



Standard Specification for Design and Installation of Overboard Discharge Hull Penetration Connections¹

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1. Scope

1.1 This specification covers carbon steel overboard discharge hull penetrations for system piping of NPS 1 through NPS 24 (see [Note 1](#)).

NOTE 1—The dimensionless designator NPS (nominal pipe size) has been substituted in this standard for such TRADITIONAL terms as nominal diameter, size, and nominal size.

1.2 The minimum pipe schedule and reinforcement dimensions presented in [Tables 1-6](#) are based on specifications in 46 CFR, 56.50-95 and Navy Design Data Sheet 100-1.

1.3 This specification does not include sea chest penetrations.

1.4 This specification does not include penetrations in protective plating.

2. Referenced Documents

2.1 ASTM Standards:²

[A519 Specification for Seamless Carbon and Alloy Steel Mechanical Tubing](#)

2.2 ANSI Standard:

[B36.10 Welded and Seamless Wrought Steel Pipe](#)³

2.3 Military Document:

[MIL-STD-1689 Fabrication, Welding, and Inspection of Ships Structure](#)⁴

2.4 Other Documents:

[Title 46 Code of Federal Regulations \(CFR\), Subchapter F, Marine Engineering](#)⁴

[Department of the Navy, Bureau of Ship Design Data Sheet 100-1](#)⁵

[ABS Rules for Building and Classing Steel Vessels](#)⁶

3. Classification

3.1 *Type I*—Nonreinforced penetrations. [Table 1](#) provides minimum schedules for the penetration pipe. See [Fig. 1](#) for details of the penetration.

3.2 *Type II*—Doubler plate-reinforced penetrations. [Table 2](#) provides minimum dimensions for doubler plates.

3.2.1 *Class 1*—Inboard doubler plates. ([Fig. 2](#))

3.2.2 *Class 2*—Outboard doubler plates. ([Fig. 3](#))

3.3 *Type III*—Insert plate-reinforced penetrations. [Table 3](#) provides minimum dimensions for insert plates.

3.3.1 *Class 1*—Single-bevel insert plates. ([Fig. 4](#))

3.3.2 *Class 2*—Double-bevel insert plates. ([Fig. 5](#))

3.4 *Type IV*—Sleeve-reinforced penetrations. [Fig. 6](#) details sleeve-reinforced penetrations.

3.4.1 *Class 1*—Sleeves of nonmachined steel tube. [Table 4](#) provides minimum dimensions for nonmachined sleeves.

3.4.2 *Class 2*—Sleeves of machined steel tube or pipe. [Table 5](#) provides minimum dimensions for machined sleeves.

3.4.3 *Class 3*—Sleeves of rolled steel flatbar or plate. [Table 6](#) provides minimum dimensions for rolled sleeves.

4. Materials

4.1 Discharge pipe shall be of an acceptable material as specified by Title 46 CFR, 56.60-1.

4.2 Doubler and insert plates shall be of material with physical properties equal to or better than the reinforced shell plate.

4.3 Reinforcing sleeve material shall depend on the penetration pipe size:

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁴ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.

⁵ Available from Department of the Navy, Naval Sea Systems Command, Washington, DC 20362.

⁶ Available from American Bureau of Shipping (ABS), ABS Plaza, 16855 Northchase Dr., Houston, TX 77060, <http://www.eagle.org>.