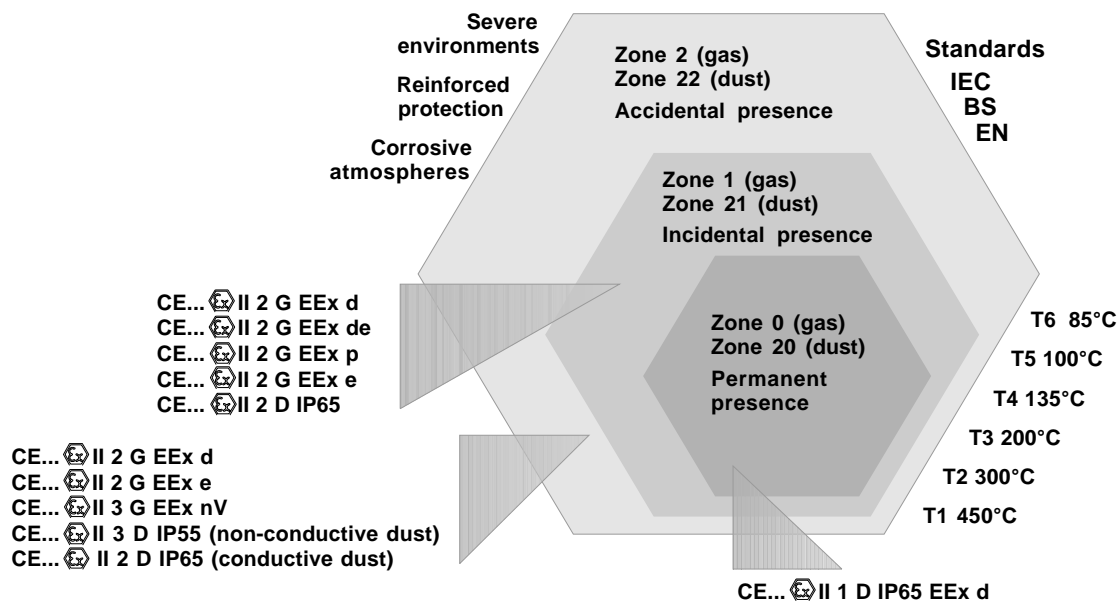
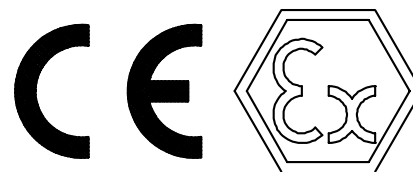


Hazardous environments



Environment	Group	Gas
Mines	I	Methane
Explosive atmospheres other than mines	IIA	Propane
	IIB	Ethylene
	IIC	Hydrogen



European Directives:

Low Voltage Directive 73/23/EEC amended by 93/68/EEC New Directive 94/9/CE (ATEX) for explosive atmospheres

Low Voltage Directive

The Low Voltage Directive is mandatory for any electrical apparatus supplied with a voltage less than 1000V (AC) except equipment and apparatus mentioned in Annex II of this directive which is stated below:

Annex II of LVD 73/23/EEC:

« Equipment and phenomena outside scope of the directive:

- Electrical equipment for use in an explosive atmosphere

-

»

Consequently the directive is not relevant for:

- Flame proof motors according to EEx d - EEx de
- Increased safety motors according to EEx e

Situation for products used in explosive atmospheres

In 1994, a new Directive (ref. **94/9/EC**) was introduced to cover products for explosive atmospheres.

Goal of 94/9/EC Directive

This directive aims to determine the framework for complete harmonization by determining the essential health and safety requirements needed for products used in explosive atmospheres.

However, according to Article 14 of 94/9/EC Directive the previous directives (76/117/EEC, 79/196/EEC) shall continue to be valid until the 30 June 2003, unless they expire before that date, after which the new directive will be enforced.

ABB Motors conform to both the previous and the new directive and thus comply with the other European Directives including:

- EMC Directive 89/336/EEC amended by 92/31/EEC and 93/68/EEC
- Machinery Directive 89/392/EEC amended by 91/368/EEC and 93/68/EEC (Certificate of Incorporation)

Furthermore, all ABB Motors products are designed and manufactured to comply with the safety requirements detailed within the Low Voltage Directive.

In addition to the above, all ABB Motors' production units are certified to ISO 9001.

Marking temperatures, gas groups and hazardous areas

To ensure equipment can be safely used in hazardous areas, its gas group must be known and its temperature class must be compared with the spontaneous ignition temperature of the gas mixtures concerned.

Classification of hazardous locations

Explosive atmosphere	Permanent presence	Incidental presence (normal operation conditions)	Accidental presence (abnormal operation conditions)
IEC (International)	Zone 0 (gas) Zone 20 (dust)	Zone 1 (gas) Zone 21 (dust)	Zone 2 (gas) Zone 22 (dust)
Canada (CEC) USA (NEC)	Cl. I Div. 1 (gas) Cl. II Div. 1 (dust) Cl. III Div. 1 (fibers)	Cl. I Div.1 (gas) Cl. II Div.1 (dust) Cl. III Div.1 (fibers)	Cl. I Div. 2 (gas) Cl. II Div. 2 (dust) Cl. III Div. 2 (fibers)

Note: In certain countries EEx d and EEx e motors also used in Zone 2.

Temperature classes

Temperature class	Ignition temperature for the gas/vapor °C	Max. permitted temperature equipment °C
T1	> 450	450
T2	> 300 < 450	300
T3	> 200 < 300	200
T4	> 135 < 200	135
T5	> 100 < 135	100
T6	> 85 < 100	85

Grouping of electrical apparatus

Group I	Apparatus for coal mines susceptible to firedamp
Group II	Apparatus for explosive atmospheres other than mines; surface industries
IIA IIB IIC	Group II is subdivided according to the severity of the environment. IIC is the highest rating; a motor from one of the higher categories can also be used in a lower category environment

Classification

	Category equipment	Inflammable substances	Level of protection	Fault protection	Comparison with present practice and IEC
Equipment group I (mines)	M1	Methane, dust	Very high level	2 types of protection or 2 independent faults	Group I
	M2	Methane, dust	High level	1 type of protection Normal operation	Group I
Equipment group II (surface)	1	Gas, vapours, mist, dust	Very high level	2 types of protection or 2 independent faults	Group II Z0 (gas) / Z20 (dust)
	2	Gas, vapours, mist, dust	High level	1 type of protection Habitual frequent malfunction	Group II Z1 (gas) / Z21 (dust)
	3	Gas, vapours, mist, dust	Normal	Required level of protection	Group II Z2 (gas) / Z22 (dust)

Marking of equipment

CE marking
 Identification of notified body
 European Commission mark for Ex-products
 Equipment group: Surface
 Equipment Category: (Zone 1 or Zone 21)
 Gas

Additional marking:

Protection "d"
 Subgroup of Gas
 Surface temperature

Certificate number example:
LCIE 98 ATEX 6016