to satisfy			with UK EC Solvent satisfy	operating pres be the lowest conditions will to ensure that best results.	ssure chosen. Ho possible consist vary from job to t the equipment	wever, the operati ent with satisfacto job, it is the applica in use has been	ng pressure should ory atomisation. As ators' responsibility set up to give the	
Mix Ratio	: 1 parts base	e to 1 part additive by volum	ie	Conventiona Nozzle Size:	I Spray	1.27mm (50 thou)		
	Ty	PICAL THICKNESS		Atomising Pre	essure	2.8kg/cm² (40 psi)	
Dry microns (mils) 250 (10) Wet microns (mils) 316 (13) Theoretical Coverage m²/L (sq ft/gal) 3.16* (130) * This figure makes no allowance for surface profile, uneven			The details of atomising pressure, fluid pressure and nozzle size a given as a guide. It may be found that slight variations of pressur will provide optimum atomisation in some circumstances accordin to the set up in use. Atomising air pressure depends on the air calin use and the fluid pressure depends on the length of line ar direction of feed i.e. horizontal or vertical.			and nozzle size are iations of pressure istances according ends on the air cap length of line and		
Film thickn	ness will vary de	pending on actual use and sp	ecification.	Brush			.	
	PRACTIC	AL APPLICATION RATES		I ne material	is suitable for e coat may be n	prush application	on. Application of equivalent drv film	
	Micro	ONS PER COAT (MILS)		thickness to a	single spray ap	plied coat.		
A Dry: Wet: Dry: Wet:	<pre>sirless Spray: 125* (5) 158 (6) 250* (10) 316 (13)</pre>	Conventional Spray: 125 (5) 158 (6) 250 (10) 316 (13)	Brush 125 (5) 158 (6) - -	Shelf Life:	18 r 'Use	nonths from date By' date where s	of manufacture or pecificed	

* Maximum sag tolerance typically 450µm wet (356µm dry) by airless spray.

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Protective & Marine Coatings

MACROPOXY[™] C88 EPOXY PRIMER FINISH

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Revised 02/2016 Issue 4

PRODUCT INFORMATION

RECOMMENDED USES

- As a single coat shop applied protective finish for structural steel
- Maintenance work on blasted and manually prepared structural steelwork
- For use in internal/external conditions, including offshore and petrochemical applications
- Can be applied at thicknesses between 125 microns (5 mils) and 250 microns (10 mils) dry to provide primer, buildcoat or finish in a single coat. A top coat is only required where prolonged colour retention is needed
- Offers good adhesion and abrasion resistance over blasted and manually prepared steel and a range of other epoxy materials

Recommended Topcoats

Indefinitely overcoatable with epoxy systems provided the surfaces to be coated have been suitably cleaned. Where a high degree of gloss and colour retention is required overcoat with Acrolon C137V2, Acrolon C237 within 7 days at a minimum dft of 50 microns (2 mils) or in the case of Acrolon C750V2 overcoat within 5 days at a minimum of 60 microns (2.5 mils). These overcoating times refer to achievement of optimum adhesion at 23°C/73°F and will vary with temperature.

ADDITIONAL NOTES

Drying times, curing times and pot life should be considered as a quide only.

The curing reaction of epoxies commences immediately when the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C/50°F increase in temperature and doubled by a 10°C/50°F decrease in temperature.

Epoxy Coatings - Colour Stability

Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age whether used on internal or external areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change. When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use

Epoxy paints at the time of mixing should not exceed a temperature of 35°C/95°F. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem.

The maximum air and substrate temperature for application is 50°C/122°F providing the conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed

50°C/122°F and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating.

Certain lead free shades such as bright oranges, reds, yellows may show reduced opacity. In these cases multiple coats of C88 may need to be applied to obtain full coverage.

Numerical values quoted for physical data may vary slightly from batch to batch.

SURFACE PREPARATION

Blast clean to Sa 21/2 BS EN ISO 8501-1:2007 (SSPC-SP10/ NACE2). Average surface profile in the range 50-75 microns

(2-3mils). Ensure surfaces to be coated are clean, dry and free from all surface contamination. Manually prepared surfaces should be prepared to a minimum standard of St 3 BS EN ISO 8501-1:2007 (SSPC-SP3) at the time of coating.

APPLICATION CONDITIONS

This material should preferably be applied at temperatures in excess of 10°C/50°F. Relative humidity should not exceed 90% and in these conditions good ventilation is essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C/32°F. At application temperatures below 10°C/50°F, drying and curing times will be significantly extended and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C/41°F is not recommended

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C/50°F during curing.

ORDERING **I**NFORMATION

Packaging: A two component material supplied in separate containers to be mixed prior to use.

Pack Size: 20 litre (5.3 gal) and 5 litre (1.3 gal) units when mixed

Weight: 1.465 kg/litre (14.7 lb/gal) (may vary with shade).

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.



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Revised 05/2016 Issue 27

Protective & Marine Coatings

MACROPOXY[™] L574 **EPOXY BLAST PRIMER**

FORMERLY KNOWN AS METAGARD L574

PRODUCT INFORMATION

Produc	T DES	SCRIPTION	PRACTICAL	APPLIC	ATION RATES	S - MICRON	S PER COAT
A 2-pack epoxy temporary pr	rotectiv	e primer.		-	Conventional		
R есом	IMEND	ED U SE	Airle	ss Spray	Spray	Roller	Brush
Temporary protective for stee cleaning.	el surfac	ces prepared by abrasive blast	Dry Wet	25 86	25 86	25 86	20 69
Suitable for use in conjunctio Suitable for welding and fabri paints in common use excep	on with ication ot high	cathodically protected steel. and for overcoating with most content metallic zinc products		Aver At 1	AGE DRYING	TIMES	
As a sealer for aluminium an As a primer for use over stai substrates.	ieat). d zinc inless s	metal spray. steel and non-ferrous metallic	To touch: To recoat: To handle:	10 mir 4 ho 30 mir	utes 5 minutes urs 3 hours utes 20 minute	3 minutes 2 hours 5 15 minute	5
Ende	ORSEN	IENTS	These figure movem	es are giv	en as a guide d humidity must a	only. Factor	s such as air sidered.
Network Rail item No. 7.1.2				-	, 		
Recommended /	Appli	CATION M ETHODS		RECO	MMENDED IC	PCOATS	
Airless Spray Conventional Spray Brush (for small areas and touch up only) Roller		Indefinitely of surfaces to be high degree o overcoat with Acrolon 7300	Indefinitely overcoatable with epoxy systems provided the surfaces to be coated have been suitably cleaned. Where a high degree of gloss and colour retention is required, overcoat with Acrolon C137V2, Acrolon C237 Acrolon 1850 and Acrolon 7300 within 7 days at a minimum dft of 50 microns or				
Recommended Cleanser/Thin	nner: N	lo 5	overcoating til	Acrolon mes refe	r to achieveme	oat within 4 ent of optim	days. These ium adhesion
P RODUCT (Char	ACTERISTICS	at 23°C and w For overcoatir	rill vary w na with a	ith temperature kvd svstems.	e. consult She	rwin-Williams
Flash Point:Base : 9°CAdditive : 12°C		for advice.	.9	,,,.			
% Solids by Volume: 29 ± 1	1% (AS	TM-D2697-86)			P ACKAGE		
Pot Life: 10hrs @ 15°C 8h	nrs @ 2	3°C 4 hrs @ 35°C	A two compo	nent mai	erial supplied i	n senarate	containers
Colour Availability: Limited	range.		to be mixed p	prior to u	se.	in copulate	containere
VOC			Pack Size:	20 li	re and 5 litre ι	inits.	
594gms/litre determined prac Regulations PG/23	ctically	in accordance with UK	Mixing Ratio	o: 4 pa	ts base to 1 pa	rt additive b	y volume.
621gms/litre calculated from Emissions Directive	formul	ation to satisfy EC Solvent	Weight:	1.20	kg/litre (may v	ary with sha	ade).
518gms/kilo content by weigh Solvent Emissions Directive	ht from	formulation, to satisfy EC	Shelf Life:	12 n 'Use	onths from da By' date wher	te of manuf e specified.	acture or
Recomme	NDED	Thickness					
Dry film Wet thickness thick	film ness	Theoretical coverage					
25 microns 86 mic	crons	- 11.6 m²/ltr*					
* This figure makes no allow application, overspray or l equipment. Film thickness use and specification.	vance f losses s will v	or surface profile, uneven in containers and ary depending on actual					

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Protective & Marine **Coatings**

MACROPOXY[™] L574 **EPOXY BLAST PRIMER**

FORMERLY KNOWN AS METAGARD L574



Revised 05/2016 Issue 27

PRODUCT INFORMATION

Protective & Marine Coatings

SURFACE PREPARATION

FERROUS SURFACES: For optimum performance blast clean to Sa21/2 BS EN ISO 8501-1 (2007). Average surface profile in the range 30-50 microns.

NON FERROUS SURFACES: For optimum adhesion all surfaces should be flash blasted using non-metallic abrasive and coated with L574 within 4 hours of blasting. Under conditions of high humidity a shorter period will be necessary. ALL SURFACES: Ensure surfaces to be coated are clean, dry and

free from all surface contamination.

0.38mm (15 thou)

Application Equipment

Airless Spray Nozzle Size

Fan Angle

80° Operating Pressure : 155kg/cm² (2200 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray

Nozzle Size 1.27mm (50 thou) Atomising Pressure 3.5kg/cm² (50 psi) : 1.0kg/cm² (15 psi) Fluid Pressure

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

Brush

The material is suitable for brush application to small areas and for touch up purposes.

Roller

The material is suitable for roller application.

Preparation and Build Up:

Metagard L574 is not intended to replace a coat of primer in the main paint specification, it is designed to provide temporary protection, until the specified paint scheme can be applied. However in practice the use of Macropoxy L574 does make a substantial contribution to the performance of the complete paint specification in terms of ultimate durability and resistance to corrosion.

The applied dry film thickness of prefabrication primers is normally below 30 microns. At this level of dry film thickness, factors such as blast profile, unevenness of application and severity of exposure conditions may significantly affect the performance.

Application Conditions and Overcoating

Epoxy paints should preferably be applied at temperatures in excess of 10°C. In conditions of high relative humidity, i.e. 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired. Application at ambient air temperatures below 5°C is not recommended. In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing

curing. If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

ADDITIONAL NOTES

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Fabrication: While Macropoxy L574 Primer is classed and approved as a welding primer, under certain types of welding operations e.g. high speed twin-fillet welding, fabricators are advised to satisfy themselves that the product is suitable for their particular welding process.

Epoxy Coatings - Tropical Use: Epoxy paints at the time of mixing should not exceed a temperature of 35°C. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application.

Thinning the mixed product will not alleviate this problem.

It is not advisable to apply epoxy coatings when the air and substrate temperatures exceed 45°C. These conditions can introduce paint film formation defects, such as dry spray.

bubbling and pinholing etc. Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH & SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue.













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Revised 05/2016 Issue 13

Protective & Marine Coatings

MACROPOXY[™] L674 **EPOXY ZINC PHOSPHATE**

FORMERLY KNOWN AS METAGARD L674

PRODUCT INFORMATION

P RODUCT D ESC	RIPTION		Average Drying Times				
ک کا 2-pack epoxy zinc phosphate blast ہ	orimer			@ 15°C	@ 23°C	@ 35°C	
Recommender	D U SE		To touch:	15 minutes	12 minutes	8 minutes	
Quick drying anti-corrosive protectio aces prepared by abrasive blast cle Suitable for use in conjunction with steel. Suitable for overcoating with most p	To recoat: To handle: These figures a movemen	2¼ hours 4 hours are given as a t and humidit	1½ hours 3 hours a guide only. Fa ty must also be	45 minutes 45 minutes actors such as air considered.			
Suitable as a primer for use over de cleaned aluminium	ducts. greased/abr	aded or blast	Indefinitely over	Recommended Systems			
Endorseme	NTS		surfaces to be c	oated have b	been suitably cl	eaned. Where a	
Network Rail Item No. 7.1.2			overcoat with Ac	crolon C137V t of 50 micro	/2, Acrolon C23	7 within 7 days	
Recommended Applic	TION MET	HODS	C750V2 overcoa refer to achieve	at within 4 da ment of optin	ays. These over num adhesion a	coating times at 23°C and will	
Airless Spray Brush (for small areas and touch up o	nly)		vary with tempe For overcoating for advice.	rature. with alkyd sy	stems consult	Sherwin-Williams	
Roller				PA	CKAGE		
Recommended Cleanser/Thinner: No	5		A two compone	ent material s	supplied in sepa	arate containers	
P RODUCT C HARAC	TERISTICS		to be mixed pri Pack Size:	or to use 20 litre a	and 5 litre units		
Flash Point: Base : 9°C Additive	: 12°C		Mixing Ratio:	4 parts b	base to 1 part ac	lditive by volume	
% Solids by Volume: 42 ± 2% (ASTN	<i>I</i> I-D2697-91)		Weight:	1.38 kg/	1.38 kg/litre (may vary with shade).		
Pot Life: 8 hrs @ 15°C, 6 hrs @ 23	3°C, 3hrs	@ 35°C	Shelf Life:	12 mont	ths from date o	f manufacture or	
Colour Availability: Buff and Red Ox /OC 515 gms/litre determined practically in Regulations PG6/23 508 gms/litre calculated from formulat Emissions Directive 382 gms/kilo content by weight from for Solvent Emissions Directive	kide accordance ion to satisfy prmulation, to	with UK EC Solvent o satisfy EC		,			
Recommended T	HICKNESS						
Dry film thicknessWet film thickness50 microns119 microns* This figure makes no allowance for application, overspray or losses i equipment. Film thickness will va use and specification.	Th c 8 8 or surface pr n containers ry dependin	eoretical overage .4 m²/ltr* rofile, uneven and g on actual					
P RACTICAL A PPLICAT	ION RATES	s -					
MICRONS PER	COAT						
Airless SprayConventional SprayDry5050Wet119119	Brush 25 60	Roller 40 95					

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Protective & Marine **Coatings**

MACROPOXY[™] L674 EPOXY ZINC PHOSPHATE

FORMERLY KNOWN AS METAGARD L674



Revised 05/2016 Issue 13

PRODUCT INFORMATION

SURFACE PREPARATION

Ferrous Surfaces

or optimum performance blast clean to Sa21/2 BS EN ISO8501-1(2007). Average surface profile in the range 30-50 microns

Aluminium

For optimum adhesion all surfaces should be flash blasted using non-metallic abrasive. Alternatively, surfaces can be degreased and thoroughly abraded using 120's grade silicone carbide paper. Ensure surfaces to be coated are clean, dry and free from all

surface contamination

APPLICATION EQUIPMENT

Airless Spray

Nozzle Size:	0.38mm (15 thou)
Fan Angle:	80°

Operating Pressure: 155kg/cm² (2200 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray

Nozzle Size	1.27mm (50 thou)
Atomising Pressure:	3.5kg/cm² (50 psi)
Fluid Pressure :	1.0kg/cm² (15 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical

Brush

The material is suitable for brush application to small areas and for touch up purposes.

Roller The material is suitable for roller application.

APPLICATION CONDITIONS AND OVERCOATING

Epoxy paints should preferably be applied at temperatures in excess of 10°C. In conditions of high relative humidity, le 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired. Application at ambient air temperatures below 5°C is not recommended

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams

Additional Notes

Drying times, curing times and pot life should be considered as a guide only

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Epoxy Coatings - Tropical Use

Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem

The maximum air and substrate temperature for application is 50°C providing conditions allow satisfactory application and film formation.

