

*The Trusted Source for
Secure Identity Solutions*

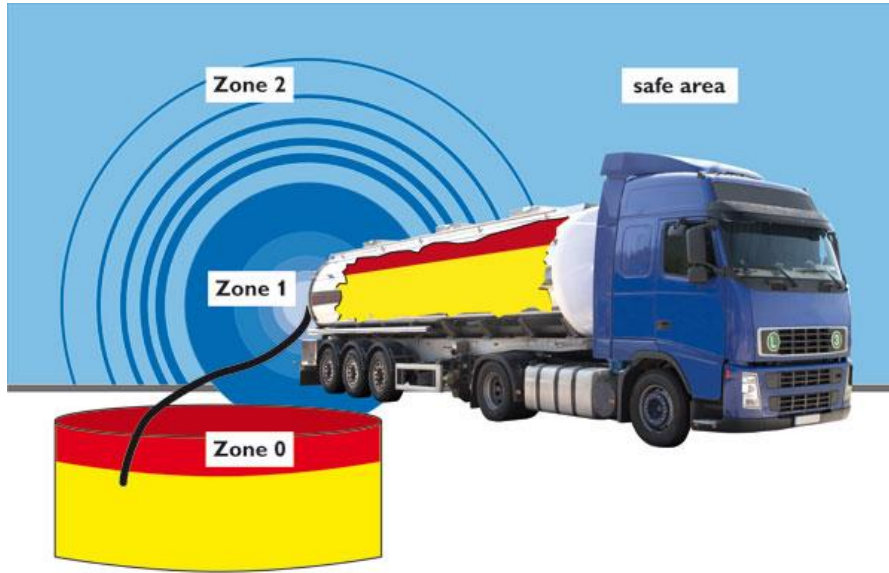


ATEX Explained

A brief Introduction

January 19, 2016

ATEX Zones



- Zones 1 (gas) or 21 (dust)
(area in which under normal operation a potentially explosive atmosphere can occasionally form)

Picture : <http://www.ecom-ex.co.uk>

PROPRIETARY INFORMATION. No unauthorized use.

HID ATEX Certified Tags

- All LogiTag™, IN Tag, Glass Tag are ATEX certified
II 1G Ex ia IIC T4 Ga and **I M1 Ex ia I Ma** (mining)
- The first ATEX marking means:
 - II – all other explosive areas (all except mining)
 - 1 – can be used in zones 0 or 20
(area in which under normal operation a potentially explosive atmosphere is continually present – no human working there)
 - G – Gas (as opposed to D – Dust)
 - Ex – ATEX certified
 - ia – intrinsic safety (permitted for zone 0)
The development of inadmissibly high temperatures, ignition sparks and arcs are avoided due to the restriction of energy in the circuit
 - IIC – Explosion group like Hydrogen
 - T4 – 275°F / 135°C Max. Temperature
 - Ga – Equipment Protection Level (EPL) = Zone 0 or 20



PROPRIETARY INFORMATION. No unauthorized use.

First IN Tag + Glass Tag Certification up to 12/2013

- HID Glass Tags and IN Tags are ATEX certified
II 2G Ex ia IIA T5 Gb – see [certificates](#)
- **Our ATEX marking means:**
 - **II** – all other explosive areas (all except mining)
 - **2** – can be used in zones **1** or **21**
(area in which under normal operation a potentially explosive atmosphere can occasionally form)
 - **G** – Gas (as opposed to D – Dust)
 - **Ex** – ATEX certified
 - **ia** – intrinsic safety (permitted for zone 0)
The development of inadmissibly high temperatures, ignition sparks and arcs are avoided due to the restriction of energy in the circuit
 - **IIA** – Explosion group like **Propane**
 - **T5** – **212°F / 100°C**
 - **Gb** – Equipment Protection Level (EPL) = Zone **1** or **21**



PROPRIETARY INFORMATION. No unauthorized use.

