

**Organiska beläggningar för skydd av industriella apparater och anläggningar mot korrosion orsakad av aggressiva media –
Del 2: Beläggningar på metalledlar**

**Organic coating systems and linings for protection of industrial apparatus and plants against corrosion caused by aggressive media –
Part 2: Coatings on metallic components**

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Organic coating systems and linings for protection of industrial apparatus and plants against corrosion caused by aggressive media - Part 2: Coatings on metallic components

Systèmes de revêtements organiques de peinture et autres revêtements rapportés pour la protection des appareils et installations industriels contre la corrosion par des milieux agressifs - Partie 2: Revêtements pour composants métalliques

Beschichtungen und Auskleidungen aus organischen Werkstoffen zum Schutz von industriellen Anlagen gegen Korrosion durch aggressive Medien - Teil 2: Beschichtungen für Bauteile aus metallischen Werkstoffen

This European Standard was approved by CEN on 25 October 2006.

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Contents

Page

Foreword.....5

1 Scope6

2 Normative references6

3 Terms and definitions7

4 General.....8

4.1 Selection criteria8

4.1.1 General.....8

4.1.2 Exposing media8

4.1.3 Type and frequency of fluid loading11

4.1.4 Thermal loading11

4.1.5 Changes in temperature.....11

4.1.6 Mechanical loading12

4.1.7 Climatic influences12

4.1.8 Additional requirements12

4.2 Load profile12

4.3 Requirements12

4.3.1 Components12

4.3.2 Coating materials.....12

4.3.3 Coating system13

4.3.4 Coated components14

5 Coating systems14

5.1 Laminate coating systems14

5.1.1 Coating system design14

5.1.2 Description of layers15

5.1.3 General requirements.....15

5.1.4 Coating process.....17

5.1.5 Requirements for the coating system19

5.2 Trowelled coating systems20

5.2.1 Coating system design20

5.2.2 Description of layers21

5.2.3 General requirements.....21

5.2.4 Coating process.....22

5.2.5 Requirements for the coating system24

5.3 Sprayed coating26

5.3.1 Coating system design26

5.3.2 Description of layers26

5.3.3 General requirements.....27

5.3.4 Application28

5.3.5 Requirements for the coating system29

5.4 Powder coating31

5.4.1 Coating system design31

5.4.2 Description of layers32

5.4.3 Component design and surface condition.....33

5.4.4 Coating materials.....33

5.4.5 Ambient conditions34

5.4.6 Surface preparation34

5.4.7 Application34

5.4.8 Requirements for the coating system34

5.5 Protection of existent coatings36

5.5.1 General.....36

5.5.2 Packaging and handling36

5.5.3 Storage.....37

5.5.4 Assembly37

5.5.5 Repair.....37

6 Designation38

6.1	Laminate coating	38
6.2	Trowelled coating	38
6.3	Sprayed coating.....	39
6.4	Powder coating.....	39
7	Testing.....	39
7.1	General	39
7.2	Suitability testing.....	39
7.3	Receiving inspection of coating material	40
7.3.1	General	40
7.3.2	Container marking.....	40
7.3.3	Viscosity or flow time.....	40
7.3.4	Density.....	40
7.3.5	Colour	40
7.3.6	Non-volatile matter content.....	40
7.3.7	Gel time	40
7.3.8	Binders	40
7.4	Testing of coating systems during application.....	40
7.4.1	General	40
7.4.2	Suitability of component for coating.....	40
7.4.3	Ambient conditions	41
7.4.4	Application method	41
7.4.5	Thickness of coating layers	41
7.5	Acceptance testing.....	41
7.5.1	General	41
7.5.2	Acceptance testing of coated component.....	41
7.5.3	Acceptance testing of specimens	41
7.6	Routine testing	42
7.7	Inspection report	42
8	Suitability verification and tests	42
8.1	Requirements.....	42
8.1.1	General	42
8.1.2	Laboratory testing.....	43
8.1.3	In-service testing (field tests).....	45
8.1.4	Testing on reference objects	45
8.2	Tests	45
8.2.1	Sample bodies	45
8.2.2	Fluid load, resistance and tightness	45
8.2.3	Thermal loading.....	47
8.2.4	Temperature change loading	47
8.2.5	Adhesion strength.....	47
8.2.6	Ageing behaviour	47
8.2.7	Dissipation capability.....	48
Annex A (informative)	Specimen form	49
Annex B (informative)	Information to be given by the coating material manufacturer	50
Annex C (informative)	Information to be given by the coating manufacturer	51
Annex D (informative)	Resistance of resins to various chemicals at ambient temperature	52
Annex E (normative)	Testing the dissipation capability	53
E.1	General	53
E.1.1	Dissipation resistance	53
E.1.2	Ground dissipating resistance.....	53
E.2	Testing the dissipation resistance of test samples	53
E.2.1	Instruments	53
E.2.2	Test procedure.....	53
E.2.3	Test report.....	53
E.3	Measuring the ground dissipation resistance on the laid surface protection system	54
E.3.1	Instruments	54
E.3.2	Preparation.....	54

EN 14879-2:2006 (E)

E.3.3	Test procedure	54
E.3.4	Test report	55
Annex F (normative) Test fluid groups for verification of suitability for material/media combinations		
		56
Annex G (informative) Selection criteria for surface protection systems		
		58
G.1	Load profiles and suitable protection for gutters, trenches, pipes etc.	58
G.2	Load profiles and suitable protection for containers	59
Annex H (informative) Sample form for acceptance inspection report		
		60
A-Deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN/CENELEC member		
		61
Bibliography		
		62

Foreword

This document (EN 14879-2:2006) has been prepared by CEN/BT/Task Force 130 "Organic coating systems and linings for protection of industrial apparatus and plants against corrosion caused by aggressive media", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2007, and conflicting national standards shall be withdrawn at the latest by June 2007.

EN 14879 "Organic coating systems and linings for protection of industrial apparatus and plants against corrosion caused by aggressive media" consists of the following parts:

- *Part 1: Terminology, design and preparation of substrate*
- *Part 2: Coatings on metallic components*
- *Part 3: Coatings on concrete components*
- *Part 4: Linings on metallic components*
- *Part 5: Linings on concrete components*
- *Part 6: Combined linings with tile and brick layers*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EN 14879-2:2006 (E)

1 Scope

This European Standard specifies the requirements for and methods of testing of organic coatings which are applied to metallic process engineering equipment that will come in contact with chemical substances (liquids, solids and gases). The requirements specified here may be used for the purposes of quality control (e.g. as agreed between the contract partners or been given by national regulations).

The standard does not cover coatings as in EN ISO 12944-1, but it does apply to coatings which serve one or more of the following purposes:

- to protect the component from adverse effects of aggressive substances;
- to protect waters (e.g. ground water) against hazardous substances;
- to protect the charge from becoming contaminated by components released from the substrate material;
- to achieve a particular surface properties.

The described coatings are to be used for metallic process engineering equipment that will come in contact with chemical substances. The different coating systems are:

- laminate coating systems which contain cold-curing resins;
- trowelled coating which contain cold-curing resins;
- sprayed coating systems which contain resins (in special cases, such coatings may also be applied by brushing, rolling, flow coating, dipping, or by other means, such as providing sleeving for nozzles);
- powder coating systems which contain organic materials (powder coatings may be used as corrosion protection or for non-stick purposes).

For design and preparation of substrate see EN 14879-1.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 59, *Glass reinforced plastics — Measurement of hardness by means of a Barcol impressor*

EN 228, *Automotive fuels — Unleaded petrol — Requirements and test methods*

EN 590, *Automotive fuels — Diesel — Requirements and test methods*

EN 13687-3, *Products and systems for the protection and repair of concrete structures — Test methods — Determination of thermal compatibility — Part 3: Thermal cycling without de-icing salt impact*

EN 14879-1:2005, *Organic coating systems and linings for protection of industrial apparatus and plants against corrosion caused by aggressive media — Part 1: Terminology, design and preparation of substrate*

prEN 14879-4, *Organic coating systems and linings for protection of industrial apparatus and plants against corrosion caused by aggressive media — Part 4: Linings on metallic components*

EN ISO 175, *Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals (ISO 175:1999)*

EN ISO 178, *Plastics — Determination of flexural properties (ISO 178:2001)*

EN ISO 291, *Plastics — Standard atmospheres for conditioning and testing (ISO 291:2005)*