If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating. Numerical values quoted for physical data may vary slightly from

HEALTH AND SAFETY

storage, handling and application of this product.

time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the



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Consult Product Health and Safety Data Sheet for information on safe

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

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Revised 01/2016 Issue 11

Protective & Marine **Coatings**

PRODUCT DESCRIPTION A high performance fast drying acrylic urethane gloss finish for

ACROLON[™] C137V2 **ACRYLIC URETHANE GLOSS FINISH**

FORMERLY KNOWN AS RESISTEX C137V2

DUCT IN	ICT INFORMATION				
	PRACT				

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characteristics are required.
Recommended Use
Material is suitable for use as final coat or coats in conjunction will epoxy or polyurethane based protective systems for new construction or maintenance purposes.
Endorsements
Highways Agency Item No.168. Network Rail Item No. 7.3.1. Certified for decontamination EX07190/06/33/05 in accordance with ISO 8690.
Recommended Application Methods

Airless Spray Brush Conventional Spray Roller (short pile only)

Recommended Thinner: Cleanser/Thinner: No 15 (for thinning) Cleanser/Thinner: No 5 (for cleaning)

PRODUCT CHARACTERISTICS

Finish:

Flash Point: Base : 30°C Additive : 58°C

% Solids by Volume: 54 ± 3% (ASTM-D2697-91)

Gloss

Colour Availability: Full range

Pot Life: 31/2hrs @15°C 21/2hrs @ 23°C 1hr @ 35°C

voc

412 gms/litre determined practically in accordance with UK Regulations PG6/23

442 gms/litre calculated from formulation to satisfy EC Solvent Emissions Directive

317 gms/kilo content by weight from formulation, to satisfy EC SED

Recommended Thickness

	Dry film thickness	Wet film thickness	Theoretical coverage
	50 microns	92 microns	10.8 m²/ltr*
*	This figure makes application, overs equipment. Film ti use and specificat	no allowance for su pray or losses in co hickness will vary de tion.	rface profile, uneven ntainers and epending on actual

PRACTICAL APPLICATION RATES -								
	MICRONS PER COAT							
	Airless Spray	Convention- al Spray	Brush#	Roller#				
Dry	50*	50	25-50	25-50				
Wet	92	**102	47-94	47-92				

Maximum sag tolerance with overlap typically 185µm wet (100µm dry) by airless spray.

**The conventional spray details relate to the paint after 10% thinning with Cleanser/Thinner No.15.

The actual thickness within the quoted range will depend on many variables including ambient conditions, type of brush or roller used and operator expertise. To ensure full obliteration and maximum opacity, the appropriate undercoat or primer shade should be used.

Average Drying Times

	@ 15°C	@ 23°C	@ 35°C
To touch:	1 hour	¾ hour	1∕₂ hour
To recoat:	8 hours	6 hours	4 hours
To handle	24 hours	16 hours	10 hours
These figures	are given as	s a quide on	ly Factors such

movement and humidity must also be considered.

Recommended Primers

Compatible with a wide range of Macropoxy, Dura-plate, Zinc Clad Epoxy Primers and Buildcoats.

Recommended Topcoats

Not normally required but indefinitely overcoatable with itself and other high performance topcoats.

PACKAGE

A two component material supplied in separate containers to be mixed prior to use

Pack Size: 20 litre and 5 litre units when mixed

lixing Ratio	9 parts base to 1 part additive by volume.
Veight:	White 1.39 kg/litre (may vary with shade).
	12 months from date of manufacture or

Shelf Life: 'Use By' date where specified.













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Protective & Marine **Coatings**

ACROLON[™] C137V2 ACRYLIC URETHANE GLOSS FINISH

FORMERLY KNOWN AS RESISTEX C137V2

Revised 01/2016 Issue 11

PRODUCT INFORMATION

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all surface contamination.

APPLICATION EQUIPMENT

0.33mm (13 thou)

: 210kg/cm² (3000 psi)

Airless Sprav Nozzle Size Fan Angle Operating Pressure

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray

Nozzle Size : 1.27mm (50 thou) Atomising Pressure Fluid Pressure

3.5kg/cm² (50 psi) : 0.7kg/cm² (10 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

For application by conventional spray thin up to 10% with Cleanser/Thinner No.15. Wet film thickness should be adjusted accordingly.

NB - Thinning will affect VOC compliance.

Brush

The material is suitable for brush application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

Roller

The material is suitable for roller application using a short pile roller. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

APPLICATION CO

This material should pref in excess of 10°C. In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not

recommended. In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

ADDITIONAL NOTES

Drving times, curing times and pot life should be considered as a guide only.

The curing reaction of the material commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Storage at high temperatures will affect build properties. Certain shades for example, yellows and reds may require ad-ditional coats to achieve full opacity.

The application by brush and roller of the aluminium shade of Acrolon C137V2 may result in an uneven finish and shade variation compared to spray application.

Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk. and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue



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MAINTENANCE

SPECS





NDITIONS AND OVERCOATING
erably be applied at temperature



ACROLON[™] C237 **ACRYLIC URETHANE SHEEN FINISH**

FORMERLY KNOWN AS RESISTEX C237

Revised 01/2016 Issue 16

PRODUCT INFORMATION

-			2				-	
	ODUCT DESCRIPT	ION	PRACT	ICAL A P	PLICATIC	ON R ATE	s - Micf	RONS PER COAT
A high performance fa	exterior colour retention	on characteristics are		Airless Spray	Conventi Spray	onal #	Brush	#Roller
required			Dry	50*	50	2	0-40	20-40
F	Recommended Us	SE	*Maximur	92 n sag tole	**106 rance with	overlan t	7-75 vnically 1	37-75 185um wet
Material is suitable for epoxy or polyurethane construction or main temperature curing co	use as final coat or co based protective systemance purposes. Conditions. May also be	bats in conjunction with stems for new Good tolerance to low used as an undercoat	(100µm d **The cor 15% with	ry) by airle ventional Cleanser/	spray det Thinner N	ails relate	to the pa	aint after thinning
where a gloss linish is			# The act many var	ual thickn iables incl	ess within uding aml	the quote bient cond	d range v itions, ty	will depend on pe of brush or
			roller use	d and ope	rator expe	ertise.		
Network Rail Item No.	. 7.3.1.			A	VERAGE	DRYING	; Times	
Recommen	NDED APPLICATION	N METHODS		(ଚ୍ଚ 15°C	@ 23°C	@ 35	5°C
Airless Spray Conventional Spray Brush Roller Recommended Thinn	er:		To touc To reco To hand <i>These</i> t	h: 2 at: dle 2 figures are	2½ hours 8 hours 24 hours e given as	1½ hours 6 hours 16 hours <i>a guide</i> o	3⁄4 ho 3⁄4 ho 4 ho 10 ho 0 <i>nly. Fac</i>	our urs ours ctors such as ail
Cleanser/Thinner No 5 Cleanser/Thinner No15	(for cleaning) (for thinning)		m	ovement	and humic	dity must a	also be c	considered.
PRODUCT CHARACTERISTICS			R	RECOMME	ENDED P	RIMERS		
Finish: Sheen			Compatit Clad Epo	ole with a	wide rang	ge of Mac iildcoats.	ropoxy, I	Dura-plate, Zino
Flash Point: Base :	28°C Additive : 32	2°C	RECOMMENDED TOPCOATS					
% Solids by Volume:	: 54 ± 2% (ASTM-D26	697-91)	Acrolon C137V/2 Special Einish Acrolon 7300					
Pot Life: 6hrs @15°C	34hrs @ 23°C 2h	rs @ 35°C						
Colour Availability: Full range		PACKAGE						
VOC 405 gms/litre determined practically in accordance with UK Regulations PG6/23 443 gms/litre calculated from formulation to satisfy EC Solvent Emissions Directive 283 gms/kilo content by weight from formulation, to satisfy EC SED		A two co to be mi Pack Si Mixing	omponent ixed prior ize: Ratio	material to use. 5 litre a 9 parts	supplied and 20 litr base to 1	in separa e units w part add	ate containers /hen mixed itive by volume.	
Rec	ommended T hick	NESS	weight	•	1.09 Kg	gillie (Illa	y valy w	
Dry film thickness	Wet film thickness	Theoretical coverage 10.8m2/itr*	Shelf Li	ife:	'Use B	y' date wh	uate of r lere spe	nanufacture or cified
50 microns	92 microns							
*This figure makes application, overspr ment. Film thicknes specification	no allowance for sur ay or losses in conta ss will vary dependin	face profile, uneven ainers and equip- ig on actual use and						



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NE	EW
SPE	ECS







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Protective & Marine **Coatings**

ACROLON[™] C237 ACRYLIC URETHANE SHEEN FINISH

FORMERLY KNOWN AS RESISTEX C237



Revised 01/2016 Issue 16

PRODUCT INFORMATION

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all surface contamination.

APPLICATION EQUIPMENT

Airless Spray Nozzle Size Fan Angle Operating Pressure

:	0.38mm (15 thou)
:	80° ` ´
:	140kg/cm² (2000 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray Nozzle 3

Nozzle Size	: 1.27mm (50 thou)
Atomising Pressure	: 3.5kg/cm ² (50 psi)
Fluid Pressure	: 0.7-1.0kg/cm ² (10-15 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

Acrolon C237 may be conventionally sprayed thinning up to15% with Cleanser/Thinner No. 15

N.B. Thinning will affect VOC compliance.

Brush

The material is suitable for brush application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

Roller

The material is suitable for roller application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

APPLICATION CONDITIONS AND OVERCOATING

This material should preferably be applied at temperatures in excess of 10°C. In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not recommended.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Additional Notes

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of the material commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Certain shades, for example yellows and reds, may require additional coats to achieve full opacity.

Numerical values quoted for physical data may vary slightly from batch to batch.

Health & Safety

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue.













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Protective & Marine Coatings

Protective & Marine Coatings Europe, Middle East & Africa

PRODUCT INFORMATION

Shelf Life:

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Revised 03/2016 Issue 9

Protective & Marine **Coatings**

TRANSGARD™ TG110 ZINC PHOSPHATE PRIMER

Average Drying Times



P RODUCT D ESCRIPTION
A zinc phosphate pigmented 2-pack epoxy temporary protective
primer

RECOMMENDED Use

Temporary protective for steel surfaces prepared by abrasive blast cleaning. Suitable for use in conjunction with cathodically protected steel.

Suitable for fabrication and for overcoating with most paints in common use except high content metallic zinc products

ENDORSEMENTS

Highways Agency Item No. 110.

Recommended Application Methods

Airless Spray Conventional Spray Brush (for small areas and touch up only) Roller

Recommended Cleanser Thinner: No 5

PRODUCT CHARACTERISTICS

Flash Point:	Base : 9°C	Additive : 12°C	
% Solids by Volume:	36± 2% (ASTM-D2	2697-91)	
Pot Life:	10 hours at 15°C	8 hours at 23°C	
Colour Availability:	Cinnamon		
VOC	aractically in accordance	o with LIK Poquilation	

itre determined practically in accordance with UK Regulations 584 gms/ PG6/23 584 gms/litre calculated from formulation to satisfy EC Solvent **Emissions Directive** 423 gms/kilo content by weight from formulation, to satisfy EC Solvent Emissions Directive

RECOMMENDED **T**HICKNESS

Dry film thickness Wet film Theoretical thickness coverage 25 microns 70 microns 14.4 m2/ltr*

* This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification

PRACTICAL APPLICATION RATES - MICRONS PER COAT

	Airless Spray	Conventional Spray	Roller
Dry	25	25	25
Wet	70	70	70

	@ 15°C	@ 23°C	
To touch:	30 minutes	20 minutes	
To recoat:	6 hours	4 hours	
To handle:	3 hours	2 hours	
These figure movem	s are given as ent and humic	a guide only. lity must also	Factors such as air be considered
	Recommen	NDED T OPC	OATS
Indefinitely ove faces to be coa	rcoatable wit ated have bee	h epoxy systeen suitably cl	ems provided the sur eaned.
	P	ACKAGE	
A two compone mixed prior to u	nt material sup se.	plied in separa	ate containers to be
Pack Size:	20 litre a	and 5 litre units	s when mixed.
Mixing Ratio:	4 parts	base to 1 par	t additive by volume.
Weight:	1.38 kg/	litre	

12 months from date of manufacture or 'Use By' date where specified













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Protective & Marine Coatings Europe, Middle East & Africa

PRODUCT INFORMATION

Shelf Life:

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Protective & Marine Coatings

TRANSGARD™ TG110 ZINC PHOSPHATE PRIMER

Average Drying Times



Nevised 05/2010 1350e 9
P RODUCT D ESCRIPTION

A zinc phosphate pigmented 2-pack epoxy temporary protective primer

RECOMMENDED Use

Temporary protective for steel surfaces prepared by abrasive blast cleaning. Suitable for use in conjunction with cathodically protected steel.

Suitable for fabrication and for overcoating with most paints in common use except high content metallic zinc products

ENDORSEMENTS

Highways Agency Item No. 110.

Recommended Application Methods

Airless Spray Conventional Spray Brush (for small areas and touch up only) Roller

Recommended Cleanser Thinner: No 5

Dry film thickness

25 microns

PRODUCT **C**HARACTERISTICS

Flash Point:	Base : 9°C	Additive : 12°C		
% Solids by Volume:	36± 2% (ASTM-D2697-91)			
Pot Life:	10 hours at 15°C	8 hours at 23°C		
Colour Availability:	Cinnamon			
VOC	rectically in coordona	o with LIK Doculation		

584 gms/litre determined practically in accordance with UK Regulations PG6/23 584 gms/litre calculated from formulation to satisfy EC Solvent **Emissions Directive** 423 gms/kilo content by weight from formulation, to satisfy EC Solvent Emissions Directive

RECOMMENDED **T**HICKNESS

Wet film Theoretical thickness coverage 70 microns 14.4 m2/ltr*

* This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification

PRACTICAL APPLICATION RATES -MICRONS PER COAT

	Airless Spray	Conventional Spray	Roller
Dry	25	25	25
Wet	70	70	70

	@ 15°C	@ 23°C		
To touch:	30 minutes	20 minutes		
To recoat:	6 hours	4 hours		
To handle:	3 hours	2 hours		
These figure mover	es are given as nent and humio	a guide only. lity must also	Factors such as air be considered	
	Recommen	NDED TOPC	OATS	
Indefinitely overcoatable with epoxy systems provided the sur faces to be coated have been suitably cleaned.				
Package				
A two compone mixed prior to u	ent material sup use.	plied in separa	ate containers to be	
Pack Size:	20 litre a	and 5 litre units	s when mixed.	
Mixing Ratio:	4 parts	base to 1 par	t additive by volume.	
Weight:	1.38 kg/	litre		

12 months from date of manufacture or 'Use By' date where specified













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Protective & Marine **Coatings**

TRANSGARD[™] TG111V2 ZINC PHOSPHATE PRIMER



Revised 03/2016 Issue 10

PRODUCT INFORMATION

P RODUCT	DESCRIPTION
-----------------	-------------

A high build 2-pack epoxy zinc phosphate primer/buildcoat.

RECOMMENDED **U**SE

Anti-corrosive protection of carbon steel surfaces prepared by abrasive blast cleaning.

Can be applied at thicknesses between 75 and 150 microns dry to provide both primer and buildcoat in a single coat. A top coat is only required for decorative purposes.

Without topcoat the material will quickly discolour and patchiness may be exaggerated due to film thickness variation, but will nonetheless provide excellent anti-corrosive protection as a single coat protective epoxy nor will intercoat adhesion be affected by any discolouration. See reverse side for further information on colour stability.

For use in internal/external exposed conditions.

ENDORSEMENTS

Highways Agency Item No. 111.

Recommended Application Methods

Airless Spray

Conventional Spray

Brush (for small areas and touch up only) Roller

Recommended Cleanser Thinner: No. 5 (for thinning) No. 9 or No. 13 (for cleaning)

PRODUCT CHARACTERISTICS

Base : 24°C Flash Point: Additive : 26°C

% Solids by Volume: 75 ± 3% (ASTM-D2697-91)

Pot Life: 2¹/₂ hours at 15°C 1¹/₂ hours at 23°C ³/₄ hour at 35°C

Colour Availability: Light Grey, Red Oxide

voc

186 gms/litre determined practically in accordance with UK **Regulations PG6/23**

249 gms/litre calculated from formulation to satisfy EC Solvent **Emissions Directive** 165 gms/kilo content by weight from formulation, to satisfy EC

Solvent Emissions Directive

Recommended Thickness			
Dry film hickness	Wet film thickness	Theoretical coverage	

thickness	thickness	coverage
100 microns	133 microns	7.5 m2/ltr*
	- 11	

* This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification

P RACTICAL A PPLICATION R ATES - MICRONS PER COAT					
Airless Spray Conventional Brush Roller Spray					
Dry	75*	75	75	65	
Wet	100	100	100	87	

* Maximum sag tolerance with overlap typically 270µm wet (200µm dry) by airless spray.