Same Tag Turck ATEX Certified

- Turck IN Tags are ATEX certified
II 2G Ex ia IIC T4/T6
- Our ATEX marking means:
 - II – all other explosive areas (all except mining)
 - **2** – can be used in zones **1** or **21**
(area in which under normal operation a potentially explosive atmosphere can **occasionally** form)
 - G – Gas (as opposed to D – Dust)
 - Ex – ATEX certified
 - ia – intrinsic safety (permitted for zone 0)
The development of inadmissibly high temperatures, ignition sparks and arcs are avoided due to the restriction of energy in the circuit
 - **IIC** – Explosion group like **hydrogen**
(most dangerous group)
 - T4 – 135°C / T6 = 85°C (claim **110°C** on tag)



TURCK

Industrial
Automation



PROPRIETARY INFORMATION. No unauthorized use.

ATEX Designation (www.ecom-ex.com)

Ex designation

Temperature Class:

Gases are divided into temperature classes based on their different ignition temperatures. The electrical equipment in Group II is divided in parallel to this according to the maximum surface temperatures at which the Ex-atmosphere can be reached.

Maximum permitted housing or component temperature of the operating devices

T1	T2	T3	T4	T5	T6
450°C	300°C	200°C	135°C	100°C	85°C

Explosion groups:

The equipment group, amongst other items, appears again in this Designation Section. Group I comprises operating devices for coal mining where coal dust and methane atmospheres prevail. Group II applies to the "aboveground" areas such as chemistry, petrochemistry, mills (dusts) etc. Due to the different minimum ignition energies of the various gases, there is a further division into the categories IIA to IIC for the ignition protection classes "personal safety", "pressure resistant casing" and "sand casing".

CENELEC marking	Type of Gas	ignition energy (mJ)
I	methane	280
IIA	propane	> 180
IIB	ethylene	60 ... 180
IIC	hydrogen	< 60

Type of protection:

In areas where the occurrence of an explosive mixture of flammable materials and air cannot be prevented by applying primary explosion protection, special measures for the prevention of ignition sources are to be taken. For example: separation (o, q, m), exclusion (p), special mech. construction (d, e), limitation of energy (ia, ib) or other methods (s).

Explosion protection

Use in hazardous areas:

Equipment which are certified according to Directive 94/9/EC (ATEX 95) regulations carries a special marking. The device group appears first, then the device category and finally the atmosphere reference (G) and (D) just.

For category II, the following classification applies:

Category 1 very high degree of safety / Safety is provided by 2 protective measures – even in cases of rarely occurring machine errors or 2 independent machine errors.

Application in zones 0, 1, 2 or 20, 21, 22, atmosphere G/D / Category 2 high degree of safety sufficient safety in cases of frequent machine errors / in cases of 1 error

Application in zones 1, 2 or 21, 22, atmosphere G/D / Category 3 normal degree of safety sufficient safety in cases of failure-free operation

Application in zone 2/22, atmosphere G/D* (*non-conductive dusts)

Mark identifying explosion prevention

(required in accordance with Directive 94/9/EC)

T6

IIC

ia

Ex

II 1 G



ATEX (Atmosphere Explosive)

94/9/EC Directive

Harmonises legal provisions of member states for devices and protection systems for designated use in potentially explosive areas.
New: ATEX 95 (Old: ATEX 100a)

1999/92/CE Directive

Minimum requirements for improving the health and safety protection of the worker at risk from explosive atmospheres.
New: ATEX 137 (Old: ATEX 118a)

Use in gaseous atmospheres:
II 1 G Ex ia IIC T4

Designation examples:

Use in dusty atmospheres:
II 2 D T90°C IP64

Use for mining applications:
I M2 EEx ia I

Temperature classes:

In the event of a malfunction, the maximum temperature of a surface that may be exposed to gas (in normal use with "n" type of protection). (Should not be used for dust ex-designations.)

T1 = 450°C
T2 = 300°C
T3 = 200°C
T4 = 135°C
T5 = 100°C
T6 = 85°C

Explosion group

(Data only for devices used in areas rendered potentially explosive by gas)

I = Methane (mining)
IIA = such as Propane
IIB = such as Ethylene
IIC = most dangerous group (e.g. hydrogen)



II 1 G Ex ia IIC T4
II 2 D Ex td A21 T90°

Device group

I = Mining
II = all other explosive areas

Category

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 freesp. continuation of operation is possible)
M2 = Mining
(Must be switched off in case of freesp.)

