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## Standard Practice for Use of Branch Connections<sup>1</sup>

This standard is issued under the fixed designation F681; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

### 1. Scope

1.1 This practice lists commonly used types of branch connections for carbon steel, chromium-molybdenum steel pipe and copper-nickel alloy tubing. Branch to run size applications are given in [Table 1](#), [Table 2](#), and [Table 3](#). Other types of branch connections ([Fig. 1](#)) may be used provided they comply with the requirements of Title 46 CFR Subparts 56.07-10(f) and 56.70-15(g) of the USCG Regulations.

### 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[F722 Specification for Welded Joints for Shipboard Piping Systems](#)

2.2 *ANSI Standard:*<sup>3</sup>

[B31.1 Power Piping](#)

2.3 *Other Document:*<sup>4</sup>

[Title 46 Code of Federal Regulations \(CFR\) Shipping, Parts 41 to 69](#)

### 3. General Requirements

3.1 Weld joint designs shall be in accordance with Specification [F722](#) and the limitations therein.

3.2 Fabricated branch connections shall meet the reinforcement requirements of Section 104.3 of ANSI B31.1 as modified by Title 46, CFR Subparts 56.07-10(f) and 56.70-15(g) of the USCG regulations.

3.3 Threaded fittings shall be subject to the limitations of Title 46 CFR, Subpart 56.30-20 of the USCG Regulations.

### 4. Keywords

4.1 branch connections; carbon steel connections; chromium-molybdenum steel pipe; copper-nickel alloy tubing

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee [F25](#) on Ships and Marine Technology and is the direct responsibility of Subcommittee [F25.11](#) on Machinery and Piping Systems.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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

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

TABLE 1 Branch Connection Matrix for Carbon Steel Piping

LEGEND (see Fig. 1)

- 1 = Tee or lateral (butt weld)
- 2 = Tee or lateral (socket weld or threaded)
- 3 = Welded outlet (butt weld end)
- 4 = Welded outlet (socket weld or threaded end)
- 5 = Fabricated joint (cut-in branch)

**BRANCH SIZE (NPS), in.**

		$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8	10	12	14	16	18	
MAIN OR RUN SIZE (NPS), in.	$\frac{1}{4}$																					
	$\frac{3}{8}$	2																				
	$\frac{1}{2}$	2	2																			
	$\frac{3}{4}$	2	2	2	2																	
	1	2	2	2	2	2																
	$1\frac{1}{4}$	2	2	2	2	2	2															
	$1\frac{1}{2}$	2	2	2	2	2	2	2														
	2	2	2	2	2	2	2	2	2													
	$2\frac{1}{2}$	4	4	4	4	4	4	4	4	5												
	3	4	4	4	4	4	4	4	4	4, 5	5											
	$3\frac{1}{2}$	4	4	4	4	4	4	4	4	4, 5	5	5										
	4	4	4	4	4	4	4	4	4	4, 5	4, 5	5	5									
	5	4	4	4	4	4	4	4	4	4, 5	4, 5	5	5	5								
	6	4	4	4	4	4	4	4	4	4, 5	4, 5	5	5	5	5							
	8	4	4	4	4	4	4	4	4	4, 5	4, 5	5	5	5	5	5						
	10	4	4	4	4	4	4	4	4	4, 5	4, 5	3	3	3	3	3	1	1	1	1		
	12	4	4	4	4	4	4	4	4	4, 5	4, 5	3	3	3	3	3	3	1	1	1	1	
	14	4	4	4	4	4	4	4	4	4, 5	4, 5	3	3	3	3	3	3	1	1	1	1	1
16	4	4	4	4	4	4	4	4	4, 5	4, 5	3	3	3	3	3	3	3	1	1	1	1	
18	4	4	4	4	4	4	4	4	4, 5	4, 5	3	3	3	3	3	3	3	3	1	1	1	

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