

# MSC Guidelines for Resiliently Seated Valves

Procedure Number: E1-23

Revision Date: 07/26/2010



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## References:

- a. 46 CFR 56.20-15
  - b. ANSI/ISA S75.01 (Flow Equations for Sizing Control Valves)
  - c. ANSI/ISA S75.02 (Control Valve Capacity Test Procedures)
  - d. American Petroleum Institute (API) 607 (Fire Test for Soft Seated Quarter Turn Valves)
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## Contact Information:

If you have questions or comments concerning this document, please contact the Marine Safety Center (MSC) by e-mail or phone, referring to Procedure Number: **E1-23**.

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## Responsibilities:

The submitter shall provide sufficient documentation and plans to indicate that the valve meets one acceptance criteria for Resiliently Seated Valves (RSV). RSV acceptance is based on actual flow testing, fire testing or calculations.

Requests for valve acceptance may only be made by the valve manufacturer.

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## General Guidance:

- ❑ RSVs are not Type Approved but are deemed “Acceptable” as meeting positive shutoff or Category A requirements based on the shutoff integrity of the valve with a resilient seat failure. Category “B” valves are not required to be tested. A list of “Acceptable” valves can be provided upon request.
- ❑ Valve tests shall be attended and/or documentation shall be certified by any one of the following:
  - 1) An independent testing facility. Formal Coast Guard lab approval is not required. The testing facility must be qualified in accordance with 46 CFR 159.010-3 & -5.
  - 2) A classification society recognized under the Alternative Compliance Program (NVIC 2-95).

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## General Guidance (continued):

- 3) A licensed professional engineer (PE can be employed by the applicant).
- ❑ Reasonable extrapolation within a series is acceptable, i.e.; test a 2 inch and an 8 inch valve and request acceptance of valve sizes from 1 inch through 12 inches. The design shall be the same for the entire valve series.
  - ❑ Materials for the body, disc, ball, stem and seat shall be in accordance with the material specifications listed in 46 CFR 56.60 or the ASME Boiler and Pressure Vessel Code, Sections I or VIII. Other materials may be considered based on documentation establishing equivalence to an acceptable material. The documentation required to establish an equivalency must be provided by the submitter.
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### Performance Test for Positive Shutoff Valves (46 CFR 56.20-15 (b)(1))

- ❑ With all resilient seat material removed and the testing arrangement at rated valve pressure, the closed valve leakage rate shall not exceed the following:
    - 1) For a fluid: 10ml/hour (0.34 oz/hour) per inch of valve NPS
    - 2) For a gas: 3 liter/hour (0.11 cu.ft/hour) per inch of valve NPS
  - ❑ Packing materials must be fire resistant.
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### Performance Test for Category "A" Valve (46 CFR 56.20-15 (b)(2))

- ❑ With all resilient seat material removed and the testing arrangement at rated valve pressure, the closed valve leakage rate shall not exceed the greatest of the following:
  - 1) 5% of its fully open flow rate
  - 2)  $\frac{15\%}{\sqrt{(\text{valve NPS})}}$  (fully open flow rate)

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## General Guidance (continued):

### Calculations (46 CFR 56.20-15 (c))

- ❑ Calculations shall be in accordance with references (b) or (c) to determine the valve flow coefficient (C).

### Fire Test (46 CFR 56.20-15 (c))

- ❑ Fire tests shall be conducted IAW reference (d).
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### Valve Installation Requirements

- ❑ Positive shutoff valves shall be fitted in piping subject to internal head pressure from a tank containing fuel or oil. Positive shutoff valves may be used in any location in lieu of a required Category “A” or Category “B” valve.
  - ❑ Category “A” valves may be used in any location except where positive shutoff valves are required. Cat “A” valves are required in the following locations:
    - 1) valves at vital piping system manifolds;
    - 2) isolation valves in cross-connects between two piping systems, at least one of which is a vital system; and,
    - 3) valves providing closure for any opening in the shell of the vessel.
  - ❑ Category “B” Valve may be used in any location except where Category “A” or positive shutoff valves are required.
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## Disclaimer

This guidance is not a substitute for applicable legal requirements, nor is it itself a rule. It is not intended to nor does it impose legally-binding requirements on any party. It represents the Coast Guard’s current thinking on this topic and may assist industry, mariners, the general public, and the Coast Guard, as well as other federal and state regulators, in applying statutory and regulatory requirements. You can use an alternative approach for complying with these requirements if the approach satisfies the requirements of the applicable statutes and regulations. If you want to discuss an alternative, you may contact the Marine Safety Center, the unit responsible for implementing this guidance.

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