
Električne naprave za potencialno eksplozivne atmosfere - Ročna oprema za elektrostatično brizganje

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

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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 2006-05-01. 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.

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, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the 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 formal vote and was approved by CENELEC as EN 50050 on 2006-05-01.

This European Standard supersedes EN 50050:2001.

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) 2007-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-05-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 94/9/EC. See Annex ZZ.

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

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Contents

Introduction	4
1 Scope	5
2 Normative references	6
3 Definitions	7
4 Constructional requirements	8
4.1 General requirements for all types of spray guns	8
4.2 Requirements only for spray guns for flammable liquid coating materials	9
4.3 Requirements only for spray guns for flammable coating powders	9
4.4 Requirements only for spray guns for flammable flock	10
5 Type tests	10
5.1 Test requirements for all types of spray guns	10
5.2 Ignition test for spray guns for liquid paints	11
5.3 Ignition test for non-triboelectrical spray guns for coating powders	12
5.4 Ignition test for triboelectrical spray guns for coating powders	12
5.5 Ignition test for spray guns for flock	12
6 Manufacturer's responsibility	12
7 Marking	13
7.1 Spray gun	13
7.2 High-voltage generator, associated equipment	13
8 Information for users	14
8.1 Instruction manual	14
Bibliography	16
Annex ZZ (informative) Coverage of Essential Requirements of EC Directives	17

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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.

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1 Scope

1.1 This European Standard specifies the constructional and test requirements for hand-held and hand-operated electrostatic spraying equipment and associated apparatus which can be used to spray flammable liquid coating materials, flammable coating powders or flammable flock creating explosive atmosphere in spraying areas which may or may not contain flammable adhesives.

This standard only deals with the hazards involved in the coating process when hand-held electrostatic spraying equipment 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 equipment, the safety requirements of EN 1953:1998 shall be met.

The spraying equipment shall be constructed suitable for group II category 2 as defined in EN 60079-0.

1.2 Requirements for automatic electrostatic spraying equipment for flammable coating materials are laid down in EN 50176, EN 50177 and EN 50223.

Hand-held electrostatic spraying equipment can be incorporated in automatic electrostatic spraying equipment provided the necessary requirements are considered.

1.3 The "General requirements" of EN 60079-0:2006 to be applied to hand-held electrostatic spray guns and to associated equipment are given in the Table 1 below:

Table 1 – General requirements of EN 60079-0:2006

Clause of EN 60079-0:2006	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	Only 6.1
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 equipment	Yes	Yes
27 Marking	Yes	No
Annex A	Yes	No

1.4 This European Standard does not deal with matters of noise created by the equipment. For this item, the requirements are laid down in EN ISO 11688-1.

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.

CLC/TR 50404	2003	Electrostatics – Code of practice for the avoidance of hazards due to static electricity
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 50176	200X ¹⁾	Automatic electrostatic spraying equipment for flammable liquid spraying materials
EN 50177	2006	Automatic electrostatic spraying equipment for flammable coating powder
EN 50223	2001	Automatic electrostatic application equipment for flammable flock material
EN 60079	series	Electrical apparatus for explosive gas atmospheres (IEC 60079 series, mod.)
EN 60079-0	2006	Electrical apparatus for explosive gas atmospheres – Part 0: General requirements (IEC 60079-0:2004, mod.)
EN 60079-1	200X ¹⁾	Electrical apparatus for explosive gas atmospheres – Part 1: Flameproof enclosures "d" (IEC 60079-1:200X)
EN 60079-7	200X ²⁾	Electrical apparatus for explosive gas atmospheres – Part 7: Increased safety "e" (IEC 60079-7:2006)
EN 60079-11	200X ²⁾	Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety "i" (IEC 60079-11:2006)
EN 60529	1991	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN 61241-1	2004	Electrical apparatus for use in the presence of combustible dust – Part 1: Protection by enclosures "tD" (IEC 61241-1:2004)
EN ISO 11688-1	1998	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)

¹⁾ At draft stage.

²⁾ To be published.

3 Definitions

The following definitions, specific to electrostatic liquid coating materials, powder and flock spray guns and associated equipment, are applicable to this European Standard; they supplement the definitions which are given in EN 60079.

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 equipment

all the electrical equipment 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

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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 equipment

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