

**MSS SP-97-2001**

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

**COMPLIMENTARY  
COPY**

**Standard Practice  
Developed and Approved by the  
Manufacturers Standardization Society of the  
Valve and Fittings Industry, Inc.  
127 Park Street, NE  
Vienna, Virginia 22180  
(703) 281-6613**



This MSS Standard Practice was developed under the consensus of the MSS Technical Committee 105 and the MSS Coordinating Committee. The content of this Standard Practice is the result of the efforts of competent and concerned volunteers to provide an effective, clear, and non-exclusive specification that will benefit the industry as a whole. This MSS Standard Practice is intended as a basis for common practice by the manufacturer, the user, and the general public. The existence of an MSS Standard Practice does not in itself preclude the manufacture, sale, or use of products not conforming to the Standard Practice. Mandatory conformance is established only by reference in a code, specification, sales contract, or public law, as applicable.

U.S. customary units in this SP are the standard; the metric units are for reference only.

Non-toleranced dimensions in this Standard Practice are nominal, and, unless otherwise specified, shall be considered "for reference only".

Unless otherwise specifically noted in this MSS SP, any standard referred to herein is identified by the date of issue that was applicable to the referenced standard(s) at the date of issue of this MSS SP. (See Annex C).

*Any part of this standard may be quoted. Credit lines should read 'Extracted from MSS SP-97, 2001, with permission of the publisher, the Manufacturers Standardization Society.' Reproduction prohibited under copyright convention unless written permission is granted by the Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.*

Originally Approved June 1987

Copyright © 1987 by  
Manufacturers Standardization Society  
of the  
Valve and Fittings Industry, Inc.  
Printed in U.S.A.

**TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>PAGE</u></b>
1 SCOPE.....	1
2 SERVICE DESIGNATION.....	1
3 SIZE.....	2
4 MARKING.....	2
5 MATERIAL.....	2
6 DESIGN AND DIMENSION.....	3
7 TESTS.....	3
TABLE 1 Correlation of Fittings Class with Schedule Number or Wall Designation of Run Pipe for Calculation of Ratings.....	1
2 Branch Outlet Height - Buttwelding, Customary Units.....	4
3 Branch Outlet Height - Threaded, Customary Units.....	5
4 Branch Outlet - Socket Welding, Customary Units.....	6
A 2 Branch Outlet Height - Buttwelding, Metric Units.....	7
A 3 Branch Outlet Height - Threaded, Metric Units.....	8
A 4 Branch Outlet - Socket Welding, Metric Units.....	9
FIGURE 1 Fitting Consolidation Gap Allowance.....	2
ANNEX A Metric (SI) Tables * .....	7, 8, 9
B Design Proof Test * .....	10
C Referenced Standards and Applicable Dates.....	11

\* This Annex is an integral part of this Standard Practice and is placed after the main text for convenience.

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

**1. SCOPE**

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

1.2 Fittings manufactured to this standard 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 may be made to special dimensions, size, shape, tolerances, or of other wrought material by agreement between manufacturer and the purchaser.

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 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 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.

**2. SERVICE DESIGNATION**

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

**TABLE 1  
Correlation of Fittings Class With Schedule Number or  
Wall Designation of Run Pipe for Calculation of Ratings**

CLASS OF FITTING	TYPE	BRANCH SIZE	PIPE WALL FOR RATING BASIS (a)
Standard	Buttwelding	NPS 1/8 - 24	Standard
Extra Strong	Buttwelding	NPS 1/8 - 24	Extra Strong
Schedule 160	Buttwelding	NPS 1/2 - 6	Schedule 160
3000	Threaded & Socket Welding	NPS 1/8 - 4	Extra Strong
6000	Threaded & Socket Welding	NPS 1/2 - 2	Schedule 160

(a) Note: The use of run or branch pipe wall thicknesses either thinner or thicker than shown in Table 1 constitutes a deviation from this standard and is provided for in Section 1.3.