L.N. 107 of 1999

# QUALITY CONTROL (EXPORTS, IMPORTS AND LOCAL GOODS) ACT (CAP. 225)

## Equipment and Protective Systems intended for Use in Potentially Explosive Atmospheres Order, 1999 (Order No. M42 of 1999)

IN exercise of the powers conferred by section 3 of the Quality Control (Exports, Imports and Local Goods) Act, the Malta Standardisation Authority has made the following order :-

Citation and commencement.

**1.1** This order may be cited as the Equipment and Protective Systems intended for Use in Potentially Explosive Atmospheres Order, 1999, and may be referred to as Order No. M42 of 1999.

1.2 This Order shall become operative on the 1st January, 2000, which date shall be notified by the Authority in the Gazette.

1.2.1 Provided that CE certificates of conformity to the harmonised standards obtained in accordance with the procedures laid down in Directives 76/117/EEC[1], 79/196/EEC[2] and 82/130/EEC[3], to be repealed as from 1st July, 2003, shall continue to be valid until 30th June, 2003 unless they expire before that date. Their validity shall continue to be limited to the harmonised standards indicated in the aforementioned Directives.

1.2.2 Provided that the requirement of paragraph 6 of this Order and the CE marking shall not be obligatory prior to the 1st June, 2000 in respect of:

1.2.2.1 stocks of equipment and protective systems already placed on the market prior to the 1st January, 2000;

1.2.2.2 equipment and protective systems ordered before the 1st January, 2000 and imported into Malta up to the 31st May, 2000.

Scope.

**2.1** This Order shall apply to equipment and protective systems intended for use in potentially explosive atmospheres.

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[1]OJ No. L24, 31-01-76, P.45. Directive as last amended by Directive 90/487/EEC (OJ No. L270, 02-10-90, P.23)

[2]OJ No. L 43, 20-02-79, P.20. Directive as last amended by Directive 90/487/EEC (OJ No. L270, 02-10-90, P23)

[3]OJ No. L59, 02-03-82, P.10.

2.1.1 Safety devices, controlling devices and regulating devices intended for use outside potentially explosive atmospheres but required for or contributing to the safe functioning of equipment and protective systems with respect to the risks of explosion are also covered by the scope of this Order.

**3.1** For the purposes of this Order, the following definitions shall apply: Definitions.

3.1.1 Equipment and protective systems intended for use in potentially explosive atmospheres

3.1.1.1 "Equipment" means machines, apparatus, fixed or mobile devices, control components and instrumentation thereof and detection or prevention systems which, separately or jointly, are intended for the generation, transfer, storage, measurement, control and conversion of energy for the processing of material and which are capable of causing an explosion through their own potential sources of ignition.

3.1.1.2 "Protective systems" means design units which are intended to halt incipient explosions immediately and/or to limit the effective range of explosion flames and explosion pressures. Protective systems may be integrated into equipment or separately placed on the market for use as autonomous systems.

3.1.1.3 "Components" means any item essential to the safe functioning of equipment and protective systems but with no autonomous function.

3.1.2. Explosive atmospheres

3.1.2.1 Mixture with air, under atmospheric conditions, of flammable substances in the form of gases, vapours, mists or dusts in which, after ignition has occurred, combustion spreads to the entire unburned mixture.

3.1.3 Potentially explosive atmosphere

3.1.3.1 An atmosphere which could become explosive due to local and operational conditions.

3.1.4 Equipment groups and categories

3.1.4.1 Equipment group I applies to equipment intended for use in underground parts of mines, and to those parts of surface installations of such mines, liable to be endangered by firedamp and/or combustible dust.

3.1.4.2 Equipment group II applies to equipment intended for use in other places liable to be endangered by explosive atmospheres.

3.1.4.3 The categories of equipment defining the required levels of protection are described in Schedule 1 to this Order.

3.1.4.4 Equipment and protective systems may be designed for a particular explosive atmosphere. In this case, they must be marked accordingly.

3.1.5 Intended use

3.1.5.1 The use of equipment, protective systems, and devices referred to in paragraph 2.1.1 in accordance with the equipment group and category and with all the information supplied by the manufacturer which is required for the safe functioning of equipment, protective systems and devices.

3.1.6 The following are excluded from the scope of this Order:

— medical devices intended for use in a medical environment,

— equipment and protective systems where the explosion hazard results exclusively from the presence of explosive substances or unstable chemical substances,

— equipment intended for use in domestic and non-commercial environments where potentially explosive atmospheres may only rarely be created, solely as a result of the accidental leakage of fuel gas,

— personal protective equipment covered by Mandatory Order M34 of 1998[4],

— seagoing vessels and mobile offshore units together with equipment on board such vessels or units,

— means of transport, which are vehicles and their trailers intended solely for transporting passengers by air or by road, rail or water networks, as well as means of transport, in so far as such means are designed for

[4]L.N. 122 of 1998.

transporting goods by air, by public road or rail networks or by water. Vehicles intended for use in a potentially explosive atmosphere shall not be excluded,

— the equipment covered by Article 223 (1) (b) of the EC Treaty, that is equipment connected with the production of or trade in arms, munitions and war material.

3.1.7 "The Directive" means Council Directive 94/9/EC[5] on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres.

