BRITISH STANDARD

BS EN 50177:2006

Incorporating corrigendum no. 1

Automatic electrostatic spraying equipment for flammable coating powder

ICS 87.100

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National foreword

This British Standard is the UK implementation of EN 50177:2006, incorporating corrigendum October 2007. It supersedes BS EN 50177:1997, which will be withdrawn on 1 May 2009.

The UK participation in its preparation was entrusted by Technical Committee GEL/31, Equipment for explosive atmospheres, to Subcommittee GEL/31/-/18, Electrostatic spray guns.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50177

October 2006

ICS 87.100

Supersedes EN 50177:1996
Incorporating corrigendum October 2007

English version

Automatic electrostatic spraying equipment for flammable coating powder

Installations automatiques
de projection électrostatique
de poudre de revêtement inflammable

Ortsfeste elektrostatische Sprühanlagen
für brennbare Beschichtungspulver

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.

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

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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 50177 on 2006-05-01.

This European Standard supersedes EN 50177:1996.

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

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0 Introduction

0.1 Process

In the process of electrostatic powder coating the powder is transported in an air stream from a powder hopper up to an electrostatic spraying device. As the powder particles flow through the spraying device they are electrostatically charged by means of a high voltage of the order of some tens of kilovolts and ejected in the form of a cloud which is directed towards the workpiece. The powder particles of the cloud are attracted to and deposited on the earthed workpiece. The powder will continue to be deposited on the earthed workpiece until, at a certain thickness, it acts as an insulator and so further deposition of powder is prevented.

Powder that is not deposited on the workpiece (overspray) is extracted by the exhaust ventilation system or other means into the powder collection unit.

The workpieces coated with powder are then passed into an oven where the powder is melted and cured into a coherent coating.

0.2 Special hazard

A flammable coating powder [1)] explosion may occur where both

– the concentration of coating powder in air is in the explosion range and

– a source of ignition of sufficient energy for that coating powder cloud 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 coating powder in air.

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

NOTE If a burning powder cloud is confined within a space which restricts free escape of expanding gases and combustion products the explosion may lead to a pressure increase.

0.2.2 The particle size distribution of coating powders is usually in the range of 5 µm to 80 µm. Where there is a doubt about or no knowledge of the lower explosion limit, an average concentration of the coating powder suspended in the air of 10 g/m³ shall not be exceeded.

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

0.2.4 Careful attention should be given to prevent the build-up of an electrostatic charge on various surfaces close to the powder application zone. These can be the workpieces being coated or moving automatic devices and fixtures of the powder spraying system etc. Care should 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 powder on them.

[1)] In the sense of this European Standard flammable coating powders are treated as combustible dusts.

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