BRANCH CONNECTIONS

BONNEY FORGE

- WELDOLET®
- SOCKOLET®
- THREDOLET®
- FLEXOLET®
- LATROLET®
- ELBOLET®
- SWEEPOLET®
- BRAZOLET®
- COUPOLET®

BONNEY FORGE

SALES CENTER • WAREHOUSE
14496 Croghan Pike - Mt. Union, PA 17066
P: (800) 345-7546 | F: (814) 542-9977
bfsales@bonneyforge.com

THE BEST VALUE
Price, Quality, Service
ALL THE TIME

AN ISO 9001 CERTIFIED COMPANY
WWW.BONNEYFORGE.COM | (800) 345-7546

Since 1931 Bonney Forge Olets® have been the benchmark in the branch connection industry...

... because they are forged with durability in mind, scrutinized, and tested to the latest industry standards which results in a superior branch connection.

Table of Contents

GLOBAL REACH

Bonney Forge Europe
Bergamo, Italy

- API 602 Forged Valves
- Pressure Seal Valves
- API 6A Valves
- Floating Ball Valves
- Trunnion Ball Valves
- Double Block & Bleed Valves

bfe.it

Bonney Forge Shanghai
Shanghai, China

- API 594 Valves
- API 600 Valves
- API 623 Valves
- API 6D Valves

bonneyforge.com

Bonney Forge
Mt. Union, PA

- Forged Elbows/Tees
- Forged Laterals/Crosses
- Forged Street Elbows
- Plugs/Bushings
- Couplings
- Reducer Inserts
- Unions
- Weldolet®
- Sockolet®
- Thredolet®
- Flexolet®
- Latrolet®
- Elbolet®
- Sweepolet®
- Brazolet®
- Coupolet®

bonneyforge.com

WFI International
Houston, TX

- Pipet®
- Bosset®
- Vesselet® *(Insert Weldolet)*
- Nozzelet®
- Flanges
- Swage Nipples
- Stub Ends
- Studding Outlet
- Safe End/Transition Piece
- Seamless Forged Specialty Tees
- Seamless Forged Wyes & Laterals

wfi-intl.com

HISTORY

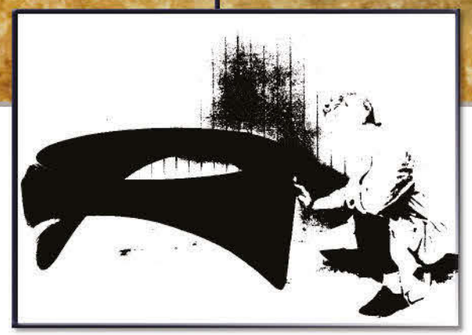
Since 1931 Bonney Forge has been providing integrally reinforced branch connections to the marketplace. We pride ourselves as being the industry leader for providing code compliant branch connections, so we take care to review, test and evaluate applications that require special attention. Give us a call to see what we can provide for your application.

1876 — Founded in Philadelphia, Pennsylvania by Mr. C.S. Bonney.

1907 — Bonney acquires additional properties in Allentown, Pennsylvania ideal for expansion.

1918 — Bonney becomes a prime supplier of forged parts to the government during the first World War.

1931 — Development of Weldolet® and Thredolet® pipe welded fittings. Recognized today across the globe.



1959 — A complete line of forged steel elbows and tees are added to the line of fittings.

1984 — John Leone purchases Bonney Forge from Gulf & Western Company.

2000 — Bonney Forge introduces run size consolidations for branch connections, reducing inventory requirements.

2001 — All manufacturing operations transitioned to Mount Union, Pennsylvania.

2002 — Began cast steel valve manufacturing operations in China.

2013 — Bonney Forge acquires WFI International, a strong partner in engineered to order branch connections.

Bonney Forge Corp. acquires Bonney Forge Europe a world leader in production of quality valves.

CONFIGURATIONS

A FULLY REINFORCED HEADER PIPE EVERY TIME

What makes a Bonney Forge Olet® work?

By adding additional material close to the run pipe, Bonney Forge is able to fully reinforce your header pipes. Bonney Forge Olets® coupled with full penetration groove welds meet ASME B31.1 and ASME B31.3 piping codes, the codes your piping systems are designed to.

TAPER BORE DESIGN

- Wider design reduces stresses in the weld and improves mechanical strength of the connection.
- Tapered bore provides smooth flow transition
- Meets MSS SP-97, ASME B16.11, B31.1 & B31.3 off the shelf. Can be designed to other codes and applications.
- Proof tested to ensure design integrity.

STRAIGHT THRU BORE DESIGN

- Smallest design resulting in less welding and fewer stocking parts to cover the entire range of header sizes.
- Meets MSS SP-97, ASME B16.11 & B31.3 off the shelf. Can be designed to other codes and applications.
- Proof tested to ensure design integrity.

INSERT BRANCH DESIGN

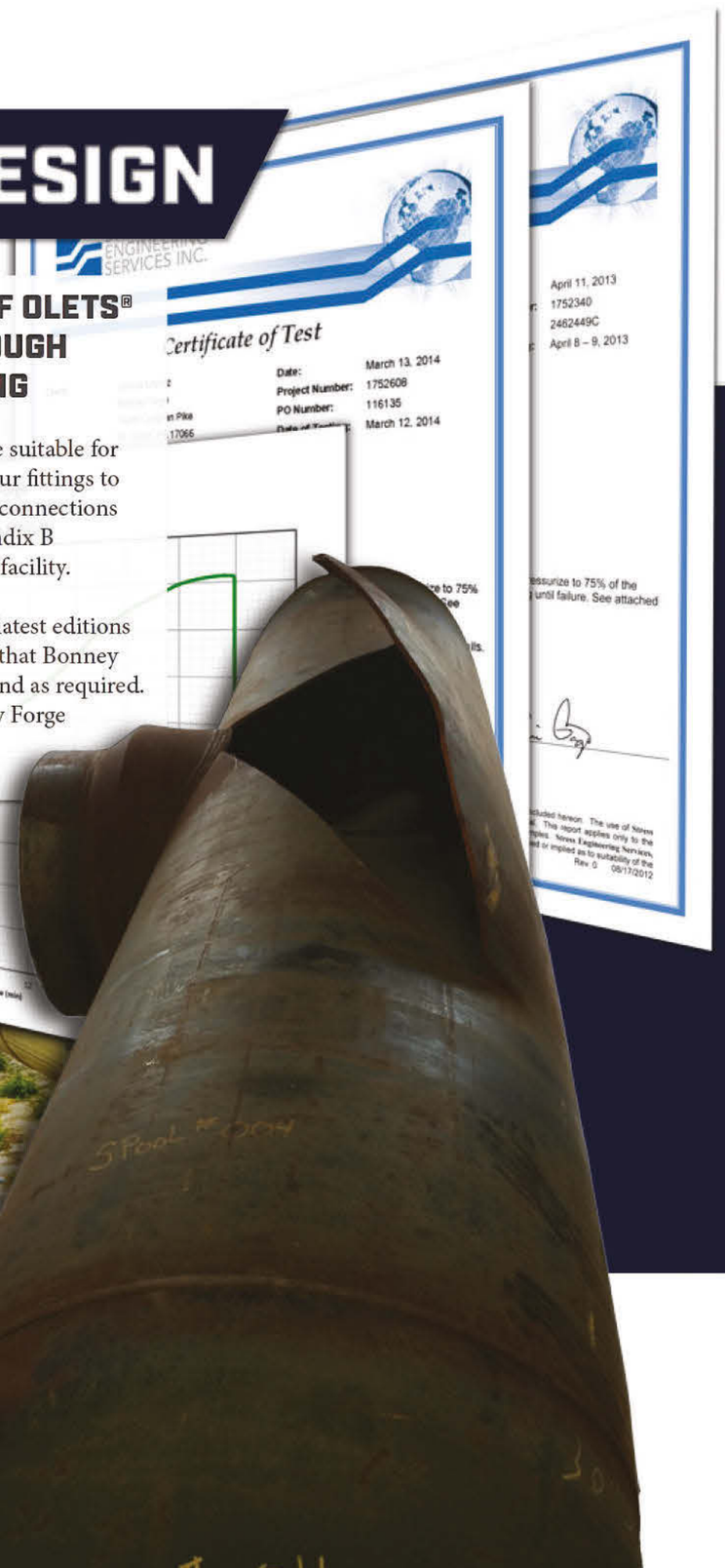
- Wide contour design for lowest stress intensification factors and easiest access for radiography
- Engineered-to-order based on application
- Best for critical applications where flow or acoustic induced vibration (FIV/AIV) are a concern. Well suited for marine, subsea, nuclear, and other critical applications.

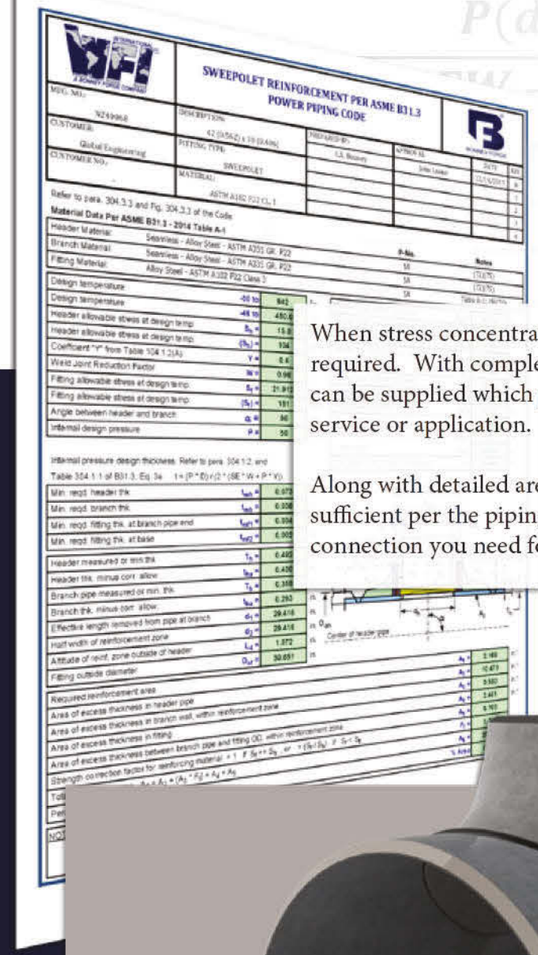
PROVEN DESIGN

COMPLETE RANGE OF OLETS® QUALIFIED THROUGH BURST TESTING

How do you know an Olet® will be suitable for your system? Because we tested our fittings to failure. All Bonney Forge branch connections are qualified per MSS SP97 Appendix B requirements by a third party test facility.

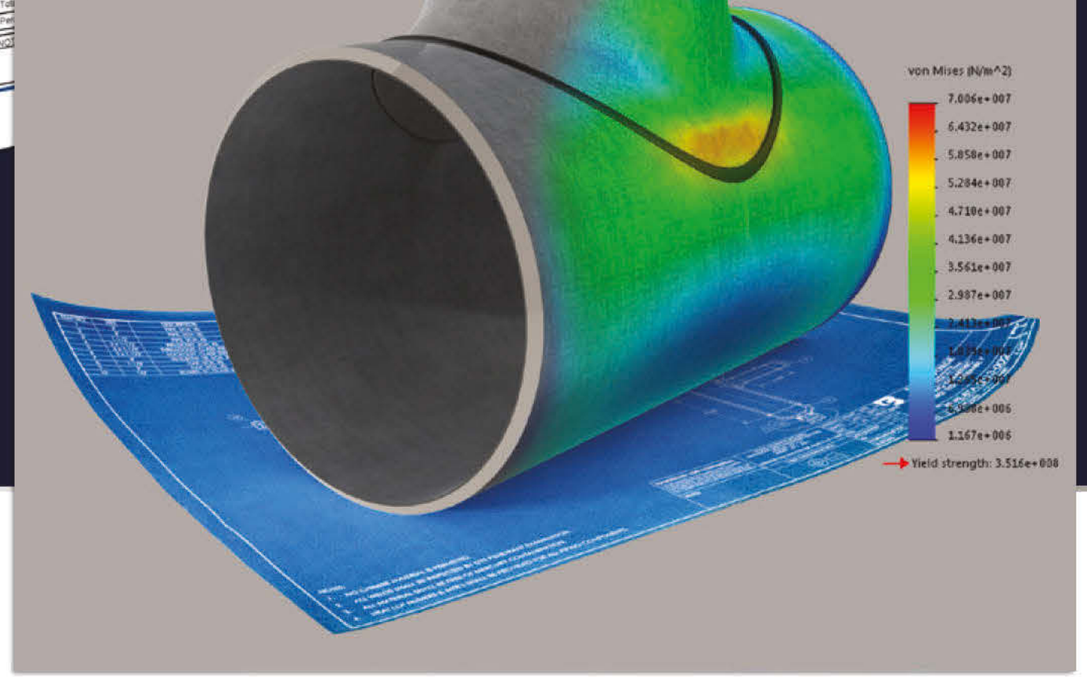
Because we test our design to the latest editions of the piping code, we can ensure that Bonney Forge Olets® perform as needed, and as required. The proof is in the testing, Bonney Forge Olets® are the superior branch connection in the industry.