3.1.8 "Approved body" means a body approved to carry out EC type examination as laid down in the Directive. The names of such approved bodies are published in the Official Journal of the European Communities.

3.1.9 "Harmonised Standard" means a technical specification adopted by the European Committee for Standardisation (CEN) or the European Committee for Electrotechnical Standardisation (CENELEC) or the European Telecommunications Standards Institute (ETSI), upon a remit from the European Commission in accordance with Directive 98/34/EC[6] of the European Parliament and of the Council laying down a procedure for the provision of information in the field of technical standards and regulations as amended by Directive 98/48/EC[7] of the European Parliament and of the Council.

3.1.10 "National Standard transposing the Harmonised Standard" means a Standard issued by one of the members of CEN/CENELEC/ETSI which is declared and noted to be technically equivalent to the Harmonised Standard originally issued by CEN/CENELEC/ETSI.

3.1.11 "OJ" means the Official Journal of the European Communities.

3.1.12 "Community" means the European Community.

3.1.13 "CE marking" means marking as set out in Schedule 3 to this Order.

3.1.14 "Placing on the market" means importation, wholesale, retail sale and distribution free of charge.

[5]OJ No. L100, 19-04-94, P.1.
[6]OJ No. L204, 21-07-98, P.37.
[7]OJ No. L217, 05-08-98, P.18.

3.1.15 "Manufacturer" means the person, who is primarily responsible for designing and manufacturing the equipment, protective systems and devices, so that these comply with the requirements of this Order.

3.1.16 "Local authorised representative" means any person (or organisation) established in Malta who has been appointed by the manufacturer to act on his behalf in carrying out certain tasks required by this Order.

3.1.17 "Importer" means any person who places the equipment, protective systems and devices from a foreign country on to the Maltese market so that he supplies such equipment, protective systems and devices on the first occasion that they are supplied in Malta.

3.1.18 "Person who supplies equipment, protective systems and devices" means a wholesaler, distributor, retailer or such other person.

3.1.19 "Responsible person" in relation to equipment and protective systems intended for use in potentially explosive atmospheres means:

(a) the manufacturer thereof;

(b) the manufacturer's local authorised representative; or

(c) where the manufacturer is not established in Malta and he has not appointed a local authorised representative, the person who places such equipment on the market.

Applicability.

**4.1** The provisions of this Order are applicable to all imported equipment and protective systems intended for use in potentially explosive atmospheres, as well as to those manufactured for the local market.

4.1.1 No person may manufacture, import, place on the market or put into service any equipment, protective systems and devices which do not comply with the provisions of this Order.

4.2. The provisions of this Order shall apply without prejudice to any other regulations or legislation concerning the safety and protection of persons and, in particular, workers using the equipment, protective systems, or devices referred to in paragraph 2.1.1 of this Order, provided that such equipment, protective systems, or devices are not modified in a way not specified in this Order.

4.3. Subject to paragraph 4.4 below, the provisions of this Order shall not apply to equipment and protective systems intended for use in potentially explosive atmospheres made exclusively for export.

4.4 Subject to paragraph 9 below, paragraph 4.3 above shall not apply if the CE marking or any inscription liable to be confused therewith is affixed to the equipment and protective systems intended for use in potentially explosive atmospheres.

**5.1** All appropriate measures shall be taken to ensure that the equipment, protective systems and devices referred to in paragraph 2.1.1 to which this Order applies may be placed on the market and put into service only if, when properly installed and maintained and used for their intended purpose, they do not endanger the health and safety of persons and, where appropriate, domestic animals or property. Conformity.

5.2 At trade fairs, exhibitions, demonstrations, etc., the showing of equipment, protective systems or the devices referred to in paragraph 2.1.1 which do not conform to the provisions of this Order shall not be prevented, provided that a visible sign clearly indicates that such equipment, protective systems, and devices referred to in paragraph 2.1.1 do not conform and that they are not for sale until they have been brought into conformity by the responsible person. During demonstrations, adequate safety measures shall be taken to ensure the protection of persons.

5.3 Equipment, protective systems and the devices referred to in paragraph 2.1.1 to which this Order applies must meet the essential health and safety requirements set out in Schedule 2 to this Order which apply to them, account being taken of their intended use.

5.4 The placing on the market and the putting into service of equipment, protective systems or devices referred to in paragraph 2.1.1 which comply with this Order, shall not be prohibited, restricted or impeded.

5.5 The placing on the market of components which, accompanied by a certificate of conformity as referred to in paragraph 8.3 of this Order, are intended to be incorporated into equipment or protective systems within the meaning of this Order, shall not be prohibited, restricted or impeded.

**6.1** Equipment, protective systems, and devices referred to in paragraph 2.1.1 accompanied by the EC declaration of conformity referred to in Schedule 3 to this Order and bearing the CE marking provided for in paragraph 9, shall be regarded as conforming to all the provisions of this Order, including the relevant conformity assessment procedures laid down in paragraph 8 of this Order and Article 9 of the Directive. CE marking and certificates of conformity.

6.2 The components referred to in paragraph 5.5, accompanied by the certificate of conformity referred to in paragraph 8.3 to this Order shall be regarded as conforming to all the provisions of this Order, including the relevant conformity assessment procedures laid down in paragraph 8 of this Order and Article 9 of the Directive.

