# Ex marking according to the International and European standards

**ATEX: Ex protection for Europa | IECEx: International Ex Protection**

ATEX

1 2 3 4 5 6 7
II 2G Ex ib IIC T4 Gb
II 2D Ex ib IIIC T135°C Db
1 2 3 4 5 6 7

IECEx

3 4 5 6 7
Ex ib IIC T4 Gb
Ex ib IIIC T135°C Db
3 4 5 6 7

## 1 Equipment groups

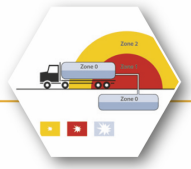
**I** Devices for use in overground and underground mining / mining.
**II** Devices for use in all other areas at risk from explosive atmospheres.

## 2 Equipment category and type of explosive atmosphere

G = Gases, vapors, fog | D = Dust

**M1** (for group I)

**M2** (for group I)



**1** (for group II) Very high safety.
For use in the zones 0, 1, 2 **(1G)** and 20, 21, 22 **(1D)**

**2** (for group II) High safety.
For use in the zones 1, 2 **(2G)** and 21, 22 **(2D)**

**3** (for group II) Normal safety.
For use in the zones 2 **(3G)** and 22 **(3D)**

## 3 Ex protection

Corresponds to one or more types of extinction.

## 4 Type of protection

| Type | Identification Degree of hazard* | Standard EN\|EC\|ANSI | Use according to approval |
|---|---|---|---|
| Flameproof enclosure | **d** da/db/dc | EN 60079-1 | 0, 1, 2 \| M1, M2 |
| Pressurized enclosure | **p** pxb/pyb/pzc | EN 60079-2 | 1, 2 \| 21, 22 \| M2 |
| Sand filling | **q** qb | EN 60079-5 | 1 or 2 \| M2 |
| Oil immersion | **o** ob/oc | EN 60079-6 | 1 or 2 \| M2 |
| Increased safety | **e** eb/ec | EN 60079-7 | 1 or 2 \| M2 |
| Intrinsic safety | **i** ia/ib/ic | EN 60079-11 | 0, 1, 2 \| 20, 21, 22 \| M1, M2 |
| Electr. resources protection type „n“ | **n** nC/nR | EN 60079-15 | 2 |
| Encapsulation | **m** ma/mb/mc | EN 60079-18 | 0, 1, 2 \| 20, 21, 22 \| M1, M2 |
| Optical radiation | **op** | EN 60079-28 | 0, 1, 2 \| 20, 21, 22 \| M1, M2 |
| Protection by housing | **t** ta/tb/tc | EN 60079-31 | 20, 21, 22 |

*Degree of hazard see table 7 Equipment Protection Level EPL

## 5 Explosion groups

| Typical Gas | | Dust groups | |
|---|---|---|---|
| **I** | Methane | **IIIA** | ignitible fibers/ flyings |
| **IIA** | Propane | **IIIB** | non conductive dust |
| **IIB** | Ethylene | **IIIC** | conductive dust |
| **IIC** | Hydrogen, Acetylene | | |

## 6 Temperature classification

Maximum surface temperature of the resources in **gas hazardous area**

| | | |
|---|---|---|
| **T1** \| 450 °C | **T2** \| 300 °C | **T3** \| 200 °C |
| **T4** \| 135 °C | **T5** \| 100 °C | **T6** \| 85 °C |

Maximum surface temperature of the resources in **dust hazardous area, ATEX, IECEx – direct indication of the maximum surface temperature in °C**

## 7 Equipment Protection Level – EPL

**G** – Gas | **D** – Dust | **M** – Open-cast mining

| Application | Degree of hazard | Equipment category | Use in zone |
|---|---|---|---|
| **G** | **a** | 1G | 0, 1, 2 |
| **G** | **b** | 2G | 1, 2 |
| **G** | **c** | 3G | 2 |
| **D** | **a** | 1D | 20, 21, 22 |
| **D** | **b** | 2D | 21, 22 |
| **D** | **c** | 3D | 22 |
| **M** | **a** | M1 | |
| **M** | **b** | M2 | |

## 8 Zones

| | Constant hazard | Occasional hazard | Rare or short term hazard |
|---|---|---|---|
| **Gas:** | **Zone 0** | **Zone 1** | **Zone 2** |
| **Dust:** | **Zone 20** | **Zone 21** | **Zone 22** |

# ExNor

**Innovative Digital Solutions For Hazardous Areas**



**IS540.1**
Zone 1/21
Android Smartphone



**IS940.1 / IS945.1**
Zone 1/21
Android/Windows Tablet



**SM1P-Ex**
Zone 1/21
Smart Headset

**www.exnor.no**