

## Hempacore / Hempafire Cellulosic PFP Approved Primer/Topcoat Core List – 23 June 2022

All primers mentioned are approved for Hempel's intumescent product range for both BS476 and EN13381-8 standards and include both standard and fast cure versions. For projects requiring CE Mark / EAD DFT's please refer to relevant product Declaration of Performance (DOP) for additional details. For multi primer systems or for conditions not shown in this document please refer to your local Hempel representative.

All primers must be approved prior to use – if the primer is not shown or is a third party primer please contact your local Hempel representative. For recommended application properties, overcoating times and instructions please refer to the relevant product technical data sheet and application instruction documents. As a rule, primers should not exceed 200µm DFT. Overcoating times are product indicative only, for further information on minimum and maximum overcoating times please contact your local Hempel representative. All stated recommended DFT's are classed as nominal.

### Durability classification: Equivalency of ISO and EAD

The two testing systems (ISO 12944 and EAD350402-00-1106) are not direct equivalents. ISO12944 relates to corrosion environments and EAD350402-00-1106 relates to specified durability environments for Intumescent Coating Systems. When used together they give a good indication of the combined anti-corrosion and fire protection performance of a coating system in different construction and end-use environments which should be confirmed by Hempel Technical. The EAD durability categories are for reference only. ISO12944 classification refers to durability high.

### Core List of Approved Primers for Carbon Steel

Primer Product	Region	Min DFT	Max DFT	Rec. DFT (PDS)	Min o/c at Rec DFT 20°C	Max o/c at Rec DFT 20°C
<b>1K Alkyd Primers – Solvent Borne</b>						
Hempel's Speed Dry Primer (13770)	Europe	30 50	75 75	50 50	1 Hr	1 Month
Hempel's Speed-Dry Alkyd 43140 (43140)	Europe	60	80	60	1 Hr	1 Month WB / 12 Months SB
Hempel's Speed-Dry Alkyd 43141 (43141)	Europe	60	80	80	See footnote <sup>2</sup>	
Hempel's Speed Dry-Alkyd 43142 (43142)	Europe	60	80	80	1 Hr	1 Month
<b>1K Acrylic Primers – Waterborne</b>						
Hemucryl Primer HI Build (18032)	Group	50	100	75	2 Hrs	6 Months
Hemucryl 48191 (48191)	Europe	75	100	80	6 Hrs	1 Month

ISO 12944 (Maximum Classification)		
Hempacore One Hempafire Pro 315 Hempafire Pro 400	Hempacore AQ	Hempafire Optima 500
C2	-	C2
C3	-	C3 <sup>1</sup>
C3	C2	C3 <sup>1</sup>
C3	-	-
C3	-	-
-	C2	-
-	C2	-

EAD (Maximum Classification)	
Hempacore One Hempafire Pro 315 Hempafire Pro 400	Hempacore AQ
Z1	-
Y	-
Y	Y <sup>3</sup>
Y	-
Y	-
-	Y <sup>3</sup>
-	Y <sup>3</sup>

<sup>1</sup> Hempafire Optima 500 is only supported up to C3-indoor

<sup>2</sup> Hempel's Speed Dry Alkyd 43141 can be overcoated wet in wet within 1 – 4 hours at 20°C. If this overcoat time is exceeded then overcoat after full drying, i.e. 4 days 20°C