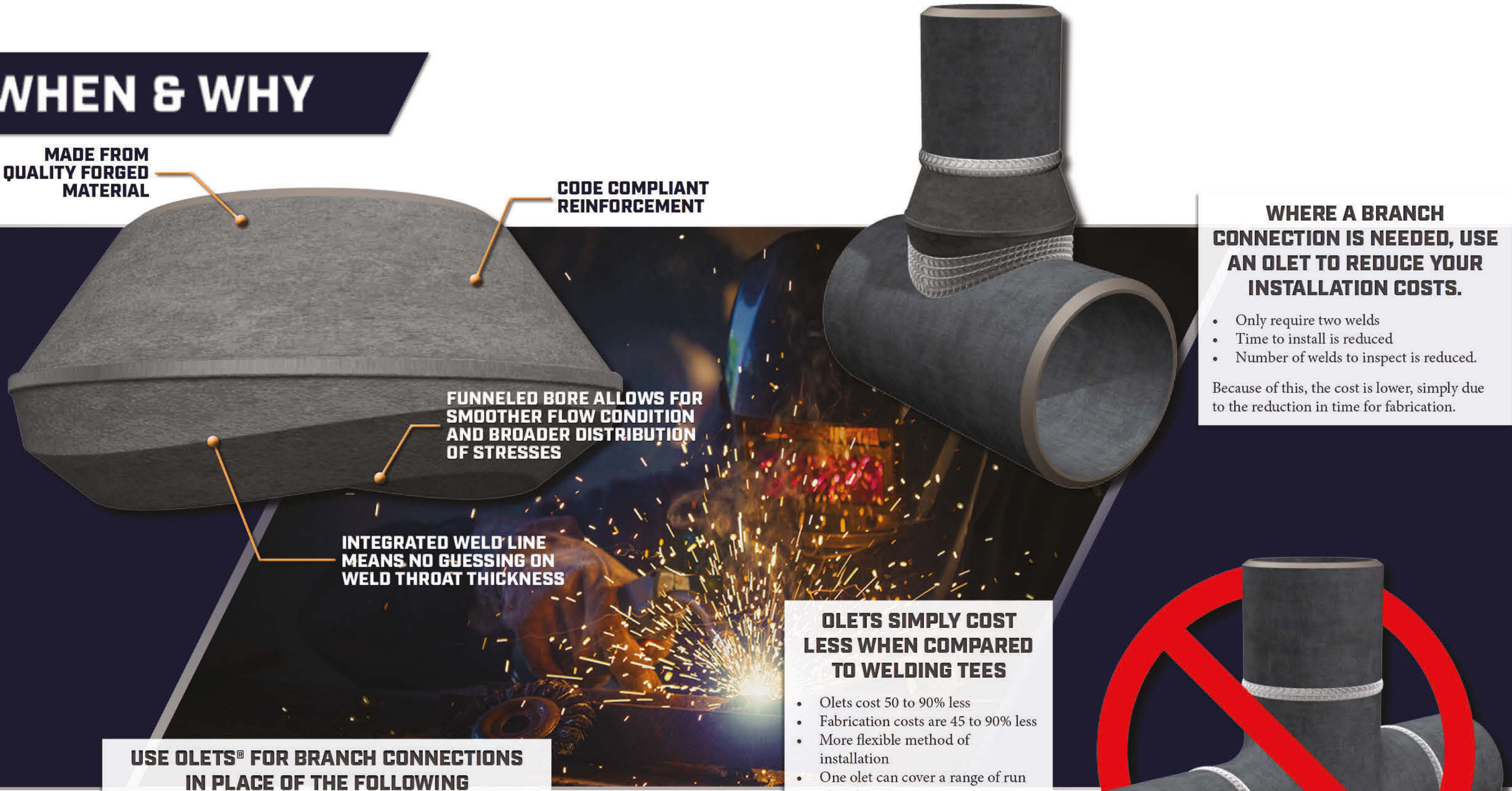


When stress concentrations and cyclic loads are a concern, detailed analysis is required. With complete FEA analysis of Bonney Forge Olets® a proper design can be supplied which provides the strength required to meet any demanding service or application.

Along with detailed area replacement calculations when burst testing is not sufficient per the piping code, Bonney Forge is ready to supply the branch connection you need for your project.



WHEN & WHY



WHERE A BRANCH CONNECTION IS NEEDED, USE AN OLET TO REDUCE YOUR INSTALLATION COSTS.

- Only require two welds
- Time to install is reduced
- Number of welds to inspect is reduced.

Because of this, the cost is lower, simply due to the reduction in time for fabrication.

USE OLETS® FOR BRANCH CONNECTIONS IN PLACE OF THE FOLLOWING

Welding Tees
Reinforcing Pads
Reinforcing Saddles
Unreinforced Branches

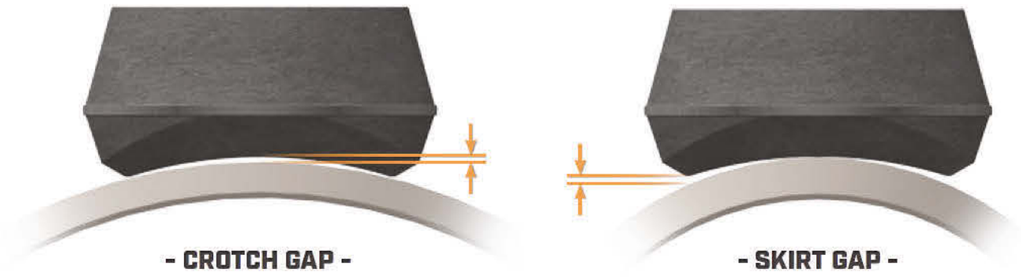
Why use olets®, because they simply cost less, allow for interior weld inspections, require less weld volume, and provide code compliant reinforcement.

OLETS SIMPLY COST LESS WHEN COMPARED TO WELDING TEES

- Olets cost 50 to 90% less
- Fabrication costs are 45 to 90% less
- More flexible method of installation
- One olet can cover a range of run pipe sizes
- Provides full fluid flow due to funnel design

INTEGRALLY REINFORCED BRANCH CONNECTIONS

MSS SP-97 ALLOWS FOR 1/16" GAPS AT THE SKIRT AND CROTCH



Run size consolidations best match the contour radius to the header pipe radius without exceeding the allowable skirt and crotch gaps.

STANDARD PRODUCT DESCRIPTION

Use the following description for standard applications

- MSS SP-97 for ASME B31.1, B31.3, & ASME Section III
- Run pipe and branch pipe are the same schedule and material

36 - 22	X	4	STD	WELDOLET®	A105N
1		2	3	4	5

Please specify

1. Header (Run) pipe size
   Header pipe is the pipe Olet® is welded onto
2. Branch pipe size
   Branch pipe is the outlet size that connects to Olet®
3. Schedule/class of branch connection
   STD, XS, S160, XXS, etc.
4. Style of branch connection
   Weldolet®, Thredolet®, Sockolet®, Latrolet®, etc.
5. Material for branch connection
   A105, A350 LF2, A182 F316/316l, Monel®

RUN SIZE CONSOLIDATIONS

NOTES:

1. Allowable gap permits multiple size applications per outlet size
2. Contoured radius is optimized to fit as many pipe sizes as possible
3. Fittings are acceptable where skirt and crotch gap is less than 1/16"

ITEM	DESCRIPTION
1	36 - 20 x 2 3M THREDOLET
2	NPS 20 RUN PIPE
3	NPS 36 RUN PIPE

SPECIAL PRODUCT DESCRIPTION

Use the following description for all other applications

- Design codes that do not recognize MSS SP-97 (ASME B31.4, B31.8, Section I, & Section VIII, etc.)
- Mixed pipe schedules and dissimilar metals

36 - 22 (XS)	X	4 (STD)	FLEXOLET®	A105N
1		2	3	4

Please specify

1. Header (run) pipe size
   Header pipe is the pipe Olet® is welded onto
2. Branch pipe size
   Branch pipe is the outlet size that connects to Olet®
3. Style of branch connection
   Weldolet®, Thredolet®, Sockolet®, Latrolet®, etc.
4. Material for branch connection
   A105, A350 LF2, A182 F316/316l, Monel®
5. Special design codes
   Design factors, location classes, design codes

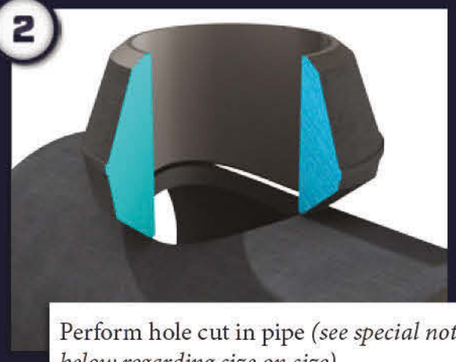
INSTALLATION PROCEDURE WELD-ON OLETS®

Olets® are provided with an integral weld line, eliminating weld thickness calculations.

1

Place Olet® onto pipe. Trace the ID of the Olet® onto the header pipe.

2



Perform hole cut in pipe *(see special notes below regarding size on size)*.

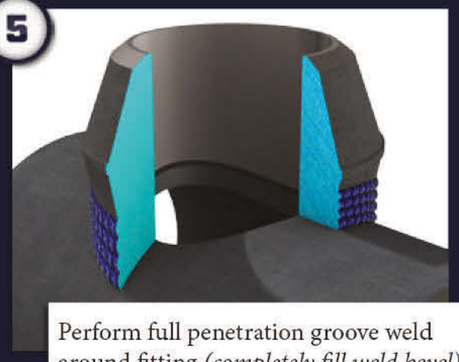
3

Add spacer between header pipe and Olet® to provide root gap.

4

Tack weld at four points to secure Olet® to header pipe for groove weld.

5



Perform full penetration groove weld around fitting *(completely fill weld bevel)*

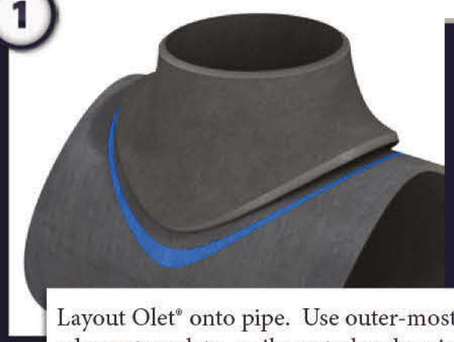
6

Apply cover fillet weld for smooth geometry transition.

INSTALLATION PROCEDURE INSERT OLETS®

Insert Olets® provide optimal inspection opportunities for critical service.

1



Layout Olet® onto pipe. Use outer-most edge as template, scribe onto header pipe.

2

Cut hole using scribe line as a guide. Cut should be parallel to branch pipe axis.

3

A second cut shall be performed to obtain the required weld bevel *(per WPS)*.

4

Brace Olet® and align centers before tack-welding.

