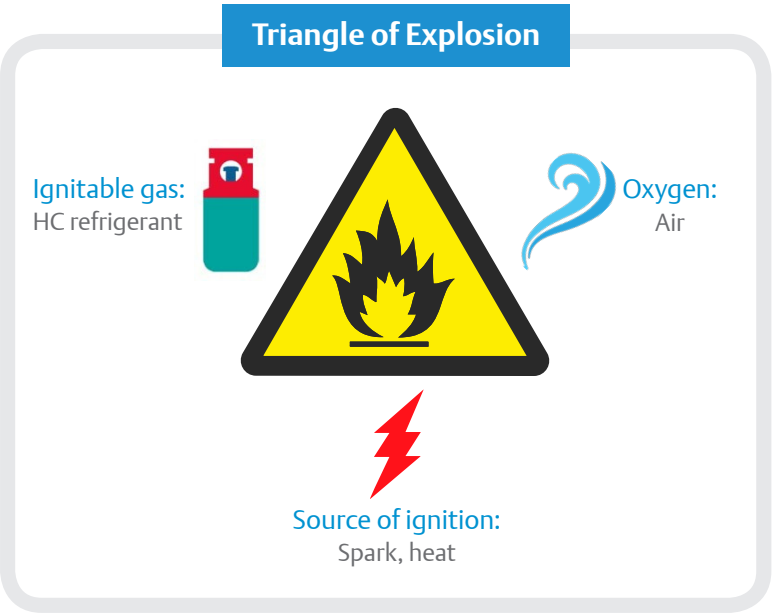
Did you know?

Flammable refrigerant R290 (No. 1)

The use of refrigerants with lower global warming potential (GWP) can significantly reduce the carbon footprint of an installation. R290 is the most discussed refrigerant in this regard, and it has long been known for its good refrigerating performance, but also for its flammability. As a consequence, it implies strict considerations for manufacturers related to system design, installation and operation.

How can an explosion happen with refrigeration system having flammable refrigerant?

An explosion can occur only if an ignitable gas (R290), oxygen (air) and an ignition source, such as spark or heat are coexisting. There is no explosion when one of these three elements is not present.



An additional condition is required for explosion. The mixture of released flammable refrigerant from the refrigeration system and air in atmosphere must be within a certain mixture range.

No explosion can occur if R290 presents with less than 39 grams per cubic meter air or above 177 grams per cubic meter air.

Example: A machine room, size 30 m^3 air volume and a refrigeration system with a total charge of 1200g R290. The potential explosion is present because $\frac{1200}{30}$ = 40 g/m^3 is within the explosion range. There are different possibilities to minimize/ eliminate the explosion's potential by:

- Making sure the mixture ratio is out of the flammability range
- Forced ventilation, in order to keep the mixture of the flammable refrigerant R290 and air below 39 g/m^3
- Removing ignition source out of the explosion area
- Using explosion proofed devices with ignition source
- Other

The next several "Did you know" publications will bring some other information in order to assist the understanding of the systems designed for flammable refrigerants.