



SLOVENSKI STANDARD SIST EN 50050:2002

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iTeh STANDARD PREVIEW

Electrical apparatus for potentially explosive atmospheres - Electrostatic hand-held spraying equipment

SIST EN 50050:2002

Elektrische Betriebsmittel für explosionsgefährdete Bereiche - Elektrostatische Handsprüheinrichtungen

Appareillage électrique pour atmosphères explosibles - Equipement manuel de projection électrostatique

Ta slovenski standard je istoveten z: EN 50050:2001

ICS:

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87.100	Oprema za nanašanje premazov	Paint coating equipment

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EUROPEAN STANDARD

EN 50050

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Supersedes EN 50050:1986

English version

**Electrical apparatus for potentially explosive atmospheres -
Electrostatic hand-held spraying equipment**

Appareillage électrique pour atmosphères
explosibles -
Équipement manuel de projection
électrostatique

Elektrische Betriebsmittel für
explosionsgefährdete Bereiche -
Elektrostatische Handsprüheinrichtungen

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This European Standard was approved by CENELEC on 2001-05-01. 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.

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by SC 31-8, Electrostatic painting and finishing equipment, of Technical Committee CENELEC TC 31, Electrical apparatus for explosive atmospheres.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50050 on 2001-05-01.

This European Standard supersedes EN 50050:1986.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2002-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-04-01

This European Standard specifies the constructional and test requirements for hand-held and hand-operated electrostatic spray guns and associated apparatus which are used to spray flammable coating materials which may form explosive atmospheres. These spraying devices are considered to be devices of group II, category 2 in accordance with Directive 94/9/EC. It is taken for granted that the devices will be used in mechanically ventilated spraying areas or under equivalent ventilation conditions.

Annexes designated "informative" are given for information only.

In this standard, annex A is informative.

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Introduction

When materials are sprayed with hand-held electrostatic spraying equipment, the material is converted into a cloud of droplets or particles directed to a surface to produce there a uniform layer of the required thickness and quality. The particles are charged by high voltage of tens of kilovolts or triboelectrically so that they are attracted by the earthed workpiece and deposited on it.

1 Scope

1.1 This European Standard specifies the constructional and test requirements for hand-held and hand-operated electrostatic spraying apparatus and associated apparatus which can be used to spray flammable liquid coating materials, flammable coating powders or flammable flock in spraying areas which may or may not contain flammable adhesives. These spraying devices are considered to be apparatus of group II category 2 in accordance with Directive 94/9/EC for use in potentially explosive atmospheres formed by their spray cloud.

This standard only deals with the hazards involved in the coating process when hand-held electrostatic spraying apparatus is used as prescribed and in accordance with the conditions which are to be expected according to the manufacturer. As to other hazards involved in the use of hand-held spraying apparatus, the safety requirements of EN 1953:1998 "Atomising and spraying equipment for coating materials - Safety requirements" shall be met.

1.2 This Standard is not applicable to automatic electrostatic spraying equipment for flammable coating materials (see EN 50176, EN 50177 and EN 50223).

1.3 The "General requirements" of the European Standard EN 50014 to be applied to hand-held electrostatic spray guns and to associated apparatus are given in the Table below:

Clause of EN 50014	Spray guns	Associated apparatus outside the hazardous area
3 Definitions	except 3.3	except 3.3
5 Temperatures	except 5.2	No
6 General	only 6.1.2	only 6.12
7 Non-metallic enclosures and non-metallic parts of enclosures	only 7.4	No
8 Light-alloy enclosures	only 8.1	No
9 Fasteners	only 9.1	only 9.1
14 Connection facilities for earthing and bonding conductors	yes	Yes
15 Connection facilities and terminal compartments	yes	No
16 Cable and conduit entries	only 16.3	No
24 Routine tests	yes	Yes
25 Manufacturer responsibility	Yes	Yes
26 Tests of modified or repaired electrical apparatus	yes	Yes
Annex A	yes	No