6.2.1 In the absence of harmonised standards, any steps deemed necessary shall be taken to bring to the attention of the parties concerned the existing national technical standards and specifications regarded as important or relevant to the proper implementation of the essential health and safety requirements referred to in Schedule 2 to this Order.

6.3. Where a national standard transposing a harmonised standard, the reference for which has been published in the Official Journal of the European Communities, covers one or more of the essential health and safety requirements, the equipment, protective systems and devices referred to in paragraph 2.1.1, or the components referred to in paragraph 5.5, constructed in accordance with that standard shall be presumed to comply with the relevant essential health and safety requirements.

6.4 Where the equipment and protective systems are subject to other Community Directives covering other aspects which also provide for the affixing of the CE marking referred to in paragraph 9, that marking shall indicate that the equipment and protective systems are also presumed to conform with the provisions of those other Directives.

6.4.1 However, where one or more of those Directives allow the manufacturer, during a transitional period, to choose which arrangements to apply, the CE marking shall indicate conformity only with the Directives applied by the manufacturer. In this case, particulars of the said Directives, as published in the Official Journal of the European Communities, must be given in the documents, notices or instructions required by the Directives and accompanying the equipment and protective systems.

Withdrawal and prohibition from market.

**7.1** Where it is ascertained that equipment, protective systems or devices referred to in paragraph 2.1.1 bearing the CE conformity marking and used in accordance with their intended use are liable to endanger the safety of persons and, where appropriate, domestic animals or property, all appropriate measures shall be taken to withdraw such equipment or protective systems from the market, to prohibit the placing on the market, putting into service or use thereof, or to restrict free movement thereof.

7.2 Where equipment or a protective system which does not comply bears the CE conformity marking, the Malta Standardisation Authority shall take appropriate action against the person having affixed the marking or against the responsible person.

**8.1** The procedures for assessing the conformity of equipment, including where necessary the devices referred to in paragraph 2.1.1, shall be as follows: Conformity assessment procedures.

8.1.1 *Equipment-group I and II, equipment-category M 1 and 1*

8.1.1.1 The manufacturer or his local authorised representative must, in order to affix the CE marking, follow the EC type-examination procedure (referred to in Annex III of the Directive), in conjunction with:

— the procedure relating to production quality assurance (referred to in Annex IV of the Directive),

or

— the procedure relating to product verification (referred to in Annex V of the Directive);

8.1.2 *Equipment-group I and II, equipment-category M 2 and 2*

8.1.2.1 In the case of internal combustion engines and electrical equipment in these groups and categories, the manufacturer or his local authorised representative shall, in order to affix the CE marking, follow the EC-type examination procedure (referred to in Annex III of the Directive), in conjunction with:

— the procedure relating to conformity to type referred to in Annex VI of the Directive,

or

— the procedure relating to product quality assurance referred to in Annex VII of the Directive;

8.1.2.2 In the case of other equipment in these groups and categories, the manufacturer or his local authorised representative must, in order to affix the CE marking, follow the procedure relating

to internal control of production (referred to in Annex VIII of the Directive) and communicate the dossier provided for in Annex VIII, paragraph 3 of the Directive, to a notified body, which shall acknowledge receipt of it as soon as possible and shall retain it;

8.1.3 *Equipment-group II, equipment-category 3*

8.1.3.1 The manufacturer or his local authorised representative must, in order to affix the CE marking, follow the procedure relating to internal control of production referred to in Annex VIII of the Directive;

8.1.4 *Equipment-groups I and II*

8.1.4.1 In addition to the procedures referred to in Paragraphs 8.1.1, 8.1.2 and 8.1.3, the manufacturer or his local authorised representative may also, in order to affix the CE marking, follow the procedure relating to CE unit verification (referred to in Annex IX of the Directive).

8.2 The provisions of paragraphs 8.1.1 or 8.1.4 above shall be used for conformity assessment of autonomous protective systems.

8.3 The procedures referred to in paragraph 8.1 of this Order shall be applied in respect of components as referred to in paragraph 5.5 of this Order, with the exception of the affixing of the CE marking. A certificate shall be issued by the manufacturer or his local authorised representative, declaring the conformity of the components with the provisions of this Order which apply to them and stating their characteristics and how they must be incorporated into equipment or protective systems to assist compliance with the essential requirements applicable to finished equipment or protective systems.

8.4 In addition, the manufacturer or his local authorised representative may, in order to affix the CE marking, follow the procedure relating to internal control of production (referred to in Annex VIII of the Directive) with regard to the safety aspects referred to in item 1.2.7 of Schedule 2 to this Order.

8.5 Notwithstanding the previous paragraphs, the Malta Standardisation Authority may, on a duly justified request, authorise

the placing on the market and putting into service of the equipment, protective systems and individual devices referred to in paragraph 2.1.1 in respect of which the procedures referred to in the previous paragraphs have not been applied and the use of which is in the interests of protection.

8.6 Documents and correspondence relating to the procedures referred to in the abovementioned paragraphs shall be drawn up in, at least, Maltese and/or English or in a language accepted by the notified body.

CE conformity marking.

**9.1** The CE conformity marking shall consist of the initials "CE" in the form shown in the specimen in Schedule 3 to this Order. The CE marking shall be followed by the identification number of the notified body where such body is involved in the production control stage.