5

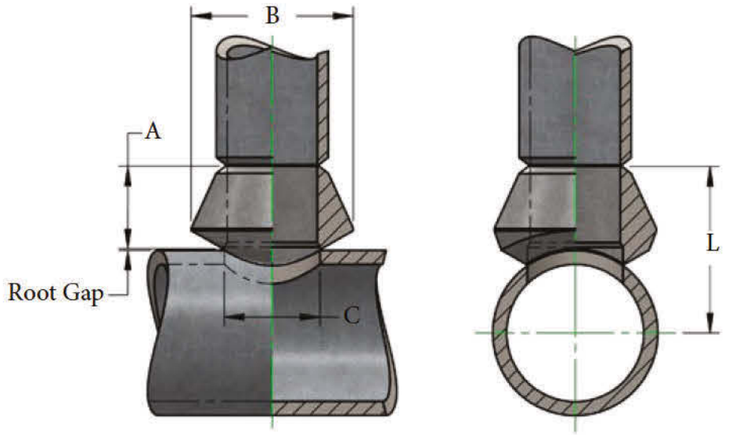
Tack-weld at four points to secure Olet® to header pipe.

6

Apply full penetration groove weld around Olet® *(completely fill weld bevel)*

WELDOLET®

REDUCING STD WEIGHT



L= A + (Run Pipe OD)/2 + Root Gap

Outlet Size	Dimensions A	B	C	Weight
NPS ⅛	⅝	1	⅝	0.100
NPS ¼	⅝	1	⅝	0.100
NPS ⅜	¾	1 ¼	¾	0.150
NPS ½	¾	1 ⅜	15/16	0.200
NPS ¾	⅞	1 ¾	1 3/16	0.250
NPS 1	1 1/16	2 ⅛	1 7/16	0.500
NPS 1 ¼	1 ¼	2 9/16	1 ¾	0.800
NPS 1 ½	1 5/16	2 ⅞	2	1.000
NPS 2	1 ½	3 ½	2 9/16	1.750
NPS 2 ½	1 ⅝	4 1/16	3	2.500
NPS 3	1 ¾	4 13/16	3 11/16	4.000
NPS 3 ½	1 ⅞	5 ¼	4	5.500
NPS 4	2	6	4 ¾	6.300
NPS 5	2 ¼	7 1/16	5 9/16	10.250
NPS 6	2 ⅜	8 3/16	6 11/16	12.000
NPS 8	2 ¾	10 ¼	8 11/16	23.000
NPS 10	3 1/16	12 11/16	10 13/16	36.000
NPS 12	3 ⅜	14 ⅞	12 13/16	59.000
NPS 14	3 ½	16 9/16	14 1/16	66.000
NPS 16	3 11/16	18 ¼	16 1/16	75.000
NPS 18	3 13/16	21 1/16	18 1/16	97.000
NPS 20	4	23 3/16	20	118.000
NPS 24	4 9/16	27 ¾	24 3/16	220.000
NPS 26	4 11/16	29 ⅞	26 ¼	265.000
NPS 30	5 ⅜	34 ½	30 7/16	430.000
NPS 36	5 ⅜	40 ½	26 ½	900.000

► * Larger outlet sizes available upon request

RUN SIZE CONSOLIDATIONS

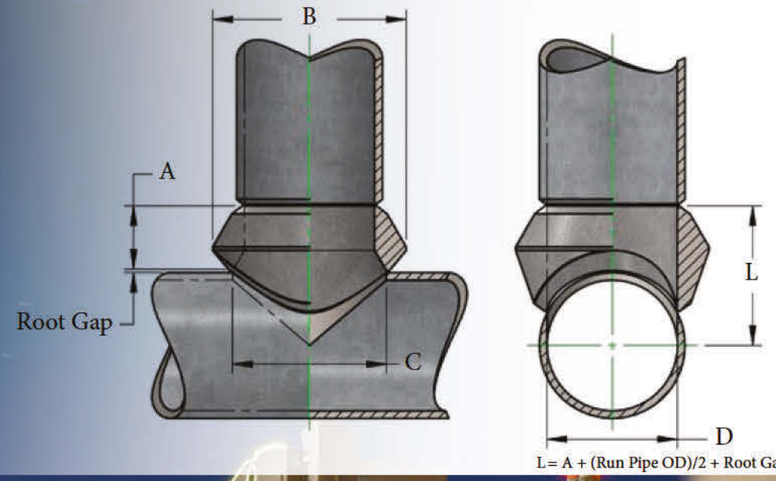
Outlet Size

RUN SIZES	⅛	¼	⅜	½	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6
	⅜	⅜	¾ - ½	½	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6
	½	½	36 - 1	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6	8
	1 - ¾	1 - ¾	FLAT	1	1 ½ - 1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6	8	10
	2 ½ - 1 ¼	2 ½ - 1 ¼		1 ½ - 1 ¼	2 ½ - 2	2	2 ½	3	4 - 3 1/2	4	5	6	8	10	14 - 12
	36 - 3	36 - 3		2 ½ - 2	5 - 3	2 ½	3 ½ - 3	4 - 3 ½	5	5	6	8	10	12	16
	FLAT	FLAT		8 - 3	12 - 6	3 ½ - 3	5 - 4	6 - 5	6	6	8	10	14 - 12	14	18
				36 - 10	36 - 14	5 - 4	8 - 6	12 - 8	10 - 8	8	10	14 - 12	20 - 16	18 - 16	22 - 20
				FLAT	FLAT	10 - 6	18 - 10	24 - 14	18 - 12	12 - 10	14 - 12	20 - 16	22	22 - 20	28 - 24
						36 - 12	36 - 20	36 - 26	36 - 20	18 - 14	20 - 16	36 - 24	36 - 24	28 - 24	36 - 30
						FLAT	FLAT	FLAT	FLAT	36 - 20 FLAT	36 - 24 FLAT	FLAT	FLAT	36 - 30 FLAT	FLAT

► * For outlet sizes NPS 8 and larger, order to specific run size required.
► * A FLAT Weldolet can be used for connections to pipe larger than NPS 36, welding caps, elliptical heads and flat surfaces.

WELDOLET®

SIZE ON SIZE STD WEIGHT



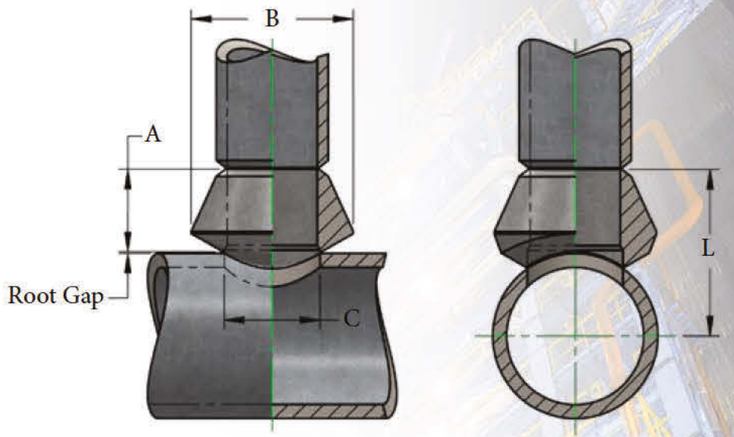
L= A + (Run Pipe OD)/2 + Root Gap

Outlet Size	Dimensions A	B	C	D	Weight
NPS ½	¾	1 ⅜	15/16	⅝	0.150
NPS ¾	⅞	1 ⅝	1 3/16	13/16	0.250
NPS 1	1 1/16	2 ⅛	1 7/16	1 1/32	0.400
NPS 1 ¼	1 ¼	2 ⅜	1 ¾	1 ⅜	0.700
NPS 1 ½	1 5/16	2 ⅞	2	1 ⅝	0.800
NPS 2	1 ½	3 ½	2 9/16	2 1/16	1.500
NPS 2 ½	1 ⅝	4 1/16	3	2 7/16	2.250
NPS 3	1 ¾	4 13/16	3 11/16	3 1/16	3.750
NPS 3 ½	2	5 ⅜	3 ⅞	3 5/16	5.000
NPS 4	2	6	4 ¾	4	6.700
NPS 5	2 ¼	7 ⅛	5 9/16	5 1/16	8.500
NPS 6	2 ⅜	7 ¾	6 11/16	6 1/16	14.000
NPS 8	2 ¾	10 ⅜	8 11/16	7 15/16	28.000
NPS 10	3 1/16	13	10 13/16	10	39.000
NPS 12	3 ⅜	15 ¼	12 13/16	12	65.000
NPS 14	3 ½	16 ½	14 1/16	13 ¼	70.000
NPS 16	3 11/16	18 ⅞	16 1/16	15 ¼	92.000
NPS 18	4 1/16	20 ¾	18 ⅝	17 ¼	125.000
NPS 20	4 ⅝	23 1/16	20 1/16	19 ¼	175.000
NPS 24	5 ⅜	27 ⅞	25 ⅛	23 ¼	280.000
NPS 30	5 ⅜	34 1/16	30 7/16	29 ¼	440.000
NPS 36	5 ⅜	40 ½	36 ½	35 ¼	1,180.000

DESIGN PER MSS SP-97
BUTT-WELD PER ASME B16.9 & B16.25

WELDOLET®

REDUCING EXTRA STRONG



L = A + (Run Pipe OD)/2 + Root Gap

Outlet Size	Dimensions A	B	C	Weight
NPS ⅛	⅝	1	⅝	0.100
NPS ¼	⅝	1	⅝	0.100
NPS ⅜	¾	1 ¼	¾	0.150
NPS ½	¾	1 ⅜	15/16	0.200
NPS ¾	⅞	1 ¾	1 3/16	0.300
NPS 1	1 1/16	2 ⅛	1 7/16	0.500
NPS 1 ¼	1 ¼	2 9/16	1 ¾	0.900
NPS 1 ½	1 5/16	2 ⅞	2	1.100
NPS 2	1 ½	3 ½	2 9/16	1.750
NPS 2 ½	1 ⅝	4 1/16	3	2.600
NPS 3	1 ¾	4 13/16	3 11/16	4.100
NPS 3 ½	1 ⅞	5 ¼	4	5.600
NPS 4	2	6	4 ¾	6.400
NPS 5	2 ¼	7 1/16	5 9/16	10.400
NPS 6	3 1/16	8 5/16	6 11/16	23.000
NPS 8	3 ⅞	11 ½	8 11/16	37.000
NPS 10	3 11/16	13 3/16	10 7/16	46.000
NPS 12	4 1/16	15 ⅝	12 ½	61.000
NPS 14	3 15/16	16	13	70.000
NPS 16	4 3/16	18 ⅜	15	102.000
NPS 18	4 ⅜	20 ⅜	17	130.000
NPS 20	4 11/16	22 15/16	19	158.000
NPS 24	5 ½	28 ½	24 3/16	290.000
NPS 26	5 ¾	30 ⅛	27 ¼	350.000

► * Larger outlet sizes available upon request

RUN SIZE CONSOLIDATIONS

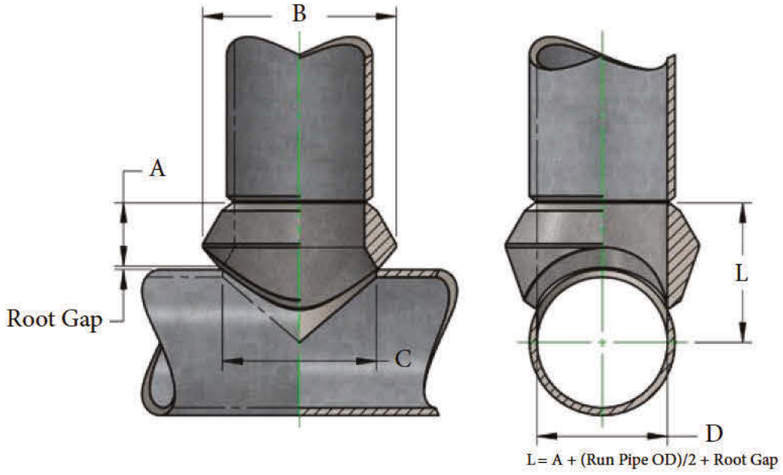
Outlet Size

RUN SIZES	⅛	¼	⅜	½	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6
	⅜	⅜	¾ - ½	½	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6
	½	½	36 - 1	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6	8
	1 - ¾	1 - ¾	FLAT	1	1 ½ - 1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6	8	10
	2 ½ - 1 ¼	2 ½ - 1 ¼		1 ½ - 1 ¼	2 ½ - 2	2	2 ½	3	4 - 3 ½	4	5	6	8	10	14 - 12
	36 - 3	36 - 3		2 ½ - 2	5 - 3	2 ½	3 ½ - 3	4 - 3 ½	5	5	6	8	10	12	16
	FLAT	FLAT		8 - 3	12 - 6	3 ½ - 3	5 - 4	6 - 5	6	6	8	10	14 - 12	14	18
				36 - 10	36 - 14	5 - 4	8 - 6	12 - 8	10 - 8	8	10	14 - 12	20 - 16	18 - 16	22 - 20
				FLAT	FLAT	10 - 6	18 - 10	24 - 14	18 - 12	12 - 10	14 - 12	20 - 16	22	22 - 20	28 - 24
						36 - 12	36 - 20	36 - 26	36 - 20	18 - 14	20 - 16	36 - 24	36 - 24	28 - 24	36 - 30
						FLAT	FLAT	FLAT	FLAT	36 - 20 FLAT	36 - 24 FLAT	FLAT	FLAT	36 - 30 FLAT	FLAT

► * For outlet sizes NPS 8 and larger, order to specific run size required.
► * A FLAT Weldolet can be used for connections to pipe larger than NPS 36, welding caps, elliptical heads and flat surfaces.

