# Labelling of explosion proof equipment according to ATEX directives *

## Classification and labelling of hazardous locations

| Flammable medium | Hazardous locations Probability of a potentially explosive atmosphere occuring | Classification of hazardous locations | Product classification: Product group | Product classification: Product category | Equipment protection level (EPL) |
|---|---|---|---|---|---|
| Gases, mists, vapours | Continuously, for long periods or frequently | Zone 0 | II | 1G | Ga |
| | Likely to occur | Zone 1 | II | 2G | Gb |
| | Infrequently and for short periods only | Zone 2 | II | 3G | Gc |
| Dusts | Continuously, for long periods or frequently | Zone 20 | II | 1D | Da |
| | Likely to occur | Zone 21 | II | 2D | Db |
| | Infrequently and for short periods only | Zone 22 | II | 3D | Dc |

**Official institutes**

| code number | Institute Notified Body (NB) |
|---|---|
| 0102 | PTB (Germany) |
| 0158 | EXAM (Germany) |

Example:

CE 0158 Ex

**II 2G Ex d IIC T6 Gb**
**II 2D Ex tb IIIC T80°C Db**

NB 12 ATEX 1007 X

## Classification Explosion groups & Temperature classes

| Explosion group | Examples depending on - explosion group - temperature class | | | | | |
|---|---|---|---|---|---|---|
| IIA | Ammonia, Methane, Ethane, Propane | Ethanol, Cyclohexene, n-Butane | Petrol, Diesel fuel, Fuel oil, n-Hexane | Acetal-dehyde | | |
| IIB | City gas, Acrylic nitrile | Ethylene, Ethylene oxide | Ethyl glycol, Carbon hydrogen | Ethyl ether | | |
| IIC | Hydrogen | Acetylene | | | | Carbon disulphide |

**Attention:** this list is only an extract of possible flammable mediums and does not claim to be complete!

| Temperature class | |
|---|---|
| T1 | <450 °C |
| T2 | <300 °C |
| T3 | <200 °C |
| T4 | <135 °C |
| T5 | <100 °C |
| T6 | < 85 °C |

Product use depending on temperature class (T1 - T6). The temperature class indicates the max. temperature of the exposed surface of the product. For dust explosion proof, the max. surface temperature is directly shown (e.g. T80°C).

**Temperature class**

| Protection principle | Type of protection | Code | Symbol | To use in zone [6] | CENELEC |
|---|---|---|---|---|---|
| Prevents transmission of the explosion outside | flameproof enclosure | Ex d | | 1, 2 | EN 60079-1 |
| Prevents high temperatures and sparks | increased safety | Ex e | | 1, 2 | EN 60079-7 |
| Low current/voltage supply | intrinsic safety | Ex i [1] Ex iD [2] | | 0, 1, 2 20, 21, 22 | EN 60079-11 |
| Positive pressure device | pressurised apparatus | Ex p Ex pD | | 1, 2 21, 22 | EN 60079-2 |
| Encapsulated | moulding | Ex m [3] Ex mD [4] | | 0, 1, 2 20, 21, 22 | EN 60079-18 |
| Parts immersed in oil to isolate from explosive atmosphere | oil immersion | Ex o | | 1, 2 | EN 60079-6 |
| Prevents transmission of explosion outside | powder filling | Ex q | | 1, 2 | EN 60079-5 |
| As above, but for use in zone 2 | protection "n" | Ex n | | 2 | EN 60079-15 |
| Dust explosion proof | protection "tD" | Ex t [5] | IP66 | 20, 21, 22 | EN 60079-31 |

**Protection principle – Type of protection – EN 60079-0 General Requirements**

| Code | Dust classification |
|---|---|
| IIIA | flammable fibres |
| IIIB | non conductive dust |
| IIIC | conductive dust |

| IP | Protection against solids/dust | Protection against water |
|---|---|---|
| 8 | – | long periods of immersion |
| 7 | – | the effects of temporary immersion |
| 6 | totally protected against dust | strong jets of water |
| 5 | dust - limited ingress | low pressure jets from all directions |
| 4 | solids objects > 1 mm | sprays from all directions |
| 3 | solids objects > 2,5 mm | direct sprays up to 60° from vertical |
| 2 | solids objects > 12,5 mm | direct sprays up to 15° from vertical |
| 1 | solids objects > 50 mm | vertical falling drops of water |
| 0 | no protection | no protection |

**Ingress Protection EN 60529**

| Application | Code |
|---|---|
| For common use | – |
| For use under special conditions | X |
| This product is an Ex-certified component for use in a complete system | U |

**Further information**

[1] ia (zone 0, 1, 2), ib (zone 1, 2), ic (zone 2)
[2] iaD (zone 20, 21, 22), ibD (zone 21, 22), icD (zone 22)
[3] ma (zone 0, 1, 2), mb (zone 1, 2), mc (zone 2)
[4] maD (zone 20, 21, 22), mbD (zone 21, 22), mcD (zone 22)
[5] ta (zone 20, 21, 22), tb (zone 21, 22), tc (zone 22)
[6] Highest possible application areas

*from April 20, 2016 replacement of ATEX 94/9/EC directives with directives according to ATEX 2014/34/EU