

ANTICORROSIVE SYSTEMS FOR UNDERWATER AND BOOTTOP - TO BE OVERCOATED WITH ANTIFOULING 3101

a seven page issue

January 2010
revision of May 2007

Application areas: Boottop and underwater area of the outside hull of vessels

Contains the following specifications:

- Specification 1: multi-purpose epoxy coating system
- Specification 2: multi-purpose epoxy coating system
- Specification 3: high solids reinforced epoxy coating system
- Specification 4: high solids glassflake reinforced epoxy coating system
- Specification 5: high solids epoxy mastic coating system
- Specification 6: solvent free abrasion resistant epoxy coating system
- Specification 7: chlorinated rubber coating system
- Specification 8: coaltar epoxy coating system

SURFACE PRE-TREATMENT

The quality of the surface pretreatment affects the performance of underwater and boottop systems, particularly when cathodic protection is applied. Optimal results will be obtained on substrates blast cleaned to ISO-Sa2½ which means that the shop primer should be removed. This is particularly important when (underfilm) corrosion has already started. Also the right blasting profile will be obtained.

ACCEPTANCE OF SHOP PRIMER

The quality and generic type of shop primer, will determine the performance of the coating system. The types of shop primer acceptable are those which are equivalent to SigmaWeld 165 and SigmaWeld 199 - zinc silicate and approved by PPG Protective & Marine Coatings. In addition, any degradation or underfilm corrosion of the shop primer will limit the performance of the total system, unless correctly treated. These remarks are of particular importance when cathodic protection is installed.

The general condition of the weathered shop primer may vary widely throughout the structure and in many instances it is difficult to assess the severity of breakdown. Experience shows that in practice reblasting of corroded shop primed steel to ISO-Sa2½ is the most satisfactory method of correcting corrosion defects and eliminating the detrimental effect of surface contamination.

Approved shop primers in good condition should be cleaned to remove contamination and/or zinc salts. If necessary sweep blasting according to SPSS/Ss or mechanical cleaning according to SPSS-Pt3 should be carried out.

Special attention should be paid to heat damaged areas, including areas alongside weldseams and backburns.

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SPECIFICATION 1	multi-purpose epoxy system for UNDERWATER and BOOTTOP with good resistance to mechanical impact, abrasion and well designed cathodic protection	
pretreatment	steel; blast cleaned to ISO-Sa2½ steel with approved zinc silicate shop primer; sweep blasted to SPSS-Ss, weld seams, burned and rusty areas; blast cleaned to ISO-Sa2½ or power tool cleaned to SPSS-Pt3	
paint system	SigmaPrime 700	125 µm
	SigmaCover 525	125 µm
	antifouling as specified	
notes	<ul style="list-style-type: none"> – SigmaCover 525 can be replaced by SigmaCover 555 – at temperatures below 5°C, SigmaPrime 700 can be replaced by SigmaPrime 700 LT 	
maintenance	should preferably be carried out to this specification	

SPECIFICATION 2	multi-purpose epoxy system for UNDERWATER and BOOTTOP with good resistance to mechanical impact, abrasion and well designed cathodic protection	
pretreatment	steel; blast cleaned to ISO-Sa2½ steel with approved zinc silicate shop primer; sweep blasted to SPSS-Ss, weld seams, burned and rusty areas; blast cleaned to ISO-Sa2½ or power tool cleaned to SPSS-Pt3	
paint system	SigmaPrime 200	125 µm
	SigmaCover 525	125 µm
	antifouling as specified	
notes	<ul style="list-style-type: none"> – SigmaCover 525 can be replaced by SigmaCover 555 – at temperatures below 5°C, SigmaPrime 200 can be replaced by SigmaPrime 200 LT 	
maintenance	should preferably be carried out to this specification	

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SPECIFICATION 3	high solids reinforced epoxy system for UNDERWATER and BOOTTOP with excellent resistance to mechanical impact, abrasion and well designed cathodic protection	
pretreatment	steel: blast cleaned to ISO-Sa2½ steel with approved zinc silicate shop primer: sweep blasted to SPSS-Ss, weld seams, burned and rusty areas: blast cleaned to ISO-Sa2½ or power tool cleaned to SPSS-Pt3	
paint system	SigmaShield 220	125 µm
	SigmaShield 420	125 µm
	SigmaCover 525	75 µm
	antifouling as specified	
notes	<ul style="list-style-type: none"> – SigmaShield 220 can be replaced by SigmaPrime 200 or 700 – SigmaCover 525 can be replaced by SigmaCover 555 – at temperatures below 5°C, SigmaPrime 200 or 700, SigmaShield 220 and SigmaShield 420 can be replaced by the LT versions 	
maintenance	should preferably be carried out to this specification	

SPECIFICATION 4	high solids, glassflake reinforced epoxy system on top of in situ applied epoxy primer for UNDERWATER and BOOTTOP with good resistance to heavy impact (fender areas - ice going vessels) and well designed cathodic protection	
pretreatment	steel; blast cleaned to ISO-Sa2½, blasting profile (Rz) 50 - 100 µm	
paint system	SigmaShield 220	100 µm
	SigmaShield 460	400 µm
	SigmaCover 525	75 µm
	antifouling as specified	
notes	<ul style="list-style-type: none"> – if a holding primer is required, SigmaShield 220 can be replaced by SigmaCover 280 at a dft of 50 µm – SigmaCover 525 can be replaced by SigmaCover 555 – at temperatures below 5°C, SigmaShield 220 and SigmaShield 460 can be replaced by the LT versions 	
maintenance	should preferably be carried out to this specification	