Average Drying Times					
@ 15°C @ 23°C @ 35°C					
To touch:	2 hours	1½ hours	1 hour		
To recoat:	6 hours	4 hours	3 hours		
To handle:	16 hours	8 hours	5 hours		
These figures are given as a guide only. Factors such as air movement and humidity must also be considered.					

Recommended Topcoats

For overcoating with epoxy products (including self overcoating), the maximum recommended interval is 28 days at 23°C. For overcoating outside this interval, consult Sherwin-Williams technical support for advice.

Where a high degree of gloss and colour retention is required, overcoat with Acrolon C137V2 or Transgard TG169 within 7 days at a minimum d.f.t. of 50 microns. These overcoating times refer to achievement of optimum adhesion at 23°C and will vary with temperature.

For overcoating outside the above parameters, consult Sherwin-Williams for advice

PACKAGE

A two component material supplied in separate containers to be mixed prior to use.

Pack Size: 20 litre and 5 litre units when mixed. **Mixing Ratio:** 4 parts base to 1 part additive by volume. Pod ovido 1 53 ka/litro (may yany with

Weight:	shade).
Shelf Life:	2 years from date of manufacture or 'Use By' date where specified













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Protective & Marine **Coatings**

TRANSGARD[™] TG111V2 ZINC PHOSPHATE PRIMER



Revised 03/2016 Issue 10

PRODUCT INFORMATION

SURFACE PREPARATION

Blast clean to Sa21/2 BS EN ISO 8501-1:2007). Average surface

profile in the range 50-75 microns. Manually prepared surfaces should be prepared to a minimum standard of St3 ISO 8501-1:2007 at the time of coating. Ensure surfaces to be coated are clean, dry and free from all

surface contamination. May also be applied over a wide range of pre-fabrication primers, including inorganic zinc silicate, and epoxy types.

APPLICATION EQUIPMENT

Airless Snrav

Anicos opiay		
Nozzle Size	:	0.33mm (13 thou)
Fan Angle	:	40° ` ´
Operating Pressure	:	155kg/cm² (2200 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray

Nozzle Size **Atomising Pressure** Fluid Pressure

1.27mm (50 thou) 2.8kg/cm² (40 psi) 0.4kg/cm² (6 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

For application by conventional spray, it may be necessary to thin the paint by the addition of up to 10% Cleanser Thinner No. 5. Where thinning has been carried out the wet film thickness must be adjusted accordingly.

N.B. Thinning will affect VOC compliance.

Brush and Roller: The material is suitable for brush and roller application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray ap-plied coat.

APPLICATION CONDITIONS AND OVERCOATING

Epoxy paints should preferably be applied at temperatures in excess of 10°C. Relative humidity should not exceed 90% and in these conditions good ventilation is essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying

characteristics may be impaired. Application at ambient air temperatures below 5°C is not recommended. In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during

curing. If it is desired to overcoat outside the times stated on the data sheet, please seek advice from Sherwin-Williams. **ADDITIONAL NOTES**

Drying times, curing times and pot life should be considered as a guide only. The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Epoxy Coatings - Colour Stability: Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age particularly when used on internal areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change. When epoxy materials are exposed to ultra-violet light a sur-face chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed prod-uct will not alleviate this problem. The maximum air and substrate temperature for application is

50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating.

Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue



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Protective & Marine Coatings

TRANSGARD[™] TG115 HI-BUILD EPOXY

Average Drying Times

@ 23°C

@ 15°C



Revised	08/2016	Issue 14

PRODUCT INFORMATION

PRODUCT **D**ESCRIPTION

High-build aluminium epoxy maintenance primer for abraded surfaces.

RECOMMENDED **U**SE

For brush application onto hand or mechanically prepared surfaces giving excellent wetting and adhesion characteristics. Suitable for atmospherically exposed surfaces but not recommended for exposure to severe chemical environments. May be spray applied to blast cleaned surfaces.

Recommended curing temperature above 10°C. Extended drying times will be observed at lower temperatures. Macropoxy M902 is recommended alternative for low temperature application and curing

ENDORSEMENTS

Highways Agency Item No.115.

Recommended Application Methods

Brush

May be airless spray applied onto blast cleaned surfaces **Recommended Cleanser Thinner:** No. 5 (for thinning) No. 9 or No. 13 (for cleaning)

P RODUCT C HARACTERISTICS

Flash Point:	Base : 47°C	Additive : 30°C
% Solids by Volume:	75 ± 3% (ASTM-D2697-91)	
Pot Life:	3 hours at 15°C	2 hours at 23°C

Aluminium.

Colour Availability:

Dry film thickness 100 microns

voc

217 gms/litre determined practically in accordance with UK Regulations PG6/23

249 gms/litre calculated from formulation to satisfy EC Solvent Emissions Directive

194 gms/kilo content by weight from formulation, to satisfy EC Solvent Emissions Directive

Recommended Thickness

Wet film thickness	Theoretical coverage
133 microns	7.5 m2/ltr*

* This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment. Film thickness will vary depending on actual use and specification.

	PRACTICAL APPLICATION RATES - MICRONS PER COAT				
	Brush	Airless Spray			
Dry	100*	100			

 Wet
 133
 133

 * Maximum sag tolerance with overlap typically 300µm dry by airless spray and 140µm by brush.

To touch:					
	6 hours	3 hour			
To recoat:	16 hours	8 hours			
To handle:	24 hours	16 hours			
These figures moveme	are given as nt and humic	a guide only. Factors such as dity must also be considered.	air		
RE	ECOMMENI	DED UNDERCOATS			
Transgard TG116	6				
F	R ecommended T opcoats				
For overcoating with epoxy products (including self overcoating), the maximum recommended interval is 28 days at 23°C. For overcoating outside this interval, consult Sherwin-Williams.					
overcoating), the days at 23°C. For Sherwin-Williams	maximum maximum or overcoat	products (including self recommended interval is 28 ing outside this interval, cor	3 Isult		
overcoating), the days at 23°C. Fo Sherwin-Williams	maximum or overcoat	products (including self recommended interval is 28 ing outside this interval, cor	} Isult		
A two component mixed prior to use	maximum or overcoat 	products (including self recommended interval is 28 ing outside this interval, cor ACKAGE	3 isult be		
A two component mixed prior to use	maximum or overcoat 3. P material sup 3. 20 litre a	products (including self recommended interval is 28 ing outside this interval, cor ACKAGE oplied in separate containers to and 5 litre units when mixed.	} isult be		
A two component mixed prior to use Mixing Ratio:	maximum or overcoat 3. material sup 20 litre a 7 parts	products (including self recommended interval is 28 ing outside this interval, cor ACKAGE oplied in separate containers to and 5 litre units when mixed. base to 1 part additive by vol	3 isult be ume		

1.29 kg/litre

Weight:

Shelf Life:

2 years from date of manufacture or 'Use By' date where specified.











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Protective & Marine **Coatings**

TRANSGARD™ TG115 HI-BUILD EPOXY

Revised 08/2016 Issue 14

PRODUCT INFORMATION

Blast clean to Sa21/2 BS EN ISO8501-1:2007. Average surface

When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use

Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem.

The maximum air and substrate temperature for application is 50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating.

Numerical values quoted for physical data may vary slightly from batch to batch

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

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MAINTENANCE SPECS

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SURFACE PREPARATION profile in the range 50-75 microns.

Manually prepared surfaces should be prepared to a minimum standard of ST3 BS EN ISO8501-1:2007 at the time of coating. Ensure surface to be coated are clean, dry and free from all surface contamination

APPLICATION EQUIPMENT

Airless Spray				
Nozzle Size Fan Angle	:0.38mm (15 thou) .40°			
Operating Pressure	: 155kg/cm² (2200 psi			

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Brush :

The material is suitable for brush application.

APPLICATION CONDITIONS AND OVERCOATING

Epoxy paints should preferably be applied at temperatures in excess of 10°C. Relative humidity should not exceed 90% and in these conditions good ventilation is essential. Substrate temperature should be at least 3°C above the dew point and always above 0°C. Application at ambient air temperatures below 5°C is not recommended. In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

ADDITIONAL NOTES

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Compatibility - This product is fully compatible with Epigrip M902 (Item 115 low temperature curing grade) and the two products may be interchanged within any specification requiring the use of Item 115, depending upon the application conditions.

Epoxy Coatings - Colour Stability: Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age whether used on internal or external areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change.



Protective &

TRANSGARD™ TG116 EPOXY UNDERCOAT



		Marine			
Sher Willi,	WIN AMS.	oatings			
Revised	08/2016 Issue	13	PRODUCT IN	IFORMATION	
	P ROD	UCT D ESCRIPT	TION	A	Verage Drying Times
Two pack e	epoxy underco	at for abraded su	faces.		@ 15°C @ 23°C
	Rec	COMMENDED U	SE	To touch:	6 hours 3 hour
For applicat use under s Recommen	tion onto suitabl suitable high per ded curing tem	y primed surfaces, formance finishes. perature above 10°	as an undercoat for	To recoat: To handle: These figures a	12 hours 8 hours 24 hours 16 hours are given as a guide only. Factors such as air
times will be recommend	e observed at lo ded alternative f	ower temperatures. or low temperature	Macropoxy M905 is application and curing.	movemen	t and humidity must also be considered.
	E	NDORSEMENTS		Transport TC115	Accommended I Rimers
Highways	Agency Item I	No.116.			ECOMMENDED TOPCOATS
R	ECOMMENDE	D APPLICATION	N METHODS		
Brush Airless Spr Recomm e	ay anded Cleanse	r Thinner: No. 5 (f No. 9 oi	or thinning) ^r No. 13 (for cleaning)	For overcoating w coating), the maxi 23°C. For overco Williams technical	Ith epoxy products (including self over- mum recommended interval is 28 days at ating outside this interval, consult Sherwin- support for advice.
	PRODUC	T CHARACTER	ISTICS	Where a high deg	ree of gloss and colour retention is required
Flash Poir	nt:	Base : 47°C	Additive : 24°C	minimum dft of 50 achievement of op	microns. These overcoating times refer to otimum adhesion at 23°C and will vary with
% Solids k	by Volume:	75 ± 3% (ASTN	1-D2697)		PACKAGE
Pot Life:		3 hours at 15°C	2 hours at 23°C		
Colour Av	ailability:	Limited Range. Not colour stab suitable finish.	le, overcoat with	mixed prior to use.	20 litre and 5 litre units when mixed
voc				Mixing Ratio	Q parts base to 1 part additive by volume
240 gms/lit Regulation	tre determined s PG6/23	practically in acc	ordance with UK	Weight:	1.58 kg/litre (may yary with shade)
250 gms/lit Emissions	tre calculated f	rom formulation to	o satisfy EC Solvent	Obertalite	2 years from date of manufacture or 'Use Ry'
167 gms/ki Solvent En	ilo content by v nissions Direct	veight from formu ive	lation, to satisfy EC	Shelf Life:	date where specified.
	Recom	MENDED THICK	INESS		
Dry thicl 100 n	r film kness nicrons	Wet film thickness 133 microns	Theoretical coverage 7.5 m2/ltr*		
* This figur application thickness v	re makes no allow , overspray or lo will vary dependi	wance for surface p sses in containers a ng on actual use an	rofile, uneven and equipment. Film d specification.		
	P RACTICAL MIC	APPLICATION	R ATES - T		
	Brush	Airless Spray			
Dry	100*	100*			
Wet	133	133			
			due de la contrata de la construcción de la del	1	

* Maximum sag tolerance with overlap typically 300 μm dry by airless spray and 140 μm by brush.

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Protective & Marine **Coatings**

TRANSGARD™ TG116 EPOXY UNDERCOAT



Revised 08/2016 Issue 13

surface contamination

Operating Pressure

Airless Spray

Nozzle Size Fan Angle

PRODUCT INFORMATION

SURFACE PREPARATION

APPLICATION EQUIPMENT

0.38 (15 thou)

155kg/cm² (2200 psi)

Ensure surfaces to be coated are clean, dry and free from all

Epoxy Coatings - Colour Stability: Variable colour stability is a feature of epoxy materials which tend to yellow and darken with age whether used on internal or external areas. Therefore any areas touched-up and repaired with the same colour at a later date may be obvious due to this colour change.

When epoxy materials are exposed to ultra-violet light a surface chalking effect will develop. This phenomenon results in loss of gloss and a fine powder coating at the surface which may give rise to colour variation depending on the aspect of the steelwork. This effect in no way detracts from the performance of the system.

Epoxy Coatings - Tropical Use: Epoxy paints at the time of mixing should not exceed a temperature of 35°C. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. application. Thinning the mixed product will not alleviate t his problem.

The maximum air and substrate temperature for application is 50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating.

Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

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only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted. N.B. Thinning will affect VOC compliance.

The airless spray details given above are intended as a guide

Brush

The material is suitable for brush application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

APPLICATION CONDITIONS AND OVERCOATING

Epoxy paints should preferably be applied at temperatures in excess of 10°C. Relative humidity should not exceed 90% and in these conditions good ventilation is essential. Substrate temperature should be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteris-tics may be impaired. Application at ambient air temperatures below 5°C is not recommended.

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Additional Notes

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Compatibility - This product is fully compatible with Macropoxy M905 (Item 116 low temperature curing grade), and the two products may be interchanged within any specification requiring the use of Item 116, depending upon application conditions.

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TRANSGARD™ TG169 ACRYLIC URETHANE FINISH



Revised 03/2016 Issue 9

PRODUCT INFORMATION

P RODUCT D ESCRIPTION				Average Drying Times		
A high performance fast drying acrylic urethane semi-gloss finish for use where long term exterior colour retention characteristics are required.			ce fast drying acrylic urethane semi-gloss finish g term exterior colour retention characteristics @ 15°C @ 23°C To touch: 2½ hours 1½ hour			
	Broowweyper Llor			To recoat:	8 hours 6 hours	
Material is s	uitable for use	as final coat or cos	te in coniu	nction with	To handle:	24 hours 16 hours
Material is suitable for use as final coat or coats in conjunction with epoxy or polyurethane based protective systems for new construction or maintenance purposes. Good tolerance to low temperature curing conditions.			These figures are given as a guide only. Factors such as air movement and humidity must also be considered.			
				Recommended Primers		
Highwave					Transgard TG112	2, TG121, M905, TG123, C123
Highways Agency Item No. 169			F	Recommended Topcoats		
Airless Spra	ay al Sprav			005	Not normally req and other high pe	uired, but indefinitely overcoatable with erformance topcoats.
Brush Roller						P ACKAGE
Recomme	nded Cleanse	r Thinner: No. 5 (No. 15	for cleaning (for thinnin	g) ng)	A two component mixed prior to use	material supplied in separate containers to be
	Produc	T CHARACTER	ISTICS		Pack Size:	20 litre and 5 litre units when mixed.
Flash Poin	ıt:	Base : 28°C	Additive	e : 32°C	Mixing Ratio:	9 parts base to 1 part additive by volur
% Solids b	y Volume:	54 ± 3% (ASTN	1-D2697-9	1)	Weight:	1.62 kg/litre (may vary with shade).
Pot Life:		5 hours at 15°C	3 hours	at 23°C	Shelf Life:	12 months from date of manufacture or 'l By' date where specified
Colour Ava	ailability:	White and limite	ed range c	of colours.		
VOC 412 gms/litr Regulations 419 gms/litr Emissions I 280 gms/kil Solvent Em	re determined s PG6/23 re calculated fi Directive lo content by v hissions Directi	practically in acco rom formulation to veight from formu ive	ordance w o satisfy E lation, to s	ith UK C Solvent satisfy EC		
	R есом	Mended Thick	NESS			
Dry thick	film mess	Wet film thickness	Theo	oretical /erage		
50 mi	icrons	92 microns wance for surface p	10.8 rofile, unev	s m2/ltr* en		
* This figure application, thickness w	e makes no allov , overspray or lo vill vary dependii	sses in containers and ng on actual use an	and equipm d specificat	ent. Film tion.		
* This figure application, thickness w	e makes no allou overspray or lo vill vary dependin PRACTICAL MIC	sses in containers and on actual use an APPLICATION RONS PER COA	and equipm d specificat RATES - T	ent. Film tion.		
* This figure application, thickness w	e makes no allou overspray or lo vill vary dependir PRACTICAL MIC Airless Spray	sses in containers and ng on actual use an APPLICATION RONS PER COA Conventional Spray	and equipm d specificat RATES - T Brush	ent. Film tion. Roller		
* This figure application, thickness w	e makes no allov overspray or lo vill vary dependin PRACTICAL MIC Airless Spray 50*	sses in containers and on actual use and on actual use and APPLICATION RONS PER COA Conventional Spray 50	And equipm d specificat RATES - T Brush 40	ent. Film tion. Roller 40		

* Maximum sag tolerance with overlap typically 230 μ m wet (125 μ m dry) by airless spray. The conventional spray details relate to the paint after thinning 15% with Cleanser/Thinner No. 15.

