

ATEX / IECEx Zoning and Equipment Marking

cBallast · IEC 60079-0:2017 / ATEX 2014/34/EU

Two schemes, one intent

ATEX = EU legal framework (Directive 2014/34/EU equipment + 1999/92/EC workplace). IECEx = parallel global scheme by IEC. Both reference IEC 60079 series — technical rules identical. ATEX adds EU certification + market surveillance. IECEx equipment usually accepted in EU with manufacturer ATEX DoC.

Hazardous area zoning

Zone	Substance	Presence	Example
0	Gas/vapour	Continuous or long periods	Fuel oil tank vapour space
1	Gas/vapour	Likely in normal ops	Immediate vicinity of pump
2	Gas/vapour	Not likely; short if occurs	Ventilated pump room, remote
20	Dust	Continuous or long periods	Flour mill bin interior
21	Dust	Likely in normal ops	Dust extraction at hopper
22	Dust	Not likely in normal ops	Room adjacent, well-cleaned

Equipment category

Category	Protection	Group I mining	Group II surface
M1 / 1	Highest	Mining energised in gas	Zone 0/20 gas/dust
M2 / 2	High	Mining de-energise on detect	Zone 1/21 gas/dust
3	Normal	—	Zone 2/22 gas/dust

Gas group

Group	Rep gas	MESG mm	MIC ratio
IIA	Propane, kerosene, methane	>0.9	>0.8
IIB	Ethylene, ethyl ether	0.5-0.9	0.45-0.8
IIC	Hydrogen, acetylene	<0.5	<0.45
IIIA	Combustible flyings	—	—
IIIB	Non-conductive dust	—	—
IIIC	Conductive dust (metal)	—	—

Temperature class

T	Max surface C	Suitable for AIT above
T1	450	450 (methane, hydrogen)
T2	300	300 (propane, butane, acetylene)
T3	200	200 (heptane, cyclohexane, diesel)
T4	135	135 (acetaldehyde, ethyl ether)
T5	100	100
T6	85	85 (carbon disulphide)

Protection technique

Ex code	Method	Use
Ex d	Flameproof enclosure	Motor T-box, lamps, switchgear
Ex e	Increased safety	Terminal boxes, junctions, luminaires
Ex ia/ib/ic	Intrinsic safety	Instruments, sensors, low-power
Ex m	Encapsulation resin-potted	Electronics, small devices
Ex n/nA/nR	Non-sparking (Zone 2 only)	Squirrel-cage motors, T-boxes Zone 2
Ex p	Pressurisation (purged)	Analyser cabinets, PLC panels Zone 1/2
Ex q	Powder filling (sand)	Capacitors, HV components
Ex t	Dust by enclosure	Dust-atmosphere equipment

Reading a marking

Example: II 2G Ex db IIB T4 Gb. II = group II surface. 2G = category 2 gas (Zone 1). Ex db = flameproof at EPL level b. IIB = gas group (ethylene, ether, propane; not hydrogen). T4 = surface temp "d 135 C. Gb = equipment protection level Gb (high, gas atmosphere).

Related on cBallast

- <https://cballast.com/categories/Hazardous Area>
- <https://cballast.com/brands/R.STAHL>
- <https://cballast.com/brands/Cortem>

Reference compiled by cBallast. Trademarks are the property of their respective owners. Consult the governing standard and OEM manual for the current revision before installation, procurement or warranty work. <https://cballast.com>