WELDOLET®

SIZE ON SIZE STD WEIGHT



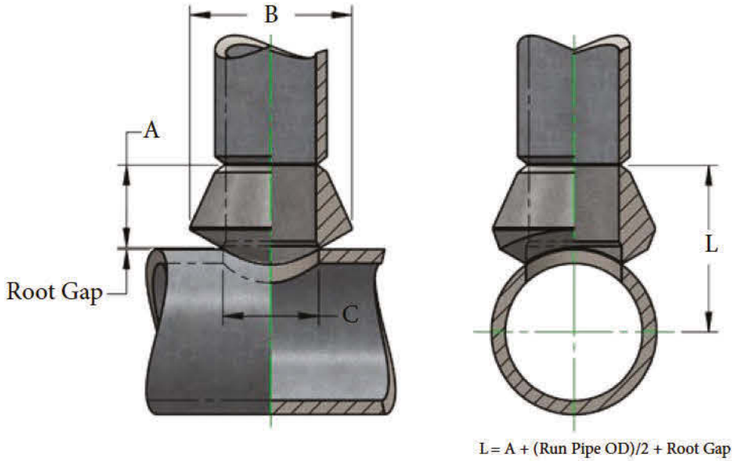
L = A + (Run Pipe OD)/2 + Root Gap

Outlet Size	Dimensions A	B	C	D	Weight
NPS ½	¾	1 ⅜	15/16	⅝	0.150
NPS ¾	⅞	1 ⅝	1 3/16	13/16	0.250
NPS 1	1 1/16	2 ⅛	1 7/16	1 1/32	0.400
NPS 1 ¼	1 ¼	2 ⅜	1 ¾	1 ⅜	0.700
NPS 1 ½	1 5/16	2 ⅞	2	1 ⅝	0.900
NPS 2	1 ½	3 ½	2 9/16	2 1/16	1.600
NPS 2 ½	1 ⅝	4 1/16	3	2 7/16	2.500
NPS 3	1 ¾	4 13/16	3 11/16	3 1/16	4.100
NPS 3 ½	2	5 ⅜	3 ⅞	3 9/16	5.100
NPS 4	2	6	4 ¾	4	7.500
NPS 5	2 ¼	7 ⅛	5 9/16	5 1/16	9.500
NPS 6	3 1/16	8 5/16	6 11/16	6 1/16	15.000
NPS 8	3 ⅞	10 ⅝	8 11/16	7 ⅝	32.000
NPS 10	3 ½	13 ⅛	10 7/16	9 ¾	46.000
NPS 12	3 15/16	15 3/16	13	11 ¾	61.000
NPS 14	4 ⅛	16	13	13	75.000
NPS 16	4 7/16	18 ¼	15	15	115.000
NPS 18	4 11/16	20 ⅜	17	17	130.000
NPS 20	5	22 ⅝	19	19	187.000
NPS 24	5 ½	28 ¾	25 ⅛	23	316.000

DESIGN PER MSS SP-97
BUTT-WELD PER ASME B16.9 & B16.25

WELDOLET®

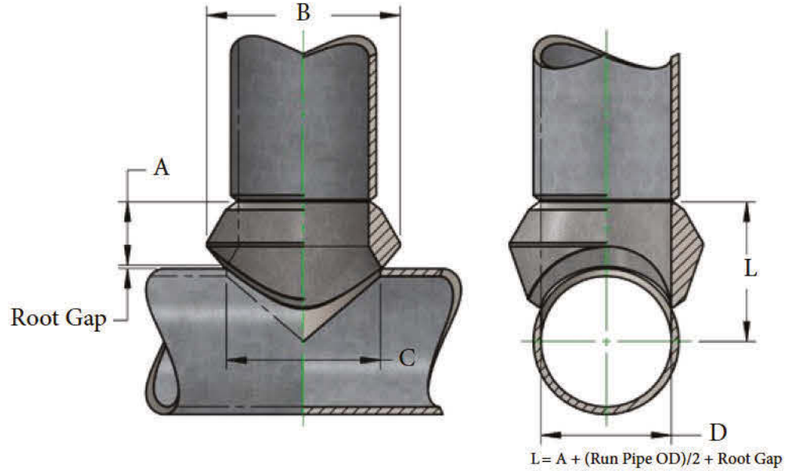
REDUCING DBL. EXTRA STRONG & SCH. 160



L = A + (Run Pipe OD)/2 + Root Gap

Outlet Size	Dimensions A	B	C	Weight
NPS ½	1 ⅛	1 ⅜	9⁄16	0.250
NPS ¾	1 ¼	1 ¾	¾	0.700
NPS 1	1 ½	2	1	0.850
NPS 1 ¼	1 ¾	2 7⁄16	1 5⁄16	1.250
NPS 1 ½	2	2 ¾	1 ½	1.750
NPS 2	2 3⁄16	3 3⁄16	1 11⁄16	2.150
NPS 2 ½	2 7⁄16	3 13⁄16	2 ⅛	3.400
NPS 3	2 ⅞	4 ¾	2 ⅞	6.300
NPS 4	3 5⁄16	6	3 ⅜	10.500
NPS 5	3 11⁄16	7 ⅜	4 13⁄16	14.250
NPS 6	4 ⅛	9 5⁄16	5 ¾	28.000

► Larger outlet sizes available upon request



L = A + (Run Pipe OD)/2 + Root Gap

Outlet Size	Dimensions A	B	C	D	Weight
NPS ½	1 ⅛	1 ⅜	9⁄16	7⁄16	0.250
NPS ¾	1 ¼	1 ¾	¾	⅝	0.700
NPS 1	1 ½	2	1	13⁄16	0.800
NPS 1 ¼	1 ¾	2 7⁄16	1 5⁄16	1 3⁄16	1.250
NPS 1 ½	2	2 ¾	1 ½	1 5⁄16	1.750
NPS 2	2 3⁄16	3 3⁄16	1 11⁄16	1 ½	2.150
NPS 2 ½	2 7⁄16	3 13⁄16	2 ⅛	1 ¾	3.400
NPS 3	2 ⅞	4 ¾	2 ⅞	2 ⅝	6.350
NPS 4	3 5⁄16	6	3 ⅜	3 7⁄16	10.500
NPS 5	3 11⁄16	7 ⅜	4 13⁄16	4 5⁄16	14.250
NPS 6	4 ⅛	8 11⁄16	5 ¾	5 3⁄16	30.250

RUN SIZE CONSOLIDATIONS

Outlet Size

RUN SIZES	½	¾	1	1 ¼	1 ½	2	2 ½	3	4
	½	1 - ¾	1	1 ½ - 1 ¼	1 ½	2	2 ½	3	4
	1 ¼ - ¾	2 - 1 ¼	2 ½ - 1 ¼	2 ½ - 2	2 ½ - 2	2 ½	3	3 ½	6
	36 - 1 ½	6 - 2 ½	10 - 3	10 - 3	3 ½ - 3	3 ½ - 3	3 ½	4	8
	FLAT	36 - 8	36 - 12	36 - 12	8 - 4	5 - 4	4	5	10
		FLAT	FLAT	FLAT	20 - 10	8 - 6	5	6	12
					22	18 - 10	8 - 6	8	14
					36 - 24	36 - 20	12 - 10	10	16
					FLAT	FLAT	18 - 14	12	18
							36 - 20	14	20
							FLAT	16	22
								18	24
								20	FLAT
								22	
								24	
								FLAT	

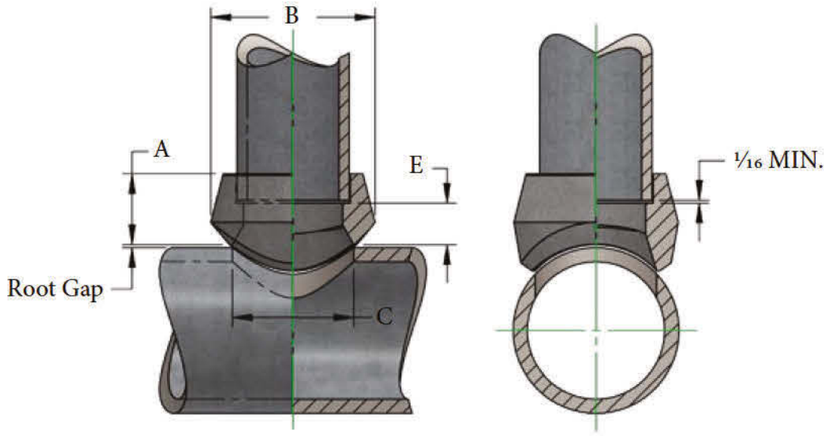
► For outlet sizes NPS 5 and larger, order to specific run size required.
► A FLAT Weldolet can be used for connections to pipe larger than NPS 36, welding caps, elliptical heads and flat surfaces.

WELDOLET®

SIZE ON SIZE DBL. EXTRA STRONG & SCH. 160

SOCKOLET®

REDUCING CLASS 3000, 6000 & 9000



	Outlet Size	Dimensions A	B	C	E	Weight
CLASS 3000	NPS ⅛	¾	1	⅜	5/16	0.100
	NPS ¼	¾	1	⅜	5/16	0.100
	NPS ⅜	13/16	1 ¼	¾	7/16	0.200
	NPS ½	1	1 7/16	15/16	9/16	0.300
	NPS ¾	1 1/16	1 ¾	1 3/16	9/16	0.350
	NPS 1	1 5/16	2 ⅛	1 7/16	13/16	0.600
	NPS 1 ¼	1 5/16	2 9/16	1 ¾	¾	0.850
	NPS 1 ½	1 ⅜	2 ⅞	2	¾	1.000
	NPS 2	1 ½	3 ½	2 9/16	13/16	1.600
	NPS 2 ½	1 9/16	4 1/16	3	¾	2.750
	NPS 3	1 ¾	4 13/16	3 11/16	15/16	3.800
	NPS 3 ½	2 ⅛	5 ⅜	4	1	4.300
	NPS 4	1 ⅞	6	4 ¾	1 1/16	7.250
	NPS 5	2 ⅝	7	5 9/16	1 ⅜	12.000
	NPS 6	2 ¾	8 ⅝	6 11/16	1 7/16	14.500
CLASS 6000	NPS ½	1 ¼	1 ¾	¾	⅞	0.500
	NPS ¾	1 7/16	2	1	⅞	0.800
	NPS 1	1 9/16	2 7/16	1 3/16	15/16	1.300
	NPS 1 ¼	1 ⅝	2 ¾	1 ½	13/16	1.600
	NPS 1 ½	1 11/16	3 ¼	1 15/16	⅞	2.000
	NPS 2	2 1/16	4 1/16	2 ¾	1 3/16	5.150
CLASS 9000	NPS ½	1 ¼	1 11/16	¾	13/16	
	NPS ¾	1 7/16	1 15/16	15/16	⅞	
	NPS 1	1 9/16	2 7/16	1 3/16	15/16	
	NPS 1 ¼	1 ⅝	2 11/16	1 ½	13/16	
	NPS 1 ½	1 11/16	3 ¼	1 15/16	15/16	
	NPS 2	2 1/16	4 1/16	2 ¾	1 ¼	