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Protective & Marine **Coatings**

TRANSGARD[™] TG169 ACRYLIC URETHANE FINISH



Revised 03/2016 Issue 9

PRODUCT INFORMATION

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all

APPLICATION EQUIPMENT

Airless Spray

Nozzle Size 0.38mm (15 thou) Fan Angle 80 **Operating Pressure** 140kg/cm² (2000 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray Noz

Nozzle Size	: 1.27mm (50 t
Atomising Pressure	: 3.5kg/cm ² (50
Fluid Pressure	: 0.7-1.0kg/cm ²

hou)) psí) ² (10-15 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

Transgard TG169 may be conventionally sprayed if thinned 15% with Cleanser/thinner No. 15. Wet film thickness should be adjusted accordingly.

NB: Thinning will affect VOC compliance.

Brush

The material is suitable for brush application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

Roller

The material is suitable for roller application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

APPLICATION CONDITIONS AND OVERCOATING

This material should preferably be applied at temperatures in excess of 10°C. In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying

characteristics may be impaired. Application at ambient air temperatures below 5°C is not recommended

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Additional Notes

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Storage at high temperatures will affect build properties. Numerical values quoted for physical data may vary slightly from batch to batch

HEALTH AND SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

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surface contamination



Protective & Marine Coatings

ZINC CLAD[™] M501 **EPOXY ZINC RICH PRIMER**

Revised 02/2016 Issu	le 2						
PRO	DDUCT D ESCRIPTION	v	ŀ	PRACTICAL	A PPLICATIO	N R ATES	
A 2-pack epoxy zinc rich	n anti-corrosive prime	er.		Microns	PER COAT	(MILS)	
Recommended Uses				Airless Sp	o ray :		
Anti-corrosive protection of steel surfaces prepared by abrasive blast cleaning.		Dry: Wet:	60* () 98 (4	2.5) I)			
May be used as a repai	r primer for galvanize	d surfaces.	* Maximum sa	g tolerance ty	vpically 164µm	wet (100µm)	(4.0 mils)
	E NDORSEMENTS			spray.			
 Meets the performan part of a three coat sy Conforms to compose Norsok M501 Rev.5 (2011) 	ce requirements of I /stem sition and performar 2004) System 1	SO20340 (2009) as nee requirements of		Average @ 98 m	nicrons (4 m	nils) wet:	@ 25°C/05
Recommend	DED APPLICATION	Methods	To touch:	25 mine	25 mins	20 mins	15 mins
Airless Spray			To handle:	16 hours	14 hours	12 hours	10 hour
Brush (for small areas	and touch up only)		To recoat	6 hours	5 hours	4 hours	3 hour
Thinner / Clean Up:	Cleanser/7	Thinner No. 5	For overcoatii Drying time i	ng informatior s temperature	n, refer to Recc e, humidity, an	mmended Top d film thicknes	coats sectior s dependent
Prod	UCT C HARACTERIST	TICS	Pot Life:		10 hours	8 hours	4 hours
Flash Point:	Base: 24°C/75°F	Additive: 24°C/75°F			ATION EQUIP	MENT	
Color: Volume Solids: VOC: 311 gms/litre determine Regulations PG6/23 379 gms/litre calculated Emissions Directive 159 gms/kilo content EC Solvent Emissions I	Grey 61 ± 3% (ASTM-I d practically in accord from formulation to s by weight from form Directive	D2697-03) dance with UK satisfy EC Solvent mulation, to satisfy	The following is be needed for p equipment befo compliant with e existing environ Airless Spray: Nozzle Size: Fan Angle: Operating Press	a guide. Ch roper spray re use with I existing VOC mental and 	anges in pres characteristic isted reducer regulations application co 0.38mm (15 t 20-30° 115kg/cm ² (10 en above are	ssures and tip cs. Always pu . Any reduction and compatibon anditions. hou) 600 psi) intended as a	o sizes may rge spray on must be ole with the
Mix Ratio:	4 parts base to 1 p	art additive by volume	Details such as	fluid hose le	ength and dia	meter, paint to	emperature
Reco	MMENDED T HICKN	ESS	operating pressu	and size all ire chosen. F	nave an eπe lowever, the c	ect on the sp operating pres	ray tip and sure should
		Minimum	be the lowest po	ssible consi	istent with sat	isfactory ator	nisation. As
Dry microns (mils)		60 (2.5)	to ensure that t	he equipme	nt in use has	been set up	to give the
Wet microns (mils)		98 (4)	best results.	-			
Theoretical Coverag	e m²/L (sq ft/gal)	9.84 * (400)		F	PACKAGE		
* This figure makes no a application, overspray of Film thickness will vary	llowance for surface p r losses in containers a depending on actual us	rofile, uneven and equipment. se and specification.	Shelf Life:	18 m 'Use	onths from onths from onths from onths from one of the second second second second second second second second s	date of manu ere specified	ifacture or

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PRODUCT INFORMATION

(2.3 mills).

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Revised 02/2016 Issue 2

Protective & Marine Coatings

ZINC CLAD[™] M501 EPOXY ZINC RICH PRIMER



Recommended	Τορςοατ

Indefinitely overcoatable with epoxy systems provided a minimum of 60 microns (2.5 mils) dft is obtained.

Do not overcoat with paints containing saponifiable resins such as oleo-resinous or alkyd based paints unless a non-saponifiable resin based barrier coat has been applied first.

ADDITIONAL NOTES

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a $10^{\circ}C/50^{\circ}F$ increase in temperature and doubled by a $10^{\circ}C/50^{\circ}F$ decrease in temperature.

Exposure to Weathering

If Zinc Clad M501 is exposed to the weather, there is a risk of the formation of zinc salts on the surface, which must be removed by flash blasting or washing down prior to overcoating, otherwise intercoat adhesion may be adversely affected.

The rate of zinc salt formation will vary from one location to another. Under severe conditions e.g. marine coastal, offshore or heavy industrial areas, it is strongly recommended that overcoating takes place within 7 days.

Epoxy Coatings - Tropical Use

Epoxy paints at the time of mixing should not exceed a temperature of 35°C/95°F. At this temperature the pot life will be approximately halved. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem.

The maximum air and substrate temperature for application is 50°C/122°F providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C/122°F and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc. can occur within the coating.

Numerical values quoted for physical data may vary slightly from batch to batch.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Thinner No.5. Clean tools immediately after use with Thinner No.5. Follow manufacturer's safety recommendations when using any solvent.

surface contamination. For repair of galvanizing, for small areas, abrade the surface to a minimum standard of St3 BS EN ISO 8501-1:2007 (SSPC-SP3) feathering off the edges of intact galvanizing surrounding such areas, and then brush apply the primer. For large areas it is recommended that the surface is flash blasted.

Surface Preparation Blast clean to Sa2½ BS EN ISO 8501-1:2007 (SSPC-SP10/

NACE2) Average surface profile in the range 50 - 75 microns

Ensure surfaces to be coated are clean, dry and free from all

APPLICATION CONDITIONS

Epoxy paints should preferably be applied at temperatures in excess of 10°C/50°F. In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C/37°F above the dew point and always above 0°C/32°F.

At application temperatures below 10°C/50°F, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C/41°F is not recommended.

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C/50°F during curing.

ORDERING **I**NFORMATION

Packaging: A two component material supplied in separate containers to be mixed prior to use.

Pack Size: 10 litre (2.6 gal) and 5 litre (1.3 gal) units when mixed

Weight: 2.64 kg/litre (26.5 lb/gal)

HEALTH & SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

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Revised 01/2016 Issue 28

Protective & Marine Coatings

MACROPOXY[™] K267 **EPOXY UNDERCOAT/MIO**

FORMERLY KNOWN AS EPIGRIP K267

PRODUCT INFORMATION

	P RODUCT D ESCRI	PTION		Average Drying Tim	ES
A 2-pack epoxy, į	pigmented with micaced	ous iron oxide.	-	@ 15°C @ 23°C	@ 35°C
	Recommended	Use	To touch:	3 hours 2 hours	1 hour
As an intermedia	ate coat in conjunction mers.	with Macropoxy high	To recoat: To handle:	6 hours4 hours24 hours16 hours	3 hours 12 hours
Also recommend galvanised steel	ded as anintermediate	primer for painting	These figures an movement	re given as a guide only. F and humidity must also be	Factors such as air e considered.
	Endorsemen	rs	Recon	MMENDED P RIMERS / T	OPCOATS
3S476 Part 7 - 5 substrates/scher Highways Agend Network Rail Ite	Surface Spread of Flar me, consult Sherwin-V cy Item No. 121 m No. 7.2.2	ne - for details of Villiams.	Compatible with Clad Epoxy Prim	a wide range of Macropox ers and Buildcoats.	xy, Dura-plate, Zinc
Recon	IMENDED APPLICATI	ON METHODS	surfaces to be co	bated have been suitably o	leaned. Where
Airless Spray Conventional Spr	Brush ray Roller		 a high degree of overcoating with 1850 and Acrolor 	gloss and colour retention Acrolon C137V2, Acrolon n 7300 within 7 days at a i	C237, Acrolon minimum dft of 50
Recommended C	leanser/Thinner: No 5		days. These ove	ercoating times refer to ac	nievement of
F	RODUCT CHARACT	ERISTICS	optimum adnesio	on at 23°C and will vary wi	th temperature.
Flash Point: Bas	se : 32°C Additive : 3	5°C	 For overcoating v for advice. 	with alkyd systems consul	t Sherwin-Williams
% Solids by Vol	ume: 66 ± 3% (ASTM-[02697-91)		Package	
Pot Life: 3 hrs @) 15°C, 2 hrs @ 23°C, ′	l hrs @ 35°C	A two component	nt material supplied in sep	arate containers
Colour Availabil	ity: Light Grey R8051,	Dark Grey R8050	to be mixed price Pack Size:	20 litre and 5 litre unit	s when mixed.
voc			Mixing Ratio:	4 parts base to 1 part a	dditive by volume.
297 gms/litre determine 297 gms/litre 297 gms/litre determine 297 gms/litre dete	ermined practically in a	ccordance with UK	Weight:	1.86 kg/litre (may vary	v with shade).
330 gms/litre calo Emissions Direct 178 gms/kilo con Solvent Emissior	culated from formulatior ive tent by weight from forr is Directive	n to satisfy EC Solvent nulation, to satisfy EC	Shelf Life:	2 years from date of n 'Use By' date where s	nanufacture or pecified.
	Recommended Thi	CKNESS			
Dry film thickness 100 microns * This figure ma application, c equipment. F use and spec	Wet film thickness s 152 microns akes no allowance for verspray or losses in o ilm thickness will vary sification.	Theoretical coverage 6.6 m²/ltr* surface profile, unever containers and depending on actual	-		
D _D /		N PATES -			
FRA	MICRONS PER CO	AT			
Air	rless Conventional pray Spray	Brush Roller	-		
Dry 10	JU* 100	75 50			

MAINTENANCE

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Protective & Marine Coatings

MACROPOXY[™] K267 EPOXY UNDERCOAT/MIO

FORMERLY KNOWN AS EPIGRIP K267

PRODUCT INFORMATION

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all surface contamination.

Application Equipment

Airless Spray

Nozzle Size:	0.46mm (18 thou)
Fan Angle:	80°

Operating Pressure: 155kg/cm² (2200 psi)

The airless spray details given above are intended as a guide only. Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent with satisfactory atomisation. As conditions will vary from job to job, it is the applicators' responsibility to ensure that the equipment in use has been set up to give the best results. If in doubt Sherwin-Williams should be consulted.

Conventional Spray

Nozzle Size :	1.27mm (50 thou)
Atomising Pressure:	3.5kg/cm² (50 psi)
Fluid Pressure :	0.7kg/cm ² (10 psi)

The details of atomising pressure, fluid pressure and nozzle size are given as a guide. It may be found that slight variations of pressure will provide optimum atomisation in some circumstances according to the set up in use. Atomising air pressure depends on the air cap in use and the fluid pressure depends on the length of line and direction of feed i.e. horizontal or vertical.

For application by conventional spray, it may be necessary to thin the paint by the addition of up to 10% Cleanser/Thinner No. 5. Where thinning has been carried out the wet film thickness must be adjusted accordingly.

Brush

The material is suitable for brush application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

Roller

The material is suitable for roller application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.

Application Conditions and Overcoating

This material should preferably be applied at temperatures in excess of 10°C. In conditions of high relative humidity, ie 80-85% good ventilation conditions are essential. Substrate temperature shall be at least 3°C above the dew point and always above 0°C.

At application temperatures below 10°C, drying and curing times will be significantly extended, and spraying characteristics may be impaired.

Application at ambient air temperatures below 5°C is not recommended.

In order to achieve optimum water and chemical resistance, temperature needs to be maintained above 10°C during curing.

If it is desired to overcoat outside the times stated on the data sheet, please seek advice of Sherwin-Williams.

Additional Notes

Drying times, curing times and pot life should be considered as a guide only.

The curing reaction of epoxies commences immediately the two components are mixed, and since the reaction is dependent on temperature, the curing time and pot life will be approximately halved by a 10°C increase in temperature and doubled by a 10°C decrease in temperature.

Epoxy Coatings - Tropical Use

Epoxy paints at the time of mixing should not exceed a temperature of 35°C. Use of these products outside of the pot life may result in inferior adhesion properties even if the materials appear fit for application. Thinning the mixed product will not alleviate this problem.

The maximum air and substrate temperature for application is 50°C providing conditions allow satisfactory application and film formation. If the air and substrate temperatures exceed 50°C and epoxy coatings are applied under these conditions, paint film defects such as dry spray, bubbling and pinholing etc, can occur within the coating.

Numerical values quoted for physical data may vary slightly from batch to batch.

Health and Safety

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Any person or company using the product without first making further enquiries as to the suitability of the product for the intended purpose does so at their own risk, and Sherwin-Williams can accept no liability for the performance of the product, or for any loss or damage arising out of such use.

