ATEX Explained

A brief Introduction

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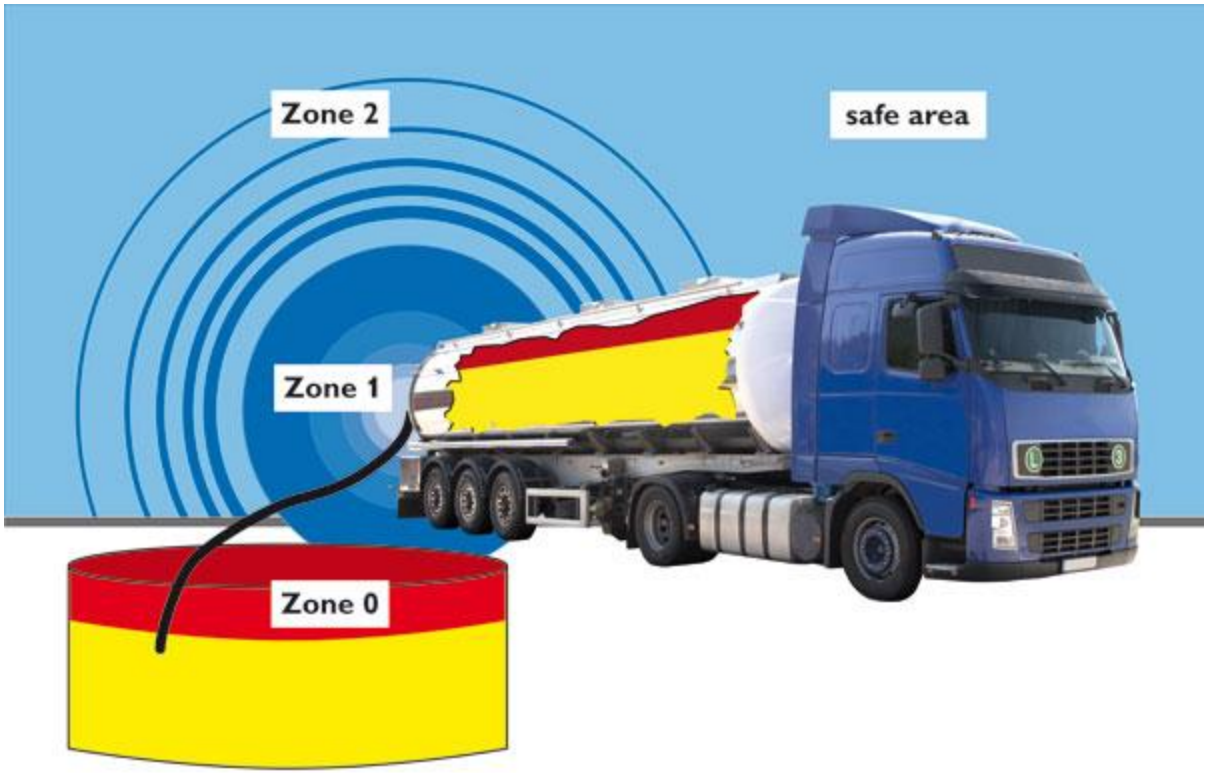
ATEX Zones



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

Picture and table on next slide: http://www.ecom-ex.co.uk

HID ATEX Certified Tags 1/2

- 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

HID ATEX Certified Tags 2/2

- All HID LogiTag™ are ATEX certified
  II 1G Ex ia IIC T4 Ga and **I M1 Ex ia I Ma** (mining)
- Our 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

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/µJ
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)**as and **(D)**ust.

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)

Designation examples:

Use in gaseous atmospheres:	Use in dusty atmospheres:	Use for mining applications:
II 1 G EEx ia IIC T4	II 2 D T90°C IP64	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 renderedpotentially explosive by gas)
I = Methane (mining)
IIA = such as Propane
IIB = such as Ethylene
IIC = most dangerous group (e.g. hydrogen)

IP Code
(Data only for devices used in areas rendered potentially explosive by dust)
Figure 1Contact and foreign body protection:
5 = Protection against dust deposits
6 = protection against dust penetration
Figure 2Water protection
Protection against:
0 = (no protection)
1 = vertically falling drip water
2 = drip water on operating device inclined to 15°
3 = spray water
4 = spray water
5 = jet water
6 = strong jet water
7 = temporary immersion
8 = continuous immersion

Ex	II 1 G	Ex	ia	IIC	T4	
Ex	II 2 D	Ex	td	A21	T90°	IP64

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

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

Types of protection:
o = oil immersion
p = high-pressure encapsulation
q = sand encapsulation
d = 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, sh)
tD = protected by housing (dust)
pD = high-pressure encapsulation (dust)
iaD = Instrinsic safety dust (use for Zone 20*)
ibD = Instrinsic 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. ignition 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, is not clearly defined by the standard. Any items only need a certification, if they are a potential ignition cause
- Experts say, certification for tags is not mandatory, still an existing certification helps to avoid any doubts when the customer certifies his whole production system (what he always needs to do)
- In practice any passive RFID tag is ATEX compliant (because they don‘t cause ignitions), but not all of them are certified
- 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 Bodys“ for certification

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

Questions and Answers