



Kansai Paint System Guide

The purpose of the "How to select the right paint system" study is to help you select the most adequate Kansai coating system to protect your structure against corrosion. All steel structures, facilities and installations exposed to atmosphere, staying under water or in soil, suffer because of corrosion and consequently require protection from the harms of corrosion during their lifetime. Throughout this study you will find important information regarding paint technology, criteria for right paint selection and surface preparation requirements.

Selecting the correct paint system for protection against corrosion requires a variety of factors to be taken into account to ensure that the most economical and best technical solution is achieved. For each project the most important factors to consider before selecting a protective coating are:

Environmental Corrosivity

When selecting a paint system it is vitally important to work out the conditions in which the structure, facility or installation is to operate. To establish the effect of environmental corrosivity, the following factors must be taken.

- Humidity and temperature (service temperature and temperature gradients)
- The presence of UV radiation
- Chemical exposure (e.g. specific exposure in industrial plants)
- Mechanical damage (impact, abrasion etc.)

The corrosive aggressiveness of the environment will have an effect on:

- The type of paint used for protection
- The total thickness of a paint system
- The surface preparation required
- minimum and maximum recoating intervals

Atmospheric Corrosivity categories according to ISO 12944 standard:

- C1 very low
- C2 low
- C3 medium
- C4 high
- C5-I very high (industrial)
- C5-M very high (marine)



The categories for water and soil according to the ISO 12944 standard are shown as:

Im1 Fresh water

Im2 Sea or brackish water

Im3 Soil

The durability required for a paint system:

LOW (L) 2 to 5 years

MEDIUM (M) 5 to 15 years

HIGH (H) more than 15 years

Surface preparation

Grades of a surface according to the ISO 8501-1 standard

Sa 3 Blast-cleaning to visually clean steel

When viewed without magnification, the surface shall be free from visible oil, grease and dirt, and shall be free from mill scale, rust, paint coatings and foreign matter¹. It shall have a uniform metallic color.

Sa 2 ½ Very thorough blast-cleaning

When viewed without magnification, the surface shall be free from visible oil, grease and dirt, and from mill scale, rust, paint coatings and foreign matter¹. Any remaining traces of contamination shall show only as slight stains in the form of spots or stripes.

Sa 2 Thorough blast-cleaning

When viewed without magnification, the surface shall be free from visible oil, grease and dirt, and from most of the mill scale, rust, paint coatings and foreign matter¹. Any residual contamination shall be firmly adhering.



Sa 1 Light blast-cleaning

When viewed without magnification, the surface shall be free from visible oil, grease and dirt, and from poorly adhering mill scale, rust, paint coatings and foreign matter.

Standard preparation grades for primary surface preparation by hand cleaning

St 3 Very thorough hand and power tool cleaning

as for St 2, but the surface shall be treated much more thoroughly to give a metallic sheen arising from the metallic substrate

St 2 Thorough hand and power tool cleaning

When viewed without magnification, the surfaces shall be free from visible oil, grease and dirt, and from poorly adhering mill scale, rust, paint coatings and foreign matter.

Description of the surface after cleaning:

Wa 1 Light high-pressure water jetting.

Wa 2 Thorough high-pressure water jetting.

Wa 2½ Very thorough high-pressure water jetting.

Description of the surface appearance relating to three grades of flash rust:

L Light flash rust

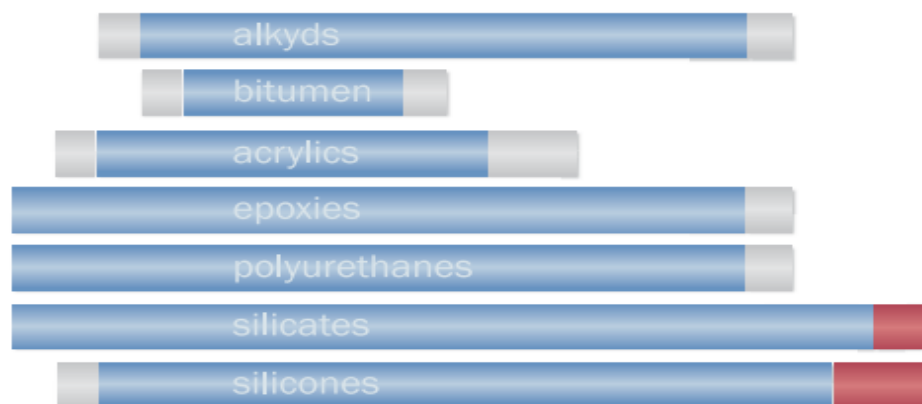
M Medium flash rust




H Heavy flash rust



MAXIMUM SERVICE TEMPERATURES

Temperature °C



-  Suitable for continuous dry service
-  Suitable for short temporary service only
-  Suitability will depend on pigmentation. Above 400 °C only aluminium pigment is suitable



USEFUL DEFINITIONS

Volume solids: The Volume Solids (VS) figure expresses in percentage the ratio:

$$V.S = 100 - \{ (\text{Paint Density} / \text{Solvent Density}) * (100 - \text{Solid } \%) \}$$

Theoretical spreading rate:

$$T.S.R = (V.S * 10) / D.F.T \quad \text{M}^2/\text{Lit}$$

COATING COVERAGE CALCULATIONS:

$$\text{Theoretical Spreading Rate (m}^2/\text{L)} = \{ (VS * 10) / (D.F.T) * 100 / (100 + \% \text{Thinner}) \}$$

$$\text{Practical Spreading Rate (m}^2/\text{L)} = T.S.R * (1 - \text{loss factor})$$

$$\text{Practical Consumption (Lit)} = \text{Total Area (m}^2) / \text{Practical Spreading Rate (m}^2/\text{Lit)} .$$

