NEWSLETTER

Wireless in Hazardous Locations: Class, Division, and Why an Access Point Can't Go Everywhere

By **Keith Parsons, CWNE #3** · 2026-08-24 · originally on LinkedIn

Download the Field Plate (PDF)

Mount a standard commercial Access Point in a refinery, a grain elevator, a fuel depot, or a spray booth, and you have installed an ignition source. That is the whole verdict. A normal AP carries enough internal energy in its radios, PoE, capacitors, and switching to light a flammable atmosphere on a fault, sometimes in normal operation. Putting one inside a classified area is illegal, uninsurable, and a real ignition risk. Everything else here is about recognizing that area before you quote it, then routing the job to the right rated gear.

These places are called hazardous (classified) locations. In the US they run on NEC Article 500 and its Class-and-Division scheme. Most of the world, and increasingly the US, uses the IEC Zone system. Three questions sort the whole subject: what is the hazard made of, how often is it present, and which classification system is in force.

Class: what the hazard is made of

- Class I is flammable gases or vapors. Refineries, oil and gas, chemical plants, paint and spray booths, fuel storage, solvent rooms.
- Class II is combustible dust. Grain elevators, flour and feed mills, sugar, coal handling, metal-dust machining.
- Class III is ignitable fibers or flyings. Textile mills, cotton gins, woodworking.

If the material in the air can burn, the space has a Class. That is the first thing to read off the site.

Division: how often the hazard is present

Division 1 means the ignitable atmosphere is present during normal operation. Expect it to be explosive and design accordingly. Division 2 means the atmosphere shows up only under fault: a leak, a spill, a ventilation failure. Division 2 is a far larger and more common market for rated wireless than Division 1, and it is where most WLAN work in these facilities happens.

Zone: the international ladder

NEC Article 505 (gases) and Article 506 (dusts) adopt the IEC Zone system used worldwide under ATEX and IECEx. It splits the same risk into three bands instead of two. For gas: Zone 0 is continuous, Zone 1 is normal operation, Zone 2 is brief and fault-only. Dust uses Zones 20, 21, and 22 on the same ladder.

The mapping a pro carries in their head:

- Division 1 is roughly Zone 0 plus Zone 1 for gas, or Zone 20 plus 21 for dust.
- Division 2 is roughly Zone 2 for gas, or Zone 22 for dust.

Both systems are legal in the US. You cannot mix Division and Zone classification in the same installation, and which one is in force is set by the facility's area-classification drawing and the AHJ, never by the installer.

What Class I Div 2 rated buys you

Permission to install that specific listed device, in that specific Division or Zone, wired per its control drawing. Nothing more. A Div 2 device is not approved for Div 1. The gas or dust group and the temperature class still have to match the specific atmosphere. "Rated" is narrow and conditional, and reading it as "safe anywhere" is how people get hurt.

To put wireless legally inside a classified area you need a recognized protection concept matched to the Division or Zone:

- Explosion-proof / flameproof (Ex d): the enclosure contains an internal explosion and cools the escaping gas below ignition temperature through engineered gaps. Zone 1 / Div 1.
- Intrinsically safe (Ex i): circuit energy limited so low it cannot ignite even on a fault. The only concept accepted in Zone 0.
- Purged / pressurized (Ex p): kept under clean-air or inert positive pressure so no flammable atmosphere gets in.

- Increased safety (Ex e): construction prevents arcs and hot surfaces in normal operation.
- Restricted breathing (Ex nR): sealed against gas ingress, the common wireless case in Zone 2 / Div 2.

US listing runs to UL 1203 for the explosion-proof method under NEC 500, and to the UL 60079 series for the Zone system under NEC 505 and 506. In Europe ATEX is mandatory; IECEx is the global scheme.

The field read

Recognize the area before you quote. Look for the facility area-classification drawing, warning placards, conduit seal fittings, purge panels, and the obvious sites: refinery, tank farm, grain, spray booth, solvent or hydrogen room. When you see them, the default move is to keep the AP out of the classified envelope. Mount it in the adjacent general-purpose area and remote the antenna into the zone through a rated penetration. Use a rated AP or a certified enclosure only where coverage genuinely requires being inside the envelope.

Purpose-built rated APs are real. At least one major enterprise vendor ships a hazardous-location AP certified Class I Div 2, ATEX Zone 2/22, and IECEx. A second pattern puts a standard AP inside a certified Ex-rated enclosure with the antenna routed out through certified glands. Know which one a spec sheet is describing before you trust it.

Misreading a classified area gets someone hurt and gets you sued. Learn to read Class, Division, and Zone well enough to recognize the site on a walkthrough, quote it straight, and hand the install to the right rated gear and the AHJ. The one move that is never on the table is mounting a commercial AP in the envelope and hoping.

This is a field reference, not code or design guidance. Confirm requirements with the AHJ, the architect of record, and a licensed electrician.

By Keith Parsons, CWNE #3, Wireless LAN Professionals. Free to read and share. Facts