9.2 The CE marking shall be affixed distinctly, visibly, legibly and indelibly to equipment and protective systems, supplementary to the provisions of item 1.0.5 of Schedule 2 to this Order.

9.3 The affixing of markings on the equipment or protective systems which are likely to deceive third parties as to the meaning and form of the CE marking shall be prohibited. Any other marking may be affixed to the equipment or protective systems, provided that the visibility and legibility of the CE marking is not thereby reduced.

9.4 Without prejudice to paragraph 7:

9.4.1 where it is established that the CE marking has been incorrectly affixed, the responsible person shall be obliged to make the product conform as regards the provisions concerning the CE marking and to end the infringement under the conditions imposed by the Malta Standardisation Authority;

9.4.2 where non-conformity continues, all appropriate measures shall be taken to restrict or prohibit the placing on the market of the product in question or to ensure that it is withdrawn from the market in accordance with the procedures laid down in paragraph 7.

## Schedule 1

## Based on Annex I of the Directive

## CRITERIA DETERMINING THE CLASSIFICATION OF EQUIPMENT-GROUPS INTO CATEGORIES

### 1. Equipment-group I

(a) Category M 1 comprises equipment designed and, where necessary, equipped with additional special means of protection to be capable of functioning in conformity with the operational parameters established by the manufacturer and ensuring a very high level of protection.

Equipment in this category is intended for use in underground parts of mines as well as those parts of surface installations of such mines endangered by firedamp and/or combustible dust.

Equipment in this category is required to remain functional, even in the event of rare incidents relating to equipment, with an explosive atmosphere present, and is characterised by means of protection such that:

— either, in the event of failure of one means of protection, at least an independent second means provides the requisite level of protection,

— or the requisite level of protection is assured in the event of two faults occurring independently of each other.

Equipment in this category must comply with the supplementary requirements referred to in item 2.0.1 of Schedule 2 to this Order.

(b) Category M 2 comprises equipment designed to be capable of functioning in conformity with the operational parameters established by the manufacturer and ensuring a high level of protection.

Equipment in this category is intended for use in underground parts of mines as well as those parts of surface installations of such mines likely to be endangered by firedamp and/or combustible dust.

This equipment is intended to be de-energised in the event of an explosive atmosphere.

The means of protection relating to equipment in this category assure the requisite level of protection during normal operation and also in the case of more severe operating conditions, in particular those arising from rough handling and changing environmental conditions.

Equipment in this category must comply with the supplementary requirements referred to in Section 2.0.2. of Schedule 2 to this Order.

2. **Equipment-group II**

(a) Category 1 comprises equipment designed to be capable of functioning in conformity with the operational parameters established by the manufacturer and ensuring a very high level of protection.

Equipment in this category is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours or mists or by air/dust mixtures are present continuously, for long periods or frequently.

Equipment in this category must ensure the requisite level of protection, even in the event of rare incidents relating to equipment, and is characterised by means of protection such that:

— either, in the event of failure of one means of protection, at least an independent second means provides the requisite level of protection,

— or the requisite level of protection is assured in the event of two faults occurring independently of each other.

Equipment in this category must comply with the supplementary requirements referred to in item 2.1 of Schedule 2 of this Order.

(b) Category 2 comprises equipment designed to be capable of functioning in conformity with the operational parameters established by the manufacturer and of ensuring a high level of protection.

Equipment in this category is intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are likely to occur.

The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring disturbances or equipment faults which normally have to be taken into account.

Equipment in this category must comply with the supplementary requirements referred to in item 2.2. of Schedule 2 to this Order.

(c) Category 3 comprises equipment designed to be capable of functioning in conformity with the operating parameters established by the manufacturer and ensuring a normal level of protection.

Equipment in this category is intended for use in areas in which explosive atmospheres caused by gases, vapours, mists, or air/dust mixtures are unlikely to occur or, if they do occur, are likely to do so only infrequently and for a short period only.

Equipment in this category ensures the requisite level of protection during normal operation.

Equipment in this category must comply with the supplementary requirements referred to in item 2.3. of Schedule 2 to this Order.

## Schedule 2

## Based on Annex II of the Directive

# ESSENTIAL HEALTH AND SAFETY REQUIREMENTS RELATING TO THE DESIGN AND CONSTRUCTION OF EQUIPMENT AND PROTECTIVE SYSTEMS INTENDED FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES

### Preliminary observations

A. Technological knowledge, which can change rapidly, must be taken into account as far as possible and be utilised immediately.

B. For the devices referred to in paragraph 2.1.1, the essential requirements shall apply only in so far as they are necessary for the safe and reliable functioning and operation of those devices with respect to the risks of explosion.

## 1. COMMON REQUIREMENTS FOR EQUIPMENT AND PROTECTIVE SYSTEMS

### 1.0 General requirements

1.0.1 *Principles of integrated explosion safety*

Equipment and protective systems intended for use in potentially explosive atmospheres must be designed from the point of view of integrated explosion safety.

In this connection, the manufacturer must take measures:

— above all, if possible, to prevent the formation of explosive atmospheres which may be produced or released by equipment and by protective systems themselves,

— to prevent the ignition of explosive atmospheres, taking into account the nature of every electrical and non-electrical source of ignition,

— should an explosion nevertheless occur which could directly or indirectly endanger persons and, as the case may be, domestic animals or property, to halt it immediately and/or to limit the range of explosion flames and explosion pressures to a sufficient level of safety.