References

- 1-ISO 12944
- 2-Norsok M-501
- 3-Total_ SP-COR_181
- 4-Kansai Paint spec for offshore & onshore Paint System
- 5- SIS 055900 Standard
- 6- IPS e-tp-100
- 7- Paint systems in oil and gas industry Book



Binder Of Primer Coat	Type
AK= Alkyd	1-Pack
CR=Chlorinated rubber	1-Pack
AY = Acrylic	1-Pack
EP = Epoxy	2-Pack
ESI = Ethylsilicate	2-Pack

Terms and definitions

Zn (R) = Zinc-rich primer
 Zn(P)=Primers with anticorrosive pigments(Zinc Phosphate,Zinc Chromate,Iron oxide).
 D,F,T=Dry film thickness.
 NDFT = Nominal dry film thickness (dry film thickness specified for each coat or for the whole paint system)
 High-Build=property of a coating material which permits the application of a coat of greater thickness than usually considered as normal for that type of coating.
 High-Solids=property of a coating material which contains a volume of solids greater than normal for that coating material.
 Primer=first coat of a coating system.
 Top Coat=final coat of a coating system.
 Tie Coat=coat designed to improve intercoat adhesion and/or avoid certain defects during application.

Classification of environments	Six atmospheric corrosivity categories	C1	Very low
		C2	low
		C3	Medium
		C4	High
		C5-I	very high (Industrial)
		C5-M	very high (Marine)
	Three categories for water and soil	Im1	Immersion in fresh water
		Im2	Immersion in sea or brackish water
		Im3	buried in soil

Durability Ranges	low	2 years to 5 years
	Medium	5 years to 15 years
	High	More than 15 years



KANSAI PAINT CO (Offshore Paint Systems)

Above water (Marine atmosphere)

	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
Recommended Sys No. 1	primer	ZINCTECT500	1	60	60
	Mid	EPOTECT HB(M)	1	190	190
	Top	RETANTECT6000(M)	1	60	60
	Total				310

	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
Recommended Sys No. 2	primer	ZINCTECT1500QD-85	1	75	75
	Mid	EPOTECT HB(M)	1	175	175
	Top	RETANTECT6000(M)	1	60	60
	Total				310

	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
Recommended Sys No. 3	primer	ZINCTECT500	1	60	60
	Mid	EPOTECT HB(M)QD	1	190	190
	Top	RETANTECT6000(M)	1	60	60
	Total				310



Recommended Sys No. 4	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer	ZINTECT1500QD-85	1	75	75
	Mid	EPOTECT HB(M)QD	1	175	175
	Top	RETANTECT6000(M)	1	60	60
				Total	310

Recommended Sys No. 5	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer	ZINTECT500	1	75	75
	Mid	EPOTECT AL	1	175	175
	Top	RETANTECT6000(M)	1	60	60
				Total	310

Recommended Sys No. 6	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer	ZINTECT1500QD-85	1	75	75
	Mid	EPOTECT AL	1	175	175
	Top	RETANTECT6000(M)	1	60	60
				Total	310

Splash Zone					
Recommended Sys No. 1	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer	-	1	0	0
	Mid	TECTBARRIER SP(A) 500	1	500	500
	Top	TECTBARRIER SP(A) 500	1	500	500
				Total	1000

**we can recommend "Above Water Paint system" for Splash zone as well*



Recommended Sys No. 2	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer		0	0	0
	Mid	EPOTECT GF	1	300	300
	Top	EPOTECT GF	1	300	300
				Total	600

Tidal Zone					
Recommended Sys No. 1	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer		0	0	0
	Mid	TECTBARRIER SP(A)	1	500	500
	Top	TECTBARRIER SP(A)	1	500	500
				Total	1000

Recommended Sys No. 2	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer	-	0	0	0
	Mid	EPOTECT GF	1	300	300
	Top	EPOTECT GF	1	300	300
				Total	600

Under water Zone					
Recommended Sys No. 1	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer	-	0	0	0
	Mid	EPOTECT TF	1	225	225
	Top	EPOTECT TF	1	225	225
				Total	450



Recommended Sys No. 2	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer	ZINCTECT 1000SP	1	225	225
	Mid	-	0	0	0
	Top	EPOTECT TF	1	225	225
				Total	450

Recommended Sys No. 3	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer	-	1	0	0
	Mid	EPOTECT GF	1	300	300
	Top	EPOTECT GF	1	300	300
				Total	600

Recommended Sys No. 4	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer	-	1	0	0
	Mid	EPOTECT GF	1	300	300
	Top	EPOTECT GF	1	300	300
				Total	600

Recommended Sys No. 5	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
	primer	SURESEAL 1208 UWE	1	150	150
	Mid	SURESEAL 1208 UWE	1	150	150
	Top	SURESEAL 1208 UWE	1	150	150
				Total	450



PFP(Epoxy Based Fire Protection)					
	layer	Paint code/Name	No.ofcoats	DFT of each coat	Total DFT
Recommended Sys No. 1	primer	ZINCTECT500	1	50	50
	Mid	-	1	0	0
	Top	ALESCHAR U	1	6000	6000
				Total	6050