FIELD & TRADE REFERENCE

Hazardous Locations: Class · Division · Zone

Class = what is in the air. **Division / Zone** = how often it is there. US NEC Article 500 uses Divisions; Articles 505/506 adopt the international Zone system. One rule gates the whole job.

STEP 1 Class - what is in the air

Class I
Flammable gases & vapors

Ignitable gas, vapor, or vapor from a flammable liquid.

- Refineries, oil & gas, tank farms
- Chemical & solvent handling
- Paint / spray booths
- Fuel storage, hydrogen / battery rooms

Class II
Combustible dust

Airborne combustible dust that can ignite or explode.

- Grain elevators, flour & feed mills
- Sugar, coal handling
- Metal-dust machining
- Some 3D-print / powder rooms

Class III
Ignitable fibers & flyings

Easily ignitable fibers or flyings suspended or settled.

- Textile mills, cotton gins
- Woodworking
- Some paper / printing operations

STEP 2 Division & Zone - how often the hazard is present

DIVISION 1

Present in normal operation

The ignitable atmosphere is there **continuously, intermittently, or periodically** when the plant runs normally. Expect it to be explosive.

maps to

ZONE 0
Present continuously or for long periods. Only intrinsically-safe gear is accepted here.
`dust: Zone 20`

ZONE 1
Likely present in normal operation.
`dust: Zone 21`

DIVISION 2

Present only on fault

There **only under abnormal conditions** - a leak, spill, or ventilation failure. Fine until something breaks. The larger market for rated wireless.

maps to

ZONE 2
Not normally present; only briefly, under fault.
`dust: Zone 22`

ONE RULE Both systems are legal in the US, but you **cannot mix Division and Zone** in one installation. The facility's area-classification drawing and the AHJ decide which is in force - not the installer.

STEP 3 So what do I install?

NEVER

A standard commercial AP

Its radios, PoE, capacitors, and switching can ignite the atmosphere. Mounting one in a classified area is illegal, uninsurable, and a real ignition source.

→

A — Default
Remote the antenna
Keep the AP in the adjacent non-classified area; run only the antenna into the zone through a rated penetration.

B — Div 1 / Div 2
Purpose-built Ex-rated AP
An AP listed for the specific Class / Division / Zone, gas group, and temperature class of that atmosphere.

C — Div 1 / Div 2
AP in a certified enclosure
A commercial AP inside an Ex-rated housing, antenna routed out through certified glands, installed per its control drawing.

Ex d
Explosion-proof / flameproof
Enclosure contains an internal blast; flame paths cool escaping gas. Higher power; Zone 1 / Div 1.

Ex i
Intrinsically safe
Circuit energy too low to ignite, even on a fault. The only concept accepted in Zone 0.

Ex p
Purged / pressurized
Positive clean-air / inert pressure keeps the atmosphere out. Larger equipment cabinets.

Ex e / nR
Increased safety / restricted breathing
No arcing parts. Ex e (increased safety) suits Zone 1; Ex nR (restricted breathing, sealed against gas ingress) is the common Zone 2 / Div 2 wireless case.

Reference only - recognize the area, then defer. A "rated for Div 2" device is not approved for Div 1, and the gas/dust group and temperature class still must match the atmosphere. Read the facility's area-classification drawing and confirm every install with the AHJ and a qualified engineer.