The information detailed in this Data Sheet is liable to modification from time to time in the light of experience and of normal product development, and before using, customers are advised to check with Sherwin-Williams, quoting the reference number, to ensure that they possess the latest issue.





www.sherwin-williams.com/protectiveEMEA

This Data Sheet is specifically subject to the disclaimer which can be found at http://protectiveemea.sherwin-williams.com/Home/Disclaimer

NEW SPECS



NEW

MAINTENANCE SPECS





Highways Agency protective systems certificates



ITEM 109 - M501



ITEM 110 - TG110



ITEM 111 - TG111V2



ITEM 112 - C267V3



ITEM 115 - M902



ITEM 115 - TG115



ITEM 116 - M905



ITEM 116 - TG116



ITEM 121 - K267



ITEM 123 - C123



ITEM 123 - M922



ITEM 155 - L703



ITEM 167 - C750V2



ITEM 168 - C137V2



ITEM 169 - TG169

HAPAS Sherwin-Williams Protective & Marine Coatings Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA



HAPAS Certificate 08/H134 Product Sheet 17

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

ZINC CLAD M501 - TO HE ITEM 109

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Zinc Clad⁽²⁾ M501, a zincrich, two-pack epoxy blast primer, for use as an anticorrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volumes 1 and 2, where Item No 109 is specified.

Zinc Clad is a registered trade mark.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance - a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability — a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate. On behalf of the British Board of Agrément Date of First issue: 19 July 2016 John Albon – Head of Approvals Claire Curtis-Thomas Construction Products Chief Executive The BBA is a UKAS accredited certification body – Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Page 1 of 5





Requirements

The Highways Technical Advisory Committee [HiTAC] and HAPAS Specialist Group 12 [Paints and similar protective coatings for corrosion protection of structural steelwork] have agreed with the BBA the aspects of performance to be used by the BBA in assessing the compliance of paints and similar protective coatings as set out in the Guideline Document. Additional requirements of the overseeing organisations are set out in the following documents:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.3) of this Certificate.

Technical Specification

1 Description

1.1 Zinc Clad M501 is a zinc rich, two-pack epoxy blast primer, available in grey only, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works (MCHW) Volumes 1 and 2, where Item No 109 is specified.

1.2 The characteristics of this product are⁽¹⁾:

Specific gravity	2.75
Volume solids (%)	61±3
Flashpoint (°C)	<24
VOC (g·l-1)	311.

(1) Tested in accordance with the methods given in the Guideline Document.

1.3 Leighs Cleanser/Thinner No 5 is used to thin the product prior to application and to clean equipment.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- · evaluated the process for management of nonconformities
- · checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 and BS EN ISO 14001 : 2004 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied as a 5 litre unit, comprising a 4 litre base in a 5 litre container and a 1 litre container of additive, or as a 10 litre unit, comprising a 8 litre base in a 12 litre container and a 2 litre additive in a 2.5 litre container.

3.2 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.3 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of 18 months.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Zinc Clad M501.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications⁽¹⁾, Zinc Clad M501 is satisfactory for use as an intermediate coat or finish on blast-cleaned steelwork over hot dip galvanized or sealed aluminium metal spray to BS EN 22063 : 1994. (1) Product Sheet 99 of this Certificate.

(1) Froduct Sheet 99 of this Certificate.

5 Practicability of installation

The coating is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been tested in accordance with the requirements of the Guideline Document and meets all the requirements of that document, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Vol 1 (Paints) Series 5000.

8 Durability

A complete paint system including Zinc Clad M501, based on the products described in this Certificate, can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 (Paints) Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

	Temperature (°C)		
	5	15	23
Surface dry (hours)	1/4	11/4	3/4
Hard dry (hours)	16	10	6
Minimum overcoating time (hours)	6	6	4
Pot life (hours)	10	10	8

9.3 The product is applied by airless spray (tip size 0.38 mm, operating pressure 1600 psi) to achieve a dry film thickness (dft) of 60 µm (equivalent to a wet film thickness (wft) of 98µm.

9.4 The product's surface texture tends to retain contaminants and the surface should be cleaned thoroughly before overcoating, especially after prolonged exposure.

9.5 The product is overcoated with the Certificate holder's products bearing the appropriate HAPAS approval as listed in Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications, observing the minimum overcoating period given in Table 1.

Technical Investigations

10 Tests

Zinc Clad M501 was tested in accordance with the requirements of SG12 Guideline for the Assessment and certification of paints and similar protective coatings, and the results were assessed to determine:

- liquid paints
 - density
 - flashpoint
 - volume solids
 - viscosity
 - volatile organic compound
 - pot life
 - other composition requirements

applied coating

- opacity of topcoat
- colour designation
- visual comparison of primer, undercoat and topcoat colours against the declared standard
- gloss
- surface dry (ballotini)
- hard dry
- application and appearance
- minimum overcoating time
- film thickness
- flexibility

complete system

- artificial weathering of topcoat
- scratch resistance of single-pack topcoat and of two-pack topcoat
- impact resistance
- adhesion for systems of thicknesses <250 µm and >250 µm
- sulfur dioxide
- humidity.

11 Investigations

The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings.

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance – Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion
Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Process Guidance Note 6/23[04] Secretary of State's Guidance for Coating of Metal and Plastic Processes

Conditions of Certification

12 Conditions

- 12.1 This Certificate:
- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

12.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

12.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 12.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

12.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

12.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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Watford		clientservices@bba.star.co.uk
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	Page 5 of 5	

HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA



HAPAS Certificate 08/H134 Product Sheet 4

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

TRANSGARD TG110 - TO HE ITEM NO 110

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Transgard TG110, a zinc phosphate, high-build, quick-drying, two-pack epoxy blast primer, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volumes 1 and 2 where Item No 110 is specified.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance — a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability — a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8)

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

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Construction Products

John Albon — Head of Approvals

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Claire Curtis-Thomas

Chief Executive

Date of Second issue: 19 July 2016

Originally certificated on 14 October 2013

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Page 1 of 5



Requirements

In the opinion of the BBA, Transgard TG110, having been registered by Highways England in accordance with the procedures of BA 27/99 and found to comply with the requirements BD 35/06 and approved for ongoing registration, when used in accordance with the provisions of this Certificate will meet or contribute to meeting the requirements of:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000.
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

1.1 Transgard TG110 is, a two-pack, zinc phosphate, high-build, quick drying, epoxy blast primer, for use as an anti-corrosion coating as part of the specification for the corrosion protection of steelwork in Highways Applications, in accordance with MCHW, Volumes 1 and 2, where Item No 110 is specified.

1.2 The product is available in one colour, cinnamon.

1.3 The characteristics of this product are:

Specific gravity	base additive mixed	1.49 0.92 1.38
Volume solids (%)	mixed	36
Flashpoint (°C)	base additive	33 33
VOC (g·l=1) (to PG 6/23)	mixed	584.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- · checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 5 litre and 20 litre packs in the correct proportions. When mixed, the gross weight of the 20 litre container is 27.6 kg.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of 12 months.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Transgard TG110.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications⁽¹⁾, Transgard TG110 is satisfactory for use as a blast primer/sealer on steel surfaces prepared by abrasive blast cleaning to a minimum standard of Sa 2½ to BS EN ISO 8501-1 : 2001. (1) Product Sheet 99 of this Certificate

5 Practicability of installation

The primer is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been registered in accordance with the requirements of BA 27/99 and BD 35/99, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in *Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications*.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Vol 1 [Paints] Series 5000.

8 Durability

A complete paint system including Transgard TG110 and based on the products described in this Certificate can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with MCHW, Volume 1 (Paints) Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

	Temperature (°C)		
-	15	23	35
Surface dry (hours)	2	11/2	1
Hard dry (hours)	16	8	5
Minimum overcoating time (hours)	6	4	3
Pot life (hours)	21/2	11/2	3/4

9.3 The product is applied by airless spray (tip range 0.46 mm to 0.53 mm, output fluid pressure 1.50 bar) to achieve a dry film thickness (dft) of 25 µm to 30 µm [equivalent to a wet film thickness (wft) of 70 µm to 84 µm.

9.4 Small areas can be coated by brush, if required

9.5 The product is overcoated with the Certificate holder's products bearing the appropriate HAPAS approval, as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications, observing the minimum overcoating period given in Table 1.

10 Investigations

10.1 Highways England has approved ongoing registration to BD 35/14 of the product when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

10.2 Transgard TG110 was registered and tested in accordance with the requirements of BD 27/99 and BD 35/14 and the results were assessed to determine:

- pigment volume concentration
- density
- sag resistance
- opacity
- · overcoating time
- resistance to sea salt

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- confirmation of pigment
- application and appearance
- drying time hard
- impact resistance

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 8501-1 : 2007 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness - Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings – Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings.

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance - Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Process Guidance Note 6/23(04) Secretary of State's Guidance for Coating of Metal and Plastic Processes

- flashpoint

- volume solids
- drying time surface
- scratch resistance
- SO₂ resistance.
- confirmation of medium viscosity

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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	Page 5 of 5	

HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA

HAPAS Certificate 08/H134

Product Sheet 5

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

TRANSGARD TG111 V2 - TO HE ITEM NO 111

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Transgard TG111 V2, a zinc phosphate, high-build, quick-drying, two-pack epoxy blast primer, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with Manual of Contract Documents for Highway Works, Volume 1 and 2, where Item No 111 is specified.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance — a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability – a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 19 July 2016

2008 ·
John Albon — Head of Approvals

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Claire Curtis-Thomas Chief Executive

Originally certificated on 14 October 2013

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Construction Products

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Page 1 of 5



Requirements

In the opinion of the BBA, Transgard TG111 V2, having been registered by Highways England and tested in accordance with the procedures of BA 27/99 and found to comply with the requirements BD 35/99 and approved for ongoing registration, when used in accordance with the provisions of this Certificate, will meet or contribute to meeting the requirements of:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

1.1 Transgard TG111 V2 is a zinc phosphate, high-build, quick-drying, two-pack epoxy blast primer, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the MCHW, Volumes 1 and 2, where Item No 111 is specified.

1.2 The product is available in light grey and red oxide.

1.3 The characteristics of the product are:

Specific gravity	base additive mixed	1.64 0.98 1.51
Volume solids (%)	mixed	75
Flashpoint (°C)	base additive	24 26
VOC (g·1-1) (to PG 6/23)	mixed	186.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 5 litre and 20 litre packs, in the correct proportions. When mixed, the gross weight of the 20 litre containers is 33.2 kg.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of two years.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Transgard TG111 V2.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications⁽¹⁾, Transgard TG111 V2 is satisfactory for use as a blast primer/sealer for steel surfaces prepared by abrasive blast cleaning to a minimum standard of Sa 2½ to BS EN ISO 8501-1 : 2001.

(1) Product Sheet 99 of this Certificate.

5 Practicability of installation

The primer is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been registered in accordance with the requirements of BA 27/99 and BD 35/06, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Volume 1 (Paints) Series 5000.

8 Durability

A complete paint system including Transgard TG111 V2 and based on the products described in this Certificate can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 (Paints) Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base (Part A) is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

	Temperature (°C)		
	15	23	35
Surface dry (hours)	2	11/2	1
Hard dry (hours)	16	8	5
Minimum overcoating time (hours)	6	4	3
Pot life (hours)	21/2	11/2	3/4

9.3 The product is applied by airless spray [tip size 0.33 mm [13 thou], output fluid pressure 150 bar] or brush to achieve a dry film thickness (dft) of 75 µm to 200 µm [equivalent to a wet film thickness [wft] of 93 µm to 200 µm].

9.4 Small areas can be coated by brush, if required.

9.5 The product is overcoated with the Certificate holder's products bearing the appropriate HAPAS approval as listed in *Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications*, observing the minimum overcoating period given in Table 1.

Technical Investigations

10 Investigations

10.1 Highways England has approved ongoing registration to BD 35/14 of the product when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

10.2 Transgard TG111 V2 was originally registered and tested in accordance with the requirements of BD 27/99 and BD 35/06 and the results were assessed to determine:

- pigment volume concentration
- mixing properties
- volume solids
- pot life
- overcoating time
- adhesion
- artificial weathering.
- flashpointapplication and appearance

confirmation of medium

- drying time surface
- scratch resistance
- resistance to sea salt
- confirmation of pigment
- sag resistance
- opacity
- drying time hard
- impact resistance
- SO₂ resistance

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 8501-1 : 2007 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance — Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Process Guidance Note 6/23[04] Secretary of State's Guidance for Coating of Metal and Plastic Processes

Page 4 of 5

Protective & Marine Coatings

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- · relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA



HAPAS Certificate 08/H134 Product Sheet 16

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

MACROPOXY C267V3 - TO HE ITEM 112

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Macropoxy⁽²⁾ C267V3, a micaceous iron oxide, high build, quick drying, two-pack epoxy undercoat/finish, for use as an anti corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volume 1 and 2, where Item No 112 is specified. (2) Macropoxy is a registered trade mark.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance — a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability – a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 19 July 2016

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Claire Curtis-Thomas Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Construction Products

John Albon - Head of Approvals

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Page 1 of 5



Requirements

The Highways Technical Advisory Committee [HiTAC] and HAPAS Specialist Group 12 [Paints and similar protective coatings for corrosion protection of structural steelwork] have agreed with the BBA the aspects of performance to be used by the BBA in assessing the compliance of paints and similar protective coatings as set out in the Guideline Document. Additional requirements of the overseeing organisations are set out in the following documents:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.3) of this Certificate.

Technical Specification

1 Description

1.1 Macropoxy C267V2 is a micaceous iron oxide, high-build, quick-drying, two-pack epoxy undercoat/finish for use as an anti-corrosion coating as part of a specification for the corrosion protection of steelwork in Highway Applications, in accordance with the MCHW, Volumes 1 and 2, where Item No 112 is specified.

1.2 The product is available in two colours, dark grey and light grey (RAL colours R8050 and R8051, respectively).

1.3 The characteristics of this product are:

Specific gravity	base additive mixed	2.22 1.01 2.08
Volume solids(%)	mixed	78
Flashpoint (°C)	base additive	32 23
VOC [g-1-1] (to PG 6/23)	mixed	203

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 and BS EN ISO 14001 : 2004 by BSI [Certificate FM828].

3 Delivery and site handling

3.1 The product is supplied in 5 litre and 18 litre packs, in the correct proportions. When mixed, the gross weight of the 18 litre container is 41 kg.

3.2 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.3 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of 12 months.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Macropoxy C267V3.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications⁽¹⁾, Macropoxy C267V3 is satisfactory for use as an intermediate coat or finish on blast-cleaned steelwork over hot dip galvanized or sealed aluminium metal spray to BS EN 22063 : 1994.

(1) Product Sheet 99 of this Certificate.

5 Practicability of installation

The coating is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been tested in accordance with the requirements of the Guideline Document and meets all the requirements of that document, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Vol 1 [Paints] Series 5000.

8 Durability

A complete paint system including Macropoxy C267V3, based on the products described in this Certificate, can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 [Paints] Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

	Tempero	sture (°C)
	15	23
Surface dry (hours)	1 1⁄4	3/4
Hard dry (hours)	10	6
Minimum overcoating time (hours)	ó	4
Pot life (hours)	2	11/2

9.3 The product is applied by airless spray (tip size 0.46 mm, operating pressure 2200 psi) to achieve a dry film thickness (dft) of 125 µm to 200 µm [equivalent to a wet film thickness (wft) of 165 µm to 235 µm].

9.4 The product's surface texture tends to retain contaminants and the surface should be cleaned thoroughly before overcoating, especially after prolonged exposure.

9.5 The product is overcoated with the Certificate holder's products bearing the appropriate HAPAS approval as listed in Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications, observing the minimum overcoating period given in Table 1.

Technical Investigations

10 Tests

Macropoxy C267V3 was tested in accordance with the requirements of SG12 Guideline for the Assessment and certification of paints and similar protective coatings, and the results were assessed to determine:

- liquid paints
 - density
 - flashpoint
 - volume solids
 - viscosity
 - volatile organic compound
 - pot life
 - other composition requirements

applied coating

- opacity of topcoat
- colour designation
- visual comparison of primer, undercoat and topcoat colours against the declared standard
- gloss
- surface dry (ballotini)
- hard dry
- application and appearance
- minimum overcoating time
- film thickness
- flexibility
- complete system
 - artificial weathering of topcoat
 - scratch resistance of single-pack topcoat and of two-pack topcoat
 - impact resistance
 - adhesion for systems of thicknesses <250 µm and >250 µm
 - sulfur dioxide
 - humidity.

