WHAT ARE SOME DIFFERENCES BETWEEN UN PRESSURE RECEPTACLES AND DOT CYLINDERS?

DOT CYLINDERS

- Are acceptable for transport to, from, or within the United States
- Aluminum oxygen cylinders must have straight threads only
- Markings
  - Marks conform to applicable requirements of §178.35
  - Service pressure shown
  - Markings expressed in conventional units

UN PRESSURE RECEPTACLES

- Must have "USA" country of approval marking to be acceptable for transport to, from, or within the United States
- Aluminum oxygen cylinders may have straight or tapered threads
- Markings
  - Required Part 178 markings displayed in 3 rows in accordance with §178.71
  - Test pressure shown
  - Markings expressed in metric units
  - Thread type must be marked on each receptacle and valve

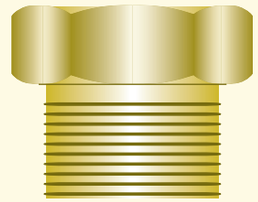
ALUMINUM CYLINDERS IN OXYGEN SERVICE

The openings on aluminum alloy UN oxygen cylinders may be configured with straight (parallel) or taper threads. The thread type must be marked on the cylinder and on the valve. Any person who installs a valve into a UN aluminum alloy cylinder in oxygen service must verify the valve and the cylinder have the same thread type.

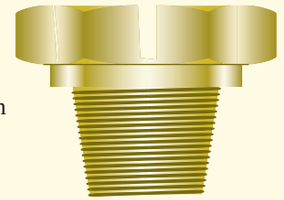
For example:

Typical straight thread: 25P
Typical tapered thread: 25E

The openings on aluminum alloy DOT specification oxygen cylinders must be configured with straight threads only.



Straight (parallel) thread



Taper thread

Note: A thread mismatch can lead to an unintentional release of product or a violent expulsion of the valve which can cause personal injury or death. Improper valve torquing can lead to cylinder damage. The correct amount of torque applied to a valve must be obtained from the cylinder manufacturer.

WHAT ARE THE FILLING REQUIREMENTS?

Filling limits for UN pressure receptacles are outlined in §173.302b and §173.304b. UN pressure receptacles may be filled with a gas by using the numerical limits or the formulas provided in P200 of the UN Model Regulations unless otherwise provided.

WHAT ARE THE REQUALIFICATION FREQUENCY AND MARKINGS?

UN pressure receptacles must be requalified at least once every ten years, except that composite cylinders and pressure receptacles used for certain specialized service must be requalified every five years (see §180.207). The requalification markings must conform to the requirements in §180.213.

HOW ARE UN PRESSURE RECEPTACLES REQUALIFIED?

UN pressure receptacles may be requalified by a hydraulic pressure test or ultrasonic examination (UE). The hydraulic pressure test may be either the volumetric expansion or the proof pressure test. UN seamless steel pressure receptacles with a tensile strength ≥950 MPa must be requalified by UE in accordance with ISO 6406 by a requalifier authorized to requalify UN pressure receptacles by UE. Alternative requalification methods may be used if prior approval has been obtained from PHMSA's Associate Administrator for Hazardous Materials Safety.

WHERE TO LEARN MORE

For information about other Hazmat Publications

Visit our web site:
http://hazmat.dot.gov

Write:
U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration
1200 New Jersey Avenue, SE, PHH-50
Washington, DC 20590-0001

Fax: (202) 366-7342
E-mail: training@dot.gov
Or Phone: (202) 366-2301

For information about Hazmat Regulations

Contact our Hazmat INFO-LINE:

GOT A HAZMAT QUESTION?
http://hazmat.dot.gov
INFO-LINE
1-800-467-4922

E-mail: infocntr@dot.gov

SafeTravel
SAFETY TIPS FOR TRAVELERS
HTTP://SAFETRAVEL.DOT.GOV

PHH50-0078-0706

HAZARDOUS MATERIALS TRANSPORTATION
Compliance Basics Series

UN Cylinders what you need to know

GUIDE TO HM-220E FINAL RULE

U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

EFFECTIVE SEPTEMBER 11, 2006, PHMSA adopted standards into the Hazardous Materials Regulations (49 CFR Parts 171-180) for the design, construction, and use of UN pressure receptacles based on the standards contained in the United Nations Recommendation on the Transport of Dangerous Goods (UN Model Regulations).

WHAT DOES HM-220E DO?

The HM-220E final rule:

- Authorizes the design, construction, testing, and use of UN cylinders, tubes, and multiple-element gas containers (MEGCs)
- Specifies requalification methods and intervals for UN pressure receptacles
- Establishes filling requirements for UN pressure receptacles conforming to the UN Model Regulations
- Promotes greater flexibility and permits the use of advanced technology for the manufacture of pressure receptacles
- Provides for a broader selection of pressure receptacles
- Reduces the need for special permits
- Facilitates international transportation

DOES HM-220E AFFECT THE CURRENT REQUIREMENTS FOR DOT SPECIFICATION CYLINDERS?

No. HM-220E allows a shipper to use either a DOT specification cylinder or a UN standard pressure receptacle, as appropriate for individual gases and circumstances.

WHAT ELSE SHOULD I KNOW?

Definitions:

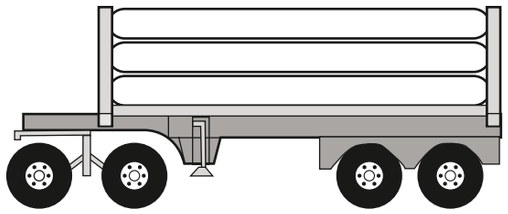
ISO—International Organization for Standardization

UN Cylinder—Transportable pressure receptacle with a water capacity generally not exceeding 150 L (37.5 gal.)

UN Tube—Transportable pressure receptacle with a capacity exceeding 150 L (37.5 gal.) but not more than 3000 L (750 gal.)

UN Pressure Receptacle—A UN cylinder or a UN Tube

Multiple-Element Gas Container (MEGC)—Assemblies of UN cylinders, tubes, or bundles of cylinders interconnected by a manifold and assembled within a framework. The term includes all service equipment and structural equipment necessary for the transport of gases.



Multiple-Element Gas Container (MEGC)

WHAT ARE THE UN PRESSURE RECEPTACLE DESIGN TYPES?

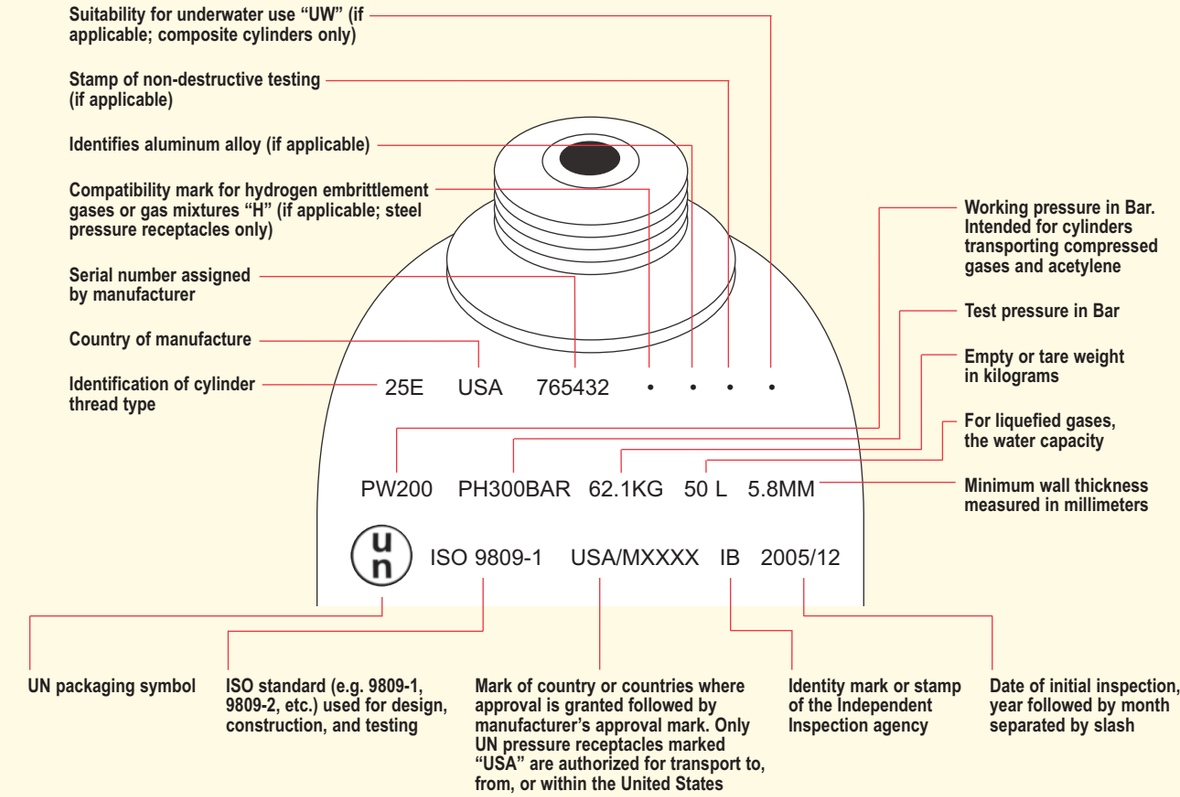
- Acetylene Cylinders: shells in accordance with ISO 9809-1 or -3; Porous mass must conform to ISO 3807-2; must contain a suitable quantity of solvent, and have fusible plugs. [§173.303, §178.71(k)]
- Refillable seamless aluminum cylinders conforming to ISO 7866
- Refillable seamless steel cylinders conforming to ISO 9809-1, 9809-2, or 9809-3
- Non-refillable cylinders conforming to ISO 11118
- Composite cylinders conforming to ISO 11119-1, 11119-2, or 11119-3
- Refillable tubes conforming to ISO 11120

WHAT TYPES OF MARKINGS APPEAR ON UN PRESSURE RECEPTACLES?

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

MIDDLE ROW
Contains operational marks such as the test pressure, the tare or empty weight, and the minimum wall thickness.

BOTTOM ROW
Contains certification marks such as the UN packaging symbol, the ISO standard, the country or countries of approval, and the manufacturer's approval mark.



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