1.0.2 Equipment and protective systems must be designed and manufactured after due analysis of possible operating faults in order as far as possible to preclude dangerous situations.

Any misuse which can reasonably be anticipated must be taken into account.

1.0.3 *Special checking and maintenance conditions*

Equipment and protective systems subject to special checking and maintenance conditions must be designed and constructed with such conditions in mind.

1.0.4 *Surrounding area conditions*

Equipment and protective systems must be so designed and constructed so as to be capable of coping with actual or foreseeable surrounding area conditions.

1.0.5 *Marking*

All equipment and protective systems must be marked legibly and indelibly with the following minimum particulars:

— name and address of the manufacturer,

— CE marking (see Schedule 3, Section A),

— designation of series or type,

— serial number, if any,

— year of construction,

— the specific marking of explosion protection



followed by the symbol of the equipment group and category,

— for equipment-group II, the letter 'G' (concerning explosive atmospheres caused by gases, vapours or mists),

and/or

the letter 'D' (concerning explosive atmospheres caused by dust).

Furthermore, where necessary, they must also be marked with all information essential to their safe use.

1.0.6 *Instructions*

(a) All equipment and protective systems must be accompanied by instructions, including at least the following particulars:

— a recapitulation of the information with which the equipment or protective system is marked, except for the serial number (see 1.0.5.), together with any appropriate additional information to facilitate maintenance (e.g. address of the importer, repairer, etc.);

— instructions for safe —

— putting into service,

— use,

— assembling and dismantling,

— maintenance (servicing and emergency repair),

— installation,

— adjustment;

— where necessary, an indication of the danger areas in front of pressure-relief devices;

— where necessary, training instructions;

— details which allow a decision to be taken beyond any doubt as to whether an item of equipment in a specific category or a protective system can be used safely in the intended area under the expected operating conditions;

— electrical and pressure parameters, maximum surface temperatures and other limit values;

— where necessary, special conditions of use, including particulars of possible misuse which experience has shown might occur;

— where necessary, the essential characteristics of tools which may be fitted to the equipment or protective system.

(b) The instructions must be drawn up in one of the European Community languages by the manufacturer or his local authorised representative.

On being put into service, all equipment and protective systems must be accompanied by a translation of the instructions in at least Maltese and/or English and by the instructions in the original language.

This translation must be made by either the manufacturer or his local authorised representative or by the person introducing the equipment or protective system in Malta.

By way of derogation from this requirement, the maintenance instructions for use by the specialist personnel employed by the manufacturer or his local authorised representative may be drawn up in a single European Community language understood by that personnel.

(c) The instructions must contain the drawings and diagrams necessary for the putting into service, maintenance, inspection, checking of correct operation and, where appropriate, repair of the equipment or protective system, together with all useful instructions, in particular with regard to safety.

(d) Literature describing the equipment or protective system must not contradict the instructions with regard to safety aspects.

### 1.1 Selection of materials

1.1.1 The materials used for the construction of equipment and protective systems must not trigger off an explosion, taking into account foreseeable operational stresses.

1.1.2 Within the limits of the operating conditions laid down by the manufacturer, it must not be possible for a reaction to take place between the materials used and the constituents of the potentially explosive atmosphere which could impair explosion protection.

1.1.3 Materials must be so selected that predictable changes in their characteristics and their compatibility in combination with other materials will not lead to a reduction in the protection afforded; in particular, due account must be taken of the material's corrosion and wear resistance, electrical conductivity, impact strength, ageing resistance and the effects of temperature variations.

### 1.2 Design and Construction

1.2.1 Equipment and protective systems must be designed and constructed with due regard to technological knowledge of explosion protection so that they can be safely operated throughout their foreseeable lifetime.

1.2.2 Components to be incorporated into or used as replacements in equipment and protective systems must be so designed and constructed that they

function safely for their intended purpose of explosion protection when they are installed in accordance with the manufacturer's instructions.

1.2.3 *Enclosed structures and prevention of leaks*

Equipment which may release flammable gases or dusts must wherever possible employ enclosed structures only.

If equipment contains openings or non-tight joints, these must as far as possible be designed in such a way that developing gases or dusts cannot give rise to explosive atmospheres outside the equipment.

Points where materials are introduced or drawn off must, as far as possible, be designed and equipped so as to limit escapes of flammable materials during filling or draining.

1.2.4 *Dust deposits*

Equipment and protective systems which are intended to be used in areas exposed to dust must be so designed that deposit dust on their surfaces is not ignited.

In general, dust deposits must be limited where possible. Equipment and protective systems must be easily cleanable.

The surface temperatures of equipment parts must be kept well below the glow temperature of the deposit dust.

The thickness of deposit dust must be taken into consideration and, if appropriate, means must be taken to limit the temperature in order to prevent a heat build up.

1.2.5 *Additional means of protection*

Equipment and protective systems which may be exposed to certain types of external stresses must be equipped, where necessary, with additional means of protection.

Equipment must withstand relevant stresses, without adverse effect on explosion protection.

1.2.6 *Safe opening*

If equipment and protective systems are in a housing or a locked container forming part of the explosion protection itself, it must be possible to open such housing or container only with a special tool or by means of appropriate protection measures.

1.2.7 *Protection against other hazards*

Equipment and protective systems must be so designed and manufactured so as to:

(a) avoid physical injury or other harm which might be caused by direct or indirect contact;

(b) assure that surface temperatures of accessible parts or radiation which would cause a danger, are not produced;

(c) eliminate non-electrical dangers which are revealed by experience;

(d) assure that foreseeable conditions of overload shall not give rise to dangerous situations.

Where, for equipment and protective systems, the risks referred to in this paragraph are wholly or partly covered by other Orders, this Order shall not apply or shall cease to apply in the case of such equipment and protective systems and of such risks upon application of those specific Orders.

1.2.8 *Overloading of equipment*

Dangerous overloading of equipment must be prevented at the design stage by means of integrated measurement, regulation and control devices, such as over-current cut-off switches, temperature limiters, differential pressure switches, flowmeters, time-lag relays, overspeed monitors, and/or similar types of monitoring devices.

1.2.9 *Flameproof enclosure systems*

If parts which can ignite an explosive atmosphere are placed in an enclosure, measures must be taken to ensure that the enclosure withstands the pressure developed during an internal explosion of an explosive mixture and prevents the transmission of the explosion to the explosive atmosphere surrounding the enclosure.

## 1.3 Potential ignition sources

1.3.1 *Hazards arising from different ignition sources*

Potential ignition sources such as sparks, flames, electric arcs, high surface temperatures, acoustic energy, optical radiation, electromagnetic waves and other ignition sources must not occur.

1.3.2 *Hazards arising from static electricity*

Electrostatic charges capable of resulting in dangerous discharges must be prevented by means of appropriate measures.

1.3.3 *Hazards arising from stray electric and leakage currents*

Stray electric and leakage currents in conductive equipment parts which could result in, for example, the occurrence of dangerous corrosion, overheating of surfaces or sparks capable of provoking an ignition must be prevented.

1.3.4 *Hazards arising from overheating*

Overheating caused by friction or impacts occurring, for example, between materials and parts in contact with each other while rotating or through the intrusion of foreign bodies must, as far as possible, be prevented at the design stage.

1.3.5 *Hazards arising from pressure compensation operations*

Equipment and protective systems must be so designed or fitted with integrated measuring, control and regulation devices that pressure compensations arising from them do not generate shock waves or compressions which may cause ignition.

## 1.4 Hazards arising from external effects

1.4.1 Equipment and protective systems must be so designed and constructed as to be capable of performing their intended function in full safety, even in changing environmental conditions and in the presence of extraneous voltages, humidity, vibrations, contamination and other external effects, taking into account the limits of the operating conditions established by the manufacturer.

1.4.2 Equipment parts used must be appropriate to the intended mechanical and thermal stresses and capable of withstanding attack by existing or foreseeable aggressive substances.

## 1.5 Requirements in respect of safety-related devices

1.5.1 Safety devices must function independently of any measurement or control devices required for operation.

As far as possible, failure of a safety device must be detected sufficiently rapidly by appropriate technical means to ensure that there is only very little likelihood that dangerous situations will occur.

For electrical circuits the fail-safe principle is to be applied in general.

Safety-related switching must, in general, directly actuate the relevant control devices without intermediate software command.

1.5.2 In the event of a safety device failure, equipment and/or protective systems shall, wherever possible, be secured.

1.5.3 Emergency stop controls of safety devices must, as far as possible, be fitted with restart lockouts. A new start command may take effect on normal operation only after the restart lockouts have been intentionally reset.

1.5.4 *Control and display units*

Where control and display units are used, they must be designed in accordance with ergonomic principles in order to achieve the highest possible level of operating safety with regard to the risk of explosion.

1.5.5 *Requirements in respect of devices with a measuring function for explosion protection*

In so far as they relate to equipment used in explosive atmospheres, devices with a measuring function must be designed and constructed so that they can cope with foreseeable operating requirements and special conditions of use.

1.5.6 Where necessary, it must be possible to check the reading accuracy and serviceability of devices with a measuring function.

1.5.7 The design of devices with a measuring function must incorporate a safety factor which ensures that the alarm threshold lies far enough outside the explosion and/or ignition limits of the atmospheres to be registered, taking into account, in particular, the operating conditions of the installation and possible aberrations in the measuring system.

1.5.8 *Risks arising from software*

In the design of software-controlled equipment, protective systems and safety devices, special account must be taken of the risks arising from faults in the programme.

## 1.6 Integration of safety requirements relating to the system

1.6.1 Manual override must be possible in order to shut down the equipment and protective systems incorporated within automatic processes which deviate from the intended operating conditions, provided that this does not compromise safety.

1.6.2 When the emergency shutdown system is actuated, accumulated energy must be dispersed as quickly and as safely as possible or isolated so that it no longer constitutes a hazard.

This does not apply to electrochemically-stored energy.

1.6.3 *Hazards arising from power failure*

Where equipment and protective systems can give rise to a spread of additional risks in the event of a power failure, it must be possible to maintain them in a safe state of operation independently of the rest of the installation.

1.6.4 *Hazards arising from connections*

Equipment and protective systems must be fitted with suitable cable and conduit entries.

When equipment and protective systems are intended for use in combination with other equipment and protective systems, the interface must be safe.

