



U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

MAR 13 2000

Mr. John Anderson
Safety and Environmental Manager
Airgas Management, Inc.
P.O. Box 20067
Cheyenne, WY 82003

Ref. No. 99-0157

Dear Mr. Anderson:

This is in response to your letter dated June 6, 1999, requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) as they relate to the qualification, use and maintenance of cylinders. Your scenarios and questions are paraphrased and answered below.

Scenario 1:

Section 173.34(e)(4)(iii) states that the hydrostatic testing system must be calibrated daily and must have an accuracy to within 1% and within 500 psi of any test pressure you will be testing, at pressures above 3,000 psi. Some of our hydrostatic test equipment have a double-jacket system; that is, they have two test jackets. The calibration of the hydrostatic test equipment is normally accomplished by "running" the calibration cylinder at 3,000, 4,000 and 5,000 psi.

- Q1. When calibrating double-jacketed hydrostatic test equipment at 3,000, 4,000, and 5,000 psi, must each of the two test jackets be calibrated to 3,000, 4,000, and 5,000 psi or can we calibrate jacket one, to 3,000 and 5,000 and calibrate jacket two to 4,000?
- A1. Either procedure may be used. The intent is that the jacket used to test a cylinder has been calibrated within the test range for that cylinder.

Scenario 2:

Section 173.34(e)(4)(v) states that a "system check" may be performed at less than 90% of the final test pressure. Our current system performs a "system check" at 85% of the final test pressure. The computer automatically stops the process at 85% and checks the sensors to ensure that the pressure is not falling and that the expansion is stable. If there is a problem, the system will not allow the process to continue. The operator must correct the problem and restart the testing process. If no problem is detected during the system check, the computer resumes the test to the final test pressure. A record is then produced that meets the requirements of 49 CFR 173.34(e)(8).

- Q2. Is a "system check" required to be recorded when, the computer automatically stops the process at 85% of test pressure to check the sensors?



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- A2. Performing a system check is permissive rather than mandatory; therefore, there is no requirement to record the results.

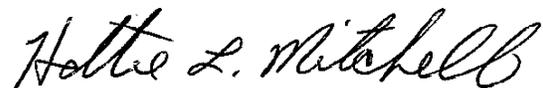
Scenario 3:

The certificate for the calibrated cylinder provides the pressure that was applied and the corresponding expansion value. Example, at 3,000 psi the calibrated cylinder would displace 55.6 grams of water. During our daily calibration of the equipment, we demonstrate that the hydrostatic test equipment is accurate to within 1%, as stated in § 173.34(e)(4)(iii)(A). In this example, at 3,000 psi, the cylinder must displace between 55.1 and 56.1 grams of water to be within the 1% range.

- Q3. (a) Must the test pressure applied to the cylinder be within a 1% range?
- (b) Would I be within the 1% testing accuracy at the applied test pressure of 2,990 psi. (with an expansion value of 55.6 grams of water)?
- (c) Would RSPA consider the system to be accurate with the allowable 1% if at 2,990 psi the calibrated cylinder displaced 55.4 grams of water?
- A3. (a) The answer is no, percentages can be divided up amongst pressure and expansion indicating devices as long as their sum does not exceed 1%.
- (b) The answer is yes. At 55.6 grams of expansion, the associated pressure is 3,000 psi. If the gauge reads 2990 psi then the gauge is within 1% (actually it is .33%). From a practical standpoint the test pressure of 3,000 psi is equivalent to an indicated gauge reading of 2,990 psi.
- (c) The answer is yes. In your example your pressure indicating device and your expansion reading are both off by .33%. In both cases, they are below the desired readings. Since the relationship between these readings is linear, the pressure readings and expansion readings are off by 0%.

I hope this information is helpful. Should you have further questions, please contact us.

Sincerely,



Hattie L. Mitchell, Chief
Regulatory Review and Reinvention
Office of Hazardous Materials Standards



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June 6, 1999

Hattie L. Mitchell
400 Seventh Street SW
Washington, DC 20590

Dear Ms. Mitchell:

Airgas, Inc. would like to receive a written response to the following questions. We have been provided with different answers from RSPA Hazardous Material Enforcement Specialists in the field and would like to receive official guidance.

No
See 173.34(e)(4)(iii)

1. 49 CFR 173.34(e)(4)(iii) states that we must calibrate the hydrotesting system daily. This calibration must be accurate to within 1% and within 500 psi of any test pressure we will be testing at pressures above 3,000 psi. Some of our hydrotesting equipment is a double jacket system. These systems have two test jackets. The calibration of the hydrotest equipment is normally accomplished by "running" the calibration cylinder at 3,000, 4,000 and 5,000 psi. This will allow us to calibrate for the common 3A and 3AA cylinders we will be hydrotesting.

The question arises if we must calibrate each test jacket to 3,000, 4,000, and 5,000. The calibration of the hydrotest equipment validates that the expansion indicating device and the pressure-indicating device are accurate. The test jacket is only the device we use to contain the cylinder during the test.

We propose that we would be well within the regulations if we calibrate at 3,000 in jacket one, 4,000 in jacket two and 5,000 in jacket one. This will document the expansion indicating device and pressure indicating device are accurate and by alternating the test jacket, we will document that no pressure leaks are present in either jacket.

See 2

2. 49 CFR 173.34(e)(4)(v) states that a "system check" may be performed at less than 90% of the final test pressure. Our current system performs a "system check" at 85% of the final test pressure. The computer automatically stops the process at 85% and checks the sensors to ensure that the pressure is not falling and that the expansion is stable. If there is a problem, the system will not allow the process to continue. The operator must correct the problem and restart the testing process. If no problem is detected during the system check, the computer resumes the test to the final test pressure. A record is produced that meets the requirements of 49 CFR 173.34(e)(8).

173.34(e)(4)(v)
No

The question is, must we record these system checks if the system detects a problem? Our position is that until the cylinder reaches 90% of the final test pressure it is not an official test. The regulations do not require a system check to be recorded, only an official test.

If 90% do not record 75% of test pressure



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3. The certificate for the calibrated cylinder provides the pressure that was applied and the corresponding expansion value. Example, at 3,000 psi the calibrated cylinder would displace 55.6 grams of water. During our daily calibration of the equipment, we must demonstrate that the hydrotesting equipment is accurate to within 1%, 49 CFR 173.34(e)(4)(iii)(A).

In the above example, at 3,000 psi the cylinder must displace between 55.1 and 56.1 grams of water to be within the 1% range. The question that we have is, can the pressure applied to the cylinder also be allowed to be within a 1% range? The normal computerized hydrotesting equipment that is used by the majority of retesters has an automatic 10 to 15 psi added to the test pressure so that the pressure recorded is somewhere in the 3,010 to 3,020 psi range. We have had numerous RSPA audits and no one has ever questioned being slightly over. Our question is, what if the pressure recorded would be somewhere in the 2,990 range? We would still be within our 1% testing accuracy. If the calibration test recorded 2,990 psi displaced 55.4 grams of water, would you consider the system to be accurate within the 1% allowed?

I spoke to Ryan Poston from your office this week and he suggested that we contact you for an official ruling. Mr. Poston has been very helpful answering questions and providing assistance.

Sincerely,

A handwritten signature in cursive script that reads "John Anderson".

John Anderson

Safety and Environmental Manager
cc: **Duane Young**