<sup>3</sup> Only when used in maximum C2 environment according to ISO12944

Primer Product	Region	Min DFT	Max DFT	Rec. DFT (PDS)	Min o/c at Rec DFT 20°C	Max o/c at Rec DFT 20°C
1K Epoxy Ester Primers – Solvent Borne						
Hempel's Uniprimer (13140)	Group	40	80	50	6 Hrs	6 Months
		60	80	60		
2K Epoxy Primers – Solvent Borne						
Hempadur Speed Dry ZP600 (4541A)	Europe	75	200	100	2 Hrs	6 Months Optima Rest 12 Months
		100	200	100		
Hempel's Shop Primer E 15275 (15275)	Europe / Asia	15	25	20	2 Hrs	6 Months
Hempel's Shopprimer E 15280 (15280)	Group	15	25	20	2 Hrs	6 Months
Hempadur 15553 (15553)	Group	50	80	50	30 Mins	6 Months
		80	80	80		
Hempadur Speed Dry ZP500 (17500)	Europe	70	125	70	2 Hrs	12 Months
		100	125	100		
Hempaprime Multi 500 Summer version (45950)	Group	100	150	125	3 Hrs	6 Months
Hempaprime Multi 500 Winter version (45953)	Group	100	150	125	3 Hrs	6 Months
Hempadur 15570 (15570)	Group	50	125	100	2 Hrs	6 Months
		100	125	100		
Hempadur Fast Dry 17410 (17410)	Group	70	125	100	2 Hrs	12 Months
		100	125	100		
Hempadur Mastic 47550 (47550)	ME / Asia	125	125	125	6 Hrs	1 Month
Hempadur Mastic 45880 (45880)	Group	100	125	125	6 Hrs	6 Months AQ Rest 1 Month
Hempadur Mastic 4588W (4588W)	Group	100	125	125	5 Hrs	1 Month

<sup>1</sup> Hempafire Optima 500 is only supported up to C3-indoor

<sup>2</sup> Only when used in maximum C2 environment according to ISO12944

<sup>3</sup> Please consult your local Hempel representative

ISO 12944 (Maximum Classification)		
Hempacore One Hempafire Pro 315 Hempafire Pro 400	Hempacore AQ	Hempafire Optima 500
C2	C2	C2
C3		C3 <sup>1</sup>
C3	C2	C3 <sup>1</sup>
C4		C3 <sup>1</sup>
C2	-	-
C2	-	-
C3	C2	C3 <sup>1</sup>
C4	-	
C3	Footnote 3	C3 <sup>1</sup>
C4	-	
C4	C2	C3 <sup>1</sup>
C4	C2	C3 <sup>1</sup>
C3	C2	C3 <sup>1</sup>
C4		C3 <sup>1</sup>
C3	C2	C3 <sup>1</sup>
C4		C3 <sup>1</sup>
C4	-	C3 <sup>1</sup>
C4	C2	C3 <sup>1</sup>
C4	-	C3 <sup>1</sup>

EAD (Maximum Classification)	
Hempacore One Hempafire Pro 315 Hempafire Pro 400	Hempacore AQ
Z1	Y <sup>2</sup>
Y	
Y	Y <sup>2</sup>
X	
Z1	-
Z1	-
Y	Y <sup>2</sup>
X	Y <sup>2</sup>
Y	Y <sup>2</sup>
X	Y <sup>2</sup>
X	Y <sup>2</sup>
X	Y <sup>2</sup>
Y	Y <sup>2</sup>
X	Y <sup>2</sup>
X	Y <sup>2</sup>
X	-

Primer Product	Region	Min DFT	Max DFT	Rec. DFT (PDS)	Min o/c at Rec DFT 20°C	Max o/c at Rec DFT 20°C
2K Epoxy Primers – Solvent Borne (Cont'd)						
Hempadur Mastic 45881 (45881)	Group	100	125	125	6 Hrs	1 Month
Hempaprime Alpha 230 (17430)	ME	80	100	90	2 Hrs	1 Month
		100	100	100		
Hempaprime Alpha 590 (45090)	SEA	100	150	130	4 Hrs	1 Month
2K Epoxy Primers - Waterborne						
Hemudur 18500 (18500)	Group	50	100	75	6 Hrs	6 Month
		75	100	75		
		100	100	100		
2K Epoxy Zinc Rich Primers – Solvent Borne						
Hempel's Epoxy Zinc Rich Primer 174CN (174CN)	Asia	50	80	50	30 Mins	1 Month
2K Activated Zinc Primers – Solvent Borne						
Hempadur Avantguard 550 (1734G)	Group	40	80	60	1 Hr	1 Month WB 12 Months SB
Hempadur Avantguard 750 (1736G)	Group	50	80	60	1 Hr	12 Months
Hempaprime Ultimate 540 (17GCN)	China	40	100	60	1 Hr	1 Month
		60	100	80		

