

# How can I read and understand the ATEX Codes label?

If you're working in an environment where there's a risk of combustion, learning to understand ATEX codes applied to equipment is essential. By learning to interpret these codes you can determine whether the equipment is safe for use, ensuring protection at all times from ignition.

We'll begin by looking at a sample code that you might see on a piece of equipment:

**Ex II 2 D Ex td A21 T90° IP64**

At first glance, this code may look like it means nothing at all and is just a selection of numbers and letters. In fact, it's very much the opposite. This code is broken down into several sections that give the user advice on the type of equipment and its suitability.

This article explores the meaning of each of the sections above and should help you on your way to understanding ATEX in the workplace.

Ex

**Ex II 2 D Ex td A21 T90° IP64**

All electrical equipment suitable for use in ATEX applications is given the Ex symbol to clearly showcase this fact.

This will most commonly be presented as the following symbol (the background/style of the symbol may vary slightly).



Look out for this symbol on your electrical equipment if you're working in a dangerous area.

Equipment Group

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The second part of the code, shown as "II" in this example, shows the area that the equipment is meant for.

There are only two codes for this section; it can either be shown as 'I' or 'II'.

- The 'I' symbol refers to the equipment being suitable for use in mining applications
- The 'II' symbol shows that this piece of equipment is made for use in all other explosive areas

Specialist equipment for mining applications must always bear the I symbol.

Zone Category

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After the 'II' symbol a number will be specified. This is the zone that the equipment is suitable for use in.

Every hazardous environment with a risk of combustion is given a zone rating dependant on the type of hazard. You should only use equipment specified for the zone you're working in.

The following combinations are possible:

- 1 – Can be used in zones 0 or 20
- 2 – Can be used in zones 1 or 21
- 3 – can be used in zones 2 or 22
- M1 – mining (in case of firedamp, continuation of operation is possible)
- M2 – mining (must be switched off in case of firedamp)

This table shows the type of zones.

| European & IEC Classification | Definition of Zone or Division   | North American Classification |
|-------------------------------|--|-------------------------------|
| Zone 0 (Gases) - "G"          | An area in which an explosive mixture is continuously present or present for long periods  | Class I Division 1 (Gases)    |
| Zone 20 (Dusts) - "D"         | An area in which an explosive mixture is continuously present or present for long periods  | Class II Division 1 (Dusts)   |
| Zone 1 (Gases) - "G"          | An area in which an explosive mixture is likely to occur in normal operation   | Class I Division 1 (Gases)    |
| Zone 21 (Dusts) - "D"         | An area in which an explosive mixture is likely to occur in normal operation   | Class II Division 1 (Dusts)   |
| Zone 2 (Gases) - "G"          | An area in which an explosive mixture is not likely to occur in normal operation and if it occurs will exist only for a short time | Class I Division 2 (Gases)    |
| Zone 22 (Dusts) - "D"         | An area in which an explosive mixture is not likely to occur in normal operation and if it occurs will exist only for a short time | Class II Division 2 (Dusts)   |
|                               |  | Class III Division 1 (Fibres) |
|                               |  | Class III Division 2 (Fibres) |

Atmosphere

**Ex II 2 D Ex td A21 T90° IP64**

Explosive atmospheres are generally categorised into two sections, gas and dust.

Depending on the type of environment the fourth symbol in this list lets the user know the type of atmosphere this equipment is suitable for.

They can be:

- G – Gas
- D – Dust

Type of Protection

## Ex II 2 D Ex **td** A21 T90° IP64

This symbol can be a wide variety of different types of protection. The protection level of equipment varies greatly depending on the type and environment, so learn the symbols and their meaning in the following table.

| <b>Symbol</b> | <b>Type of Protection</b>   |
|---------------|---|
| o             | Oil Immersion   |
| p             | High-Pressure Encapsulation   |
| q             | Sand Encapsulation  |
| d             | Pressure-Resistant Encapsulation  |
| e             | Increased Safety  |
| ia            | Intrinsic Safety (Permitted for Zone 0*)<br>*depending on device category |
| ib            | Intrinsic Safety (sufficient for zone 1 (+2))                             |
| ma            | Cast Encapsulation (for zone 0*)  |
| mb            | Sufficient for Zone 1 (+2)  |
| s             | Special Protection  |
| n             | Normal Operation In Normal Conditions (only for zone 2)                   |
| nA            | Non-Sparking  |
| nC            | Enclosed Break  |
| nR            | Vapour-Proof Housing  |

| Symbol | Type of Protection                 |
|--------|------------------------------------|
| nL     | Energy Limited                     |
| nZ     | High-Pressure Encapsulation        |
| op     | Optical Radiation (is, pr, sh)     |
| tD     | Protection by Housing (Dust)       |
| pD     | High Pressure Encapsulation (Dust) |
| iD     | Intrinsic Safety (Dust)            |
| mD     | Cast Encapsulation (Dust)          |

Testing for Leak Tightness

## Ex II 2 D Ex td A21 T90° IP64

This rating can be either an 'A' or 'B' value to inform the user of the procedure used for determining the housing's leak tightness. The 21 seen above refers to the zone (and can be different values depending on the zone type).

Maximum Surface Temperature

## Ex II 2 D Ex td A21 T90° IP64

This values shows the highest possible temperature generated by the piece of equipment during normal operation. Since the atmosphere can ignite due to high temperature, having equipment below the ignition threshold is essential.

The following table has more information on this classification:

| Temperature Classification |                | Maximum Surface Temperature |
|----------------------------|----------------|-----------------------------|
| European/I.E.C             | North American |                             |
| T1                         | T1             | 450°C                       |
| T2                         | T2             | 300°C                       |
|                            | T2A            | 280°C                       |
|                            | T2B            | 260°C                       |

|    | <b>Temperature Classification</b> | <b>Maximum Surface Temperature</b> |
|----|-----------------------------------|------------------------------------|
|    | T2C                               | 230°C                              |
|    | T2D                               | 215°C                              |
| T3 | T3                                | 200°C                              |
|    | T3A                               | 180°C                              |
|    | T3B                               | 165°C                              |
|    | T3C                               | 160°C                              |
| T4 | T4                                | 135°C                              |
|    | T4A                               | 120°C                              |
| T5 | T5                                | 100°C                              |
| T6 | T6                                | 85°C                               |

IP (Ingress Protection) Code

## **Ex II 2 D Ex td A21 T90° IP64**

Most types of test equipment come with an IP rating that shows how the casing is protected against various foreign bodies that could cause damage.

The first value, the 6 above, is either a 5 or a 6. This means:

- 5 – Protection against dust deposits
- 6 – Protection against dust penetration

The other value shows protection against water. The following numbers are possible:

- 0 – no protection
- 1 – vertically falling drip water
- 2 – drip water on operating device inclined to 15°
- 3 – water spray
- 4 – water spray
- 5 – water jet
- 6 – strong jet water
- 7 – temporary immersion
- 8 – continuous immersion (waterproof)