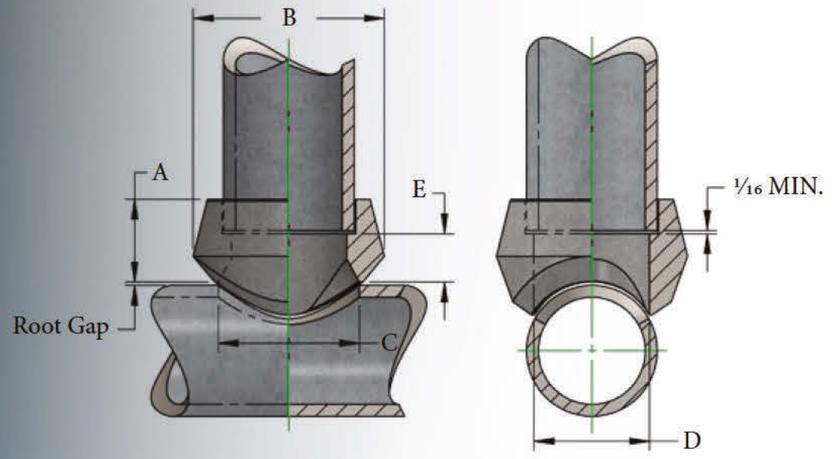
RUN SIZE CONSOLIDATIONS - CLASS 3000
Outlet Size

RUN SIZES	⅛	¼	⅜	½	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6
	⅜	⅜	½	½	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6
	½	½	1 - ¾	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6	8
	1 - ¾	1 - ¾	2 ½ - 1 ¼	1	1 ½ - 1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6	8	10
	2 ½ - 1 ¼	2 ½ - 1 ¼	36 - 3	FLAT	1 ½ - 1 ¼	2 ½ - 2	2	2 ½	3	4 - 3 ½	4	5	6	8	10	14 - 12
	36 - 3	36 - 3	FLAT		2 ½ - 2	5 - 3	2 ½	3 ½ - 3	4 - 3 ½	5	5	6	8	10	12	16
	FLAT	FLAT			8 - 3	12 - 6	3 ½ - 3	5 - 4	6 - 5	6	6	8	10	14 - 12	14	18
					36 - 10	36 - 14	5 - 4	8 - 6	12 - 8	10 - 8	8	10	14 - 12	20 - 16	18 - 16	22 - 20
					FLAT	FLAT	10 - 6	18 - 10	24 - 14	18 - 12	12 - 10	14 - 12	20 - 16	22	22 - 20	28 - 24
							36 - 12	36 - 20	36 - 26	36 - 20	18 - 14	20 - 16	36 - 24	36 - 24	28 - 24	36 - 30
							FLAT	FLAT	FLAT	FLAT	36 - 20	36 - 24	FLAT	FLAT	36 - 30	FLAT
											FLAT	FLAT			FLAT	

► A FLAT Sockolet can be used for connections to pipe larger than NPS 36, welding caps, elliptical heads and flat surfaces.

SOCKOLET®

SIZE ON SIZE CLASS 3000



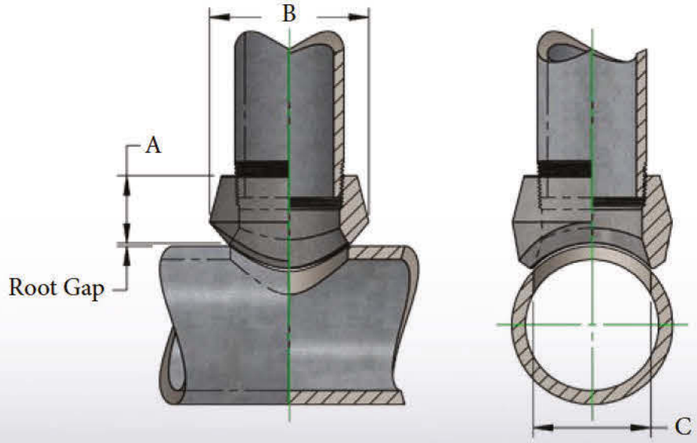
Outlet Size	Dimensions A	B	C	D	E	Weight
NPS ½	1	1 ⅜	15/16	0.622	9/16	0.150
NPS ¾	1 1/16	1 ⅝	1 3/16	0.824	½	0.250
NPS 1	1 5/16	2	1 7/16	1.049	¾	0.450
NPS 1 ¼	1 5/16	2 ⅜	1 ¾	1.380	9/16	0.650
NPS 1 ½	1 ⅜	2 ⅞	2	1.610	11/16	0.850
NPS 2	1 ½	3 ½	2 9/16	2.067	15/16	1.400
NPS 2 ½	1 9/16	4 1/16	3	2.469	¾	2.250
NPS 3	1 ¾	4 13/16	3 11/16	3.068	15/16	3.750
NPS 3 ½	1 11/16	5 ⅜	4 7/16	3.548	11/16	4.300
NPS 4	1 ⅞	6 1/16	4 ¾	4.026	1 1/16	6.600
NPS 5	2 7/16	7 ¼	5 ¼	5.047	1	9.000
NPS 6	2 11/16	8 11/16	6 1/16	6.065	1 3/16	15.500

RUN SIZE CONSOLIDATIONS - CLASS 6000
Outlet Size

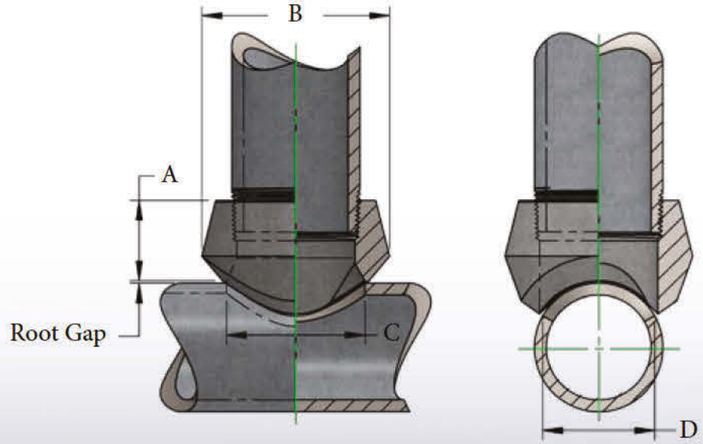
RUN SIZES	½	¾	1	1 ¼	1 ½	2
	1 - ¾	1	1 ½ - 1 ¼	1 ½	2	2 ½
	2 - 1 ¼	2 ½ - 1 ¼	2 ½ - 2	2 ½ - 2	2 ½	3
	6 - 2 ½	10 - 3	10 - 3	3 ½ - 3	3 ½ - 3	4
	36 - 8	36 - 12	36 - 12	8 - 4	5 - 4	5
	FLAT	FLAT	FLAT	36 - 10	8 - 6	6
				FLAT	18 - 10	10 - 8
					36 - 20	20 - 12
					FLAT	36 - 24
						FLAT

RUN SIZE CONSOLIDATIONS - CLASS 9000
Outlet Size

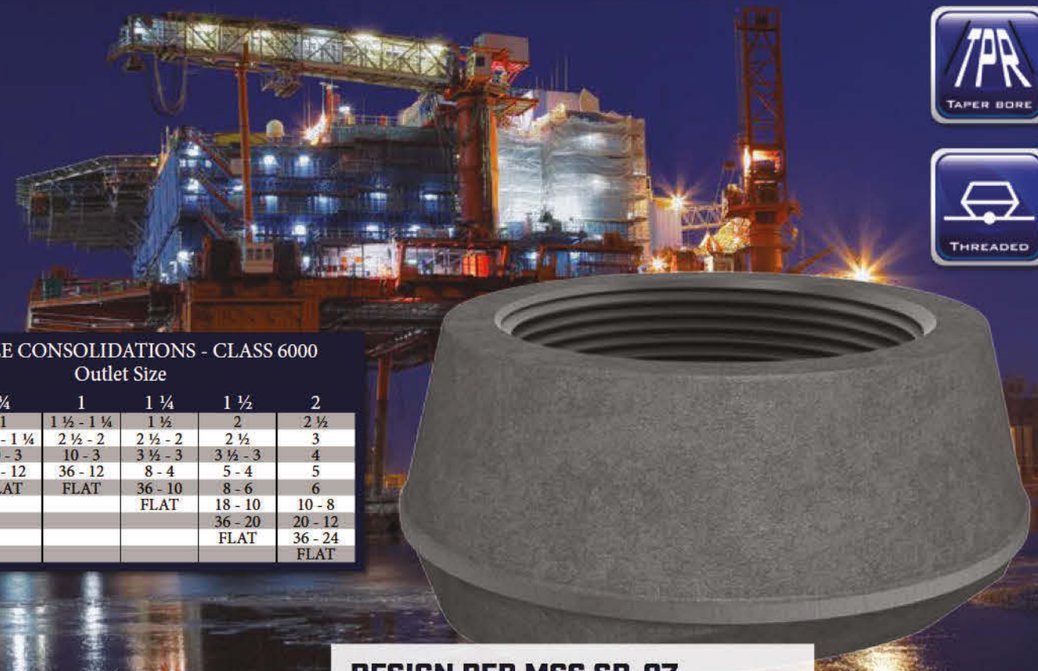
RUN SIZES	½	¾	1	1 ¼	1 ½	2
	1 - ¾	1	1 ½ - 1 ¼	1 ½	2	2 ½
	2 - 1 ¼	2 ½ - 1 ¼	2 ½ - 2	2 ½ - 2	2 ½	4 - 3
	6 - 2 ½	10 - 3	10 - 3	3 ½ - 3	3 ½ - 3	6 - 5
	36 - 8	36 - 12	36 - 12	8 - 4	8 - 4	14 - 8
	FLAT	FLAT	FLAT	36 - 10	36 - 10	36 - 16
				FLAT	FLAT	FLAT



	Outlet Size	Dimensions A	B	C	Weight
CLASS 3000	NPS ⅛	¾	1	⅝	0.100
	NPS ¼	¾	1	⅝	0.100
	NPS ⅜	13/16	1 ¼	¾	0.200
	NPS ½	1	1 7/16	15/16	0.250
	NPS ¾	1 1/16	1 ¾	1 3/16	0.350
	NPS 1	1 5/16	2 ⅛	1 7/16	0.600
	NPS 1 ¼	1 5/16	2 9/16	1 ¾	0.900
	NPS 1 ½	1 ⅜	2 7/16	2	1.000
	NPS 2	1 ½	3 ½	2 9/16	1.750
	NPS 2 ½	1 13/16	4 1/16	3	3.000
	NPS 3	2	4 13/16	3 11/16	4.350
	NPS 3 ½	2 ⅛	5 ¼	4	5.750
	NPS 4	2 ¼	6	4 ¾	7.100
	NPS 5	2 ⅝	7 5/16	5 9/16	12.000
	NPS 6	2 ¾	8 ⅝	6 11/16	15.300
CLASS 6000	NPS ¼	1 ⅛	1 ⅜	9/16	0.300
	NPS ⅜	1 ⅛	1 ⅜	9/16	0.300
	NPS ½	1 ¼	1 ¾	¾	0.450
	NPS ¾	1 7/16	2	1	0.750
	NPS 1	1 9/16	2 7/16	1 5/16	1.250
	NPS 1 ¼	1 ⅝	2 ¾	1 ½	1.600
	NPS 1 ½	1 11/16	3 ¼	1 15/16	1.950
	NPS 2	2 1/16	4 1/16	2 ¾	5.000



Outlet Size	Dimensions A	B	C	D	Weight
NPS ½	1	1 ⅜	15/16	⅝	0.150
NPS ¾	1 1/16	1 11/16	1 3/16	13/16	0.250
NPS 1	1 5/16	2 ⅛	1 7/16	1 1/16	0.450
NPS 1 ¼	1 5/16	2 ⅜	1 ¾	1 ⅜	0.700
NPS 1 ½	1 ⅜	2 ⅞	2	1 ⅝	0.900
NPS 2	1 ½	3 ½	2 9/16	2 1/16	1.400
NPS 2 ½	1 13/16	4 1/16	3	2 ½	2.500
NPS 3	2	4 13/16	3 11/16	3 1/16	4.300
NPS 3 ½	2 ⅛	5 ⅜	4 7/16	3 9/16	4.500
NPS 4	2 ¼	6	4 ¾	4 1/16	6.800
NPS 5	2 7/16	7 ¼	5 ¼	5 ¼	9.200
NPS 6	2 ¾	8 11/16	5 ¾	5 ¾	15.700



