SVENSK STANDARD SS-EN 50223

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Svenska Elektriska Kommissionen, SEK

Explosionsskyddad elektrisk materiel – Installation av utrustning för automatisk sprutmålning med brännbart flock

Automatic electrostatic application equipment for flammable flock material

Som svensk standard gäller europastandarden EN 50223:2001. Den svenska standarden innehåller den officiella engelska språkversionen av EN 50223:2001.

ICS 87.100

Denna standard är fastställd av Svenska Elektriska Kommissionen, SEK,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
Postadress: SEK, Box 1284, 164 29 KISTA
Telefon: 08 - 444 14 00. *Telefax*: 08 - 444 14 30
E-post: sek@sekom.se. *Internet*: www.sekom.se

EUROPEAN STANDARD **EN 50223**

NORME EUROPÉENNE

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ICS 87.100

English version

Automatic electrostatic application equipment for flammable flock material

Matériel automatique de projection électrostatique de flock inflammable

Ortsfeste elektrostatische Flockanlagen für entzündbaren Flock

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

Ref. No. EN 50223:2001 E

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 50223 on 2000-08-01.

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)	2001-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2003-08-01

Contents

Introduction

Process

In the process of electrostatic flock application the flock is transported e.g. either by gravitational forces from a hopper, or in an air stream, or by electrostatic forces through an electric field. As the flock particles flow through the flock application device and/or the electric field they are electrostatically charged by means of a high voltage of the order of some tens of kilovolts provided by a high voltage generator. In the form of a cloud they are attracted to and deposited on the earthed workpiece. They 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 not deposited on the workpiece (overspray) are extracted by the exhaust ventilation system or other means into the flock collection unit.

Special hazard

An explosion may occur where both:

- the adhesives used form explosive gas atmospheres or the concentration of flock or the hybrid mixture of both in air is in the explosion range, and

- a source of ignition of sufficient energy for that explosive gas atmosphere or flock cloud[1)] is present. This ignition source can be, for example, a hot surface, a naked flame or an electrical arc or spark.

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 concentrations of gas and flock in air.

NOTE 1 If an aqueous based or a flammable solvent free adhesive is used, an explosive gas atmosphere cannot be formed.

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

NOTE 2 If a flammable gas and/or flock cloud is confined within a space which restricts free escape of expanding gases and combustion products the explosion may lead to a pressure increase.

Where there is a doubt about or no knowledge of the lower explosion limit, an average concentration of the flock suspended in the air of 100 g/m^3 shall not be exceeded in the flock application cabin or booth. This does not apply to the flock field.

It is important that deposits of flock are not allowed to accumulate within the application areas for they may become disturbed and suspended in air and give rise to an explosive atmosphere. This does not apply to deposits on filter devices and accumulations of flock in hoppers where filters and hoppers are integrated in the flock application area and are designed to collect the flock.

Careful attention should be given to prevent the build-up of an electrostatic charge on various surfaces close to the flock application area. These can also be the workpieces being flocked or moving automatic devices and fixtures of the flock application system etc. Care shall be taken that these are adequately earthed. Of special importance is the attention needed to maintain proper earthing through the fixtures supporting the workpieces. These should be carefully designed to minimize deposition of flock and/or adhesives on them.

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1) Flammable flock material can behave as combustible/flammable dusts.

1 Scope

1.1 This European Standard specifies requirements for automatic electrostatic flock application equipment which is used for applying flammable flock which may form explosive atmospheres in the flock application area. In this connection a distinction is made between flock application devices which due to their type of construction comply with requirements as laid down in EN 50050:1986 as applicable, and those for which other discharge energies and/or current limits are stipulated.

It also specifies the constructional requirements for the safe operational conditions of the electrical installations including ventilation requirements. Additional requirements as to the construction of the flock application cabins and booths, etc. are dealt with in other standards, currently in preparation in CEN/TC 271.

1.2 This European Standard considers the following three broad classes of electrostatic flock application systems and two types of adhesives flammable and not flammable used in the flocking industry:

Type A Systems complying with EN 50050:1986 with a discharge energy limit of 0,24 mJ or 5 mJ (see 5.1.1)

In cases of flock application in association with adhesives which can form an explosive atmosphere, the energy limit of the flock application device shall be 0,24 mJ.

In cases of flock application in association with adhesives which do not form an explosive atmosphere, the discharge energy limit of the application device shall be 5 mJ.

In these systems there is no danger of either electric shock or incendive energy.

Type B Systems with a discharge energy limit in excess of 0,24 mJ or 5 mJ but less than 350 mJ and a current limit of less than 0,7 mA (see 5.1.2)

In these systems there is no danger of electric shock but there are dangers from incendive energy.

Type C Systems with a discharge energy in excess of 350 mJ and/or a current in excess of 0,7 mA (see 5.1.3)

In these systems there are dangers of electric shock and from incendive energy.

1.3 This European Standard considers only the hazards specific to the electrostatic characteristics of the electrostatic flock process.

1.4 For other aspects, such as:

- classification of hazardous areas for example into zones;
- selection, installation and use of electrical equipment in hazardous areas;
- health hazards;
- cleaning of application areas;
- fire hazard from external sources and flammable adhesives;
- storage and handling of flammable flock outside of the electrostatic flock application installation;
- fire protection;
- explosion protection systems;

where there are no harmonized European Standards then national regulations apply.

NOTE The use of electrostatic hand-held flock application equipment for flock material of minimum ignition energies in excess of 500 mJ only used with adhesives which do not form explosive gas atmospheres is covered by EN 50059.

1.5 This standard applies to automatic electrostatic flock applications, which have been produced after the date of publication of the present standard and in which flammable substances are released.