

ISO 12944:2018

Summary of major changes to applicators and specifiers



About this booklet

This booklet summarizes the major changes to the ISO 12944 standard (revisions made in 2017 and 2018) regarding applicators and specifiers. It is intended as a quick reference guide for professionals who already know and work with ISO 12944.

About ISO 12944

The ISO 12944 standard is one of the leading international standards for anti-corrosion protection of steel through painting. It is a guide that professionals adhere to during the specification and application of painting cycles and helps to ensure adequate protection from corrosion for steel structures and equipment in different environments and industries.

The first edition of ISO 12944 was published in 1998. In subsequent revisions, several changes were made to the entire ISO 12944 standard. A new part (Part 9) has also been added, which focuses in particular on the painting cycles of off-shore structures.

For more information about valveIT or our ISO 12944-compliant painting cycles, visit www.valveit.com

ISO 12944

ISO 12944 consists of 9 parts:

Part 1 – General introduction

Part 2 – Classification of Environments

Part 3 – Design Considerations

Part 4 – Surface Types and Surface Preparation

Part 5 – Protective Painting Cycles

Part 6 – Lab Tests for Performance*

Part 7 – Performing and supervising of painting work

Part 8 – Development of specifications for new work and maintenance

Part 9 – Painting offshore structures (ISO 20340 integrated into ISO 12944)

NEW in 2018

*Changes made to Parts 6 and 8 during the last revision are not considered relevant to specifiers and applicators, and are therefore not described in this booklet.

Part 1 – General introduction

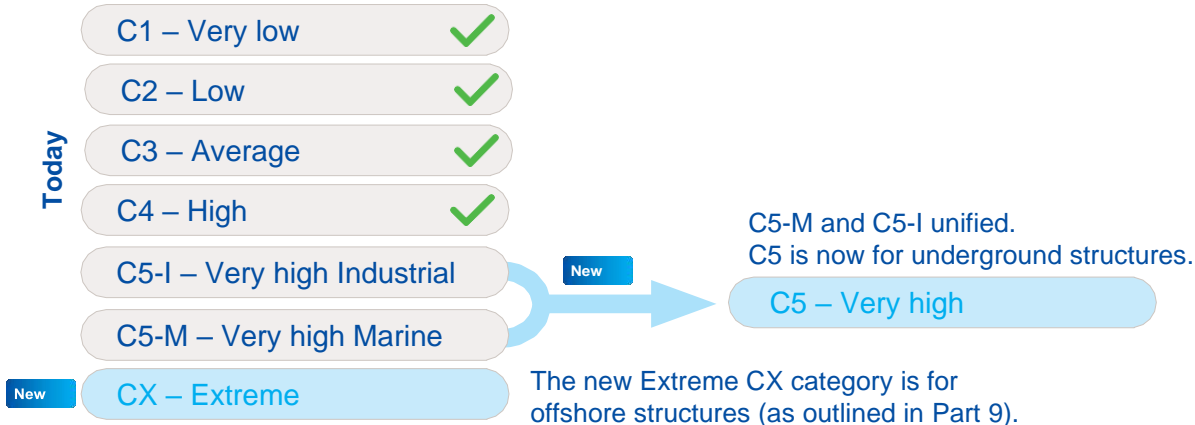
Part 1 defines the purpose, terminology, and definitions of the standard. It also contains the durability class, which is the length of time that the painting cycle should last.

Schema of Durability	Previous	New
Low Durability (L)	2–5 years	up to 7 years
Average Durability (M)	5–15 years old	7–15 years old
High Durability (H)	>15 years old	15–25 years old
New Very High Durability (VH)	–	> 25 years

Part 2 – Classification of environments

Part 2 deals with categories of corrosiveness. There are two main categories: atmospheric conditions and immersion conditions.

Categories of corrosiveness – atmospheric conditions



Part 2 – Classification of environments

New and modified categories of corrosiveness – atmospheric conditions

Mass loss per surface unit/loss of thickness (after the first year of exposure)				
Category of corrosiveness	Low-carbon steel		Zinc	
	Mass loss g/m ²	Thickness Loss mm	Mass loss g/m ²	Thickness Loss mm
C5, New1001 Very high	> 650 to 1,500	> 80 to 200	> 30 to 60	> 4.2 to 8.4
Cx Extreme	> 1,500 to 5,500	> 200 to 700	> 60 to 180	> 8.4 to 25

New



Significant difference between C5 and CX

Part 2 – Classification of environments

Categories of corrosiveness – immersion conditions

Previous

Im 1 – Freshwater

Im 2 – Sea or brackish water

Im 3 – Soil

Defined in Part 2 and present in Part 5 and 6

Im 4 – Sea or brackish water

Defined in Part 2 and present in Part 9 (Offshore)

New

Part 3 – Design Considerations

Part 3 takes into account the best structural design for the proper use of the painting cycle.

New

The degree of preparation must be P3* (EN ISO 8501-3) in the case of high and very high durability for C4, C5 and Cx, in addition to Im1, Im2, Im3, and Im4.

