

Hazardous areas



THE CLASSIFICATION OF AREAS AND THE USE OF PROTECTED APPARATUS

Codes of practice have been established for the classification of the potential hazards, the selection of suitable equipment to protect against the hazards, their installation and their maintenance.

These codes of practice may be local, national or international documents. The codes of practice will list the methods of protection which, used singly or in combination, may be employed to attain an acceptable degree of safety.

GUIDE TO HAZARDOUS AREA EQUIPMENT

Whitecroft Lighting hazardous area products are manufactured in accordance with the best engineering practices and to established construction standards for explosion protected apparatus. The equipment must be selected, installed, maintained and disposed of to comply with any regulations or legislation appropriate to the operational situation.

Surface temperature rating and gas groupings

Any flammable mixture can be classified for explosion protection under two main characteristics:

- Temperature of ignition by hot surfaces
- Spark energy to ignite the mixture.

The spark energy of ignition is also related to the intensity of explosion. This property is crucial to the design of the joints in 'flameproof enclosures' and the energy level of intrinsically safe apparatus.

Other characteristics are the specific gravity and flash point, which are used in the determination of the Zonal classification.

GAS GROUPING

The gas and vapour mixtures are classified as shown in Table 4 (left). The list shown is only representative as the possible number of chemical compounds is extensive.

The classification shown is that associated with the IEC and CENELEC harmonised standards.

Once the Zone has been established (Table 1), the Gas Group has been identified (examples are given in Table 4) and the required Temperature class (see Table 3) has been determined, suitable equipment can be selected.

The chosen equipment must have an explosion protection category which matches the hazard or provides a greater level of safety.



Certification Authority Mark

Group II products only
BASEEFA, Buxton



Community Mark

This should be used in addition to the above mark if the product is certified to the harmonised standards under the EEC directives



ACFDN
see p184



Curie Hazardous
see p245

Table 1

HAZARDOUS AREAS CLASSIFICATION	
Zone 0	Zone in which an explosive atmosphere is continuously present for long periods
Zone 1	Zone in which an explosive atmosphere is likely to occur in normal operation
Zone 2	Zone in which an explosive atmosphere is not likely to occur in normal operation, and if it occurs it will exist only for a short time

The deployment of protected apparatus in the areas according to BS 5345 is summarised in Table 2 below.

Table 2

DEPLOYMENT OF PROTECTED APPARATUS		
ZONE	TYPE OF PROTECTION	CODE PART REFERENCE
0	Ex 'ia'	Part 4
	Ex 's' (Specifically certified for use in Zone 0)	Part 8
1	Any type of protection suitable for Zone 0 &	
	Ex 'd'	Part 3
	Ex 'ib'	Part 4
	Ex 'p'	Part 5
	Ex 'e'	Part 6
	Ex 's'	Part 8
2	Any type of protection suitable for Zone 0 or 1 &	
	Ex 'N'	Part 7
	Ex 'o'	Part 9
	Ex 'q'	Part 9

Note: Ex'm' is included in Zone 1

Table 3

CLASSIFICATION OF GROUP II ELECTRICAL APPARATUS	
TEMPERATURE CLASS	MAXIMUM SURFACE TEMPERATURE °C
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

(From EN 50014)

Table 4

GAS GROUPING FOR ELECTRICAL APPARATUS	
GROUP	GAS
I (MINING)	Firedamp (methane)
IIA	Industrial methane, propane and most industrial gases
IIB	Ethylene, coke oven gas and other industrial gases
IIC	Hydrogen, acetylene, carbon di-sulphide

(EN 50014/BS5345)