
Requirements for the selection, installation and use of electrostatic spraying equipment for flammable materials - Part 3: Hand held electrostatic flock spray guns with an energy limit of 0,24 mJ or 5 mJ and their associated apparatus

Requirements for the selection, installation and use of electrostatic spraying equipment for flammable materials -- Part 3: Hand-held electrostatic flock spray guns with an energy limit of 0,24 mJ or 5 mJ and their associated apparatus

Bestimmungen für die Auswahl, Errichtung und Anwendung elektrostatischer Sprühanlagen für brennbare Sprühstoffe -- Teil 3: Elektrostatische Handsprüheinrichtungen für Flock mit einer Energiegrenze von 0,24 mJ oder 5 mJ sowie Zubehör

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Règles de sélection, d'installation et d'utilisation d'un équipement de projection électrostatique pour produits inflammables -- Partie 3: Pistolets manuels de projection électrostatique de flock avec une énergie limite de 0,24 mJ ou 5 mJ et leur matériel associé

Ta slovenski standard je istoveten z: EN 50053-3:1989

ICS:

29.260.20	Električni aparati za eksplozivna ozračja	Electrical apparatus for explosive atmospheres
87.100	Oprema za nanašanje premazov	Paint coating equipment

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KEY WORDS: Potentially explosive atmosphere; explosive atmosphere; explosion proofing; electrostatic hand-held spraying equipment; spray gun; flock; requirement for selection; requirement for installation; requirement for use

ENGLISH VERSION

REQUIREMENTS FOR THE SELECTION, INSTALLATION AND USE OF ELECTROSTATIC SPRAYING EQUIPMENT FOR FLAMMABLE MATERIALS
PART 3: HAND-HELD ELECTROSTATIC FLOCK SPRAY GUNS WITH AN ENERGY LIMIT OF 0.24 mJ OR 5 mJ AND THEIR ASSOCIATED APPARATUS

Règles de sélection, d'installation et d'utilisation d'un équipement de projection électrostatique pour produits inflammables

Troisième partie: Pistolets manuels de projection électrostatique de flock avec une énergie limitée de 0,24 mJ ou 5 mJ et leur matériel associé

Bestimmungen für die Auswahl, Errichtung und Anwendung elektrostatischer Sprühanlagen für brennbare Sprühstoffe
Teil 3: Elektrostatische Handsprüheinrichtungen für Flock mit einer Energiegrenze von 0,24 mJ oder 5 mJ sowie Zubehör

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This European Standard was ratified by CENELEC on 7 March 1989. CENELEC members are bound to comply with the requirements of the CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date list and bibliographical references concerning such national standards may be obtained on application to the CENELEC Central Secretariat or to any CENELEC member.

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

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, 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 Bréderode 2, B-1000 Brussels

EN 50 053-3

Foreword

The European Standard EN 50 053 is published in three parts:

Part 1: Hand-held electrostatic paint spray guns with an energy limit of 0,24 mJ and their associated apparatus.

Part 2: Hand-held electrostatic powder spray guns with an energy limit of 5 mJ and their associated apparatus.

Part 3: Hand-held electrostatic flock spray guns with an energy limit of 0,24 mJ or 5 mJ and their associated apparatus.

The reason for the publication in three parts is to draw to the attention of the user the particular requirements relevant to the chosen spraying material.

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TECHNICAL TEXT

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The following dates were fixed:

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- date of withdrawal of conflicting national standard (dow) : 1990-01-01

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EN 50 053-3

CENELEC Harmonization Document referred to in European Standard
EN 50 053 Part 3:

CENELEC HD 365 S3 Classification of degrees of protection provided by
enclosures (IEC 529 (1976) and amendments 1 and 2)

ISO Publication referred to in European Standard EN 50 053 Part 3:
ISO 2251 (1975) Lined antistatic rubber footwear.

European Standards referred to in European Standard EN 50 053 Part 3:

- EN 50 014 (1977)
(1st edition) Electrical apparatus for potentially explosive
atmospheres
- General requirements (including amendment 1 (July
1979), amendment 2 (June 1982), amendment 3
(December 1982), amendment 4 (December 1982) and
amendment 5 (February 1986).
- EN 50 050 (1986)
(1st edition) Electrical apparatus for potentially explosive
atmospheres - Electrostatic hand-held spraying
equipment.