RUN SIZE CONSOLIDATIONS - CLASS 3000
Outlet Size

RUN SIZES	⅛	¼	⅜	½	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6
	⅜	⅜	½	½	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6
	½	½	1 - ¾	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6	8
	1 - ¾	1 - ¾	2 ½ - 1 ¼	1	1 ½ - 1 ¼	1 ½	2	2 ½	3	3 ½	4	5	6	8	10
	2 ½ - 1 ¼	2 ½ - 1 ¼	36 - 3	1 ½ - 1 ¼	2 ½ - 2	2	2 ½	3	4 - 3½	4	5	6	8	10	14 - 12
	36 - 3	36 - 3	FLAT	2 ½ - 2	5 - 3	2 ½	3 ½ - 3	4 - 3 ½	5	5	6	8	10	12	16
	FLAT	FLAT		8 - 3	12 - 6	3 ½ - 3	5 - 4	6 - 5	6	6	8	10	14 - 12	14	18
				36 - 10	36 - 14	5 - 4	8 - 6	12 - 8	10 - 8	8	10	14 - 12	20 - 16	18 - 16	22 - 20
				FLAT	FLAT	10 - 6	18 - 10	24 - 14	18 - 12	12 - 10	14 - 12	20 - 16	22	22 - 20	28 - 24
						36 - 12	36 - 20	36 - 26	36 - 20	18 - 14	20 - 16	36 - 24	36 - 24	28 - 24	36 - 30
						FLAT	FLAT	FLAT	FLAT	36 - 20 FLAT	36 - 24 FLAT	FLAT	FLAT	36 - 30 FLAT	FLAT

► A FLAT Thredolet can be used for connections to pipe larger than NPS 36, welding caps, elliptical heads and flat surfaces.

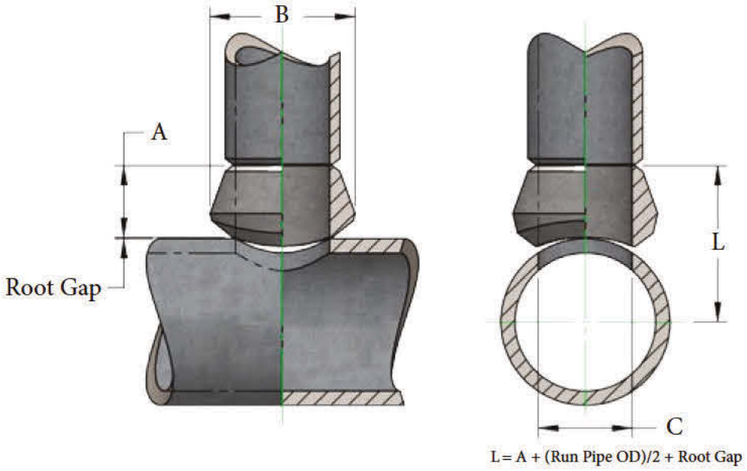
RUN SIZE CONSOLIDATIONS - CLASS 6000
Outlet Size

RUN SIZES	½	¾	1	1 ¼	1 ½	2
	1 - ¾	1	1 ½ - 1 ¼	1 ½	2	2 ½
	2 - 1 ¼	2 ½ - 1 ¼	2 ½ - 2	2 ½ - 2	2 ½	3
	6 - 2 ½	10 - 3	10 - 3	3 ½ - 3	3 ½ - 3	4
	36 - 8	36 - 12	36 - 12	8 - 4	5 - 4	5
	FLAT	FLAT	FLAT	36 - 10	8 - 6	6
				FLAT	18 - 10	10 - 8
					36 - 20	20 - 12
					FLAT	36 - 24
						FLAT

DESIGN PER MSS SP-97
NPT THREADS PER ASME B1.20.1

FLEXOLET®

BUTT-WELD
STD WEIGHT &
EXTRA STRONG



L = A + (Run Pipe OD)/2 + Root Gap

	Outlet Size	Dimensions A	B	C	Weight
STD Weight	NPS ⅜	¾	1	0.493	0.100
	NPS ½	¾	1 ⅛	0.622	0.120
	NPS ¾	⅞	1 ½	0.824	0.220
	NPS 1	1 1/16	1 13/16	1.062	0.320
	NPS 1 ¼	1 ¼	2 ¼	1.380	0.640
	NPS 1 ½	1 5/16	2 9/16	1.625	0.780
	NPS 2	1 ½	3	2.062	1.140
	NPS 2 ½	1 ⅝	3 11/16	2.500	1.940
	NPS 3	1 ¾	4 5/16	3.125	2.600
	NPS 4	2	5 ⅜	4.145	4.120
	NPS 6	2 ⅜	7 11/16	6.112	11.000
Extra Strong	NPS ⅜	¾	1	0.423	0.100
	NPS ½	¾	1 ⅛	0.546	0.120
	NPS ¾	⅞	1 ½	0.742	0.180
	NPS 1	1 1/16	1 13/16	1.062	0.360
	NPS 1 ¼	1 ¼	2 ¼	1.278	0.550
	NPS 1 ½	1 5/16	2 9/16	1.625	0.680
	NPS 2	1 ½	3	2.062	1.240
	NPS 2 ½	1 ⅝	3 11/16	2.500	2.260
	NPS 3	1 ¾	4 5/16	3.125	2.840
	NPS 4	2	5 ⅜	4.145	4.560
	NPS 6	3 1/16	7 ¾	5.800	15.000

RUN SIZE CONSOLIDATIONS - STD Weight
Outlet Size

RUN SIZES	¼	⅜	½	¾	1	1 ¼	1 ½	2	2 ½	3	4	6
	¼	½ - ⅜	1 - ½	2 - ¾	1	1 ¼	1 ½	2	2 ½	3	4	6
	36 - ⅜	36 - ¾	36 - 1 ¼	36 - 2 ½	1 ½ - 1 ¼	2 - 1 ½	3 ½ - 2	3 - 2 ½	4 - 3	4 - 3 ½	6 - 5	8
					36 - 2	6 - 2 ½	36 - 4	6 - 3 ½	10 - 5	6 - 5	10 - 8	10
						36 - 8		36 - 8	36 - 12	14 - 8	20 - 12	14 - 12
										36 - 16	36 - 22	18 - 16
												24 - 20
												34 - 26
												42 - 36

► FLAT Flexolet branch connections for use on welding caps, elliptical heads, and flat surfaces is available upon request.

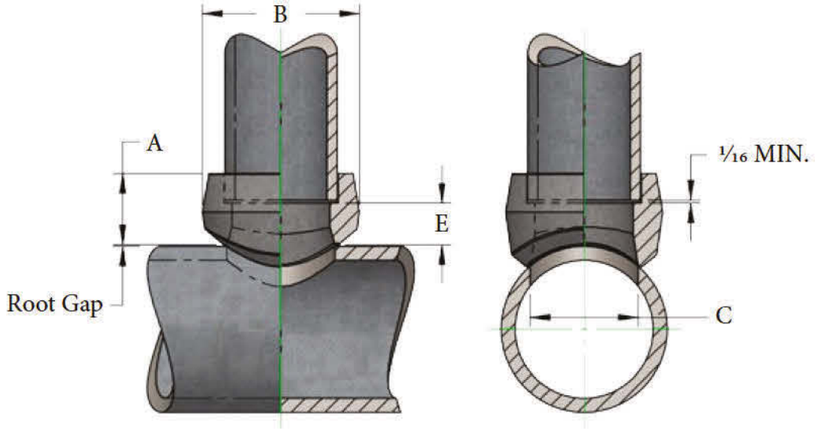
RUN SIZE CONSOLIDATIONS - Extra Strong
Outlet Size

RUN SIZES	¼	⅜	½	¾	1	1 ¼	1 ½	2	2 ½	3	4	6
	36 - ¼	⅜	¾ - ½	1 ½ - ¾	1	2 - 1 ¼	1 ½	2	2 ½	3	4	6
		36 - ½	36 - 1	36 - 2	1 ½ - 1 ¼	5 - 2 ½	3 ½ - 2	3 - 2 ½	4 - 3	4 - 3 ½	6 - 5	8
					36 - 2	36 - 6	36 - 4	6 - 3 ½	10 - 5	6 - 5	10 - 8	10
								36 - 8	36 - 12	14 - 8	20 - 12	14 - 12
										36 - 16	36 - 22	18 - 16
												24 - 20
												34 - 26
												42 - 36

► FLAT Flexolet branch connections for use on welding caps, elliptical heads, and flat surfaces is available upon request.

FLEXOLET®

SOCKET-WELD
CLASS 3000, 6000
& 9000



	Outlet Size	Dimensions A	B	C	E	Weight
CLASS 3000	NPS ¼	¾	1	0.364	⅜	0.140
	NPS ⅜	13/16	1 1/16	0.493	7/16	0.140
	NPS ½	1	1 ½	0.622	9/16	0.280
	NPS ¾	1 1/16	1 11/16	0.824	9/16	0.390
	NPS 1	1 5/16	2 ⅛	1.049	13/16	0.730
	NPS 1 ¼	1 5/16	2 9/16	1.380	¾	0.960
	NPS 1 ½	1 ⅜	2 13/16	1.610	¾	1.120
	NPS 2	1 ½	3 5/16	2.067	13/16	1.660
	NPS 2 ½	1 13/16	3 13/16	2.469	¾	2.730
	NPS 3	2	4 11/16	3.068	15/16	3.880
	NPS 4	2 ¼	5 13/16	4.026	1 1/16	6.600
CLASS 6000	NPS ½	1 ¼	1 ¾	0.464	13/16	0.280
	NPS ¾	1 7/16	2 1/16	0.612	15/16	0.390
	NPS 1	1 9/16	2 9/16	0.815	1	0.730
	NPS 1 ¼	1 ⅝	2 ½	1.160	1	0.960
	NPS 1 ½	1 11/16	3 5/16	1.338	1 1/16	1.630
	NPS 2	2 1/16	4	1.687	1 ⅜	1.660
CLASS 9000	NPS ½	1 ¼	1 ¾	0.252	13/16	
	NPS ¾	1 7/16	1 ⅞	0.434	⅞	
	NPS 1	1 9/16	2 ¼	0.599	1	
	NPS 1 ¼	1 ⅝	2 ¾	0.896	1 1/16	
	NPS 1 ½	1 11/16	3	1.100	1 ⅛	
	NPS 2	2 1/16	3 ½	1.503	1 ⅜	

RUN SIZE CONSOLIDATIONS - CLASS 3000
Outlet Size

RUN SIZES	¼	⅜	½	¾	1	1 ¼	1 ½	2	2 ½	3	4
	¼	½ - ⅜	½	1 ¼ - ¾	1	1 ½ - 1 ¼	1 ½	2	2 ½	3	4
	36 - ⅜	36 - ¾	36 - ¾	36 - 1 ½	2 ½ - 1 ¼	3 ½ - 2	2 ½ - 2	3 ½ - 2 ½	3 ½ - 3	5 - 3 ½	6 - 5
					36 - 3	36 - 4	5 - 3	6 - 4	6 - 4	14 - 6	10 - 8
							36 - 6	36 - 8	36 - 8	36 - 16	20 - 12
											36 - 22

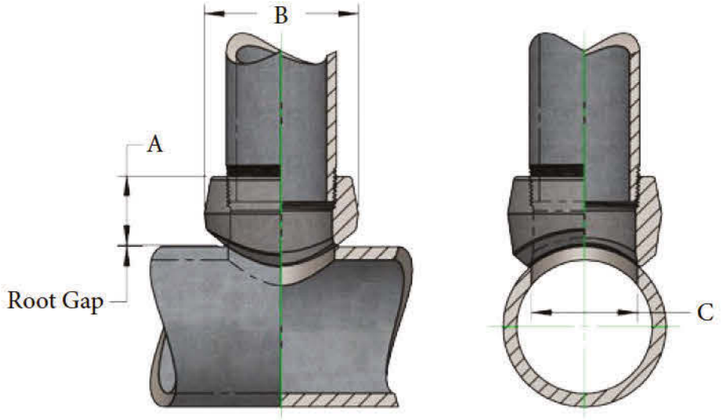
► FLAT Flexolet branch connections for use on welding caps, elliptical heads, and flat surfaces are available upon request.

