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Razprševalna in brizgalna oprema za prekrivne materiale - Varnostne zahteve

Atomising and spraying equipment for coating materials - Safety requirements

Spritz- und Sprühgeräte für Beschichtungsstoffe - Sicherheitsanforderungen

Equipements d'atomisation et de pulvérisation pour produits de revêtement - Exigences de sécurité

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ICS:

87.100

Oprema za nanašanje
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Paint coating equipment

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EUROPEAN STANDARD
NORME EUROPÉENNE
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English Version

Atomising and spraying equipment for coating materials - Safety requirements

Equipements d'atomisation et de pulvérisation pour
produits de revêtement - Exigences de sécurité

Spritz- und Sprüngeräte für Beschichtungsstoffe -
Sicherheitsanforderungen

This European Standard was approved by CEN on 19 July 2013.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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EN 1953:2013 (E)

Foreword

This document (EN 1953:2013) 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 March 2014, and conflicting national standards shall be withdrawn at the latest by March 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1953:1998+A1:2009.

This document 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 Annex ZA and informative Annex ZB, which are an integral part of this document.

Compared with EN 1953:1998+A1:2009, the following changes have been made:

- the Scope has been limited to applicators with maximum pneumatic pressure < 15 bar;
- ATEX requirements have been integrated into the standard;
- safety requirements against ejection of fluids have been detailed for handheld applicators;
- testing requirements for mechanical strength have been revised.

This document is part of a series of standards related to safety of design and construction of machinery and systems for surface coating with organic materials (paints, varnishes and similar products).

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

Introduction

This European Standard is a type C standard as stated in EN ISO 12100:2010.

The equipment concerned and the extent to which hazards, hazardous situations and events are covered is 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 type 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.

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EN 1953:2013 (E)

1 Scope

This European Standard deals with all significant hazards, hazardous situations and events which are relevant for both manual and automatic atomising and spraying equipment for application of coating materials on workpieces.

In this standard, the term “machine” is used equivalently to “atomising and spraying equipment” and “applicator”.

Together with this standard, EN 50050, EN 50059, EN 50176, EN 50177 or EN 50348 give requirements for electrostatic applicators.

The specific significant risks related to the use of this machinery with foodstuffs and pharmaceutical products are not dealt with in this standard.

This standard is only applicable to machinery which is used as intended. It also covers hazards arising from conditions which are reasonably foreseeable by the manufacturer.

Applicators can consist of the following parts:

- atomising or spraying system;
- trigger;
- filter;
- swivel joint;
- safety and control systems;
- non-pressurised gravity or siphon feed cup.

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This European Standard is not applicable to:

- applicators designed for operating pneumatic pressure above 15 bar;
- non-atomising equipment (e.g. extruding equipment, dispenser);
- fluidised bed powder coating machinery;
- equipment for the automated application of flock;
- spray guns covered by EN 50580;
- supply hoses and ducts;
- high-pressure cleaner equipped with high pressure water jet machines according to EN 1829-1;
- airbrushes for graphic and artistic works;
- machinery for the supply and circulation of coating materials under pressure according to EN 12621;
- water-jet cutters;
- automated devices like robots or reciprocators (EN ISO 10218-1).

This standard is not applicable to machinery manufactured before the date of its publication as a European Standard.

2 Normative references

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

EN 614-1, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 13463-1:2009, *Non-electrical equipment for use in 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 14462, *Surface treatment equipment — Noise test code for surface treatment equipment including its ancillary handling equipment — Accuracy grades 2 and 3*

EN 50050, *Electrical apparatus for potentially explosive atmospheres — Electrostatic hand-held spraying equipment*

EN 50059, *Specification for electrostatic hand-held spraying equipment for non-flammable material for painting and finishing*

EN 50176, *Stationary electrostatic application equipment for ignitable liquid coating material — Safety requirements*

EN 50177, *Stationary electrostatic application equipment for ignitable coating powders — Safety requirements*

EN 50223, *Stationary electrostatic application equipment for ignitable flock material — Safety requirements*

EN 50348, *Stationary electrostatic application equipment for non-ignitable liquid coating material — Safety requirements*

EN 60079-0, *Explosive atmospheres — Part 0: Equipment — General requirements (IEC 60079-0, modified)*

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

EN ISO 4414, *Pneumatic fluid power — General rules and safety requirements for systems and their components (ISO 4414)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1)*

EN ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

- 3.1**
atomising equipment
applicator for liquid coating materials
- 3.2**
spraying equipment
applicator for powder coating materials and flock
- 3.3**
automatic atomising and spraying equipment
applicators which are not operated manually
- 3.4**
fluid
liquid and/or gas
- 3.5**
coating material
product, in liquid or powder form, that, when applied to a substrate, forms a film possessing protective, decorative and/or other specific properties
- [SOURCE: EN ISO 4618:2006, 2.50]
- Note 1 to entry: In general, coating materials consist of binders, pigments, dyestuff, fillers and other additives. Moreover, liquid coating materials can contain organic solvents and/or water.
- Note 2 to entry: Coating materials are, for instance, paints, lacquers, varnishes, impregnating varnishes, paste fillers, filling materials, impregnating agents, anti-noise agents, fire resisting agents, stains, burnishes, adhesives, sealing compounds, as well as coating powders.
- 3.6**
cleaning liquid
all liquids which can be used for cleaning and/or rinsing of applicators
- Note 1 to entry: A distinction is made between aqueous and organic cleaning liquids.
- Note 2 to entry: Cleaning liquids may consist of or contain organic solvents.
- 3.7**
maximum working pressure
maximum admissible static or dynamic fluid pressure as defined by the manufacturer
- 3.8**
hydraulic pressure
- 3.8.1**
static hydraulic pressure
pressure of the liquid material without flow
- Note 1 to entry: This includes flow through the nozzle and/or recirculation through the applicator.

3.8.2**dynamic hydraulic pressure**

pressure of the liquid material under flow conditions

Note 1 to entry: This includes flow through the nozzle and/or recirculation through the applicator.

Note 2 to entry: The dynamic hydraulic pressure is reached shortly after having opened the valve.

Note 3 to entry: The dynamic hydraulic pressure depends on the installation and can vary temporarily.

3.9**pneumatic applicator**

applicator for liquid coating materials which atomises the coating material after leaving the nozzle by charging it with air at high-speed

3.10**hydraulic applicator**

applicator for liquid coating materials which atomises the material discharges from a nozzle at high liquid velocity and at high liquid pressure

Note 1 to entry: The corresponding process is generally referred to as "airless".

3.11**hydraulic applicator combined with air**

applicator in which atomisation and/or spray pattern shape is modified by the addition of air

3.12**components of applicators****3.12.1****nozzle**

component through which liquid, powder or flock coating material is discharged

Note 1 to entry: The geometry of the nozzle influences the shape of the spray pattern.

3.12.2**air cap**

component arranged around the nozzle in pneumatic applicator and hydraulic applicator combined with air

Note 1 to entry: The geometry of the air cap influences the degree of atomisation and the shape of the spray pattern.

3.12.3**horns**

parts of the air cap projecting in the direction of the spray equipped with holes through which the air discharges and forms the spray pattern

3.13**routine test**

test to which each individual device is subjected during or after manufacture to ascertain whether it complies with certain criteria

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