

**Pindamisseadmed. Sukel- ja
elektrofoor-pindamismasinad
orgaaniliste vedelike
pindamismaterjalide kasutamiseks.
Ohutusnõuded**

Coating plants - Machinery for dip coating and
electrodeposition of organic liquid coating material -
Safety requirements

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 12581:2006 sisaldab Euroopa standardi EN 12581:2005 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 27.02.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 12581:2006 consists of the English text of the European standard EN 12581:2005.</p> <p>This document is endorsed on 27.02.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala: This European Standard applies to the design and construction of machinery for dip coating and electrodeposition of organic liquid coating material to industrial items.</p>	<p>Scope: This European Standard applies to the design and construction of machinery for dip coating and electrodeposition of organic liquid coating material to industrial items.</p>
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ICS 87.100

Võtmesõnad: coating materials, coatings, constructions, design, marking

ICS 87.100

English Version

Coating plants - Machinery for dip coating and electrodeposition
of organic liquid coating material - Safety requirements

Installations d'application - Installations au trempé et par
électrodéposition de produits de revêtements organiques
liquides - Prescriptions de sécurité

Beschichtungsanlagen - Tauchbeschichtungsanlagen und
Elektrotauchbeschichtungsanlagen für organische flüssige
Beschichtungsstoffe - Sicherheitsanforderungen

This European Standard was approved by CEN on 28 October 2005.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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Foreword

This European Standard (EN 12581:2005) has been prepared by Technical Committee CEN/TC 271 "Surface treatment equipment — Safety", 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 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are an integral part of this European Standard.

This European Standard is one of a set of standards devoted to the health and safety requirements of coating plants for the application and drying of organic liquid coating material and varnishes.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This standard is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

1.1 This European Standard applies to the design and construction of machinery for dip coating and electrodeposition of organic liquid coating material to industrial items.

This machinery consists of the following equipment:

- Transport system including hoists;
- Dip tank and safety tank;
- forced ventilation system;
- ancillary equipment such as pumps, filters, heaters.

This European Standard deals with the significant hazards, hazardous situations and events relevant to dip and electrophoretic coating machinery when they are used as intended and under the conditions foreseen by the manufacturer (see Clause 4).

In addition, the equipment marking and minimum use requirements are specified.

1.2 This European Standard does not cover:

- automatic loading and unloading systems;
- lifting accessories;
- dip and electrophoretic coating tanks without any technical devices such as enclosure, lip extractions, pumps, heaters;
- machinery for organic liquid coating material preparation, supply and draining systems (e. g. pumps);
- water and waste liquids treatment machinery;
- dip and electrodeposition coating machinery for web or coil coating;
- dip and electrophoretic coating machinery with tank volume less than 1 m³;

This European Standard is not applicable to industrial machinery for dip or electrophoretic coating processes which are manufactured before the date of publication of this European Standard by CEN.

2 Normative references

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

EN 294, *Safety of machinery — Safety distance to prevent danger zones being reached by the upper limbs*

EN 349, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 418, *Safety of machinery - Emergency stop equipment, functional aspects - Principles for design*

EN 525, *Non-domestic direct gas-fired forced convection air heaters for space heating not exceeding a net heat input of 300 kW*

EN 547-1, *Safety of machinery - Human body measurements - Part 1: Principles for determining the dimensions required for openings for whole body access into machinery*

EN 547-3, *Safety of machinery — Human body measurements — Part 3: Anthropometric data*

EN 563, *Safety of machinery — Temperature of touchable surfaces — Ergonomics data to establish temperature limit values for hot surfaces*

EN 574, *Safety of machinery — Two-hand control devices — Functional aspects - Principles for design*

EN 619, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of unit loads*

EN 809, *Pumps and pump units for liquids — Common safety requirements*

EN 811, *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs*

EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 954-1:1996, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

CR 954-100, *Safety of machinery - Safety-related parts of control systems - Part 100: Guide on the use and application of EN 954-1:1996*

EN 971-1, *Paints and varnishes — Terms and definitions for coating materials — Part 1: General terms*

