

## SCHEDULE 1

### ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

#### *COMMON REQUIREMENTS FOR EQUIPMENT AND PROTECTIVE SYSTEMS*

##### General requirements

##### **Principles of integrated explosion safety**

2.—(1) Equipment and protective systems intended for use in potentially explosive atmospheres shall be designed from the point of view of integrated explosion safety.

(2) In this connection, the manufacturer shall take measures—

- (a) above all, if possible, to prevent the formation of explosive atmospheres which may be produced or released by equipment and by protective systems themselves;
- (b) to prevent the ignition of explosive atmospheres, taking into account the nature of every electrical and non-electrical source of ignition; and
- (c) should an explosion nevertheless occur which could directly or indirectly endanger persons and, as the case may be, domestic animals or property, to halt the explosion immediately or to limit the range of explosion flames and explosion pressures to a sufficient level of safety, or both.

(3) Equipment and protective systems shall be designed and manufactured after due analysis of possible operating faults in order as far as possible to preclude dangerous situations.

(4) Any misuse which can reasonably be anticipated shall be taken into account.

##### **Special checking and maintenance conditions**

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

##### **Surrounding area conditions**

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

##### **Marking**

5.—(1) All equipment and protective systems shall be marked legibly and indelibly with the following minimum particulars—

- (a) name, registered trade name or registered trade mark, and address of the manufacturer;
- (b) CE marking (see Annex II to RAMS);
- (c) designation of series or type;
- (d) batch or serial number, if any;
- (e) year of construction;
- (f) the specific marking of explosion protection



followed by the symbol of the equipment-group and category;

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- (g) for equipment-group II,
    - (i) the letter 'G' (concerning explosive atmospheres caused by gases, vapours or mists);  
or
    - (ii) the letter 'D' (concerning explosive atmospheres caused by dust); or
    - (iii) both the letter 'G' (concerning explosive atmospheres caused by gases, vapours or mists) and the letter 'D' (concerning explosive atmospheres caused by dust).
- (2) Furthermore, where necessary, they shall also be marked with all information essential to their safe use.

### **Instructions**

6.—(1) All equipment and protective systems shall be accompanied by instructions, including at least the following particulars—

- (a) a recapitulation of the information with which the equipment or protective system is marked, except for the batch or serial number (see paragraphs 5(1) and (2)), together with any appropriate additional information to facilitate maintenance (e.g. address of the repairer, etc.);
- (b) instructions for safe—
  - (i) putting into service;
  - (ii) use;
  - (iii) assembling and dismantling;
  - (iv) maintenance (servicing and emergency repair);
  - (v) installation;
  - (vi) adjustment;
- (c) where necessary, an indication of the danger areas in front of pressure-relief devices;
- (d) where necessary, training instructions;
- (e) 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;
- (f) electrical and pressure parameters, maximum surface temperatures and other limit values;
- (g) where necessary, special conditions of use, including particulars of possible misuse which experience has shown might occur;
- (h) where necessary, the essential characteristics of tools which may be fitted to the equipment or protective system.

(2) The instructions shall 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.

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

### **Selection of materials**

7.—(1) The materials used for the construction of equipment and protective systems shall not trigger off an explosion, taking into account foreseeable operational stresses.

(2) Within the limits of the operating conditions laid down by the manufacturer, it shall 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.

(3) Materials shall 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 shall be taken of the material's corrosion and wear resistance, electrical conductivity, mechanical strength, ageing resistance and the effects of temperature variations.

### **Design and construction**

8.—(1) Equipment and protective systems shall be designed and constructed with due regard to technological knowledge of explosion protection so that they can be safely operated throughout their foreseeable lifetime.

(2) Components to be incorporated into or used as replacements in equipment and protective systems shall 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.

### **Enclosed structures and prevention of leaks**

9.—(1) Equipment which may release flammable gases or dusts shall, wherever possible, employ enclosed structures only.

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

(3) Points where materials are introduced or drawn off shall, as far as possible, be designed and equipped so as to limit releases of flammable materials during filling or draining.

### **Dust deposits**

10.—(1) Equipment and protective systems which are intended to be used in areas exposed to dust shall be so designed that deposit dust on their surfaces is not ignited.

(2) In general, dust deposits shall be limited where possible. Equipment and protective systems shall be easily cleanable.

(3) The surface temperatures of equipment parts shall be kept well below the glow temperature of the deposit dust.

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

### **Additional means of protection**

11.—(1) Equipment and protective systems which may be exposed to certain types of external stresses shall be equipped, where necessary, with additional means of protection.

(2) Equipment shall withstand relevant stresses, without adverse effect on explosion protection.

### **Safe opening**

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

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### **Protection against other hazards**

13.—(1) Equipment and protective systems shall be so designed and manufactured 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 do not give rise to dangerous situations.

(2) Where, for equipment and protective systems, the risks referred to in this paragraph (1) are wholly or partly covered by other European Union legislation, these Regulations do not apply or cease to apply in the case of such equipment and protective systems and of such risks upon application of that specific European Union legislation.

### **Overloading of equipment**

14. Dangerous overloading of equipment shall 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 or similar types of monitoring devices, or both overspeed monitors and similar types of monitoring devices.

### **Flameproof enclosure systems**

15. If parts which can ignite an explosive atmosphere are placed in an enclosure, measures shall 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.