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 292-1	1991	Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology
EN 292-2 + A1	1991 1995	Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles and specifications
EN 1127-1	1997	Explosive atmospheres – Explosion prevention and protection – Part 1: Basic concepts and methodology
EN 1953	1998	Atomising and spraying equipment for coating materials – Safety requirements
EN 50014	1997	Electrical apparatus for potentially explosive atmospheres – General requirements
EN 50018	2000	Electrical apparatus for potentially explosive atmospheres – Flameproof enclosures "d"
EN 50019	2000	Electrical apparatus for potentially explosive atmospheres – Increased safety "e"
EN 50020	1994	Electrical apparatus for potentially explosive atmospheres – Intrinsic safety "i"
EN 50176	1996	Automatic electrostatic spraying installations for flammable liquid coating materials
EN 50177	1996	Automatic electrostatic spraying installations for flammable coating powder
EN 50223	2001	Automatic electrostatic application equipment for flammable flock material
EN 50281-1-1	1998	Electrical apparatus for use in the presence of combustible dust – Part 1-1: Electrical apparatus protected by enclosures – Construction and testing
EN 60079-10	1996	Electrical apparatus for explosive gas atmospheres – Part 10: Classification of hazardous areas
EN 60204-1	1997	Safety of machinery - Electrical equipment of machines – Part 1: General requirements
EN 60529	1991	Degrees of protection provided by enclosures (IP Code)

3 Definitions

The following definitions, specific to electrostatic liquid coating materials, powder and flock spray guns and associated apparatus, are applicable to this European Standard; they supplement the definitions which are given in EN 50014.

3.1

hand-held electrostatic paint, powder or flock spraying equipment

equipment for producing, charging and depositing suspended particles with the assistance of electric fields. It consists in general of the following parts: spray gun, high-voltage generator and connecting cable

3.1.1

associated apparatus

all the electrical apparatus required to generate and control the electrostatic voltage of the spray gun

3.1.2

connecting cable

all cables to the spray gun, including high-voltage cables

3.1.3

earth terminal

terminal intended to provide means for reliable earthing of parts of an equipment

3.1.4

high-voltage electrode

conducting part of the spray gun which is at high potential and serves to directly or indirectly charge the spraying material

3.1.5

high-voltage generator

part of the equipment for producing the high voltage and the corona current required

NOTE The high-voltage generator can be incorporated in the spray gun.

3.1.6

spray gun

part of the electrostatic spraying equipment from which the charged spraying material emerges and which is held and operated by the hand

NOTE This part is named **application** device in flocking technology.

3.2

hazardous area

area in which explosive atmosphere are, or may be expected to be, present in quantities such as to require special precautions for the construction, installation and use of electrical apparatus

3.3

spraying material

material which is applied by means of an electrostatic hand-held spraying equipment

3.3.1

explosive atmosphere

mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapour, mist, powders or flock, in which after ignition, combustion spreads throughout the unconsumed mixture

3.3.2

flammable spraying material

material which may be ignited by contact with an effective source of ignition and which may continue to burn or explode after removal of the source of ignition

3.4

U_{max}

maximum rated voltage of the high-voltage generator

3.5

workpiece

article on which the spraying material is to be deposited

4 Constructional requirements

4.1 General requirements for all types of spray guns

4.1.1 In view of other hazards which are important without being treated in this standard, the equipment shall in addition be constructed in accordance with the principles of EN 292 and the safety requirements of EN 1953.

As category 2 equipment according to Directive 94/9/EC, running under atmospheric conditions (0 °C to + 40 °C and 0,8 bar to 1,1 bar), hand-held spraying apparatus meeting these requirements is suitable for use in spraying areas.

4.1.2 The handle of the spray gun shall have a contact surface area of conductive material of at least 20 cm². This surface of metal or other conductive material shall be connected to the earth terminal (see 4.1.7). The resistance of this surface to earth shall not exceed 1 MΩ.

4.1.3 All cables shall be permanently attached to the spray gun (see 5.1.6). For flock spraying guns it is sufficient that all cables are attached securely.

4.1.4 Any cable to the gun, other than those carrying only earthed intrinsically safe circuits, shall include an earthed metallic screen protected by an insulated sheath. This does not apply to guns with high voltage generator inside the gun if there are two independent cables for the earth line on two separated contacts and if the insulation of the cables is high enough to withstand spraying with the gun directly on the cable. No voltage peaks on the high voltage generator may occur during this process.

4.1.5 All conductive parts of the spray gun other than those designed to acquire a high potential shall be assembled so that they remain in electrical contact with each other. These metal parts shall be connected to the earth terminal in the power supply or control unit of the high-voltage generator by means of terminals of the type described in 3.1 or 3.2 of the European Standard EN 50019 or other connections which are equally reliable.

NOTE A method of connection between the metal parts of the spray gun and the earth terminal of the power supply unit for the high-voltage generator is via the metallic screen referred to in 4.1.4.