11 Investigations

The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings.

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance – Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Process Guidance Note 6/23(04) Secretary of State's Guidance for Coating of Metal and Plastic Processes

Conditions of Certification

12 Conditions

12.1 This Certificate:

- · relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

12.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

12.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.
- 12.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

12.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

12.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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	Page 5 of 5	

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HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

MACROPOXY M902 WINTERFAST HI-BUILD BRUSHING ALUMINIUM - TO HE ITEM NO 115

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Macropoxy^[2] M902 Winterfast Hi-Build Brushing Aluminium, a high-build, two-pack epoxy primer, pigmented with aluminium and micaceous iron oxide, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volumes 1 and 2, where Item No 115 is specified. (2) Macropoxy is a registered trade mark.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance — a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability — a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 19 July 2016

Originally certificated on 14 October 2013

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Claire Curtis-Thomas

Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Construction Products

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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HAPAS Certificate 08/H134 Product Sheet 7





Requirements

In the opinion of the BBA, Macropoxy M902 Winterfast Hi-Build Brushing Aluminium, having been registered by the Highways Agency and tested in accordance with the procedures of BA 27/99 and found to comply with the requirements BD 35/06 and approved for ongoing registration, when used in accordance with the provisions of this Certificate, will meet or contribute to meeting the requirements of:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000.
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

1.1 Macropoxy M902 Winterfast Hi-Build Brushing Aluminium is a two-pack, high-build, epoxy primer, pigmented with aluminium and micaceous iron oxide, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the MCHW, Volumes 1 and 2, where Item No 115 is specified.

1.2 The product is available in one colour, aluminium.

1.3 The characteristics of the product are:

Specific gravity	base additive mixed	1.38 0.97 1.12
Volume solids (%)	mixed	75
Flashpoint (°C)	base curing agent	47 30
VOC (g·l-1) (to PG 6/23)	mixed	219.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- · checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 2 litre and 10 litre packs in the correct proportions of each component.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of 2 years.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Macropoxy M902 Winterfast Hi-Build Brushing Aluminium.

Design Considerations

4 Use

4.1 Where included as part of the specification for a paint system as listed in Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications⁽¹⁾, Macropoxy M902 Winterfast Hi-Build Brushing Aluminium is satisfactory for use over steelwork steel surfaces prepared by abrasive blast cleaning to a minimum standard of Sa 2½ to BS EN ISO 8501-1 : 2001.

4.2 Macropoxy M902 Winterfast Hi-Build Brushing Aluminium may also be considered for use over steels prepared to surface standard St3 (to BS EN ISO 8501-1: 2007, BS 7079-A1: 1989), bright or sound metal coating and sound weathered coatings. However, in these applications the durability of a complete paint system based on the material described in this Certificate will be dependent on the standard of surface preparation actually achieved and, where applicable, the integrity of any existing coatings.

Product Sheet 99 of this Certificate.

5 Practicability of installation

The coating is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been registered in accordance with the requirements of BA 27/99 and BD 35/06, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Vol 1 (Paints) Series 5000.

8 Durability

A complete paint system including Macropoxy M902 Winterfast Hi-Build Brushing Aluminium and based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 (Paints) Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

	Temperature (°C)	
	5	23
Surface dry (hours)	51/2	31/2
Hard dry (hours)	16	8
Minimum overcoating time (hours)	61/2	4
Pot life (hours)	(1)	11/2

9.3 The product is applied by airless spray (tip size 0.38 mm, operating pressure 250 bar) or brush to achieve a dry film thickness (dft) of 100 µm to 150 µm (equivalent to a wet film thickness (wft) of 133 µm to 200 µm).

9.4 The product is overcoated with the Certificate holder's products bearing the appropriate HAPAS approval as listed in *Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications*, observing the minimum overcoating period given in Table 1.

Technical Investigations

10 Investigations

10.1 Highways England has approved ongoing registration to BD35/14 of the product when include as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

10.2 Macropoxy M902 Winterfast Hi-Build Brushing Aluminium was tested in accordance with the requirements of BD 27/99 and BD 35/06 and the results were assessed to determine:

- pigment volume concentration
- confirmation of medium
- confirmation of pigment
- mixing properties
- flashpoint
- viscosity
- resistance to sag
- volume solids.

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 7079-A1 Supplement 1 : 1989 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Representative photographic examples of the change of appearance imparted to steel when blast-cleaned with different abrasives

BS EN ISO 8501-1 : 2001 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Rust grades and preparation grades of uncoated steel substrates after overall removal of previous coatings

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance — Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Page 4 of 5

Process Guidance Note 6/23(04) Secretary of State's Guidance for Coating of Metal and Plastic Processes

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- · the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA

HAPAS Certificate 08/H134

Product Sheet 13

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

TRANSGARD TG115 - TO HE ITEM 115

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Transgard TG115, a two-pack, high-build epoxy coating pigmented with aluminium, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volumes 1 and 2, where Item No 115 is specified.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance — a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability — a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

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John Albon - Head of Approvals

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Claire Curtis-Thomas

Chief Executive

Date of Second issue: 19 July 2016

Originally certificated on 14 October 2013

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Construction Products

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Requirements

In the opinion of the BBA, Transgard TG115, having been registered by Highways England and tested in accordance with the procedures of BA 27/99 and found to comply with the requirements BD 35/06 and approved for ongoing registration, when used in accordance with the provisions of this Certificate, will meet or contribute to meeting the requirements of:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 [Paints] Series 1900 and 5000
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

1.1 Transgard TG115 is a two-pack, high-build epoxy coating pigmented with aluminium, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the MCHW, Volumes 1 and 2, where Item No 115 is specified.

1.2 The product is available in one colour, aluminium.

1.3 The characteristics of the product are:

Specific gravity	base	1.33
	activator	1.01
	mixed	1.29
Volume solids(%)	mixed	75
Flashpoint (°C)	base	47
	activator	30
VOC (g·l-1) (to PG 6/23)	mixed	217.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- · checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 5 litre and 20 litre packs in the correct proportions of each component. The gross weight of the mixed 20 litre pack is 27 kg.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of 2 years.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Transgard TG115.

4 Use

4.1 Where included as part of the specification for the paint system as listed in Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications⁽¹⁾, Transgard TG115 is satisfactory for use over steelwork prepared by abrasive blast cleaning to a minimum standard of Sa 21/2 to BS EN ISO 8501-1 : 2001, at ambient temperatures of 10°C or above.

4.2 Transgard TG115 may also be considered for use over steels prepared to surface standard St3 (to BS EN ISO 8501-1: 2007, BS 7079-A1: 1989], bright or sound metal coating and sound weathered coatings. However, in these applications the durability of a complete paint system based on the material described in this certificate will be dependent on the standard of surface preparation actually achieved and, where applicable, the integrity of any existing coatings. (1) Product Sheet 99 of this Certificate.

5 Practicability of installation

The coating is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been registered in accordance with the requirements of BA 27/99 and BD 35/06, and may contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Vol 1 [Paints] Series 5000.

8 Durability

A complete paint system including Transgard TG115 and based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance.

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 (Paints) Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

	Temperature (°C)	
	15	23
Surface dry (hours)	6	3
Hard dry (hours)	24	16
Minimum overcoating time (hours)	16	8
Pot life (hours)	3	2

9.3 Transgard TG115 is applied by airless spray (tip size 0.38 mm, output fluid pressure 250 bar) or brush to achieve a dry film thickness (dft) of 100 µm to 150 µm [equivalent to a wet film thickness (wft) of 133 µm to 200 µm]:

9.4 The product may be overcoated with the Certificate holder's products bearing the appropriate HAPAS approval as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications, observing the minimum overcoating period given in Table 1.

Technical Investigations

10 Investigations

10.1 Highways England has approved ongoing registration to BD 35/14 of the product when included as part of the specification for a paint system as listed in *Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.*

10.2 An assessment was made of Transgard TG115's compliance in accordance with the requirements of BD 27/99 and BD 35/06.

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 7079-A1 Supplement 1 : 1989 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Representative photographic examples of the change of appearance imparted to steel when blast-cleaned with different abrasives

BS EN ISO 8501-1 : 2001 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Rust grades and preparation grades of uncoated steel substrates after overall removal of previous coatings

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance — Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Process Guidance Note 6/23(04) Secretary of State's Guidance for Coating of Metal and Plastic Processes

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 822115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA

BBBA APPROVAL INSPECTION TECHNICAL APPROVALS FOR CONSTRUCTION

HAPAS Certificate 08/H134 Product Sheet 8

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

MACROPOXY M905 WINTERFAST HI-BUILD UNDERCOAT - TO HE ITEM 116

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Macropoxy^[2] M905 Winterfast Hi-Build Undercoat, a high-build, two-pack epoxy maintenance undercoat for abraded surfaces, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volumes 1 and 2, where Item No 116 is specified. (2) Macropoxy is a registered trade mark.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance - a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability – a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 19 July 2016

Originally certificated on 14 October 2013



John Albon - Head of Approvals

Clain

Claire Curtis-Thomas Chief Executive

Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Requirements

In the opinion of the BBA, Macropoxy M905 Winterfast Hi-Build Undercoat, having been registered by Highways England in accordance with the procedures of BA 27/99 and found to comply with the requirements BD 35/06 and approved for ongoing registration, when used in accordance with the provisions of this Certificate will meet or contribute to meeting the requirements of:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000.
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

1.1 Macropoxy M905 Winterfast Hi-Build Undercoat is a high-build, two-pack epoxy maintenance undercoat for abraded surfaces, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the MCHW, Volumes 1 and 2 where Item No 116 is specified.

1.2 The product is available in one colour, off-white.

1.3 The characteristics of the products are:

Specific gravity	base additive mixed	1.84 0.975 1.54
Volume solids (%)	mixed	75
Flashpoint (°C)	base curing agent	47 24
VOC [g-1-1] (to PG 6/23)	mixed	219.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- · assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- · evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 2.5 litre and 1.5 litre packs in the correct proportions. When mixed, the gross weight of the 1.5 litre pack is 2.5 kg.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original container in a paint store in the conditions recommended by the paint manufacturer, the product has a minimum shelf-life of 2 years.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Macropoxy M905 Winterfast Hi-Build Undercoat.

Design Considerations

4 Use

4.1 When included as part of the specification for the paint system as listed in Supplement to Sherwin-Williams Marine & Protective Coatings for Highways Applications¹¹, Macropoxy M905 Winterfast Hi-Build Undercoat is satisfactory for use over steel prepared by abrasive blast cleaning to a minimum standard of Sa 2½ to BS EN ISO 8501-1 : 2001, primed with Macropoxy M902 Winterfast Hi-Build Brushing Aluminium (which meets Item No. 115).
(1) Product Sheet 99 of this Certificate.

- 4.2 Macropoxy M905 Winterfast Hi-Build Undercoat may also be considered for use over:
- steels prepared to surface standard St3 (to BS EN ISO 8501-1: 2007, BS 7079-A1: 1989) and primed with Epigrip M902 Winterfast Hi-Build Brushing Aluminium (Item No. 115)
- bright or sound metal coatings primed with Macropoxy M902 Winterfast Hi-Build Brushing Aluminium (Item No. 115)
- suitably prepared sound weathered coatings.

However, in these applications the durability will be dependent on the standard of surface preparation actually achieved and, where applicable, the integrity of any existing coatings.

5 Practicability of installation

The undercoat is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been registered in accordance with the requirements of BA 27/99 and BD 35/06, and may contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwir-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Vol 1 [Paints] Series 5000.

8 Durability

A complete paint system including Macropoxy M905 Winterfast Hi-Build Undercoat and based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 1.5 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 [Paints] Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

Tuble 1 Application properties	, Tempero	sture (°C)
	5	23
Surface dry (hours)	31/2	1½
Hard dry (hours)	16	8
Minimum overcoating time (hours) brush spray	5 2½	2½ 2
Pot life (hours)	8	11/2

9.3 The product is applied by airless spray (tip size 0.38 mm, operating pressure 250 bar) or brush to achieve a dry film thickness (dft) of 75 µm to 150 µm (equivalent to a wet film thickness (wft) of 100 µm to 200 µm).

9.4 The product is overcoated with the Certificate holder's products as defined in the Supplement to Sherwin-Williams Marine & Protective Coatings for Highways Applications, observing the minimum overcoating period given in Table 1.

Technical Investigations

10 Investigations

10.1 Highways England has approved ongoing registration to BD 35/14 of the product when include as part of the specification for a paint system as listed in *Supplement to Sherwin-Williams Marine & Protective Coatings for Highways Applications.*

10.2 Macropoxy M905 Winterfast Hi-Build Undercoat was tested in accordance with the requirements of BD 27/99 and BD 35/06 and the results were assessed to determine:

- pigment volume concentration
- mixing properties
- resistance to sag
- opacity
- drying time hard
- resistance to impact
- so to impact
 - pact
- confirmation of medium
- flashpoint
- volume solids
- pot life
- overcoating timeadhesion.
- confirmation of pigment
- viscosity
- application and appearance
- drying time surface
- resistance to scratch

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 7079-A1 Supplement 1 : 1989 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Representative photographic examples of the change of appearance imparted to steel when blast-cleaned with different abrasives

BS EN ISO 8501-1 : 2001 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Rust grades and preparation grades of uncoated steel substrates after overall removal of previous coatings

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance — Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Process Guidance Note 6/23[04] Secretary of State's Guidance for Coating of Metal and Plastic Processes

Protective & Marine Coatings

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- · relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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Bucknalls Lane Watford		fax: 01923 665301 clientservices@bba.star.co.uk
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	Page 5 of 5	

HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 822115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA

HAPAS Certificate 08/H134 **Product Sheet 14**

APPROVAL INSPECTION ESTING

ERTIFICATION

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

TRANSGARD TG116 - TO HE ITEM 116

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Transgard TG116, a twopack, high-build, epoxy maintenance undercoat, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volumes 1 and 2, where Item No 116 is specified.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance - a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability - a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 19 July 2016

John Albon - Head of Approvals Originally certificated on 14 October 2013 Construction Products

The BBA is a UKAS accredited certification body - Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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dan

Claire Curtis-Thomas Chief Executive

Requirements

In the opinion of the BBA, Transgard TG116, having been registered by Highways England in accordance with the procedures of BA 27/99 and found to comply with the requirements BD 35/06 and approved for ongoing registration, when used in accordance with the provisions of this Certificate will meet or contribute to meeting the requirements of:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

1 Description and 3 Delivery and site handling [3.1 and 3.2] of this Certificate.

Technical Specification

1 Description

See sections:

1.1 Transgard TG116 is a high-build, two-pack epoxy maintenance undercoat for abraded surfaces, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the MCHW, Volumes 1 and 2 where Item No 116 is specified.

1.2 The product is available in off-white and light grey (00 A 0.5) to BS 4800 : 2011.

1.3 The characteristics of the products are:

Specific gravity	base	1.65
	activator	1.01
	mixed	1.00
Volume solids (%)	mixed	75
Flashpoint (°C)	base	47
	curing agent	24
VOC (g·l-1) (to PG 6/23)	mixed	240.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coating has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 5 litre and 20 litre packs in correct proportions. When mixed, the gross weight of 20 litre pack is 35 kg.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in the conditions recommended by the paint manufacturer, the product has a minimum shelf-life of 2 years.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Transgard TG116.

Design Considerations

4 Use

4.1 When included as part of the specification for the paint system as listed in *Supplement to Sherwin-Williams* Protective & Marine Coatings for Highways Applications⁽¹⁾, Transgard TG116 is satisfactory for use over steel surfaces prepared by abrasive blast cleaning to a minimum standard of Sa 2½ to BS EN ISO 8501-1 : 2001, primed with Transgard TG115 (which meets Item No. 115) at ambient temperatures of 10°C or above.