1.6.5 *Placing of warning devices as parts of equipment*

Where equipment or protective systems are fitted with detection or alarm devices for monitoring the occurrence of explosive atmospheres, the necessary instructions must be provided to enable them to be provided at the appropriate places.

## 2. SUPPLEMENTARY REQUIREMENTS IN RESPECT OF EQUIPMENT

### 2.0 Requirements applicable to equipment in category M of equipment-group I

2.0.1 *Requirements applicable to equipment in category M 1 of equipment-group I*

2.0.1.1 Equipment must be so designed and constructed that sources of ignition do not become active, even in the event of rare incidents relating to equipment.

Equipment must be equipped with means of protection such that:

— either, in the event of failure of one means of protection, at least an independent second means provides the requisite level of protection,

— or, the requisite level of protection is ensured in the event of two faults occurring independently of each other.

Where necessary, this equipment must be equipped with additional special means of protection.

It must remain functional with an explosive atmosphere present.

2.0.1.2 Where necessary, equipment must be so constructed that no dust can penetrate it.

2.0.1.3 The surface temperatures of equipment parts must be kept clearly below the ignition temperature of the foreseeable air/dust mixtures in order to prevent the ignition of suspended dust.

2.0.1.4 Equipment must be so designed that the opening of equipment parts which may be sources of ignition is possible only under non-active or intrinsically safe conditions. Where it is not possible to render equipment non-active, the manufacturer must affix a warning label to the opening part of the equipment.

If necessary, equipment must be fitted with appropriate additional interlocking systems.

2.0.2 *Requirements applicable to equipment in category M 2 of equipment-group I*

2.0.2.1 Equipment must be equipped with means of protection ensuring that sources of ignition do not become active during normal operation, even under more severe operating conditions, in particular those arising from rough handling and changing environmental conditions.

The equipment is intended to be de-energised in the event of an explosive atmosphere.

2.0.2.2 Equipment must be so designed that the opening of equipment parts which may be sources of ignition is possible only under non-active conditions or via appropriate interlocking systems. Where it is not possible to render equipment non-active, the manufacturer must affix a warning label to the opening part of the equipment.

2.0.2.3. The requirements regarding explosion hazards arising from dust applicable to category M 1 must be applied.

**2.1 Requirements applicable to equipment in category 1 of equipment-group II**

2.1.1 *Explosive atmospheres caused by gases, vapours or hazes*

2.1.1.1 Equipment must be so designed and constructed that sources of ignition do not become active, even in the event of rare incidents relating to equipment.

It must be equipped with means of protection such that:

— either, in the event of failure of one means of protection, at least an independent second means provides the requisite level of protection,

— or, the requisite level of protection is ensured in the event of two faults occurring independently of each other.

2.1.1.2 For equipment with surfaces which may heat up, measures must be taken to ensure that the stated maximum surface temperatures are not exceeded even in the most unfavourable circumstances.

Temperature rises caused by heat build-ups and chemical reactions must also be taken into account.

2.1.1.3 Equipment must be so designed that the opening of equipment parts which might be sources of ignition is possible only under non-active or intrinsically safe conditions. Where it is not possible to render equipment non-active, the manufacturer must affix a warning label to the opening part of the equipment.

If necessary, equipment must be fitted with appropriate additional interlocking systems.

2.1.2 *Explosive atmospheres caused by air/dust mixtures*

2.1.2.1 Equipment must be so designed and constructed that ignition of air/dust mixtures does not occur even in the event of rare incidents relating to equipment.

It must be equipped with means of protection such that:

— either, in the event of failure of one means of protection, at least an independent second means provides the requisite level of protection,

— or, the requisite level of protection is ensured in the event of two faults occurring independently of each other.

2.1.2.2 Where necessary, equipment must be so designed that dust can enter or escape from the equipment only at specifically designated points.

This requirement must also be met by cable entries and connecting pieces.

2.1.2.3 The surface temperatures of equipment parts must be kept well below the ignition temperature of the foreseeable air/dust mixtures in order to prevent the ignition of suspended dust.

2.1.2.4 With regard to the safe opening of equipment parts, requirement 2.1.1.3 applies.

## 2.2 Requirements for category 2 of equipment-group II

2.2.1 *Explosive atmospheres caused by gases, vapours or mists*

2.2.1.1 Equipment must be so designed and constructed as to prevent ignition sources arising, even in the event of frequently occurring disturbances or equipment operating faults, which normally have to be taken into account.

2.2.1.2 Equipment parts must be so designed and constructed that their stated surface temperatures are not exceeded, even in the case of risks arising from abnormal situations anticipated by the manufacturer.

2.2.1.3 Equipment must be so designed that the opening of equipment parts which might be sources of ignition is possible only under non-active conditions or via appropriate interlocking systems. Where it is not possible to render equipment non-active, the manufacturer must affix a warning label to the opening part of the equipment.

2.2.2 *Explosive atmospheres caused by air/dust mixtures*

2.2.2.1 Equipment must be so designed and constructed so that ignition of air/dust mixtures is prevented, even in the event of frequently occurring disturbances or equipment operating faults which normally have to be taken into account.