ISO 12944 (Maximum Classification)		
Hempacore One Hempafire Pro 315 Hempafire Pro 400	Hempacore AQ	Hempafire Optima 500
C4	C2	C3 <sup>1</sup>
C3	C2	C3 <sup>1</sup>
C4		
C4	-	C3 <sup>1</sup>
C2	C2	C2
C3		C3 <sup>1</sup>
C4		
C4	-	-
C4	-	C3 <sup>1</sup>
C4	-	-
C3	-	-
C4		

EAD (Maximum Classification)	
Hempacore One Hempafire Pro 315 Hempafire Pro 400	Hempacore AQ
X	Y <sup>2</sup>
-	-
-	-
Z1	Z1
Y	Y <sup>2</sup>
X	
-	-
X	-
X	-
-	-

<sup>1</sup> Hempafire Optima 500 is only supported up to C3-indoor

<sup>2</sup> Only when used in maximum C2 environment according to ISO12944

## Hempacore / Hempafire Cellulosic PFP Approved Primer/Topcoat Core List – 23 June 2022

### Primers for Substrates Other Than Carbon Steel

The following primers below are approved for use under the Hempacore / Hempafire product range for galvanized and other treated substrates.

All primers mentioned are approved for Hempel's intumescent product range for both BS476 and EN13381-8 standards. For projects requiring CE Mark / EAD DFT's please refer to relevant product Declaration of Performance (DOP) for additional details. For multi primer systems please refer to your local Hempel representative.

All primers must be approved prior to use – if the primer is not shown or is a third party primer or if the substrate is not listed below please contact your local Hempel representative  
For recommended application properties, overcoating times and instructions please refer to the relevant product technical data sheet and application instruction documents. As a rule primers should not exceed 200µm DFT.

Primer Product / Substrate	Region	Min DFT	Max DFT	Rec. DFT (PDS)	Min o/c at Rec DFT 20°C	Max o/c at Rec DFT 20°C
<b>Galvanized Substrates</b>	<b>2K Epoxy Primers – Solvent Borne</b>					
Hempadur 15553 (15553)	Group	50	80	50	30 Mins	6 Months
Hempadur 15570 (15570)	Group	50	100	100	2 Hrs	6 Months
Hemucryl Primer Hi-Build (18032)	Group	50	100	75	2 Hrs	6 Months
<b>St3 (Small Areas Only)</b>	<b>2K Epoxy Primers – Solvent Borne</b>					
Hempadur Mastic 45880 (45880)	Group	125	200	125	6 Hrs	6 Months AQ Rest 1 Month
Hempadur Mastic 45881 (45881)	Group	125	200	125	6 Hrs	1 Month WB 6 Months SB
<b>Stainless Steel</b>	<b>2K Epoxy Primers – Solvent Borne</b>					
Hempadur 15553 (15553)	Group	50	80	50	30 Mins	6 Months
Hempadur 15570 (15570)	Group	50	125	100	2 Hrs	6 Months
<b>Thermal Sprayed Aluminium</b>	<b>2K Epoxy Primers – Solvent Borne</b>					
Hempadur 15553 (15553)	Group	50	80	50	30 Mins	6 Months
Hempadur 15570 (15570)	Group	50	125	100	2 Hrs	6 Months
<b>Thermal Sprayed Zinc</b>	<b>2K Epoxy Primers – Solvent Borne</b>					
Hempadur 15553 (15553)	Group	50	80	50	30 Mins	6 Months
Hempadur 15570 (15570)	Group	50	125	100	2 Hrs	6 Months

<sup>1</sup> Hempafire Optima 500 is only supported up to C3-indoor

<sup>2</sup> Only when used in maximum C2 environment according to ISO12944

ISO 12944 (Maximum Classification)			
Hempacore One Hempafire Pro 400	Hempafire Pro 315	Hempacore AQ	Hempafire Optima 500
C4	C4	C2	C3 <sup>1</sup>
C4	-	C2	-
-	-	C2	C3 <sup>1</sup>
C4	C4	C2	C3 <sup>1</sup>
C4	C4	C2	C3 <sup>1</sup>
C4	-	-	-
C4	-	C2	-
C4	-	-	-
C4	-	C2	C3 <sup>1</sup>
C4	-	-	-
C4	-	C2	C3 <sup>1</sup>