RUN SIZE CONSOLIDATIONS - CLASS 6000
Outlet Size

RUN SIZES	½	¾	1	1 ¼	1 ½	2
	½	1 - ¾	1	1 ¼	1 ½	2
	36 - ¾	36 - 1 ¼	2 ½ - 1 ¼	4 - 1 ½	2 ½ - 2	3 ½ - 2 ½
			36 - 3	36 - 5	5 - 3	6 - 4
					36 - 6	36 - 8

RUN SIZE CONSOLIDATIONS - CLASS 9000
Outlet Size

RUN SIZES	½	¾	1	1 ¼	1 ½	2
	36 - ½	36 - ¾	1	1 ½ - 1 ¼	1 ½	2
			36 - 1 ¼	2 ½ - 2	2 ½ - 2	3 - 2 ½
				36 - 3	4 - 3	5 - 3 ½
					36 - 5	8 - 6
						36 - 10



	Outlet Size	A	B	C	Weight
CLASS 3000	NPS ¼	¾	1 1/16	0.437	0.140
	NPS ⅜	13/16	1 1/16	0.578	0.140
	NPS ½	1	1 ½	0.718	0.280
	NPS ¾	1 1/16	1 11/16	0.922	0.390
	NPS 1	1 5/16	2 ⅛	1.156	0.730
	NPS 1 ¼	1 5/16	2 ½	1.500	0.960
	NPS 1 ½	1 ⅜	2 13/16	1.734	1.120
	NPS 2	1 ½	3 5/16	2.218	1.660
	NPS 2 ½	1 13/16	3 15/16	2.625	2.730
	NPS 3	2	4 ⅝	3.250	3.880
	NPS 4	2 ¼	5 13/16	4.250	6.180
CLASS 6000	NPS ¼	¾	1 1/16	0.437	0.140
	NPS ⅜	1 ⅛	1 5/16	0.578	0.140
	NPS ½	1 ¼	1 ¾	0.718	0.280
	NPS ¾	1 7/16	2 1/16	0.922	0.390
	NPS 1	1 9/16	2 5/16	1.156	0.730
	NPS 1 ¼	1 ⅝	2 ½	1.500	0.960
	NPS 1 ½	1 11/16	3 5/16	1.734	1.120
	NPS 2	2 1/16	4	2.218	1.660

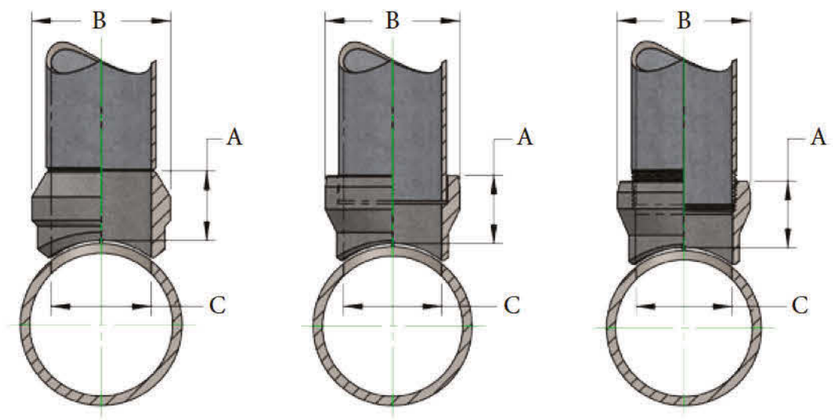
RUN SIZE CONSOLIDATIONS - CLASS 3000

Outlet Size	¼	⅜	½	¾	1	1 ¼	1 ½	2	2 ½	3	4
RUN SIZES	⅜ - ¼	1 - ⅜	½	1 ¼ - ¾	1	1 ½ - 1 ¼	1 ½	2	2 ½	3	4
	36 - ½	36 - 1 ¼	36 - ¾	36 - 1 ½	2 ½ - 1 ¼	3 ½ - 2	2 ½ - 2	3 ½ - 2 ½	3 ½ - 2 ½	5 - 3 ½	6 - 5
					36 - 3	36 - 4	5 - 3	6 - 4	6 - 4	14 - 6	10 - 8
							36 - 6	36 - 8	36 - 8	36 - 16	20 - 12
											36 - 22

► FLAT Flexolet branch connections for use on welding caps, elliptical heads, and flat surfaces is available upon request.

RUN SIZE CONSOLIDATIONS - CLASS 6000

Outlet Size	¼	⅜	½	¾	1	1 ¼	1 ½	2
RUN SIZES	⅜ - ¼	1 - ⅜	½	¾	1	1 ½ - 1 ¼	1 ½	2
	36 - ½	36 - 1 ¼	36 - ¾	1 ¼ - 1	2 ½ - 1 ¼	3 ½ - 2	2 ½ - 2	3 ½ - 2 ½
				36 - 1 ½	36 - 3	8 - 4	5 - 3	6 - 4
						36 - 10	36 - 6	36 - 8



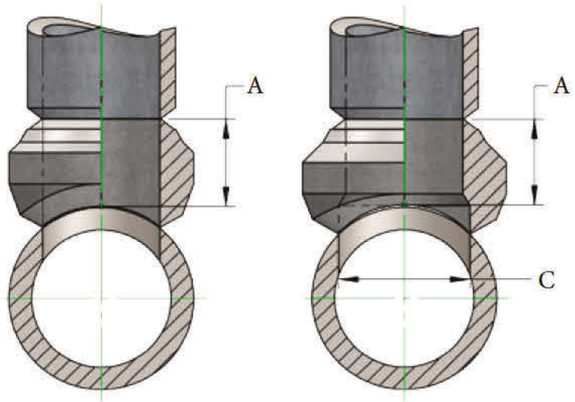
	Outlet Size	A	B	C	Weight
BUTT-WELD	NPS ⅛	⅜	⅞	C = I.D. of specified branch pipe	-
	NPS ¼	⅝	⅞		-
	NPS ⅜	¾	1		-
	NPS ½	¾	1 ⅛		0.100
	NPS ¾	⅞	1 ½		0.230
	NPS 1	1 1/16	1 ¾		0.260
	NPS 1 ¼	1 ¼	2 ¼		0.610
	NPS 1 ½	1 5/16	2 ½		0.780
	NPS 2	1 ½	3		0.890
	NPS 2 ½	1 ⅝	3 ⅜		2.170
	NPS 3	1 ¾	4		2.270
	NPS 3 ½	1 ⅞	4 ½		4.270
	NPS 4	2	5		4.370
	NPS 5	2 ¼	6 1/16		6.090
	NPS 6	2 ⅜	7 ⅛		10.190
THREADED	NPS ½	1	1 ¼	0.719	0.250
	NPS ¾	1 1/16	1 ½	0.922	0.350
	NPS 1	1 5/16	1 ⅞	1.156	0.650
	NPS 1 ¼	1 5/16	2 ¼	1.500	0.800
	NPS 1 ½	1 ⅜	2 ½	1.734	0.920
	NPS 2	1 ½	3	2.219	1.400

Outlet Size	A	B	C			Weight
			CL. 3000	SCH. 5s	SCH. 10s	
SOCKET-WELD	NPS ½	¾	1 ⅛	0.622	0.710	0.674	0.100
	NPS ¾	⅞	1 ½	0.824	0.920	0.884	0.230
	NPS 1	1 1/16	1 ¾	1.049	1.185	1.097	0.260
	NPS 1 ¼	1 ¼	2 ¼	1.380	1.530	1.442	0.610
	NPS 1 ½	1 5/16	2 ½	1.610	1.770	1.682	0.780
	NPS 2	1 ½	3	2.067	2.245	2.157	0.890

- REDUCES WELD VOLUME AND WELD TIME
- ALLOWS FULL PENETRATION WELD WITHOUT DISTORTION
- REDUCES HEAT BUILD UP
- CAN BE USED ON ALL HEADER PIPE THICKNESSES
- MEETS APPLICABLE PIPING CODES AND STANDAROS

WELDOLET®

TYPE 1 & TYPE 2 HEAVY WALL



TYPE 1
STRAIGHT BORE

TYPE 2
TAPER BORE

Run Wall Thickness	¾		1		1 ¼		1 ½		1 ¾	
Outlet Size	A	C	A	C	A	C	A	C	A	C
NPS 3	2 ⅞	2.906	3 7/32	2.900	3 ⅜	2.906	3 ⅝	2.900	4 ⅛	2.900
NPS 3 ½	3 ⅛	3.359	3 ¼	3.359	3 7/16	3.359	3 ¾	3.359	4 5/16	3.359
NPS 4	3 5/16	3.843	3 ⅜	3.826	3 ½	3.828	3 ⅞	3.826	4 ¾	3.826
NPS 5	3 ¾	4.812	3 ¾	4.812	4	4.812	4 ¼	4.812	4 ¾	4.812
NPS 6	4 ⅛	5.750	4 11/32	5.761	4 ½	5.760	4 11/16	5.760	5 ¼	5.760
NPS 8	4 3/16	7.625	4 ⅝	7.625	4 ⅞	7.625	5 5/32	7.625	5 ¾	7.625
NPS 10	4 ¼	9.750	4 27/32	9.750	5	9.562	5 5/16	9.562	5 15/16	9.562
NPS 12	4 ⅜	11.750	5 5/32	11.750	5 ⅜	11.375	5 11/16	11.375	6 5/16	11.375
NPS 14	4 ½	13.000	5 ¼	13.000	5 ½	12.500	5 13/16	12.500	6 5/16	12.500
NPS 16	4 11/16	15.000	5 ⅞	15.000	6	14.312	6 7/16	14.310	6 ⅜	14.310
NPS 18	5 ⅛	17.000	6 ½	17.000	6 ½	16.125	6 ½	16.126	6 13/16	16.126
NPS 20	5 ⅝	19.000	6 ¾	19.000	7	17.937	7 9/16	17.938	7 25/32	17.938
NPS 24	6 ½	23.000	7 ⅝	23.000	8	21.564	8 23/32	21.564	8 31/32	21.564

Run Wall Thickness	2		2 ¼		2 ½		2 ¾		3	
Outlet Size	A	C	A	C	A	C	A	C	A	C
NPS 3	4 9/16	2.900	5	2.900	5 ½	2.900	5 ⅞	2.900	6 1/16	2.900
NPS 3 ½	4 ⅝	3.359	5 1/16	3.359	5 9/16	3.359	6	3.359	6 5/16	3.359
NPS 4	4 ¾	3.826	5 5/16	3.826	5 ⅝	3.826	6 ⅛	3.826	6 9/16	3.826
NPS 5	5 ¼	4.812	5 ¾	4.812	6 ¼	4.812	6 ⅝	4.812	7 5/16	4.812
NPS 6	5 ¾	5.760	6 ¼	5.760	6 ¾	5.760	7 ¼	5.760	7 13/16	5.760
NPS 8	6 11/32	7.625	6 15/16	7.625	7 17/32	7.625	8 3/32	7.625	8 11/16	7.625
NPS 10	6 9/16	9.562	7 3/16	9.562	7 13/16	9.562	8 7/16	9.562	9 1/16	9.562
NPS 12	6 15/16	11.375	7 9/16	11.375	8 3/16	11.375	8 13/16	11.375	9 7/16	11.375
NPS 14	6 15/16	12.500	7 9/16	12.500	8 3/16	12.500	8 13/16	12.500	9 7/16	12.500
NPS 16	7 ¼	14.310	7 ⅞	14.310	8 ½	14.310	9 ⅛	14.310	9 ¾	14.310
NPS 18	7 7/16	16.126	8 7/32	16.126	8 13/16	16.126	9 13/32	16.126	10 1/32	16.126
NPS 20	8 3/32	17.938	8 21/32	17.938	9 ¼	17.938	9 29/32	17.938	10 15/32	17.938
NPS 24	9 13/16	21.568	10 ½	21.568	11	21.564	12 9/16	21.564	10 21/32	21.564

► Order Heavy Wall Weldolets to specific header run sizes.

