

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

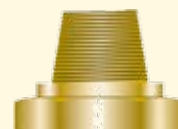
UN PRESSURE RECEPTACLES



- 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.



Taper thread

For example:

Straight	Tapered
18P	17E
25P	25E



Straight (parallel) thread

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

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:
<http://hazmat.dot.gov>

Write:

U.S. Department of Transportation
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For information about Hazmat Regulations contact our Hazmat INFO-LINE:
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HAZARDOUS MATERIALS TRANSPORTATION
Compliance Basics Series

UN Cylinders

what you need to know

GUIDE TO HM-220E FINAL RULE EFFECTIVE SEPTEMBER 11, 2006

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:

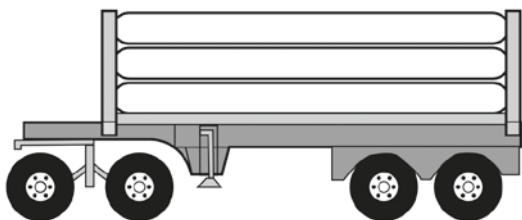
ISO – International Organization for Standardization

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

UN Pressure Receptacle – A UN cylinder or a UN Tube

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

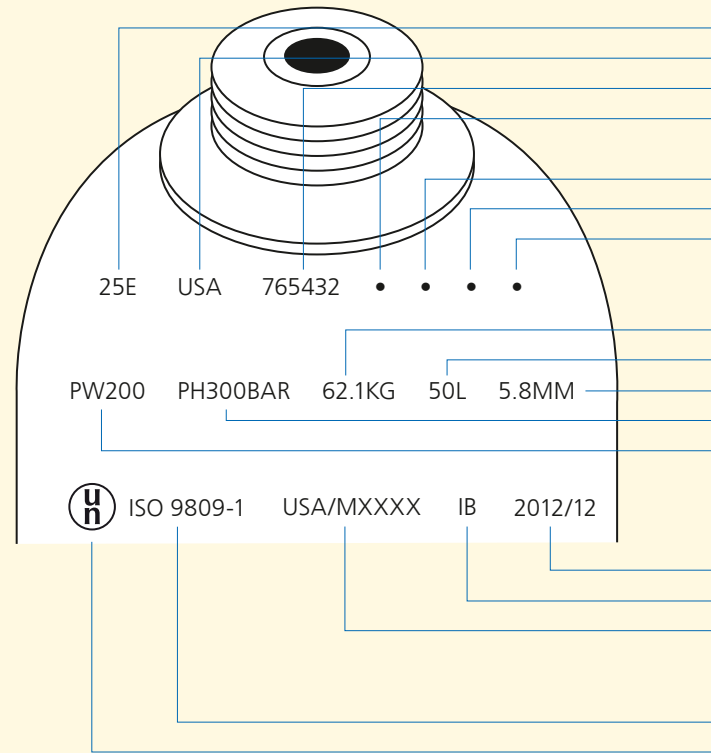
Multiple-Element Gas Container (MEGC) – Assemblies of UN cylinders, tubes, or bundles of cylinders interconnected by a manifold and assembled within a framework. The term includes all service equipment and structural equipment necessary for the transport of gases.



Multiple-Element Gas Container (MEGC)

WHAT 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.



TOP ROW:

- Identification of cylinder thread type
- Country of manufacture
- Serial number assigned by manufacturer
- Compatibility mark for hydrogen embrittlement gases or gas mixtures "H" (if cable; steel pressure receptacles only)
- Identifies aluminum alloy (if applicable)
- Stamp of non-destructive testing (if applicable)
- Suitability for underwater use "UW" (if applicable; composite cylinders only)

MIDDLE ROW:

- Empty or tare weight in kilograms
- For liquefied gases, the water capacity
- Minimum wall thickness measured in millimeters
- Test pressure in Bar
- Working pressure in Bar. Intended for cylinders transporting compressed gases and acetylene

BOTTOM ROW:

- Date of initial inspection, year followed by month separated by slash
- Identity mark or stamp of the Independent Inspection agency
- Mark of country or countries where approval is granted followed by manufacturer's approval mark. Only UN pressure receptacles marked "USA" are authorized for transport to, from, or within the United States
- ISO standard used for design, construction, and testing
- UN packaging symbol

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.

WHAT ARE THE NEW UN PRESSURE RECEPTACLE DESIGN TYPES?

- Acetylene cylinders; except the cylinders must be made of seamless steel, 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