EAD (Maximum Classification)		
Hempacore One Hempafire Pro 400	Hempafire Pro 315	Hempacore AQ
X	X	Y <sup>2</sup>
X	-	Y <sup>2</sup>
-	-	-
-	-	-
-	-	-
X	-	-
X	-	Y <sup>2</sup>
X	-	-
X	-	Y <sup>2</sup>
X	-	-
X	-	Y <sup>2</sup>

## **Hempacore / Hempafire Cellulosic PFP Approved Primer/Topcoat List 23 June 2022**

All topcoats mentioned below are approved primers for Hempel's intumescent product range for both BS476 and EN13381-8 standards and include both standard and fast cure versions. For projects requiring CE Mark / ETAG018-2 DFT's please refer to relevant product Declaration of Performance (DOP) for further topcoat information. For conditions not shown in this document, please contact your Hempel representative for further information.

In some instances, topcoats can be left uncoated (see below) however it is advised that a topcoat is applied regardless for optimal Cellulosic PFP performance. All topcoats must be approved prior to use – if the topcoat is not shown or is a third party topcoat please contact your local Hempel representative.

For recommended application properties, overcoating times and instructions please refer to the relevant product technical data sheet. For overcoating interval instructions and guidance please refer to the relevant Cellulosic PFP technical documentation. Further information on handling, transportation and repair can be found in the relevant product application instructions. All stated recommended DFT's are classed as nominal.

### **Without a topcoat**

Exposure without topcoat	Hempacore One		Hempafire Pro 315		Hempafire Pro 400		Hempacore AQ		Hempafire Optima 500	
	ISO 12944	EAD	ISO 12944	EAD	ISO 12944	EAD	ISO 12944	EAD	ISO 12944	EAD
Supported	C2	Y	C2	Y	C2	Y	C1	Z2	C1	Z2
Maximum 12 months	C3 <sup>4</sup>		C3 <sup>4</sup>		C3 <sup>4</sup>		-		-	

### **Temporary exposure of waterborne PFP systems**

	Hempacore AQ	Hempafire Optima 500
Max 2 weeks (without a topcoat)	-	Mild outdoor environments without high humidity, condensation or any direct contact with water
Max 3 months (when suitable topcoated with Polyurethane topcoat)	Mild outdoor environments without high humidity, condensation or any direct contact with water	Mild outdoor environments without high humidity, condensation or any direct contact with water

Hempel's solvent based intumescent coatings maybe left with no topcoat in C3 environments during construction phase of a building for a maximum of 12 months in mild environments however high humidity, ponding and running water must be avoided.

Waterborne products must in all situations be protected from condensation, rain, high humidity, ponding and running water. Waterborne coatings are moisture sensitive, during construction phase Hempafire Optima 500 can be exposed without topcoat to outdoor conditions for a maximum of 2 weeks with the conditions mentioned above. Once a suitable topcoat has been applied Hempafire Optima 500 can be exposed to outdoor conditions with the conditions mentioned above for a maximum period of 3 months. Hempafire Optima 500 with approved and appropriate topcoat can be exposed up to C3 interior conditions.

<sup>4</sup> Max C3 without longer periods of rainfall, snow and very high humidity, for further details please consult the Application Instructions

### Durability classification: Equivalency of ISO and EAD

The two testing systems (ISO 12944 and EAD350402-00-1106) are not direct equivalents. ISO12944 relates to corrosion environments and EAD350402-00-1106 relates to specified durability environments for Intumescent Coating Systems. However, when used together they give a good indication of the combined anti-corrosion and fire protection performance of a given coating system in different construction and end-use environments which should be confirmed by Hempel Technical. ISO12944 classification refers to durability High.

Projects requiring CE marking, topcoat must be chosen from the approved topcoat listed under EAD.

