

Is Your Boat Ignition Protected?

Keeping sparks and flammable vapors apart is vital on a boat, and many boaters fail to consider all the hazards. Careless gasoline storage, improper locker venting, and use of power tools that can spark a flame may lead to explosions resulting in injury and damage to the vessel.

Using ignition protected fuses, fuse blocks, circuit breakers, switches, and motors in critical areas is not only a good idea, it is required by United States Coast Guard regulation 33 CFR 183.410. The American Boat and Yacht Council (ABYC) defines what ignition protection is and where ignition protected devices are required on board. This article offers a summary of ignition protection. For additional detail, see ABYC standard E-11.4.15 and E-11.5.3.

Ignition protected devices are designed in such a way that

- **they won't ignite a surrounding air-fuel mixture** if there's an explosion inside them, and
- **they can't reach a high enough surface temperature** or generate enough spark to ignite an air-fuel mixture.

Four agencies or organizations publish standards to test products for ignition protection. The tests evaluate resistance to high temperatures, leakage, and risk of internal and external explosion. Any device which passes the tests is considered to be ignition protected.

Although the testing is complicated, the recipe for an explosion is simple: Take a quantity of air, add the right amount of fuel (flammable vapors, in this case), and introduce an ignition source.

Follow the guidance below to help keep your boat safe.

Know your fuel sources. It's easy to think that there's nothing to worry about if your boat has a diesel engine. Your starting motor does not need to be ignition protected, and neither does the circuit protection in the engine space. But if the gasoline for your dinghy's outboard is stored in the same compartment as a non-ignition protected device, your vessel is at risk. A non-ignition protected starter could provide the spark that ignites the vapors from a leaky gas can cap. Other fuel sources include vapors from propane or gasoline, propane bar-b-que bottles, gasoline tanks, and fuel joints and fittings.

Know your ignition sources. Anything that produces or can produce a spark or flame, intentionally or otherwise, is a potential ignition source. Circuit breakers, starters, alternators, and distributors, and open flames are obvious, but exploding fuses, switches, household GFCI outlets, and power-tool motors are possibly just as hazardous.

Check your bulkheads. There are very specific rules involving keeping fuel sources and ignition sources isolated. USCG regulations and ABYC standards referenced earlier detail bulkhead height, water-tightness, enclosures, and distance between electrical devices and fuel sources. Charlie Wing's Boatowner's Illustrated Electrical Handbook is an excellent resource for an in-depth discussion of this issue. An area that is well ventilated and blocked from areas with potential explosive fumes need not use ignition protected components.

Check your devices. SAE, ISO, and UL require ignition-protected devices to be so marked. If you find an unmarked device in an area where one is required, immediately consult a marine electrical professional or check with the device manufacturer to determine if the device is in fact ignition protected. If you can't verify ignition protection, replace the device.

Use common sense. If the circuit breakers in your DC distribution panel are not ignition protected, the panel back shouldn't be protruding into a propane locker. When you replace fuses and fuse blocks, consider ignition protection. And do not use non-ignition protected automotive starting system or ignition parts on a marine gasoline engine!

Proper ignition protection is essential for safe boating. Strict test procedures ensure that devices conform to standards and regulations. It's up to boaters to use them where required.