4.2 Transgard TG116 may also be considered for use over steels prepared to surface standard St3 (to BS EN ISO 8501-1: 2007, BS 7079-A1: 1989) and primed with Transgard TG115 (Item No. 115), over bright or sound metal coatings primed with Transgard TG115 (Item No. 115), or over suitably prepared sound weathered coatings. However, in these applications the durability will be dependent on the standard of surface preparation actually achieved and, where applicable, the integrity of any existing coatings.

(1) 'Product Sheet 99'.

4.3 Transgard TG116 complies with the requirements of BD 27/99 and BD 35/06.

4.4 The Highways Agency have approved ongoing registration to BD 35/14 of the product when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications .

5 Practicability of installation

The undercoat is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been registered in accordance with the requirements of BA 27/99 and BD 35/06 and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in *Supplement* to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Vol 1 [Paints] Series 5000.

8 Durability

A complete paint system including Transgard TG116 and based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 [Paints] Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

	Temperature (°C)	
	15	23
Surface dry (hours)	6	3
Hard dry (hours)	24	16
Minimum overcoating time (hours)	12	8
Pot life (hours)	3	2

9.3 The product is applied by airless spray (tip size 0.38 mm, output fluid pressure 250 bar) or brush to achieve a dry film thickness (dft) of 75 µm to 150 µm [equivalent to a wet film thickness (wft) of 100 µm to 200 µm].

9.4 The product is to be overcoated with the Certificate holder's products as defined in Supplement to Sherwin-Williams Protective and Marine Coatings for Highways Applications, observing the minimum overcoating period given in Table 1.

Technical Investigations

10 Investigations

10.1 An assessment was made of Transgard TG116's compliance in accordance with the requirements of BD 27/99 and BD 35/06.

10.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 7079-A1 Supplement 1 : 1989 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Representative photographic examples of the change of appearance imparted to steel when blast-cleaned with different abrasives

BS EN ISO 8501-1 : 2001 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Rust grades and preparation grades of uncoated steel substrates after overall removal of previous coatings

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/06 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance — Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Page 4 of 5

Process Guidance Note 6/23(04) Secretary of State's Guidance for Coating of Metal and Plastic Processes

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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	Page 5 of 5	
HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 822115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

MACROPOXY K267 - TO HE ITEM 121

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Macropoxy⁽²⁾ K267, an extendedcure, micaceous iron oxide, two-pack epoxy undercoat/ finish, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volumes 1 and 2, where Item No 121 is specified.

Macropoxy is a registered trade mark.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance - a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability — a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

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Chief Executive

Claire Curtis-Thomas

Date of Second issue: 19 July 2016

Originally certificated on 14 October 2013

Construction Products

John Albon - Head of Approvals

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Page 1 of 5



HAPAS Certificate 08/H134 Product Sheet 9



Requirements

In the opinion of the BBA, Macropoxy K267, having been registered by Highways England in accordance with the procedures of BA 27/99 and found to comply with the requirements BD 35/06 and approved for ongoing registration, when used in accordance with the provisions of this Certificate will meet or contribute to meeting the requirements of:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000.
- Manual of Contract Documents for Highways Works [MCHW], Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

See sections:

1.1 Macropoxy K267 is a two-pack, extended-cure, micaceous iron oxide, epoxy undercoat/finish, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the MCHW, Volumes 1 and 2 where Item No 121 is specified.

1.2 The product is available in dark grey (R8050) and light grey (R8051).

1.3 The characteristics of the products are:

Specific gravity	base additive mixed	2.09 0.94 1.86
Volume solids (%)	mixed	66
Flashpoint (°C)	base additive	32 51
VOC (g·l-1) (to PG 6/23)	mixed	297.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI [Certificate FM828].

3 Delivery and site handling

3.1 The product is supplied in 5 litre and 20 litre packs in the correct proportions. When mixed, the gross weight of the 20 litre container is 40 kg.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of 2 years.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Macropoxy K267.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications⁽¹⁾, Macropoxy K267 is satisfactory for use over galvanized steel lighting columns, bracket arms and other components. (1) Product Sheet 99 of this Certificate.

5 Practicability of installation

The undercoat/finish is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been registered in accordance with the requirements of BA 27/99 and BD 35/06, and may contribute to corrosion resistance when included as part of the specification for a paint system as listed in *Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications*.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Vol 1 [Paints] Series 5000.

8 Durability

A complete paint system including Macropoxy K267 and based on the products described in this Certificate can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 [Paints] Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

	Temperature (°C)		
	5	23	35
Surface dry (hours)	3	2	1
Hard dry (hours)	24	16	12
Minimum overcoating time (hours)	6	4	3
Pot life (hours)	3	2	1

9.3 The product is applied by airless spray (tip size 0.46 mm, output fluid pressure 155 bar) or brush to achieve a dry film thickness (dft) of 75 µm to 125 µm [equivalent to a wet film thickness (wft) of 114 µm to 190 µm].

9.4 The product may be overcoated with the Certificate holder's products bearing the appropriate HAPAS approval, as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications, observing the minimum overcoating period given in Table 1.

Technical Investigations

10 Investigations

10.1 Highways England has approved ongoing registration to BD 35/14 of the product when included as part of the specification for a paint system as listed in Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

10.2 Macropoxy K267 was tested in accordance with the requirements of BD 27/99 and BD 35/06 and the results were assessed to determine:

- pigment volume concentration
- mixing properties
- resistance to sag
- opacity
- drying time hard
- impact resistance
- specific gravity.

- confirmation of medium flashpoint
- volume solids
- pot life
- overcoating time
- adhesion

- confirmation of pigment
- viscosity
- application and appearance
- drying time surface
- scratch resistance
- artificial ageing

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance — Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Process Guidance Note 6/23(04) Secretary of State's Guidance for Coating of Metal and Plastic Processes

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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	Page 5 of 5	

HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA

HAPAS Certificate 08/H134

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

MACROPOXY C123 - TO HE ITEM NO 123

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Macropoxy⁽²⁾ C123, a highbuild, glass flake, two-pack epoxy undercoat for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volume 1 and 2, where Item No 123 is specified. (2) Macropoxy is a registered trade mark.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance — a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability — a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

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John Albon — Head of Approvals

Lan

Claire Curtis-Thomas

Chief Executive

Date of Third issue: 19 July 2016

Originally certificated on 31 July 2010

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Construction Products

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Requirements

The Highways Technical Advisory Committee (HiTAC) and HAPAS Specialist Group 12 (Paints and similar protective coatings for corrosion protection of structural steelwork) have agreed with the BBA the aspects of performance to be used by the BBA in assessing the compliance of paints and similar protective coatings as set out in the Guideline Document. Additional requirements of the overseeing organisation are set out in the following documents:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 [Paints] Series 1900 and 5000
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections:

1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

1.1 Macropoxy C123 is a high-build, glass flake, two-pack epoxy undercoat, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works (MCHW) Volumes 1 and 2, where Item No 123 is specified.

1.2 The product is available in light grey and red oxide colours.

1.3 Full data on the product is given in the Certificate holder's product data sheet, material safety data sheet and package labelling.

1.4 The characteristics	of this product are ⁽¹⁾ :	
Specific gravity	mixed	1.50
Volume solids (%)	mixed	83.3
Flashpoint (°C)	mixed	39
VOC (g-1-1)	mixed	177.
(1) Tested in accordance wi	th the methods given in the C	Suideline Document

2 Manufacture

2.1 The product is manufactured in a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- · assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 20 litre or 5 litre packs, containing the correct proportions of Parts A and B. The packs weigh 33 kg and 8.2 kg respectively.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in the conditions recommended by the Certificate holder, the base [Part A] and curing agent (Part B) have a shelf-life of 24 months from the date of manufacture or the 'use by' date (where specified).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Macropoxy C123.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in *Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications*⁽¹⁾, Macropoxy C123 is satisfactory for use as an intermediate coat where Item No 123 is specified, over a primer coat meeting the requirements of Item 110 and then overcoated with a topcoat meeting the requirements of Item No 168. (1) Product Sheet 99 of this Certificate.

5 Practicability of installation

The undercoat is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been tested in accordance with the requirements of the Guideline Document and meets all the requirements of that document, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Volume 1 (Paints) Series 5000.

8 Durability

A complete paint system including Macropoxy C123 and based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 (Paints) Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base (Part A) is mixed with the entire contents of the curing agent (Part B), and mixed thoroughly. The mixed product has a pot life of one hour at 23°C and is overcoated with the Certificate holder's products, as defined in section 3, observing the minimum overcoating period given in Table 1.

Table 1 Application properties		
	Temperature 23°C	
Surface dry (hours)	4	
Through dry (hours)	8	
Cured (days)	7	
Minimum overcoating time (hours)	4	

9.3 The mixed product is applied by airless spray [tip range 0.48 mm to 0.58 mm, with a nozzle pressure of 23 MPa (3360 psi)] to achieve a typical dry film thickness (dft) range of 250 µm to 400 µm [equivalent to a wet film thickness [wft] of 301 µm to 482 µm]. The Certificate holder can advise on suitable spray equipment.

9.4 Small areas can be coated by brush or roller, if required.

9.5 The product is overcoated with the Certificate holder's products bearing the appropriate HAPAS approval, as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications, observing the minimum overcoating period given in Table 1.

10 Investigations

10.1 Highways England has approved ongoing registration to BD 35/14 of the product when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

10.2 Tests were conducted in accordance with the requirements of SG12 Guideline for the Assessment and certification of paints and similar protective coatings and the results assessed to determine:

- density
- viscosity
- composition
- colour designation
- drying time surface
- minimum overcoating
- artificial weathering
- adhesion
- resistance to humidity.

- sag resistance
- colour comparison
- drying time hard

VOC content

flashpoint

- film thickness
- scratch resistance
- resistance to sea salt

- volume solids
- · pot life
- opacity · gloss
- · application and appearance
- flexibility
- impact resistance
- SO₂ resistance

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings - Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance - Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300 fax: 01923 665301 clientservices@bba.star.co.uk www.bbacerts.co.uk

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HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA

HAPAS Certificate

Claire Curtis-Thomas

Chief Executive

08/H134 Product Sheet 1

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

MACROPOXY M922 - TO HE ITEM NO 123

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Macropoxy^[2] M922, a highsolids, two-pack epoxy-amine glass flake coating, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volumes 1 and 2, where Item No 123 is specified. (2) Macropoxy is a registered trade mark.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Originally certificated on 16 April 2008

Corrosion resistance — a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability — a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate. On behalf of the British Board of Agrément

Construction Products

John Albon - Head of Approvals

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Page 1 of 5





Requirements

The Highways Technical Advisory Committee (HiTAC) and HAPAS Specialist Group 12 (Paints and similar protective coatings for corrosion protection of structural steelwork) have agreed with the BBA the aspects of performance to be used by the BBA in assessing the compliance of paints and similar protective coatings as set out in the Guideline Document. Additional requirements of the overseeing organisation are set out in the following documents:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 [Paints] Series 1900 and 5000
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

1.1 Macropoxy M922 is a high-solids, two-pack epoxy-amine glass flake coating, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highway Applications, in accordance with the Manual of Contract Documents for Highways Works Volumes 1 and 2, where Item No 123 is specified.

1.2 The product is available in a range of colours, details of which are available from the Certificate holder.

1.3 The characteristics of the product are⁽¹⁾:

Specific gravity	base	1.78(2)
	curing agent	1.01
	mixed	1.6(2)
Volume solids (%)	mixed	83
Flashpoint (°C)	base	13
	curing agent	>50
	mixed	20
VOC (g·l-1)	mixed	215.
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Tested in accordance with the methods given in the Guideline Document.

(2) Varies slightly by colour.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- · evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 20 litre packs and 4 litre packs, in the correct proportions. The gross weights of the mixed containers are 33 kg or 36 kg and 6.6 kg or 7.2 kg, respectively.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of two years.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Macropoxy M922.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications⁽¹⁾, Macropoxy M922 is satisfactory for use as an intermediate coat, over a primer coat meeting the requirements of Item 110 and then overcoated with a topcoat meeting the requirements of Item No. 168.

(1) Product Sheet 99 of this Certificate.

5 Practicability of installation

The coating is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been tested in accordance with the requirements of the Guideline Document and meets all the requirements of that document, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Volume 1 [Paints] Series 5000.

8 Durability

A complete paint system including Macropoxy M922 and based on products described in this Certificate can be expected to perform satisfactorily for a period in excess of 1.5 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 (Paints) Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base (Part A) is mixed with a power agitator, the entire contents of the curing agent (Part B) are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

	Temperature (°C)		
	5	15	23
Surface dry (hours)	12	8	6
Hard dry (hours)	30	20	16
Minimum overcoating time (hours)	24	16	8
Maximum overcoating time (days)(1)	14	7	5
Pot life (minutes)	180	90	60

(1) Maximum self overcoating interval can be increased by 7 days.

9.3 The product is applied over a previous primer coat, using the Certificate holder's products, as defined in section 4.

9.4 The product is applied by airless spray (tip range 0.38 mm to 0.53 mm, output fluid pressure 207 bar) to achieve a typical dry film thickness (dft) of 400 µm [equivalent to a wet film thickness (wft) of 480 µm]. The Certificate holder can advise on suitable spray equipment.

9.5 Small areas can be coated by brush or roller, if required. Stripe coating can be carried out by brush application.

9.6 The product is overcoated with the Certificate holder's products bearing the appropriate HAPAS approval, as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications, observing the minimum overcoating period given in Table 1.

10 Investigations

10.1 Highways England has approved ongoing registration to BD 35/14 of the product when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

10.2 Tests were conducted in accordance with the requirements of SG12 Guideline for the Assessment and certification of paints and similar protective coatings and the results assessed to determine:

- density
- viscosity
- metals content
- colour designation
- drying time surface
- minimum overcoating time
- adhesion
- SO₂ resistance
- colour comparison drying time hard
- film thickness

VOC content

sag resistance

flashpoint

- artificial weathering
- resistance to humidity.
- impact resistance
 - resistance to sea salt

application and appearance

volume solids

pot life

opacity

gloss

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings - Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance – Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA

HAPAS Certificate 08/H134 Product Sheet 10

APPROVAL INSPECTION

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

MORDANT WASH L703

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Mordant Wash L703, a phosphoric acid-based mordant wash for galvanized steel surfaces, for use as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volumes 1 and 2 where Item No 155 is specified.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance — a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability — a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second	issue:	19 July	2016
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Originally certificated on 14 October 2013

Construction Products

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

John Albon - Head of Approvals

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Claire Curtis-Thomas

Chief Executive

Requirements

In the opinion of the BBA, Mordant Wash L703, having been registered by Highways England in accordance with the procedures of BA 27/99 and found to comply with the requirements BD 35/06 and approved for ongoing registration, when used in accordance with the provisions of this Certificate will meet or contribute to meeting the requirements of:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.2) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

1.1 Mordant Wash L703 is a phosphoric acid-based mordant wash for galvanized steel surfaces, for use as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with MCHW, Volumes 1 and 2, where Item No 155 is specified.

1.2 The characteristics of this product are:

Specific gravity	0.99
Flashpoint (°C)	24
VOC (g-1-1) (to PG 6/23)	307.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the guality control operated over batches of incoming materials
- · monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI [Certificate FM828].

3 Delivery and site handling

3.1 The product is supplied in 5 litre plastic bottles.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in conditions recommended by the Certificate holder, the product has a minimum shelf-life of 2 years.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Mordant Wash L703.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications⁽¹⁾, Mordant Wash LZO3 is satisfactory for use as a mordant treatment for new or weathered, galvanized steelwork as an adhesion promoter for subsequent overcoating. (1) Product Sheet 99 of this Certificate.

5 Practicability of installation

The product is designed to be applied by operatives familiar with this type of material.

6 Corrosion resistance

The product has been registered in accordance with the requirements of BA 27/99 and BD 35/06, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Volume 1 [Paints] Series 5000.

8 Durability

A complete paint system including Mordant Wash L703 and based on products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCWH, Volume 1 (Paints) Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The container is agitated thoroughly before use.

9.3 The product is applied by a brush to new surfaces within seven days of galvanizing, or to clean, dry, weathered galvanized surfaces.

