



UN/ISO vs. DOT/TC High Pressure Cylinders

Gas Filling and Certification Overview

All Safe Global has been a US DOT-certified hydrostatic testing facility for over 40 years. In addition to offering new cylinders, we refurbish cylinders and perform hydrostatic cylinder re-certification compliant with, and monitored by, the US DOT. UN/ISO Cylinders are equivalent (and arguably superior) to DOT/TC rated cylinders for the following reasons:

1. **In addition to the USA and Canada, All Safe's UN/ISO cylinders are approved for use in almost every country around the world.** UN/ISO is a worldwide, harmonized regulation for compressed gas cylinders. UN/ISO cylinders can cross country borders and still be filled easily.
2. **Higher rated capacities allow for UN/ISO cylinders to be easily integrated into a fleet of DOT / TC cylinders.** UN/ISO service pressures are at or above the common fill pressure of a DOT cylinder with a + 10% overfill designation. Also, UN/ISO cylinders contain friendly markings with service pressures rated in PSI and BAR.
3. **UN/ISO cylinders remain in circulation at maximum capacity for the life of the tank.** Due to the higher design pressure ratings, UN/ISO cylinders do not require REE (Rejection Elastic Expansion) testing to achieve the common cylinder service pressures used and approved in North America. While REE is a valuable and stringent test, DOT cylinders will often have their maximum fill pressure ratings reduced. This is inconvenient for fillers, as they like to fill many cylinders at once with the same pressure.

FACTS AND DIFFERENCES ABOUT UN/ISO AND DOT/TC STAMPING REQUIREMENTS

1. Gas fillers in the USA can legally fill UN/ISO or DOT cylinders that meet CFR regulations.
2. Both All Safe UN/ISO and DOT cylinders are manufactured in the USA and other Foreign countries.
3. Both DOT and UN/ISO cylinders have the same dimensions, internal water volume, steel chemistry, and valve compatibility.
4. ISO cylinders are tested to, and have a higher working pressure and gas volume capability than DOT/TC cylinders.
5. DOT-stamped cylinders are acceptable for transport to, from, and within the United States. UN/ISO-stamped cylinders must have "USA" country of approval marking to be acceptable for transport to, from or within the United States. All Safe's UN/ISO cylinders are stamped "USA".
6. DOT markings must conform to applicable requirements of 49 CFR 178.35. UN/ISO pressure receptacle markings must conform to applicable requirements of 49CFR 178.71.
7. DOT and All Safe UN/ISO cylinder markings are expressed in conventional units.
8. DOT and TC date of manufacture is month-year (10-13) while UN/ISO is year and month (2013/10)

9. DOT stamps service pressure only in psi. All Safe UN/ISO cylinders have stamps for Service Pressure (PW) and Test Pressure (PH) in metric (BAR) and PSI.
10. UN/ISO requires inlet thread to stamped. DOT does not.
11. Manufacture approval number granted by U.S. Department of Transportation (Pipeline and Hazardous Materials Safety Administration) for both the DOT and UN/ISO. If manufactured in same facility, the approval number will be the same.
12. Third-party independent inspection is required for both DOT and UN/ISO designs.
13. There is no plus or star for UN/ISO cylinders. The service pressure is already at or above the 10% over-fill authorized for select gas services by DOT.

WHAT ARE THE REQUALIFICATION FREQUENCY AND MARKINGS FOR UN/ISO CYLINDERS AND HOW ARE THEY REQUALIFIED?

1. Generally, UN/ISO pressure receptacles must be requalified at least once every ten years. Composite cylinders and pressure receptacles used for certain specialized service must be re-qualified every five years. 49 CFR 180.207
2. The requalification markings must conform to requirements in 49 CFR 180.213. UN/ISO pressure receptacles may be requalified by hydraulic pressure test or ultrasonic examination (UE). The hydraulic pressure test may be either a volumetric expansion or a proof pressure test. 49 CFR 180.207
3. UN/ISO pressure receptacles must be requalified at the interval specified below:

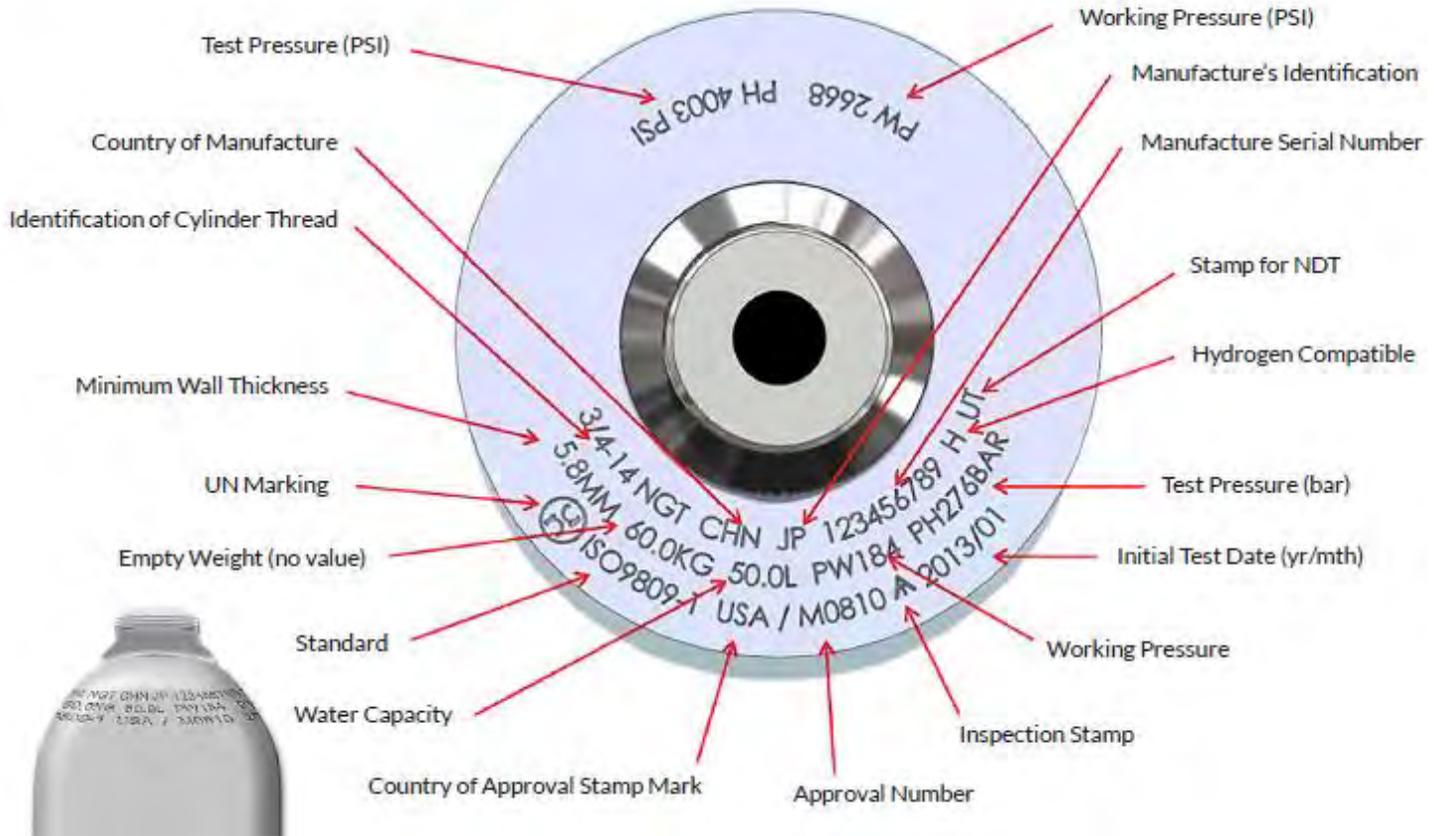
TABLE 1—REQUALIFICATION INTERVALS OF UN PRESSURE RECEPTACLES

Interval (years)	UN pressure receptacles/hazardous materials
10	Pressure receptacles for all hazardous materials except as noted below (also for dissolved acetylene, see paragraph (d)(3) of this section):
5	Composite pressure receptacles.
5	Metal hydride storage systems
5	Pressure receptacles used for:
	All Division 2.3 materials.
	UN1013, Carbon dioxide.
	UN1043, Fertilizer ammoniating solution with free ammonia.
	UN1051, Hydrogen cyanide, stabilized containing less than 3% water.
	UN1052, Hydrogen fluoride, anhydrous.
	UN1745, Bromine pentafluoride.
	UN1746, Bromine trifluoride.
	UN2073, Ammonia solution.
	UN2495, Iodine pentafluoride.
	UN2983, Ethylene Oxide and Propylene oxide mixture, not more than 30% ethylene oxide.

All ISO/UN cylinders provided by All Safe comply with the requirements in 49 CFR 173.301(b) and 173.304(b) for transportation and filling.

UN-ISO AND DOT/TC FRIENDLY MARKINGS ON ALL SAFE CYLINDERS

(Note both ISO and TC Markings are Present for Ease of Filling in USA and Canada):



TOP ROW - Manufacturing marks such as the cylinder thread type, the country of manufacture, and the serial number assigned by the manufacturer.

MIDDLE ROW - Operational marks such as the minimum wall thickness, the tare or empty weight, water capacity in KG, working pressure "PW" Bar, and test pressure "PH" in Bar.

BOTTOM ROW - Certification marks such as the UN packaging symbol, the ISO standard, the country or countries of approval, manufacturer's approval mark, approved third-party independent inspection agency identification stamp, and initial inspection year followed by month separated by a slash.

Other markings are permitted in other low stress areas provided they are not on the side wall. Other marks must not conflict with the required markings.

***Note:** Refillable seamless steel cylinders conforming to ISO 9809-1, 9809-2, or 9809-3 are authorized with UN USA approval within the USA. All Safe UN/ISO cylinders are ISO9809-1 UN USA-approved.