Atmosphere

G = Gas
D = Dust
(Mining – no details)

Types of protection:

o = oil immersion
p = high-pressure encapsulation
q = sand encapsulation
r = pressure-resistant encapsulation
e = increased safety
ia = intrinsic safety (permitted for Zone 0*)
*depending on the 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
nL = energy limited
nZ = high-pressure encapsulation
op = optical radiation (is, pr, th)
td = protected by housing (dust)
pD = high-pressure encapsulation (dust)
sdD = intrinsic safety dust (see for Zone 20*)
ibD = intrinsic safety dust (sufficient for Zone 21 and 22)
mD = cast encapsulation (dust)

Max. surface temperature

(Data for devices used in areas rendered potentially explosive by dust - rarely also used in gas ex marking)
- Maximum temperature of a surface during a machine error (normal operation in the case of category 3 devices) that can be reached by the ex atmosphere.
Evaluation by the user:
a) Limit temperature 1 = 2/3 of min. igniti on temperature of dust present
b) Limit temperature 2 = min. glow temperature of dust present minus 75k (applies for layer thicknesses of up to 5mm)
The smaller value for the limit temperature must be above the indicated max surface temperature of the device.

Zone

Procedure for determining the housing's leak tightness (A or B)

ATEX FAQ 1/2



- Whether passive RFID tags need an ATEX certification at all, was up to 11/2013 not clearly defined by the standard. Until then it demanded that „any items that could be a potential ignition cause“ needed a certification
- In IEC 60079-14 Edition 5 from 11/2013 it is now clearly stated that passive RFID Tags are intrinsically safe for use in Explosive environments and do not need to be certified
- In general ATEX Certified items need to be marked with ATEX Logo and certification string so that on-site it is always obvious that this is a certified equipment
- Mining and non-mining certificates are separate
- ATEX is an European norm, internationally it's represented by IECEx which is similar, but not identical
- List of [ATEX „Notified Body“](#) for certification

PROPRIETARY INFORMATION. No unauthorized use.

ATEX FAQ 2/2



- Higher certification also allows for use in lower categories e.g. Zone 0/Hydrogen also includes Zone 2/propane
- Temperature value is maximum surface temperature of device (environment + added heat by device operation e.g. Motor which for passive tags = environment). Lower temperature class (T6) is better
- Gas and dust are separate certificates
- In zone 0 no human is allowed to work, usually these areas are extra protected e.g. by reducing the oxygen level
- Higher explosion group e.g. Hydrogen can explode with lower ignition energy, but explosion is very fast. Most industrial damage is caused by lower explosion groups which is slower and burns
- Anything that can burn, can typically also explode if milled to fine enough dust, because the surface exposed to oxygen gets bigger

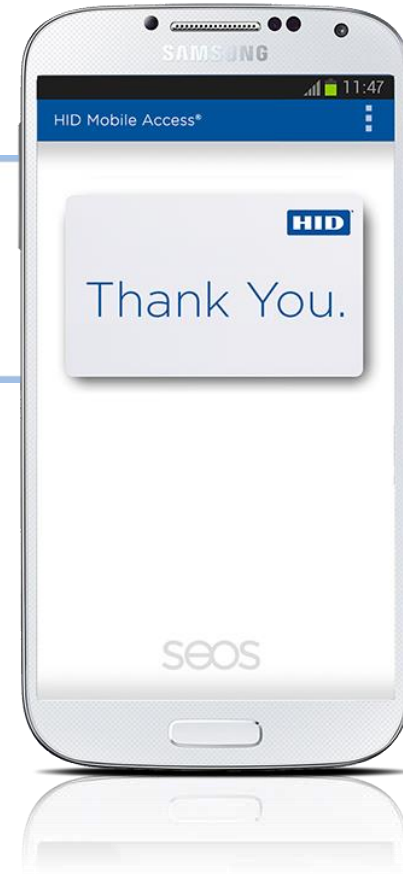
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Questions and Answers

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hidglobal.com/rfid



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