EN 981, *Safety of machinery — System of auditory and visual danger and information signals*

EN 982, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics*

EN 983, *Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics*

EN 999, *Safety of machinery — The positioning of protective equipment in respect of approach speeds of parts of the human body*

EN 1037, *Safety of machinery — Prevention of unexpected start-up*

EN 1088, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

EN 1127-1:1997, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology*

EN 1760-1, *Safety of machinery — Pressure sensitive protective devices — Part 1: General principles for the design and testing of pressure sensitive mats and pressure sensitive floors*

EN 1760-2, *Safety of machinery — Pressure sensitive protective devices — Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars*

EN 1837, *Safety of machinery - Integral lighting of machines*

EN 1838, *Lighting applications — Emergency lighting*

EN 12445, *Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Test methods*

EN 12453, *Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Requirements*

prEN 12621, *Machinery for the supply and circulation of coating materials under pressure — Safety requirements*

prEN 12650-1, *Automatic door systems – Part 1: Product requirements and test methods*

prEN 12650-2, *Automatic door systems – Part 2: Safety at automatic pedestrian doors*

EN 12978, *Industrial, commercial and garage doors and gates - Safety devices for power operated doors and gates - Requirements and test methods*

EN 13463-1:2001, *Non-electrical equipment for potentially explosive atmospheres — Part 1: Basic method and requirements*

EN 13463-5, *Non-electrical equipment intended for use in potentially explosive atmospheres — Part 5: Protection by constructional safety "c"*

EN 13478, *Safety of machinery — Fire prevention and protection*

EN 14462, *Surface treatment equipment — Noise test code for surface treatment equipment including its ancillary handling equipment — Accuracy grades 2 and 3*

EN 50073, *Guide for the selection, installation, use and maintenance of apparatus for the detection and measurement of combustible gases or oxygen*

EN 60079-0, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements (IEC 60079-0:2004)*

EN 60079-15, *Electrical apparatus for explosive gas atmospheres — Part 15: Type of protection "n" (IEC 60079-15:2001, modified)*

EN 60079-17, *Electrical apparatus for explosive gas atmospheres - Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines) (IEC 60079-17:2002)*

EN 60204-1:1997, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:1997)*

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 61000-6-1, *Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments (IEC 61000-6-1:1997, modified)*

EN 61000-6-3, *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3:1996, modified)*

EN 61000-6-4, *Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:1997, modified)*

EN 61496-1, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1:2004, modified)*

EN 61779-1, *Electrical apparatus for the detection and measurement of flammable gases — Part 1: General requirements and test methods* (IEC 61779-1:1998, modified)

EN 61779-4, *Electrical apparatus for the detection and measurement of flammable gases — Part 4: Performance requirements for group II apparatus indicating a volume fraction up to 100 % lower explosive limit* (IEC 61779-4:1998, modified)

EN ISO 11688-1, *Acoustics - Recommended practice for the design of low-noise machinery and equipment - Part 1: Planning* (ISO/TR 11688-1:1995)

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology* (ISO 12100-1:2003)

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles* (ISO 12100-2:2003)

EN ISO 14122-1, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means of access between two levels* (ISO 14122-1:2001)

EN ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways* (ISO 14122-2:2001)

EN ISO 14122-3, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails* (ISO 14122-3:2001)

EN ISO 14122-4, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders* (ISO 14122-4:2004)

3 Terms and definitions

For the purposes of this European standard, the terms and definitions given in EN 971-1 and EN ISO 12100-1:2003 apply.

Additional terms and definitions specifically needed for this European Standard are added below.

3.1

dip coating machinery

dip coating machinery are the machines constituting a dip coating installation. Dip coating installations are used to apply organic liquid coating material to industrial items. Dip coating installation may consist of the following machinery and parts:

- transport equipment,
- transport system consisting of the following parts (dip, drip, dry),
- dip tank and safety tank,
- forced ventilation system,
- equipment for draining area with method of containing,
- equipment for flash-off area,
- ancillary equipment such as pumps, filters, heaters, stirring device ...;

NOTE Dip coating machinery can be placed: