



U.S. Department  
of Transportation

**Pipeline and Hazardous  
Materials Safety  
Administration**

1200 New Jersey Avenue, SE  
Washington, DC 20590

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Reference No. 20-0029

Dear Mr. Muñoz:

This letter is in response to your April 1, 2020, email requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to United Nations (UN) cylinders. You state that you intend to use higher pressure rated UN cylinders for fire extinguishing systems that typically have used lower pressure rated UN cylinders. Specifically, you ask about the applicability of specification and testing requirements, including ISO 10297, for valve accessories, such as pressure gauges and switches.

Please note, PHMSA recently published a final rule, HM-2150 [85 FR 27810], which incorporated by reference (IBR) the newest versions of various international hazardous materials standards to include ISO 10297:2014. All valves subject to the requirements of ISO 10297:2014 had an effective date of May 11, 2020, with a delayed compliance date of May 10, 2021.

We have paraphrased and answered your questions as follows:

- Q1. You ask whether service equipment, such as pressure gauges and pressure switches, are subject to the requirement to withstand 1.5 times the test pressure of the receptacle as specified for in § 178.71(d)(1).
- A1. The answer is yes. Section 178.71(d)(1) requires that equipment subject to pressure must be designed and constructed to withstand at least 1.5 times the test pressure of the receptacle.
- Q2. You ask whether service equipment, as specified in § 178.71(d)(1), meets the design and construction requirement to withstand 1.5 times the test pressure of the pressure receptacle if permanent deformation is observed, but the equipment does not burst and no components are ejected during testing.
- A2. The answer is no. If permanent deformation occurs on the valve during the test, this is considered a failure for the pressure receptacle's service equipment. In accordance with ISO 10297:2014, cylinder valves must be capable of withstanding a hydraulic pressure

test of 1.5 times the test pressure of the cylinder for 2 minutes *without permanent deformation* (emphasis added), leak, or rupture.

- Q3. You ask what type of documentation would be sufficient to demonstrate that a valve and its accessories meet the design and construction (e.g., burst pressure) requirements in § 178.71(d). Specifically, you ask whether a vendor's safety data sheet that demonstrates that a valve and its accessories meet specification for burst pressure is acceptable documentation demonstrating compliance.
- A3. If a valve manufacturer or a third-party testing lab can certify the valve and its accessories comply with ISO 10297:2014 and the valve is appropriately marked to demonstrate compliance, then that is sufficient.
- Q4. You ask whether there are requirements to test at a given sampling rate at 1.5 times the test pressure even if a burst test cannot be implemented as part of the manufacturing process for the valve and its accessories. Further, you ask how a sampling rate would be established to meet the requirement.
- A4. The answer is no, there is no specified sampling rate. In accordance with ISO 10297:2006, a minimum number of test samples are required, but this is dependent on the number of variant types to be tested. In ISO 10297:2014, the number of test samples for testing a valve was clarified to include, pressure gauges or pressure indicators (see ISO 10297:2014, Section 6.3). However, no sampling rate is specified in either edition; the valve manufacturer selects a sampling rate that sufficiently indicates achievement of the design and construction standard.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,



Dirk Der Kinderen  
Chief, Standards Development Branch  
Standards and Rulemaking Division

## REGULATION INTERPRETATION REQUEST

### BACKGROUND:

We are seeking interpretation of DOT requirements for compliance to transport pressurized UN ISO USA refillable seamless steel containers.

The purpose is to use higher rated cylinders for system configurations that are typically served with lower rated cylinders.

Container assemblies of interest include valve assemblies that incorporate accessories, i.e. pressure gauges and pressure switches that are transported under pressure. Container assemblies incorporate burst discs to prevent excessive build-up that are rated to suit the original lower rated cylinders.

Typically accessories are sourced from vendors who state burst pressure of accessories in their data sheets.

### PARAGRAPH OF DOT REGULATION FOR WHICH INTERPRETATION IS SOUGHT:

DOT regulation established in CFR 49, Section 178.71(d) states:

*“Except for pressure relief devices, UN pressure receptacle equipment, including valves, piping, fittings, and other equipment subjected to pressure must be designed and constructed to withstand at least 1.5 times the test pressure of the pressure receptacle”*

### QUESTION 1:

Does equipment referred to in CFR 49 Section 178.71(d) comply the requirement if when tested at 1.5 times the test pressure of the pressure receptacle the equipment does not burst and no parts are ejected but permanent deformation is observed?

### QUESTION 2:

Are data sheets from vendors showing the value of burst pressure enough to document compliance with this requirement? If not, what type of documentation would be enough?

### QUESTION 3:

Considering that burst test cannot be implemented as part of the manufacturing process, is there any requirement to test a given sampling rate at 1.5 times the test pressure of the pressure receptacle? If yes how the sampling rate is established to meet the requirement?