### Approved Topcoat List

Topcoat Product	Region	Min DFT	Max DFT	Rec. DFT (PDS)
Acrylic – Solvent Borne				
Hempatex Enamel 56360 (56360)	Group	35	40	40
		2x40	2x40	2x40
Hempatex Hi-build 46410 (46410)	Group	75	125	75
		100	125	100
Acrylic – Waterborne				
Hemucryl Enamel (58100)	Group	30	50	40
		40	50	40
Hemucryl Enamel Hi-Build (58030)	Group	50	100	50
		50	100	75
		100	100	100
Topaz Matt Emulsion 588ME (588ME)	ME	30	60	40
Topaz Silk Emulsion 589ME (589ME)	ME	30	50	40
Hemucryl 48190 (48190)	Group	75	125	100
Wattyl Aqua Trim Satin (11736)	AU/SEA	60	60	60
Wattyl Aqua Trim Gloss (11737)	AU/SEA	60	60	60
2K Acrylic Isocyanate Free				
Hempel's Pro-Acrylic (55883)	Group	50	100	50
		75	100	75
		100	100	100
Alkyd – Solvent Borne				
Hempalin Enamel 52140 (52140)	Europe	30	40	30
		40	40	40
Hempel's Pintura Metálica DTM (52410)	Group	40	75	40
Hempaquick Enamel (53840)	Group	25	25	25
		2x25	2x25	2x25
Alkyd – Solvent Borne (Cont'd)				
Hempel's Speed-Dry Alkyd 43140 (43140)	Europe	60	120	60
		80	120	80

ISO 12944 (Maximum Classification)		
Hempacore One Hempafire Pro 315 Hempafire Pro 400	Hempacore AQ	Hempafire Optima 500
C2	C1	C1
C3	C2	C2
C2	C2	C2
C3		
C2	C1	-
C2	C2	C2
C2	C2	C3 <sup>1</sup>
C3	C2	C3 <sup>1</sup>
-	-	C2
-	-	C2
-	-	C2
C2	C2	C2
C2	C2	C2
C3	-	C2
C3		C2
C4		C3 <sup>1</sup>
-	C1	-
-	C2	-
-	C2	-
-	C1	-
-	C2	-
C2	-	-
C3		

EAD (Maximum Classification)		
Hempacore One Hempafire Pro 400	Hempafire Pro 315	Hempacore AQ
Y	Y	Z1
X		Z1
Y	Y	Z1
X		Z1
Y	Y	Z2
Y		Z1
Y		Z1
X		Z1
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
Y	-	-
X		-
-	-	Z2
-	-	Y <sup>1</sup>
-	-	Y <sup>1</sup>
-	-	Z1 <sup>1</sup>
-	-	Y <sup>1</sup>
Y	Y	-

Topcoat Product	Region	Min DFT	Max DFT	Rec. DFT (PDS)
Hempel's Speed-Dry Alkyd 43141 (43141)	Europe	60	120	60
		80	120	80
Epoxy – Solvent Borne				
Hempadur Fast Dry 45410 (45410)*	Europe	80	125	80
		100	125	100
2k Polyurethane – Solvent Borne				
Hempathane DTM (55620)	Europe	50	125	100
Hempathane Topcoat 55210 (55210)	Group	50	75	50
		2x40	2x75	2x50
Hempel's Polyenamel 55102 (55102)	Group	30	40	35
		2x30	2x40	2x40
		2x40	2x40	2x40
Hempathane Speed Dry Topcoat 250 (55250)	Europe	50	120	60
		100	120	100
Hempathane HS 55610 (55610)	Group	50	125	80
		100	125	100
Hempathane 55613 (55613)	Group	50	125	100
		100	125	100
Hempathane Fast Dry (55750)	Group	60	100	100
		100	100	100
Hempathane HS (55810)	Europe	50	50	50
		2x40	2x50	2x50
Hempathane TL87/EG 87480	Europe	50	80	80
		2x50	2x50	2x50
Hempatop Finish 830 HS (555CN)	China	30	35	30
		35	35	35
2k Polyurethane – Solvent Borne (Cont'd)				
Hempel's Polyurethane Matt Enamel (556ME)	ME	50	75	50
		2x50	2x75	2x50

ISO 12944 (Maximum Classification)		
Hempacore One Hempafire Pro 315 Hempafire Pro 400	Hempacore AQ	Hempafire Optima 500
C2	-	-
C3		
C3*	-	-
C4*		
-	C2	-
C3	C2	C2
C4		C3 <sup>1</sup>
C2	C2	-
C3		-
C4		-
C3	-	C2
C4		C3 <sup>1</sup>
C3	C2	C2
C4		C3 <sup>1</sup>
C3	C2	-
C4		-
C3	C2	C2
C4		C3 <sup>1</sup>
C3	C2	C2
C4		C3 <sup>1</sup>
C3	-	-
C4		-
C2	-	-
C3		-
-	-	C2
-	-	C3 <sup>1</sup>