**P3 = Very thorough preparation – the surface is free of significant visible imperfections*



Steel Manufacturer Responsibility



Part 4 – Surface Types & Preparation

Part 4 describes surface and the pre-treatment methods needed to ensure the best performance of the painting cycle.

New

Mostly editorial changes, with abbreviate texts

Removal of cleaning with flame as surface preparation

Removal of chemical treatment as surface preparation

Clarification of the cleaning method with high & very high pressure water

Reference to EN ISO 8501 Part 4

Part 5 – Cycles of Protective Painting

Part 5 covers the selection of the protective painting cycle and includes the guidelines for different environments and durability requirements.

New

New Durability Category (very high)

New values for dry film thickness (DFT)

Regulatory not informative DFT

All updated tables

Part 5 – Cycles of Protective Painting

New

New durability category; new DFT values

Durability, New		Low (l)			Average (m)			High (h)		
Primer type		Zn (R)	Misc.		Zn (R)	Misc.		Zn (R)	Misc.	
Primer binder base		ESI EP PUR	EP PUR ESI	AK AY	ESI EP PUR	EP PUR ESI	AK AY	ESI EP PUR	EP PUR ESI	AK AY
Next hand binder base		EP PUR AY	EP PUR AY	AK AY	EP PUR AY	EP PUR AY	AK AY	EP PUR AY	EP PUR AY	AK AY
C2	MNOC	*			–	–	1	1	1	1
	NDFT				–	–	100	60	120	160
C3	MNOC	–	–	1	1	1	1	2	2	2
	NDFT	–	–	100	60	120	160	160	180	200
C4	MNOC,	1	1	1	2	2	2	2	2	2
	NDFT	60	120	160	160	180	200	200	240	260
C5	MNOC	2	2	–	2	2	–	3	2	–
	NDFT	160	180	–	200	240	–	260	300	–

NEW	Very High (VH)	
Zn (R)	Misc.	
ESI EP PUR	EP PUR ESI	AK AY
EP PUR AY	EP PUR AY	AK AY
2	2	2
160	180	200
2	2	2
200	240	260
3	2	–
260	300	–
3	3	–
320	360	–

Summary of minimum layer number and NDFTs of the painting cycle based on durability and corrosiveness

Part 5 – Cycles of Protective Painting

New

Regulatory not informative DFT

- New attachments added and defined:
 - A and B** are regulatory . . .
 - C – G** are informative = only for orientation
- No table for painting cycles on zinc and metallic surfaces for the maintenance of submerged surfaces.

Only few recommendations on their possible use are provided.

Part 5 – Cycles of Protective Painting

A new section on the use of new and innovative painting cycles which do not fully comply with ISO 12944 requirements has been added.



Part 7 – Execution e Supervision of Painting works

Part 7 describes how to perform and supervise the application of the coating.

Use of the [ISO 19840](#) to measure thickness

The number of reference [areas](#) has been reduced

Structure Sizes (painted area) m ²	Maximum number of recommended reference areas	Maximum reference area percentage compared to the recommended total %
5,000	1	0,3
> 5,000 ≤ 10,000	2	0,3
> 10,000 ≤ 25,000	3	0,2
> 25,000 ≤ 50,000	4	0,15
> 50,000	5	0,1

Part 9 – Painting of Facilities Offshore

Part 9 covers protective painting cycles and laboratory performance tests for offshore structures and related structures. It is a new ISO 12944 section which incorporates some elements and replaces ISO 20340.

Former ISO 20340

New ISO 20340 is now part of ISO12944 as Part 9



Part 9 – Painting of Facilities Offshore

New Categories of Corrosiveness for the atmospheric conditions

New

(CX) and dipped (Im4)

	Carbon steel sandblasting Sa 2 ^{1/2} ; Surface profile: Average {G}						Hot zinc steel or zinc-based metal steel	
Category of environmental corrosiveness	CX (offshore)		Bath and areas intertidal CX (offshore) and Im4		Im4		CX (offshore)	
First hand	Zn (R)	Other primer	Zn (R)	Other primer		Other primer		
NDFT	≥ 40	≥ 60	≥ 40	≥ 60	≥ 200	–	≥ 150	
Minimum number of layers	3	3	3	3	2	1	2	2
Painting cycle NDFT (µm)	≥ 280	≥ 350	≥ 450	≥ 450	≥ 600	≥ 800	≥ 350	≥ 200
Minimum value of the adherence test (before aging) determined in accordance with ISO4624, Method X (Mpa)	5	5	5	5	5	8	5	5

Minimum requirements for protective painting cycles and their initial performance

Part 9 – Painting of Facilities Offshore

New Categories of Corrosiveness for the atmospheric conditions New

(CX) and submerged (Im4) – requirements for laboratory tests

Test	Environment of the CX corrosiveness category (offshore)	Environment of the CX combined corrosiveness category (offshore) and Im4 (dry and intertidal area)	Environment of the Im4 corrosiveness category
Resistance to aging (cyclical tests)	4,200 hr	4,200 hr	-
Cathodic Disconnection	-	4,200 hr	4,200 hr
Seawater Immersion	-	4,200 hr	4,200 hr

CX: 4,200 hours = 175 days = 25 weeks*

*C5 very high – 2,688 hours = 112 days = 16 weeks





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