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SPECIFICATION 5

high solids, epoxy mastic coating system for maintenance of UNDERWATER and BOOTTOP with good resistance to mechanical impact and well designed cathodic protection

pretreatment

steel; blast cleaned to ISO-Sa2½, blasting profile (R_Z) 40 - 70 µm
steel with approved zinc silicate shop primer; sweep blasted to SPSS-Ss, or power tool cleaned to SPSS-Pt3

paint system

SigmaCover 380	125 µm
SigmaCover 525	125 µm

notes

- SigmaCover 380 can be replaced by SigmaCover 630 aluminium
- at temperatures below 5°C, SigmaCover 380 can be replaced by the LT version

maintenance

should preferably be carried according to this specification

pretreatment

in case of hydrojetted to VIS WJ2 L or ISO Wa 2½ L SigmaCover 280 should be applied as first coat at a dft of 50 µm (for more info see information sheet 1498)

SPECIFICATION 6

solvent free, abrasion resistant epoxy system for UNDERWATER and BOOTTOP with excellent resistance to mechanical impact (e.g. for ice going and ice breaking vessels) and well designed cathodic protection

pretreatment

steel; blast cleaned to ISO-Sa2½, blasting profile (R_Z) 50 - 100 µm

paint system

SigmaShield 1200	400 µm
SigmaCover 525	75 µm
antifouling as specified	

notes

- SigmaCover 525 can be replaced by SigmaCover 555
- at temperatures below 5°C, SigmaShield 1200 can be replaced by SigmaShield 1200 LT

maintenance

should preferably be carried out to this specification

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SPECIFICATION 7

chlorinated rubber system for UNDERWATER and BOOTTOP with good resistance to well designed cathodic protection

pretreatment

steel; blast cleaned to ISO-Sa2½
steel with approved zinc silicate shop primer; sweep blasted to SPSS-Ss, weld seams, burned and rusty areas; blast cleaned to ISO-Sa2½ or power tool cleaned to SPSS-Pt3

paint system

Sigma Vikote 18 light	75 µm
Sigma Vikote 18 dark	75 µm
Sigma Vikote 18 light	75 µm
antifouling as specified	

note

for touch up areas 2 coats of Sigma Vikote 18 at a dft of 100 µm each can be specified

maintenance

should preferably be carried out to this specification

SPECIFICATION 8

coaltar epoxy system for UNDERWATER and BOOTTOP with good resistance to mechanical impact, abrasion and well designed cathodic protection

pretreatment

steel: blast cleaned to ISO-Sa2½
steel with approved zinc silicate shop primer:
sweep blasted to SPSS-Ss
weld seams, burned and rusty areas: blast cleaned to ISO-Sa2½ or power tool cleaned to SPSS-Pt3
if a holding primer is required, SigmaCover 280 can be used (dft of 50 µm)

paint system

SigmaCover 300 brown	125 µm
SigmaCover 510	125 µm
antifouling as specified	

note

at temperatures below 5°C, SigmaCover 300 can be replaced by SigmaCover 300 brown LT

maintenance

should preferably be carried out to this specification

pretreatment

in case of hydrojetted to VIS WJ2 L or ISO Wa 2½ L SigmaCover 280 should be applied as first coat at a dft of 50 µm (for more info see sheet 1498)

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MAINTENANCE

As in normal dry-docking practice, fouling, loose paint and other contaminants should be removed by high pressure water cleaning (HPWC). Any fouling and/or loose paint remaining after HPWC must be removed by scraping or sweep blasting. The removal of an oil or grease belt can be achieved by scraping heavy deposits from the surface followed by HPWC in combination with the use of suitable detergents. This should be followed by a thorough fresh water wash and drying prior to blasting and/or repainting. It might, however, be necessary to blast clean such areas after this operation when oil has penetrated the underlying paint systems. Rusty spots should be pretreated by blast cleaning and touched up with the original anticorrosive system within the requirements given in the relevant specifications.

CATHODIC PROTECTION

Sacrificial zinc anodes produce potential differences related to the Ag/AgCl reference electrode of approx. minus 1050 mV. As the resistance of bituminous aluminium coatings and chlorinated rubber coatings lie in the region of this figure it is therefore recommended to apply a protective shield around the anodes when a vessel with such a coating system is fitted with anodes. For this purpose it is recommended to blast the related area to ISO-Sa2½ followed by 1 coat of 75 µm of SigmaCover 280 and 2 coats of 300 µm each of SigmaShield 460 as a protective shield.

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REFERENCES

Sigma Vikote 18	see product data sheet 7318
SigmaCover 280	see product data sheet 7417
SigmaCover 300	see product data sheet 7472
SigmaCover 300 LT	see product data sheet 7483
SigmaCover 380	see product data sheet 7979
SigmaCover 380 LT	see product data sheet 7980
SigmaCover 510	see product data sheet 7479
SigmaCover 525	see product data sheet 7902
SigmaCover 555	see product data sheet 7905
SigmaCover 630 aluminium	see product data sheet 7431
SigmaPrime 200	see product data sheet 7416
SigmaPrime 200 LT	see product data sheet 7931
SigmaPrime 700	see product data sheet 7930
SigmaPrime 700 LT	see product data sheet 7946
SigmaShield 220	see product data sheet 7922
SigmaShield 220 LT	see product data sheet 7926
SigmaShield 420	see product data sheet 7951
SigmaShield 420 LT	see product data sheet 7955
SigmaShield 460	see product data sheet 7952
SigmaShield 460 LT	see product data sheet 7972
SigmaShield 1200	see product data sheet 7744
SigmaShield 1200 LT	see product data sheet 7746
SigmaWeld 165	see product data sheet 7171
SigmaWeld 199	see product data sheet 7177
Cleaning of steel and removal of rust	see information sheet 1490
Hydrojetting	see information sheet 1498
Prefabrication primers	see system sheet 3015

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