


<u>Rev. 1.0</u>	EC 101 – Minimal requirements for surface coating			
<u>Doc. Nounber</u>	<u>Status</u>	<u>Responsibility</u>	<u>Date</u>	<u>Page</u>
EC101	Released	Ecotec Standarization group	07.11.2023	1/5

Document releases

Version	Date	Created by	Checked by	Approved by	Remarks
1.0	07.11.2023	Cezary Bureta Konrad Krawczyk	Ecotec standardization group	Ecotec standardization group	Initial release

Subject & Purpose

This instruction contains regulations for the specification of surface coatings on newly created or modified drawings.

The purpose of the instruction is to provide specific surface coating information for components/assemblies.

Each company can individually decide if in some cases below standard could be overruled, for example because of customer request.


Scope & Responsibilities

- Employees engineering: for new drawings
- Employees purchase department: for purchased parts

Description

Standard contains the minimal requirements that are generally taken into account as requirements common to Kirchhoff Ecotec Design Departments when preparing the documentation and construction.

NORM	Title/Description	Remarks
ISO 8501-1	Preparation of steel substrates prior to application of paints and related products - Visual assessment of surface cleanliness: Rust grades and preparation grades for bare steel substrates and steel substrates after complete removal of previous coatings	
ISO 8501-2	Preparation of steel substrates prior to application of paints and related products - Visual assessment of surface cleanliness: Degrees of preparation of previously coated steel substrates after local removal of these coatings	
DIN ISO 12944-4	Paints and varnishes - Corrosion protection of steel structures by protective paint systems: Types of surfaces and surface preparation methods	
DIN ISO 12944-6	Paints and varnishes - Corrosion protection of steel structures by protective paint systems: Laboratory methods of properties testing	
EN ISO 2081	Metallic and other inorganic coatings - Electrolytic zinc coatings with post-treatment on iron or steel	


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ISO 19598	Metal coatings - Electrolytic zinc and zinc alloy coatings on iron or steel with Cr(VI)-free post-treatment	
EN 12329	Corrosion protection of metals - Electrolytic zinc coatings with additional treatment on iron or steel	
DIN EN ISO 1461	Zinc coatings applied to steel and cast iron products by hot-dip method - Requirements and test methods	
DIN EN ISO 2813	Paints and varnishes - Determination of gloss values at 20 degrees, 60 degrees and 85 degrees	
DIN ISO 13715	Technical documentation of the product - Edges of unspecified shape - Indication and dimensioning	

1. Painting:

a) Steel, Stainless steel

- Pre-treatment
 - Surface must be cleaned (e.g. steam jet).
 - Surface preparation according DIN 12944-4 (ISO 8501-1 / ISO 8501-2):
 - Sand blasting - Standard preparation grade = Sa 2.5.
 - Alternative: Hand or Power-tool cleaning - Standard prep. grade = St3.
 - Surface must be free of grease and oil.
 - To avoid corrosion, bare metal should be primed within 2 hours, maximum within 1 working day.
 - Temperature changes should be avoided when transporting vehicles, since dew moisture affects metal and also leads to corrosion.
- Priming/Base filler
 - Before applying the top coat a primer or base filler shall be applied to the painted surface.
 - At least 1 layer of primer/base filler must be applied.
 - Primer/base filler must be sanded with P150 (optional P80 and P150) before top coating.
- Sealing
 - A suitable sealant (e.g. Sikaflex-221, Wurth K+D sealant) should be used on edges, welds seams or gaps that may corrode.
- Topcoat DTM (Direct To Metal; optional)
 - At least 2 layers of topcoat DTM should be applied.
- Topcoat
 - At least 1.5 layers of topcoat must be applied.
 - Optional: Inside containers at least 2 gravel protection layers must be applied.


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b) Aluminum

- Pre-treatment
 - Surface for painting must be cleaned, degreased (e.g. Glasurit 360-4) and sanded with P150.
- Base filler
 - Before applying the top coat a base filler shall be applied to the painted surface.
 - At least 1 layer of base filler shall be applied.
 - The base filler must be sanded with P150 (optional P80 and P150) before applying top coating.
- Sealing
 - A suitable sealant (e.g. Sikaflex-221, Wurth K+D sealant) should be used on edges, welds seams or gaps that may corrode.
- Topcoat DTM (Direct To Metal; optional)
 - At least 2 layers of topcoat DTM must be applied.
- Topcoat
 - At least 1.5 layers of topcoat must be applied.