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This European Standard has been prepared by CENELEC Sub-Committee 31-8.

1. Introduction

1.1 Process

In the process of electrostatic flock spraying the flock is transported in an air stream or by gravitational forces to an electrostatic spraying device. As the flock particles flow through the spraying device they are electrostatically charged by means of a high voltage of the order of tens of kilovolts provided by a high voltage generator. They are attracted by the earthed workpiece and stick to those parts of it which are covered with an adhesive layer. The adhesive is set at room temperature or by heating. Flock particles which are not deposited on the workpiece are extracted by a cleaning device.

1.2 Special hazard

An explosion may occur where both:

- the adhesives used form explosive gas atmospheres or the concentration of flock in air and/or gas falls within the limits for an explosive atmosphere.
and
- a source of ignition of sufficient energy for that explosive gas atmosphere or flock cloud is present. This ignition source can be, for example, a hot surface, a naked flame, an electrical arc or spark.

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It follows that an explosion can be prevented if one or preferably both of these conditions are avoided. Due to the difficulty in totally eliminating sources of ignition most reliance should be placed on avoiding explosive atmospheres of flock.

1.2.1 Although an intimate mixture of flammable flock and air may burn with explosive violence not all mixtures will do so. There is a range of concentrations of flock in air in which the mixture can explode but mixtures above or below this range cannot.

1.2.2 Experience has shown that when allowance is made for reasonable safety factor applied to the lower explosive limit of flock, a figure of 100 g/m³ is obtained.

1.2.3 Careful attention should be given to prevent the build-up of an electrostatic charge on various surfaces close to the flock application zone. These can be the workpieces being coated, the operator himself, etc. Care shall be taken to see that these are all adequately earthed. Of special importance is the attention needed to maintain proper earthing through the jigs supporting the workpieces. These should be carefully designed to minimize deposition of flock and/or adhesives on them.

2. Scope

This European Standard gives requirements for the selection, installation and safe use of hand-held electrostatic flock spray guns and their associated apparatus complying with EN 50 050 for the following cases when:

- a) flock spraying in association with adhesives which can form an explosive atmosphere, then the energy limit of the spray gun shall be 0,24 mJ;
- b) flock spraying in association with adhesives which do not form an explosive atmosphere, then the energy limit of the spray gun shall be 5 mJ.

This European Standard considers only the hazards that are specific to the electrostatic characteristics of the electrostatic spraying process.

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For other aspects, such as:

- classification of hazardous areas (for example classification into zones),
- selection, installation and use of electrical equipment in hazardous areas,
- health hazards (for example toxic and skin effects, electric shock),
- cleaning of flock spraying areas,
- fire hazard from external sources,
- storage and handling of flammable materials,
- explosion protection systems

national regulations apply.

NOTE: Applications of flock spray guns used only in association with adhesives which do not form an explosive atmosphere and where the ignition energy of flock is greater than 500 mJ are being considered by CENELEC/TC104.

3. Definitions

For this European Standard the following definitions apply:

3.1 Antistatic footwear

Footwear that has a resistance to earth, via the sole, which is low enough to prevent the build-up of electrostatic charges.

3.2 Antistatic gloves

Gloves that have a resistance low enough to prevent the build-up of electrostatic charges.

3.3 Antistatic floor

A floor that has a resistance to earth which is low enough to prevent the build-up of electrostatic charges.

3.4 Explosive atmosphere

A mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapour, mist, powder or flock, in such proportions that it can be exploded by excessive temperature, arcs or sparks (the danger is a real one).

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3.5 Average concentration of flock in air.

The quantity of flock emitted by the spray guns divided by the volume of air extracted by the ventilation system in the same period of time.

3.6 Flock

Flock consists of monofibres usually of uniform length of either natural or synthetic material.

3.7 Lower explosive limit (LEL)

The concentration of flammable vapour or flock in air below which an explosive atmosphere will not be formed.