SVENSK STANDARD SS-EN 50050-1

Fastställd	Utgåva	Sida	Ansvarig kommitté
2014-02-19	1	1 (1+30)	SEK TK 31

Handhållen elektrostatisk sprututrustning – Säkerhetsfordringar – Del 1: Handhållen sprututrustning för ytbeläggning med brännbar vätska

Electrostatic hand-held spraying equipment – Safety requirements – Part 1: Hand-held spraying equipment for ignitable liquid coating materials

Som svensk standard gäller europastandarden EN 50050-1:2013. Den svenska standarden innehåller den officiella engelska språkversionen av EN 50050-1:2013.

Nationellt förord

Tidigare fastställd svensk standard SS-EN 50050, utgåva 3, 2006, gäller ej fr o m 2016-10-14.

SS-EN 50050-1, utgåva 1, 2014, SS-EN 50050-2, utgåva 1, 2014 och SS-EN 50050-3, utgåva 1, 2014 ersätter tillsammans SS-EN 50050, utgåva 3, 2006.

ICS 87.100.00

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
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Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

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Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50050-1

November 2013

ICS 87.100

Supersedes EN 50050:2006 (partially)

English version

Electrostatic hand-held spraying equipment - Safety requirements - Part 1: Hand-held spraying equipment for ignitable liquid coating materials

Equipement manuel de projection électrostatique - Exigences de sécurité - Partie 1 : Equipement manuel de projection de liquides de revêtement inflammable

Elektrostatische Handsprüheinrichtungen - Sicherheitsanforderungen - Teil 1: Handsprüheinrichtungen für entzündbare flüssige Beschichtungsstoffe

This European Standard was approved by CENELEC on 2013-10-14. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Ref. No. EN 50050-1:2013 E

SEK Svensk Elstandard

Contents

Foreword

This document (EN 50050-1:2013) has been prepared by SC 31-8, "Electrostatic painting and finishing equipment", of CLC/TC 31, "Electrical apparatus for potentially explosive atmospheres".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-10-14
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2016-10-14

In combination with EN 50050-2:2013 and EN 50050-3:2013, this document supersedes EN 50050:2006.

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

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

0 Introduction

0.1 Process

During the electrostatic coating process the liquid coating material is transported to an applicator where it is atomised and converted to droplets by mechanical forces and by the influence of an electric field. During this atomising process the droplets are charged by high voltage of some 10 kV and a spray cloud is generated. The charged droplets are attracted by and applied to the earthed workpiece.

Droplets, which are not applied to the workpiece (overspray) are removed by a suction device or by other means.

After the coating process the coated workpieces are introduced into a dryer where the solvent is evaporated and a dry film of coating material is generated.

0.2 Explosion hazards

0.2.1 An explosion could occur, if

— the concentration of sprayed ignitable liquid coating material in air is within the explosion limits,

— an ignition source of appropriate energy for this explosive atmosphere is present.

Ignition sources could be, for instance, a hot surface, a naked flame, an electric arc or a spark.

An explosion could be prevented, if at least one condition is avoided. Because it is very difficult to exclude the possibility of ignitable discharges completely, the main focus should be the prevention of an explosive atmosphere.

0.2.2 An explosive atmosphere can only explode within a given range of concentration, but not, if the concentration is above or below this range.

NOTE If an explosive mixture of coating materials and air is trapped into a closed room, an explosion can lead to a fatal increase of pressure.

0.2.3 Particular attention should be paid to the prevention of electrostatic charges on different surfaces located in the vicinity of the spraying cloud. This could apply to e.g. workpieces during the coating process. Grounding is critical to the prevention of electrostatic charge to any conductive objects in the spray area.

0.3 Electric hazards

0.3.1 Electric shock (by direct or indirect contact) can be generated, for instance, by contact with

- live parts, which are not insulated for operational reasons,
- conductive parts, which are not connected to dangerous voltage during normal operation, but only in case of failure,
- insulated live parts with insufficient or damaged insulation due to external impact.

0.3.2 Inadequate earthing may occur, for instance, due to

- faulty connections to the protective earthing system,
- a too high resistance to earth (e. g. contamination by coating materials).