2. Powder coating:

- Pre-treatment
 - No sharp edges allowed.
 - Surface preparation according DIN 12944-4 (ISO 8501-1 / ISO 8501-2):
 - Sand blasting - Standard preparation grade = Sa 2.5.
 - Alternative: Hand or Power-tool cleaning - Standard prep. grade = St3.
 - Surface must be free of grease and oil.
- Topcoat
 - Cover threads and fitted holes.
 - Two layers of topcoat must be applied.
 - Alternative: 1 layer of primer (e.g. epoxy powder) and 1 layer of topcoat
 - DIN ISO 12944-6 C5-1 (low level) corrosion protection must be fulfilled.


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3. Galvanic zinc coating

- Pre-treatment:
 - The entire specification for galvanic zinc coating shall be included on the drawing.
 - Proper galvanization requirements must be defined by the designer (in case of problems with specifying the coating, contact the galvanization specialist).
- Examples of galvanic zinc coating specification:
 - DIN EN ISO 2081-Fe/Zn12/C.
 - ISO 19598-Fe//ZnNi8-12//Cn//T0.

4. Hot-dip galvanizing

- Pre-treatment
 - The entire specification for hot-dip galvanizing shall be included on the drawing.
 - Proper galvanization requirements must be defined by the designer (in case of problems with specifying the coating, contact the galvanization specialist).
 - Observe the quality requirements for the material to be hot-dip galvanized. Unalloyed structural steels, low-alloy steels and cast steel according to DIN EN 10025-2 (item 7.4.3); class 3
- Types
 - Piece galvanizing (discontinuous) for components without holes and with holes $\geq 7\text{mm}$
 - Holes $< 7\text{ mm}$ must be reworked
 - Centrifugal galvanizing for small components (up to approx. 300 mm length and approx. 3 kg weight) and with holes $< 7\text{ mm}$
- Examples of galvanic zinc coating specification:
 - DIN EN ISO 1461 - t Zn o
 - Centrifugally galvanized

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5. Hydraulic cylinders

a) Family classifications:

- A class - All cylinders which are using for lifting, locking or damping the waste bin, also call container for house waste. The exclusion is about commercial waste lifting.
- B class - All cylinders which are using for compacting the waste.
- C class - All cylinders which are using for emptying waste or actuate other parts that use one or up to 10 times per shift day.
 - C₁ sub-class - Inside, below the wastes trajectory / easy reachable from bins manipulations, or the rod not so protected.
 - C₂ sub-class - Out of the wastes trajectory / bins manipulations, or well protected behind covers.
 - C₃ sub-class - Out of the wastes trajectory / bins manipulations, or well protected behind covers. 95% of the time use in retracted position or out of the rain drop.
- D class: Special - All cylinders which aren't in these 3 first class: for example on a compaction system where the compaction cell is also use for emptying, the first extension of the telescopic cylinder is used for compaction: B and the last extension are used for emptying: C.

b) Rod protection:

- Hard chromium plating: chrome thickness 20 µm minimum ISO 6507-1 Class: A B C₁ C₂
- Hard chromium plating: chrome thickness 15 µm minimum ISO 6507-1 Class: C₃
- Surface hardening: Outside hardness 55 – 65 HRC Depth 2.5 to 3mm Class: A B C₁
- Corrosion resistance: NSS 200 Hrs. ISO 9227 Class: A B C D
- Corrosion resistance: Rating 9 ISO 10289 Class: A B C D

c) Tube articulations eyes:

- Mandatory
 - Surface preparation ISO 12944 Class: A B C D
 - Corrosion resistance: Corrosivity C3 Class: A B C D
 - Durability M (7-15)- ISO 12944 Class: A B C D
 - Topcoat Polyurethane PUR Black RAL 9005 Class: A B C D
- For information
 - Anticorrosive epoxy priming paint EP Class: A B C D
 - Priming coating nominal thickness 55µm if 2 layers system Class: A B C D
 - Nominal Dry Film Thickness 120 µm Class: A B C D