2.2.2.2 With regard to surface temperatures, requirement 2.1.2.3 applies.

2.2.2.3 With regard to protection against dust, requirement 2.1.2.2 applies.

2.2.2.4 With regard to the safe opening of equipment parts, requirement 2.2.1.3 applies.

## 2.3 Requirements applicable to equipment in category 3 of equipment-group II

2.3.1 *Explosive atmospheres caused by gases, vapours or mists*

2.3.1.1 Equipment must be so designed and constructed as to prevent foreseeable ignition sources which can occur during normal operation.

2.3.1.2 Surface temperatures must not exceed the stated maximum surface temperatures under intended operating conditions. Higher temperatures in exceptional circumstances may be allowed only if the manufacturer adopts special additional protective measures.

2.3.2 *Explosive atmospheres caused by air/dust mixtures*

2.3.2.1 Equipment must be so designed and constructed that air/dust mixtures cannot be ignited by foreseeable ignition sources likely to exist during normal operation.

2.3.2.2 With regard to surface temperatures, requirement 2.1.2.3 applies.

2.3.2.3 Equipment, including cable entries and connecting pieces, must be so constructed that, taking into account the size of its particles, dust can neither develop explosive mixtures with air nor form dangerous accumulations inside the equipment.

## 3. SUPPLEMENTARY REQUIREMENTS IN RESPECT OF PROTECTIVE SYSTEMS

### 3.0 General requirements

3.0.1 Protective systems must be dimensioned in such a way as to reduce the effects of an explosion to a sufficient level of safety.

3.0.2 Protective systems must be designed and capable of being positioned in such a way that explosions are prevented from spreading through dangerous chain reactions or flashover and incipient explosions do not become detonations.

3.0.3 In the event of a power failure, protective systems must retain their capacity to function for a period sufficient to avoid a dangerous situation.

3.0.4 Protective systems must not fail due to outside interference.

### 3.1 Planning and design

3.1.1 *Characteristics of materials*

With regard to the characteristics of materials, the maximum pressure and temperature to be taken into consideration at the planning stage are the expected pressure during an explosion occurring under extreme operating conditions and the anticipated heating effect of the flame.

3.1.2 Protective systems designed to resist or contain explosions must be capable of withstanding the shock wave produced without losing system integrity.

3.1.3 Accessories connected to protective systems must be capable of withstanding the expected maximum explosion pressure without losing their capacity to function.

3.1.4 The reactions caused by pressure in peripheral equipment and connected pipe-work must be taken into consideration in the planning and design of protective systems.

3.1.5 *Pressure-relief systems*

If it is likely that stresses on protective systems will exceed their structural strength, provision must be made in the design for suitable pressure-relief devices which do not endanger persons in the vicinity.

3.1.6 *Explosion suppression systems*

Explosion suppression systems must be so planned and designed that they react to an incipient explosion at the earliest possible stage in the event of an incident and counteract it to best effect, which due regard to the maximum rate of pressure increase and the maximum explosion pressure.

3.1.7 *Explosion decoupling systems*

Decoupling systems intended to disconnect specific equipment as swiftly as possible in the event of incipient explosions by means of appropriate devices must be planned and designed so as to remain proof against the transmission of internal ignition and to retain their mechanical strength under operating conditions.

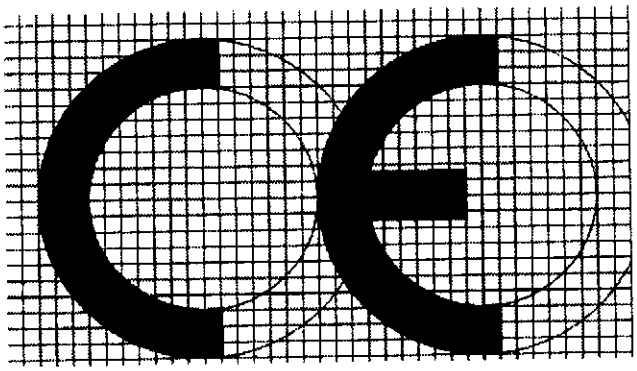
3.1.8 Protective systems must be capable of being integrated into a circuit with a suitable alarm threshold so that, if necessary, there is cessation of product feed and output and shutdown of equipment parts which can no longer function safely.

## Schedule 3

## Based on Annex X of the Directive

### A. CE MARKING

The CE conformity marking shall consist of the initials "CE" in the following form:



For the avoidance of doubt, it is hereby declared that the grid providing the background in the above graduated drawing is not part of the CE marking.

If the CE marking is reduced or enlarged the proportions given in the above graduated drawing must be respected.

The various components of the CE marking must have substantially the same vertical dimension, which may not be less than 5mm.

This minimum dimension may be waived for small-scale equipment, protective systems or devices referred to in paragraph 2.1.1.

## B. CONTENT OF THE EC DECLARATION OF CONFORMITY

The EC declaration of conformity must contain the following elements:

— the name or identification mark and the address of the manufacturer or his local authorised representative;

— a description of the equipment, protective system, or device referred to in paragraph 2.1.1;

— all relevant provisions fulfilled by the equipment, protective system, or device referred to in paragraph 2.1.1.;

— where appropriate, the name, identification number and address of the notified body and the number of the EC-type-examination certificate;

— where appropriate, reference to the harmonised standards;

— where appropriate, the standards and technical specifications which have been used;

— where appropriate, references to other Community Directives which have been applied;

— identification of the signatory who has been empowered to enter into commitments on behalf of the manufacturer or his local authorised representative.