0.3.3 Hazards could occur, for instance, if hazardous malfunctions (e.g. shortcut of electronic safety circuits) occur due to interferences of the electrostatic high voltage equipment and the components of the control and safety systems.

0.3.4 Hazardous electrostatic discharges could be generated, for instance, by non-earthed conductive components or by large insulating surfaces, especially if they are backed with conductive material.

1 Scope

1.1 This European Standard specifies the requirements for hand-held or hand-operated electrostatic spraying equipment for ignitable liquid coating materials to be used in explosive atmospheres generated by their own spray cloud within a temperature range from 5 °C to 40 °C.

This European Standard deals with all hazards significant for the electrostatic spraying of liquid coating materials, which could also contain small quantities of added metal particles, if the work is carried out under conditions recommended by the manufacturer. In particular, this includes ignition hazards resulting from the generated explosive atmosphere.

This European Standard specifies the design-related and test requirements for electrostatic spraying equipment of type A-L according to Table 1 of EN 50176:2009.

1.2 With regard to explosion protection and prevention measures, this European Standard also applies to ionisators with high voltage corona charging. Ionisators in conformity with EN 50050-1 provide equipment category 2G. Parts of ionisators, which are intended to be used or installed in Zone 2, provide equipment category 3G in conformity with EN 50050-1:2013, see Annex D.

1.3 Electrostatic applicators are considered to be equipment of group II, category 2G for use in potentially explosive areas of zone 1 or 2, which have been generated by the equipment itself. All other parts of hand-held electrostatic spraying equipment are considered to be equipment of category 3G if they are installed or used in potentially explosive areas of zone 2.

1.4 All other significant hazards relevant for applicators (e.g. ejection of fluids, mechanical strength, electrical hazards (apart from the electrostatic hazards), noise, explosion, contact with or inhalation of dangerous substances, ergonomics) are covered by EN 1953.

1.5 This European Standard also gives details regarding quality assurance systems for electrostatic spraying equipment, see Annex C.

1.6 Additional requirements may be applicable to equipment designed for use in food and pharmaceutical industry.

1.7 This European Standard does not apply to

— zone classification of the areas in and around spray booths [see EN 12215],

— zone classification of other areas with potentially explosive atmosphere [see EN 60079-10-1],

— selection, erection and application of other electrical and non-electrical equipment in areas with explosion hazard [see EN 60079-14 and EN 12215],

— cleaning of spraying areas, see instruction manual of the spray booth,

— fire prevention and protection, for instance fire hazards due to other sources [see EN 12215],

— requirements for machinery for the supply and recirculation of coating material under pressure [see EN 12621].

1.8 When processing coating materials having specific electrical properties (conductivity, resistivity) the function of the hand-held spraying equipment to charge coating materials electrostatically may be affected as a result of a voltage drop at the charging electrode.

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 1149-5	*Protective clothing – Electrostatic properties – Part 5: Material performance and design requirements*
EN 1953	*Atomising and spraying equipment for coating materials – Safety requirements*
EN 12215	*Coating plants – Spray booths for application of organic liquid coating materials – Safety requirements*
prEN 50059:2011	*Electrostatic hand-held spraying equipment – Safety requirements – Hand-held spraying equipment for non-ignitable coating materials*
EN 50176:2009	*Stationary electrostatic application equipment for ignitable liquid coating material – Safety requirements*
EN 60079-0	*Explosive atmospheres – Part 0: Equipment - General requirements (IEC 60079-0)*
EN 60079-7:2007	*Explosive atmospheres – Part 7: Equipment protection by increased safety "e" (IEC 60079-7:2006)*
EN 60204-1	*Safety of machinery – Electrical equipment of machines – Part 1: General requirements (IEC 60204-1)*
EN 60529	*Degrees of protection provided by enclosures (IP code) (IEC 60529)*
EN 61340-4-1	*Electrostatics – Part 4-1: Standard test methods for specific applications – Electrical resistance of floor coverings and installed floors (IEC 61340-4-1)*
EN 62061	*Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061)*
EN ISO 12100	*Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100)*
EN ISO 13849-1	*Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design (ISO 13849-1)*
EN ISO 20344	*Personal protective equipment – Test methods for footwear (ISO 20344)*