

MSS SP-97-2019

**Integrally Reinforced
Forged Branch Outlet Fittings:
Socket Welding, Threaded,
and Buttwelding Ends**

Standard Practice
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This Standard Practice has been substantially revised from the previous 2012 edition. It is suggested that if the user is interested in knowing what changes have been made, that direct page by page comparison should be made of this document and previous edition.

Non-toleranced dimensions in the Standard Practice are nominal unless otherwise specified.

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Manufacturers Standardization Society of the Valve and Fittings Industry

INTEGRALLY REINFORCED FORGED BRANCH OUTLET FITTINGS: SOCKET WELDING, THREADED, AND BUTTWELDING ENDS

1. SCOPE

1.1 This Standard Practice includes essential dimensions, finish, tolerances, testing, marking, material, and minimum strength requirements for 90° and 45° integrally reinforced forged branch outlet fittings of butt welding, socket welding, and threaded types.

1.1.1 Unless specified otherwise by the manufacturer, conventional integrally reinforced forged branch outlet fittings are intended for the following header by branch combinations: STD x STD, XS x XS, SCH. 160 x SCH 160, XXS x XXS, XS x 3000, SCH 160 x 6000, and XXS x 9000. When the run and branch pipes are of differing or mixed schedules, then the selection of the branch connection shall be determined by contacting the manufacturer. Such selections shall be agreed upon by purchaser and manufacturer at time of order and may involve supplemental marking requirements determined by other standards (e.g., material grade determination, other factors). See Section 1.3. Mixed schedule branch outlet fittings are unique to the design of each system, and thus outside the scope of this Standard Practice. The adequacy of the design for light, intermediate, and heavy wall branch outlet fittings may be established by mathematical analysis as contained in the applicable pressure vessel or piping codes, or by finite element analysis.

1.2 Fittings manufactured to this Standard Practice are designed to make a fully reinforced branch connection in accordance with applicable piping code requirements, when attached, at an opening in a run pipe by means of a full penetration weld.

1.3 Fittings, otherwise conforming to this Standard Practice, may be made to special dimensions, size, shape, tolerances, or other dimensional requirements of other wrought material by agreement between the manufacturer and the purchaser. See Section 4.2 (f) for supplemental marking requirements.

1.4 **Standard Units** Tables 2 through 7 show the fitting's dimensional requirements in U.S. customary units or inches (decimal). Tables A2 through A7 show the fitting's dimensional requirements in SI (metric) units (e.g., millimeters). The values stated in either U.S. customary or SI (metric) units are to be regarded separately as the Standard. Within the body text, the SI (metric) units are shown in parenthesis. Combining values from the two systems may result in non-conformance with the Standard Practice. The values stated in each option are not exact equivalents; therefore, each measurement system must be used independently of the other.

2. SERVICE DESIGNATION

2.1 These fittings are designated by their size, type, and class, as shown in Table 1.

2.2 Design temperature and other service conditions shall be limited as provided by the applicable piping code or regulation for the material of construction of the fitting. Within these limits, the maximum allowable pressure of a fitting shall be that computed for straight seamless run pipe of equivalent material (as shown by comparison of composition and mechanical properties in the respective material specifications). The wall thickness used in such computation shall be that tabulated in ASME B36.10M for the size and applicable schedule of pipe reduced by applicable manufacturing tolerances and other allowances (e.g., threaded allowances).

2.3 Any corrosion allowance and any variation in allowable stress due to temperature or other design factors shall be applied to the pipe and fitting alike. The pipe wall thickness corresponding to each Class of fitting, for rating purposes only, is shown in Table 1.