EAD (Maximum Classification)		
Hempacore One Hempafire Pro 400	Hempafire Pro 315	Hempacore AQ
Y	Y	-
Y*	Y*	-
X*	X*	
-	-	Y <sup>1</sup>
Y	Y	Y <sup>1</sup>
X	X	Y <sup>1</sup>
Y	Y	
X	X	-
Y	Y	Y <sup>1</sup>
X	X	
-	Y	-
Y	Y	Y <sup>1</sup>
X	X	
Y	-	Y <sup>1</sup>
X		-
Y	Y	-
X		-
-	-	-
-	-	-
-	-	-

<sup>1</sup> Only when used in maximum C2 environment according to ISO12944

\* Discolouration on certain shades maybe possible, however this can be avoided if multiple coats are used

Topcoat Product	Region	Min DFT	Max DFT	Rec. DFT (PDS)
Hempathane 55930 (55930)	Group	30	60	50
		2x50	2x50	2x50
Hempathane 55190 (55190)	China	55	80	60
		2x50	2x50	2x50
Hempel's PU Flat Topcoat 552C0 (552C0)	China	40	60	50
		2x40	2x60	2x50
Polyurethane - Waterborne				
Hemuthane Enamel (58510)	Group	40	60	50
		2x40	2x60	2x50
Hemuthane Enamel (58521)	Group	30	60	50
		40	60	50
		2x50	2x60	2x50

ISO 12944 (Maximum Classification)		
Hempacore One Hempafire Pro 315 Hempafire Pro 400	Hempacore AQ	Hempafire Optima 500
-	-	C2
-	-	C3
C3	-	-
C4	-	-
C3	-	-
C4	-	-
C3	C2	C1
C4	-	C3 <sup>1</sup>
-	-	C1
		C2
		C3 <sup>1</sup>

EAD (Maximum Classification)		
Hempacore One Hempafire Pro 400	Hempafire Pro 315	Hempacore AQ
-	-	-
-	-	-
-	-	-
Y	Y	-
X	X	-
-	-	-

<sup>1</sup> Only when used in maximum C2 environment according to ISO12944



## Appendix A

### Comparison of Durability Classification to EN ISO 12944 Part 2 and EU reactive fire protection coating approvals

#### Durability classification: Equivalency of ISO and EAD

The two testing systems (ISO 12944 and EAD350402-00-1106) are not direct equivalents. ISO12944 relates to corrosion environments and EAD350402-00-1106 relates to specified durability environments for Intumescent Coating Systems. However, when used together they give a good indication of the combined anti-corrosion and fire protection performance of a given coating system in different construction and end-use environments which should be confirmed by Hempel Technical.

The table below, from the British Coatings Federation, provides a rough equivalence between the two standards.

Classifying environments. The environmental categorisation systems for corrosive and fire protection coating systems <i>British Coatings Federation, Ref. G020 version 2 , September 2017</i>		
Exposure Description	Typical examples of locations similar to ISO 12944	
Type X	Exterior	Similar to C3 external and C4 environments
Type Y	Internal and semi-exposed	Similar to C2 external and C3 internal environments
Type Z1	Internal with high humidity	Similar to C2 internal
Type Z2	Internal	Similar to C1 environments

Please note: As stated above, this is a rough equivalence and therefore intumescent specifications should always be confirmed by Hempel Technical.

The ISO 12944 performance testing (part 6) aims to determine the anti-corrosion performance of a coating system by exposure to various test regimes, such as water immersion, water condensation, neutral salt spray and cyclic aging. This testing does not differentiate between interior and exterior. The basic pass/fail criteria are steel corrosion and film defects, such as blisters or cracks.

Crucially, the EAD350402-00-1106 performance testing also determines if the fire performance of an intumescent coating system is maintained after exposure to various test conditions, such as cycles of UV, humidity and temperature. In this case, the various conditions correspond to exterior, interior or semi-exposed environments. In certain cases, durability is referred to EN16623, which has equivalent exposure categories and testing as the EAD350402-00-1106.