EN ISO 527-3, *Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets (ISO 527-3:1995)*

EN ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)*

EN ISO 2811-1, *Paints and varnishes — Determination of density — Part 1: Pycnometer method (ISO 2811-1:1997)*

EN ISO 2811-2, *Paints and varnishes — Determination of density — Part 2: Immersed body (plummet) method (ISO 2811-2:1997)*

EN ISO 2815, *Paints and varnishes — Buchholz indentation test (ISO 2815:2003)*

EN ISO 3001, *Plastics — Epoxy compounds — Determination of epoxy equivalent (ISO 3001:1999)*

EN ISO 3251, *Paint, varnishes and plastics — Determination of non-volatile-matter content (ISO 3251:2003)*

EN ISO 3882, *Metallic and other inorganic coatings — Review of methods of measurement of thickness (ISO 3882:2003)*

EN ISO 4624, *Paints and varnishes — Pull-off test for adhesion (ISO 4624:2002)*

EN ISO 4625-1, *Binders for paints and varnishes — Determination of softening point — Part 1: Ring-and-ball method (ISO 4625-1:2004)*

EN ISO 8503-2, *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 2: Method for the grading of surface profile of abrasive blast-cleaned steel — Comparator procedure (ISO 8503-2:1988)*

EN ISO 12944-4, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 4: Types of surface and surface preparation (ISO 12944-4:1998)*

ISO 813, *Rubber, vulcanized or thermoplastic — Determination of adhesion to a rigid substrate — 90° peel method*

ISO 2559, *Textile glass — Mats (made from chopped or continuous strands) — Designation and basis for specifications*

ISO 8130-2, *Coating powders — Part 2: Determination of density by gas comparison pycnometer (reference method)*

IEC 60093:1980, *Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials*

IEC 60167, *Methods of test for the determination of the insulation resistance of solid insulating materials*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14879-1:2005 and the following apply.

EN 14879-2:2006 (E)

3.1 fibre reinforced coatings
resin coatings reinforced by means of glass, carbon or synthetic fibres, for the standard named "lamine coatings"

3.2 contract partners
coating material manufacturer, component manufacturer, person(s) responsible for applying the coating, and client ordering the coated component(s)

3.3 substrate
surface on which a coating is applied

3.4 coating system (on a metallic component)
continuous film on the surface of a metallic component, comprising one or more layers, with a total system thickness of at least 100 µm

NOTE For non-stick coatings as in 5.4, the minimum total thickness is 50 µm.

3.5 coating material (for use on a metallic component)
cold- or heat-curing material, in liquid, paste or powder form, which will form a continuous film (coating) on the surface of a metallic component. Liquid coating materials may or may not contain solvents

3.6 total coating system thickness
sum of the thickness of all layers in a coating system

NOTE When specifying requirements for various aspects such as the suitability of a coating, the method of application, the component design or the surface condition of the substrate, it is expedient to differentiate between the following categories of coating system thickness:

- a) up to 200 µm;
- b) above 200 µm up to 1 mm;
- c) above 1 mm.

4 General

4.1 Selection criteria

4.1.1 General

The stress to be encountered by a protective coating shall be known before the requirements for it can be specified. For the scope of this European Standard, the stress types detailed in 4.1.2 to 4.1.8 are the most relevant. Where necessary, grades have been used to describe different levels of stress.

4.1.2 Exposing media

Aggressive substances or water pollutants may occur as solids, fluids or gases. Their aggressive action on metallic components usually occurs when they are in a liquid state (e.g. aqueous solutions or condensates). The substances may occur at varying intervals in their pure state or as mixtures.

These substances shall be designated using the Geneva nomenclature, IUPAC¹⁾ nomenclature or CAS²⁾ number. They may also be designated by trivial names which have become established in the literature. Concentrations and any changes to these shall be given as a percentage by mass or volume, or as g/l, g/kg, mol/l etc. The pH value shall also be given for aqueous solutions.

All constituents, including traces and impurities, shall be named, even if they do not attack metallic components. Successive exposure shall be represented accordingly.

Table 1 lists commonly used chemicals, which may have the properties mentioned above.

1) International Union of Pure and Applied Chemistry.

2) Chemical Abstract Service.