9.4 In a satisfactory treatment, the surface will turn black. If this does not occur, it is likely that the surface is greasy or contaminated, or may have a coherent film of corrosion products. In such cases, the surface must be cleaned and the product reapplied.

Duration	Temperature (°C)		
	15	23	35
Min (hours)	3	2	11/2
Max (days)	2	2	2

Technical Investigations

10 Investigations

10.1 Highways England has approved ongoing registration to BD 35/14 of the product when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

10.2 An assessment was made of the product compliance and registration in accordance with the requirements of BD 27/99 and BD 35/06.

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance — Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Process Guidance Note 6/23[04] Secretary of State's Guidance for Coating of Metal and Plastic Processes

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
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- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA



HAPAS Certificate 08/H134 **Product Sheet 15**

PAINTS FOR CORROSION PROTECTION OF STRUCTURAL STEELWORK IN HIGHWAY APPLICATIONS

ACROLON C750V2 - TO HE ITEM NO 167

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Acrolon⁽²⁾ C750V2, for use as part of a specification for the corrosion protection of structural steelwork in Highway Applications, in accordance with the Manual of Contract Documents for Highway Works, Volumes 1 and 2, where Item No 167 is specified.

(2) Acrolon is a trade mark with registration pending.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance - a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability - a complete paint system based on the product described in this Certificate can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate. On behalf of the British Board of Agrément

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John Albon - Head of Approvals

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Claire Curtis-Thomas

Chief Executive

Date of Second issue: 19 July 2016

Originally certificated on 19 February 2014

The BBA is a UKAS accredited certification body - Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Construction Products

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Requirements

The Highways Technical Advisory Committee (HiTAC) and HAPAS Specialist Group 12 (Paints and similar protective coatings for corrosion protection of structural steelwork) have agreed with the BBA the aspects of performance to be used by the BBA in assessing the compliance of paints and similar protective coatings as set out in the Guideline Document. Additional requirements of the overseeing organisations are set out in the following documents:

- Manual of Contract Documents for Highway Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000
- Manual of Contract Documents for Highway Works (MCHW)⁽¹⁾, Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges, BD 35/14
- Design Manual for Roads and Bridges, BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.2) and 3 Delivery and site handling (3.2 and 3.3) of this Certificate.

Technical Specification

1 Description

1.1 Acrolon C750V2 is a two-pack, gloss, epoxy acrylic topcoat, for use as part of a specification for the corrosion protection of structural steelwork in Highway Applications, in accordance with the Manual of Contract Documents for Highways Works Volumes 1 and 2, where Item No. 167 is specified. The product is available in white.

1.2 The characteristics of the product are:

Specific gravity	base	1.54
	curing agent	0.98
	mixed	1.43
Volume solids (%)	mixed	54.6
Flashpoint (°C)	base curing agent mixed	34 33 32
VOC (g·l-1)	mixed	425.8.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- · evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 5 litre and 20 litre packs in the correct proportions. The gross weights of the mixed containers are 7.15 kg and 28.6 kg, respectively.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of 2 years.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Acrolon C750V2.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in Supplement to Paints for Corrosion Protection of Structural Steelwork in Highways Applications⁽¹⁾, Acrolon C750V2 is satisfactory for use as a topcoat of a corrosion protection system for structural steel where Item No 167 is specified.

(1) Product Sheet 99 of this Certificate.

5 Practicability of installation

The product is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been tested in accordance with the requirements of the Guideline Document and meets all the requirements of that document, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Any damage must be repaired in accordance with MCHW, Volume 1 (Paints), Series 5000.

8 Durability

A complete paint system including Acrolon C750V2 and based on the products described in this Certificate can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 [Paints] Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base (Part A) is mixed with a power agitator, the entire contents of the curing agent (Part B) are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

	Temperature (°C)		
	15	23	35
Surface dry (hours)	2	1	1/2
Hard dry (hours)	12	6	4
Minimum overcoating time (hours)	6	3	2
Pot life (hours)	12	8	6

Note: For maximum overcoating time consult the Certificate holder.

9.3 The product is applied by airless spray [tip size 0.33mm (13 thou] operating pressure 176 kg/cm² [2500 PSI]] or air assisted spray, to achieve a typical dry film thickness (dft) of 50 µm to 75 µm [equivalent to a wet film thickness [wft] of 91 µm to 136 µm]. The Certificate holder can advise on suitable spray equipment.

9.4 Small areas can be coated by brush or roller, if required.

9.5 The product is overcoated with the Certificate holder's products holding the appropriate HAPAS approval, as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications, observing the minimum overcoating period given in Table 1.

Technical Investigations

10 Tests

Tests were conducted in accordance with the requirements of SG12 Guideline for the Assessment and certification of paints and similar protective coatings, and results assessed to determine:

liquid paints

- density
- flashpoint
- volume solids
- viscosity
- volatile organic compound
- pot life
- other composition requirements

applied coating

- opacity of topcoat
- colour designation
- visual comparison of primer, undercoat and topcoat colours against the declared standard
- gloss
- surface dry (ballotini)
- hard dry
- application and appearance
- minimum overcoating time
- film thickness
- flexibility

complete system

- artificial weathering of topcoat
- scratch resistance of single-pack topcoat and of two-pack topcoat
- impact resistance
- adhesion for systems of thicknesses <250 µm and >250 µm
- sulfur dioxide
- humidity.

11 Investigations

The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 1 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance — Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, August 1998 (as amended)

Manual of Contract Documents for Highway Works Volume 2 Notes for Guidance on the Specification for Highway Works, August 1998 (as amended)

Conditions of Certification

12 Conditions

- 12.1 This Certificate:
- · relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
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- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

12.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

12.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 12.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

12.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

12.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 5211771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA



HAPAS Certificate 08/H134 Product Sheet 11

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

ACROLON C137V2 - TO HE ITEM NO 168

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Acrolon⁽²⁾ C137V2, a twopack, polyurethane gloss finish, for use as an anticorrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volumes 1 and 2, where Item No 168 is specified.

(1) Acrolon is a trade mark with registration pending.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance - a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability - a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate. lan. On behalf of the British Board of Agrément Date of Second issue: 19 July 2016 John Albon — Head of Approvals Claire Curtis-Thomas Originally certificated on 14 October 2013 **Construction Products** Chief Executive The BBA is a UKAS accredited certification body - Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Page 1 of 5

Requirements

In the opinion of the BBA, Acrolon C137V2, having been registered by Highways England in accordance with the procedures of BA 27/99 and found to comply with the requirements BD 35/06 and approved for ongoing registration, when used in accordance with the provisions of this Certificate will meet or contribute to meeting the requirements of:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

1.1 Acrolon C137V2 is a two-pack, polyurethane gloss finish, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highway Applications, in accordance with the Manual of Contract Documents for Highways Works (MCHW) Volumes 1 and 2, where Item No 168 is specified.

1.2 The product is available in a range of colours, details of which are available from the Certificate holder.

1.3 The characteristics of this product are:

Specific gravity (varies with shade)	base additive mixed	1.43 1.08 1.39
Volume solids (%)	mixed	54
Flashpoint (°C)	base additive	30 58
VOC (g-l-1) (to PG 6/23)	mixed	412.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 ; 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 5 litre and 20 litre packs in the correct proportions. The gross weight of the mixed 20 litre container is 33 kg.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of 12 months.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Acrolon C137V2.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications⁽¹⁾, Acrolon C137V2 is satisfactory for use as a finish coat of a corrosion protection system for structural steelwork. (1) Product Sheet 99 of this Certificate.

5 Practicability of installation

The finish is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been registered in accordance with the requirements of BA 27/99 and BD 35/06, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Vol 1 (Paints) Series 5000.

8 Durability

A complete paint system including Acrolon C137V2 and based on the products described in this Certificate can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 (Paints) Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used with the pot life given in Table 1.

	Tempero	ature (°C)
	15	23
Surface dry (hours)	1	3/4
Hard dry (hours)	24	16
Minimum overcoating time (hours)	8	6
Pot life (hours)	31/2	21/2

9.3 The product is applied by airless spray (tip size 0.33 mm, output fluid pressure 150 bar) or brush, to achieve a dry film thickness (dft) of 50 µm to 70 µm in a spray application or of 40 µm to 50 µm by brush [equivalent to a wet film thickness (wft) range of 93 µm to 130 µm and 74 µm to 93 µm respectively].

9.4 The product is overcoated with the Certificate holder's products bearing the appropriate HAPAS approval, as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications, observing the minimum overcoating period given in Table 1.

Page 3 of 5

10 Investigations

10.1 Highways England has approved ongoing registration to BD 35/14 of the product when included as part of the specification for a paint system as listed in Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications

10.2 Acrolon C137V2 complies with, and was originally registered and tested in accordance with, the requirements of BD 27/99 and BD 35/06. The results were assessed to determine: • flashpoint

- density
- viscosity
- composition
- colour designation
- drying time surface
- minimum overcoating time
- artificial weathering
- adhesion
- resistance to humidity.
- colour comparison drying time hard

volatile organic content

film thickness

resistance to sag

- scratch resistance
- resistance to salt spray
- solids

- flexibility
- SO₂ resistance

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings - Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance – Part 2 Maintenance Painting of Steelwork

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Process Guidance Note 6/23(04) Secretary of State's Guidance for Coating of Metal and Plastic Processes

- pot life
- opacity
- gloss
- application and appearance
- impact resistance

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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Page 5 of 5

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HAPAS

Sherwin-Williams Protective & Marine Coatings

Tower Works Kestor Street Bolton Lancashire BL2 2AL Tel: 01204 521771 Fax: 01204 882115 e-mail: enquiries@sherwin.co.uk website: www.sherwin-williams.com/protectiveEMEA

ESTING ERTIFICATION HAPAS Certificate 08/H134

Claire Curtis-Thomas

Chief Executive

APPROVAL INSPECTION

Product Sheet 12

SHERWIN-WILLIAMS PROTECTIVE & MARINE COATINGS FOR HIGHWAYS APPLICATIONS

TRANSGARD TG169 - TO HE ITEM NO 169

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years. (1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Transgard TG169, a twopack, polyurethane semi-gloss finish, for use as an anti-corrosion coating as part of a specification for the corrosion protection of structural steelwork in Highways Applications, in accordance with the Manual of Contract Documents for Highways Works, Volume 1 and 2, where Item No 169 is specified.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Corrosion resistance - a complete paint system incorporating the product will provide satisfactory resistance to corrosion of the substrate steel (see section 6).

Durability - a complete paint system based on the products described in this Certificate can be expected to perform satisfactorily for a period in excess of 15 years before its first major maintenance (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate. dan

On behalf of the British Board of Agrément

Date of Second issue: 19 July 2016

Originally certificated on 14 October 2013

The BBA is a UKAS accredited certification body - Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Construction Products

John Albon - Head of Approvals

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Requirements

In the opinion of the BBA, Transgard TG169, having been registered by Highways England in accordance with the procedures of BA 27/99 and found to comply with the requirements BD 35/06 and approved for ongoing registration, when used in accordance with the provisions of this Certificate will meet or contribute to meeting the requirements of:

- Manual of Contract Documents for Highways Works (MCHW)⁽¹⁾, Volume 1 (Paints) Series 1900 and 5000
- Manual of Contract Documents for Highways Works (MCHW), Volume 2 Series NG 1900 and NG 5000
- Design Manual for Roads and Bridges BD 35/14
- Design Manual for Roads and Bridges BD 87/05.
- The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 Description (1.3) and 3 Delivery and site handling (3.1 and 3.2) of this Certificate.

Technical Specification

1 Description

1.1 Transgard TG169 is a two-pack, polyurethane semi-gloss finish, for use as part of a specification for the protection of steelwork in accordance with the Manual of Contract Documents for Highway Works (MCHW), Volumes 1 and 2, where Item No 169 is specified.

1.2 The product is available in a range of colours, details of which are available from the Certificate holder.

1.3 The characteristics of this product are:

Specific gravity	base additive mixed	1.54 1.09 1.50
Volume solids (%)	mixed	54
Flashpoint (°C)	base additive	28 32
VOC content (g·l-1) (to PG 6/23)	mixed	412.

2 Manufacture

2.1 The product is manufactured by a batch-blending process.

- 2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:
- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Sherwin-Williams Protective & Marine Coatings has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM828).

3 Delivery and site handling

3.1 The product is supplied in 5 litre and 20 litre packs in the correct proportions. The gross weight of the mixed 20 litre containers is 32 kg.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the product under the CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures. Users must refer to the relevant Safety Data Sheet(s).

3.3 Containers of both parts carry the appropriate hazard labelling, product reference and batch code.

3.4 When stored in the original containers in a paint store in the conditions recommended by the Certificate holder, the product has a minimum shelf-life of 12 months.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Transgard TG169.

Design Considerations

4 Use

Where included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications⁽¹⁾, Transgard TG169 is satisfactory for use as a semi-gloss finish. (1) Product Sheet 99 of this Certificate.

5 Practicability of installation The finish is designed to be applied by operatives familiar with this type of product.

6 Corrosion resistance

The product has been registered in accordance with the requirements of BA 27/99 and BD 35/06, and can contribute to corrosion resistance when included as part of the specification for a paint system as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.

7 Maintenance

Regular planned maintenance may be required as per section 8. Accidental damage can be repaired in accordance with MCHW Vol 1 [Paints] Series 5000.

8 Durability

A complete paint system including Transgard TG169 and based on the products described in this Certificate can be expected to perform satisfactorily for a period greater than 15 years before its first major maintenance.

Installation

9 Application

9.1 Substrates must be cleaned and prepared in accordance with the MCHW, Volume 1 (Paints) Series 1900 and 5000, and the Certificate holder's instructions.

9.2 The base is mixed with a power agitator, the entire contents of the additive are added, and the product is mixed thoroughly. The product is used within the pot life given in Table 1.

Table 1 Application properties		
	Temperature (°C)	
	15	23
Surface dry (hours)	21/2	11/2
Hard dry (hours)	24	16
Minimum overcoating time (hours)	8	6
Pot life (hours)	51/2	3

9.3 The product is applied by airless spray (tip size 0.38 mm, operating pressure 140 kg/cm² (2000 psi) or brush, to achieve a dry film thickness (dft) of 50 µm to 125 µm in a spray application, or 40 µm to 60 µm by brush [equivalent to a wet film thickness (wft) from 140 µm to 234 µm and from 75 µm to 112 µm respectively].

9.4 The product is overcoated with the Certificate holder's products bearing the appropriate HAPAS approval as listed in the Supplement to Sherwin-Williams Protective & Marine Coatings for Highway Applications, observing the minimum overcoating period given in Table 1.

Technical Investigations

10 Investigations

10.1 Highways England has approved ongoing registration to BD 35/14 of the product when included as part of the specification for a paint system as listed in *Supplement to Sherwin-Williams Protective & Marine Coatings for Highways Applications.*

10.2 An assessment was made of Transgard TG169's compliance and registration in accordance with the requirements of BD 27/99 and BD 35/06.

10.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 9001 : 2008 Quality management systems - Requirements

BA 27/99 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings — Part 2 Quality Assurance Scheme for Paints and Similar Protective Coatings

BD 35/14 Design Manual for Roads and Bridges (DMRB), Volume 2 Highway Structures : Design (Substructures and Special Structures), Materials, Section 4 Paints and Other Protective Coatings Part 1 Quality assurance Scheme for Paints and Similar Protective Coatings

BD 87/05 Design Manual for Roads and Bridges (DMRB), Volume 3 Highway Structures : Inspection and Maintenance, Section 2 Maintenance — Part 2 Maintenance Painting of Steelwork.

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork

Process Guidance Note 6/23(04) Secretary of State's Guidance for Coating of Metal and Plastic Processes

Conditions of Certification

11 Conditions

- 11.1 This Certificate:
- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

11.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
 are reviewed by the BBA as and when it considers appropriate.
- 11.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

11.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

11.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/ system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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	Page 5 of 5	