

## § 56.20-5

(ii) Subjecting a representative model to a proof test or experimental stress analysis described in paragraph A-22 of section I the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 56.01-2); or

(iii) Other means specifically accepted by the Marine Safety Center.

(3) Valves must be tested in accordance with § 56.97-5 of this part.

(4) If welded, valves must be welded in accordance with subpart 56.70 of this part and part 57 of this chapter or by other processes specifically approved by the Marine Safety Center.

(d) Where liquid trapped in any closed valve can be heated and an uncontrollable rise in pressure can result, means must be provided in the design, installation, and operation of the valve to ensure that the pressure in the valve does not exceed that allowed by this part for the attained temperature. (For example, if a flexible wedge gate valve with the stem installed horizontally is closed, liquid from testing, cleaning, or condensation can be trapped in the bonnet section of the closed valve.) Any resulting penetration of the pressure wall of the valve must meet the requirements of this part and those for threaded and welded auxiliary connections in ASME B16.34 (incorporated by reference; see 46 CFR 56.01-2).

[CGD 77-140, 54 FR 40604, Oct. 2, 1989; 55 FR 39968, Oct. 1, 1990; USCG-2003-16630, 73 FR 65176, Oct. 31, 2008]

## § 56.20-5 Marking (modifies 107.2).

Each valve shall bear the manufacturer's name or trademark and reference symbol to indicate the service conditions for which the manufacturer guarantees the valve. The marking shall be in accordance with MSS SP-25 (incorporated by reference; see 46 CFR 56.01-2).

[USCG-2003-16630, 73 FR 65176, Oct. 31, 2008]

## § 56.20-7 Ends.

(a) Valves may be used with flanged, threaded, butt welding, socket welding or other ends in accordance with applicable standards as specified in subpart 56.60.

## 46 CFR Ch. I (10-1-13 Edition)

## § 56.20-9 Valve construction.

(a) Each valve must close with a right-hand (clockwise) motion of the handwheel or operating lever as seen by one facing the end of the valve stem. Each gate, globe, and angle valve must generally be of the rising-stem type, preferably with the stem threads external to the valve body. Where operating conditions will not permit such installations, the use of a nonrising-stem valve will be acceptable. Each nonrising-stem valve, lever-operated valve, or other valve where, because of design, the position of the disc or closure mechanism is not obvious must be fitted with an indicator to show whether the valve is opened or closed, except as provided for in § 56.50-1(g)(2)(iii) of this part. No such indicator is required for any valve located in a tank or similar inaccessible space when indicators are available at accessible sites. The operating levers of each quarter-turn (rotary) valve must be parallel to the fluid flow when open and perpendicular to the fluid flow when closed.

(b) Valves of Class I piping systems (for restrictions in other classes refer to sections on low temperature service), having diameters exceeding 2 inches must have bolted, pressure seal, or breech lock bonnets and flanged or welding ends, except that socket type welding ends shall not be used where prohibited by § 56.30-5(c) of this part, § 56.30-10(b)(4) of this part for the same pressure class, or elsewhere in this part. For diameters not exceeding 2 inches, screwed union bonnet or bolted bonnet, or bonnetless valves of a type which will positively prevent the stem from screwing out of the body may be employed. Outside screw and yoke design must be used for valves 3 inches and larger for pressures above 600 pounds per square inch gage. Cast iron valves with screwed-in or screwed-over bonnets are prohibited. Union bonnet type cast iron valves must have the bonnet ring made of steel, bronze, or malleable iron.

(c) Valves must be designed for the maximum pressure to which they may be subjected, but in no case shall the design pressure be less than 50 pounds per square inch gage. The use of wafer type resilient seated valves is not permitted for shell connections unless

they are so arranged that the piping immediately inboard of the valve can be removed without affecting the watertight integrity of the shell connection. Refer also to § 56.20–15(b)(2)(iii) of this part. Large fabricated ballast manifold connecting lines exceeding 8 inches nominal pipe size must be designed for a pressure of not less than 25 pounds per square inch gage.

(d) Disks or disk faces, seats, stems and other wearing parts of valves shall be made of material possessing corrosion and heat-resisting qualities suitable for the service conditions to which they may be subjected.

(e) Plug cocks shall be constructed with satisfactory and positive means of preventing the plug from becoming loosened or removed from the body when the plug is operated. Cocks having plug locking arrangements depending on cotter pins are prohibited.

(f) Cocks shall be marked in a straight line with the body to indicate whether they are open or closed.

(g) Materials forming a portion of the pressure barrier shall comply with the applicable provisions of this part.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 77–140, 54 FR 40604, Oct. 2, 1989; CGD 95–012, 60 FR 48050, Sept. 18, 1995; USCG–2004–18884, 69 FR 58346, Sept. 30, 2004; USCG–2003–16630, 73 FR 65176, Oct. 31, 2008]

#### § 56.20–15 Valves employing resilient material.

(a) A valve in which the closure is accomplished by resilient nonmetallic material instead of a metal to metal seat shall comply with the design, material, construction and testing for valves specified in this part.

(b) Valves employing resilient material shall be divided into three categories, Positive shutoff, Category A, and Category B, and shall be tested and used as follows:

(1) *Positive shutoff valves.* The closed valve must pass less than 10 ml/hr (0.34 fluid oz/hr) of liquid or less than 3 l/hr (0.11 cubic ft/hr) of gas per inch nominal pipe size through the line after removal of all resilient material and testing at full rated pressure. Packing material must be fire resistant. Piping subject to internal head pressure from a tank containing oil must be fitted with positive shutoff valves located at

the tank in accordance with § 56.50–60(d). Otherwise positive shutoff valves may be used in any location in lieu of a required Category A or Category B valve.

(2) *Category A valves.* The closed valve must pass less than the greater of 5 percent of its fully open flow rate or 15 percent divided by the square root of the nominal pipe size (NPS) of its fully open flow rate through the line after complete removal of all resilient seating material and testing at full rated pressure; as represented by the formula:  $(15\% / \text{SQRT} \times (\text{NPS}))$  (Fully open flow rate). Category A valves may be used in any location except where positive shutoff valves are required by § 56.50–60(d). Category A valves are required in the following locations:

(i) Valves at vital piping system manifolds;

(ii) Isolation valves in cross-connects between two piping systems, at least one of which is a vital system, where failure of the valve in a fire would prevent the vital system(s) from functioning as designed.

(iii) Valves providing closure for any opening in the shell of the vessel.

(3) *Category B valves.* The closed valve will not provide effective closure of the line or will permit appreciable leakage from the valve after the resilient material is damaged or destroyed. Category B valves are not required to be tested and may be used in any location except where a Category A or positive shutoff valve is required.

(c) If a valve designer elects to use either a calculation or actual fire testing instead of material removal and pressure testing, the calculation must employ ISA–S75.02 (incorporated by reference; see 46 CFR 56.01–2) to determine the flow coefficient ( $C_v$ ), or the fire testing must be conducted in accordance with API 607 (incorporated by reference; see 46 CFR 56.01–2).

[CGD 95–028, 62 FR 51200, Sept. 30, 1997, as amended by USCG–2003–16630, 73 FR 65176, Oct. 31, 2008]

#### § 56.20–20 Valve bypasses.

(a) Sizes of bypasses shall be in accordance with MSS SP–45 (incorporated by reference; see 46 CFR 56.01–2).