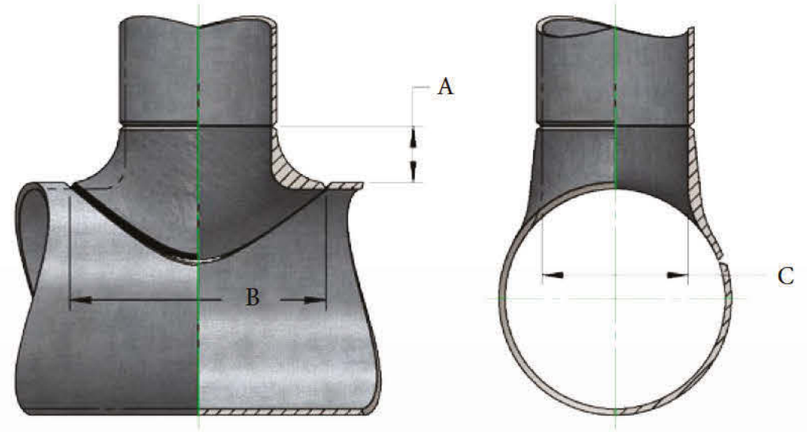
TAPER BORE

STRAIGHT BORE

BUTT-WELD

SWEEPOLET®

BUTT-WELD INSERT REINFORCEMENT

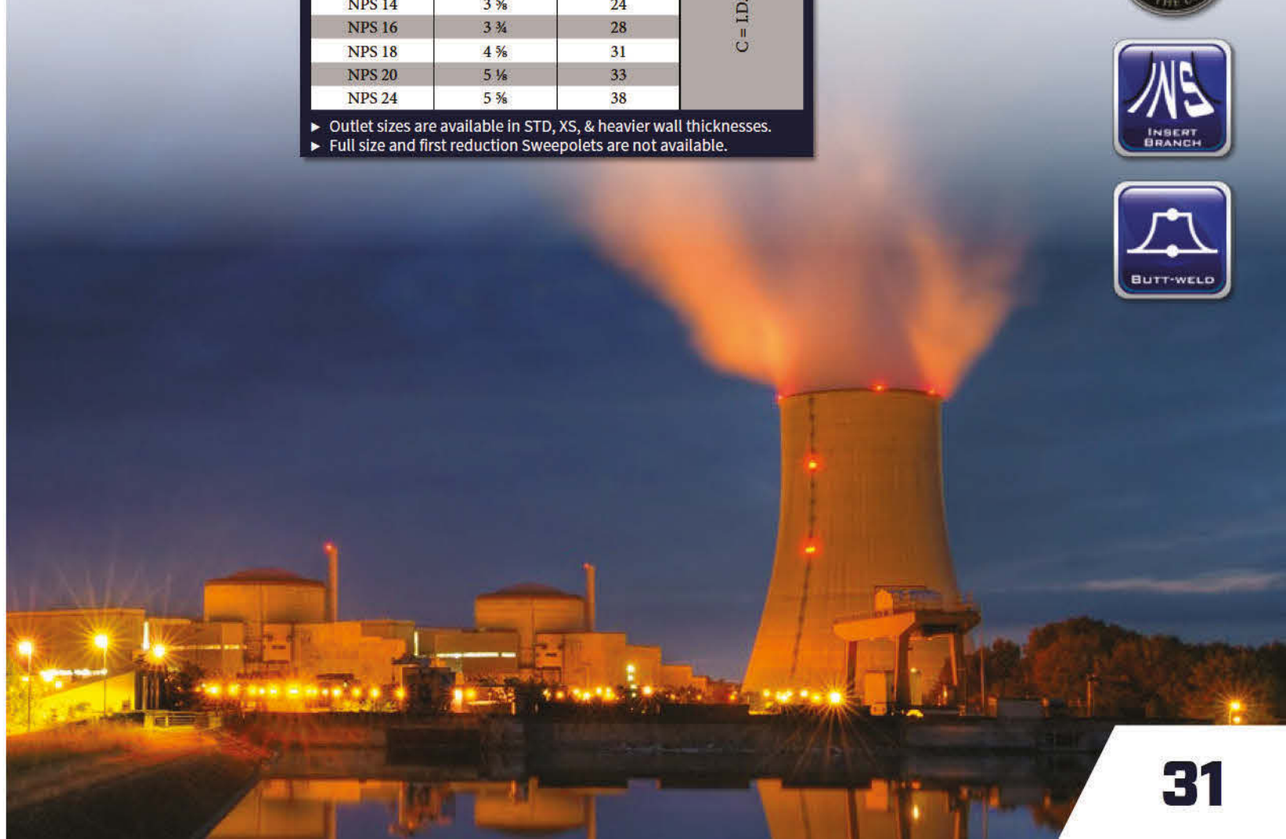


Outlet Size	Dimensions A	B	C
NPS 1 ¼	1 ¼	4	C = I.D. of specified branch pipe
NPS 1 ½	1 ¾	5 ½	
NPS 2	1 ½	5 ½	
NPS 3	1 21/32	7	
NPS 4	2 ⅓2	8 ¾	
NPS 6	2 11/16	13	
NPS 8	3	15	
NPS 10	3 ⅛	18 ½	
NPS 12	3 5/16	20 ½	
NPS 14	3 ⅜	24	
NPS 16	3 ¾	28	
NPS 18	4 ⅝	31	
NPS 20	5 ⅛	33	
NPS 24	5 ⅜	38	

► Outlet sizes are available in STD, XS, & heavier wall thicknesses.
► Full size and first reduction Sweepolets are not available.

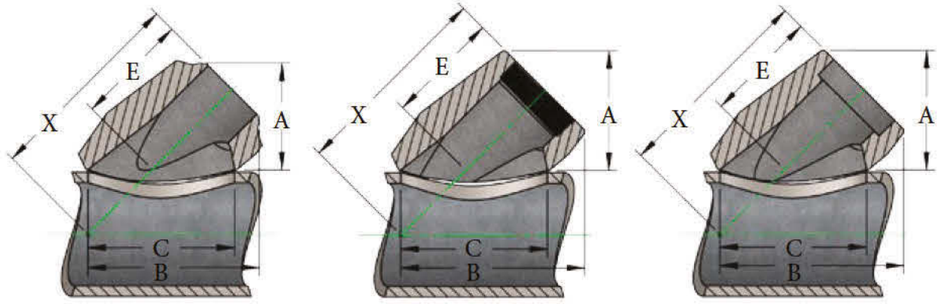
INSERT BRANCH

BUTT-WELD



LATROLET®

BUTT-WELD, THREADED & SOCKET-WELD 45° CONNECTIONS



BUTT WELD | THREADED | SOCKET-WELD

X = ((RUN PIPE O.D.)/2 + ROOT GAP) / 0.707 + E

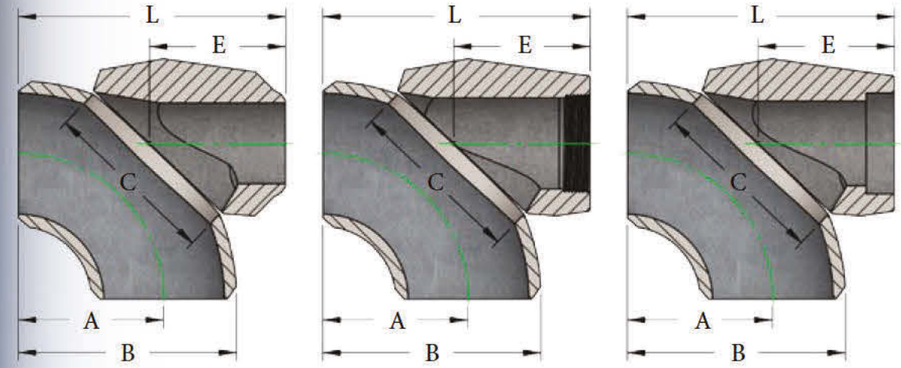
Outlet Size	DIMENSIONS CLASS 3000 THREADED & SOCKET-WELD				CLASS 6000 THREADED & SOCKET-WELD			
	A	B	C	E	A	B	C	E
NPS ¼	1 9/16	2 11/32	1 7/16	1 9/16	1 9/16	2 11/32	1 7/16	1 9/16
NPS ⅜	1 9/16	2 11/32	1 7/16	1 9/16	1 9/16	2 11/32	1 7/16	1 9/16
NPS ½	1 9/16	2 11/32	1 7/16	1 9/16	1 ⅞	2 ¾	1 ¾	1 29/32
NPS ¾	1 ⅞	2 ¾	1 ¾	1 29/32	2 3/16	3 ¼	2 ⅛	2 3/16
NPS 1	2 3/16	3 ¼	2 ⅛	2 3/16	2 ½	3 27/32	2 ⅝	2 15/16
NPS 1 ¼	2 ½	3 27/32	2 ⅝	2 15/16	2 ¾	4 7/32	3 1/32	2 ⅝
NPS 1 ½	2 ¾	4 7/32	3 1/32	2 ⅝	3 ⅜	5 7/16	4 ⅛	3 5/32
NPS 2	3 ⅜	5 7/16	4 ⅛	3 5/32	3 ⅜	5 7/16	4 ⅛	3 5/32

Outlet Size	DIMENSIONS BUTT-WELD (STD)				BUTT-WELD (XS)			
	A	B	C	E	A	B	C	E
NPS ½	1 13/32	1 15/16	1 3/16	1 ½	1 7/16	2	1 5/16	1 19/32
NPS ¾	1 ¾	2 13/32	1 ⅝	1 29/32	1 17/32	2 3/16	1 9/16	1 ⅝
NPS 1	2 3/32	2 ⅞	1 ⅞	2 9/32	1 27/32	2 ¾	1 15/16	1 31/32
NPS 1 ¼	2 9/32	3 13/32	2 9/16	2 ⅜	2 ¼	3 13/32	2 ½	2 ⅜
NPS 1 ½	2 19/32	3 25/32	2 13/16	2 11/16	2 9/16	3 27/32	2 13/16	2 11/16
NPS 2	3	4 9/16	3 ½	3 ½	2 31/32	4 9/16	3 ½	3 ½
NPS 3	3 ⅞	6 7/16	5 3/16	3 25/32	3 13/16	6 3/16	4 ⅞	3 ¾
NPS 4	4 13/16	7 15/16	6 ⅜	4 ⅜	4 25/32	7 13/16	6 ¼	4 21/32
NPS 6	6 23/32	11 5/16	9 ⅝	6 9/32	7 1/16	11 23/32	9 7/16	6 ⅞
NPS 8	8 9/32	14 15/32	12 9/16	7 ½	9 1/16	15 3/32	12 ¼	8 ¾
NPS 10	10 3/16	18 7/32	15 ½	9 3/16	10 15/32	18 ½	15 ⅜	9 11/16
NPS 12	11 21/32	20 19/32	18 ½	10 ¼	12 13/32	21 13/32	18 ⅜	11 7/16
NPS 14	12 7/16	22 1/32	20 ¼	10 ¾	13 ½	22 29/32	20 ⅛	11 11/16
NPS 16	14 ½	25 19/32	23 3/16	12	14 9/32	25 9/16	23 1/16	12 7/16
NPS 18	15 15/16	28 19/32	26 ⅛	13 11/16	16 ¼	29	26	14 ¼
NPS 20	17 17/32	31 ⅝	29 1/16	14 15/16	17 15/16	32 ½	28 ⅞	15 ⅝
NPS 24	20 ⅞	37 15/16	35	17 11/16	21 15/32	38 7/16	34 13/16	18 ⅝
NPS 30	25 27/32	47 ½	43 ¾	21 11/16	-	-	-	-

Outlet Size	DIMENSIONS BUTT-WELD (SCH. 160)				BUTT-WELD (XXS)			
	A	B	C	E	A	B	C	E
NPS ½	1 ⅝	2 ⅛	1 3/16	1 29/32	1 9/16	2 ½	1 1/16	1 ⅞
NPS ¾	1 27/32	2 17/32	1 ½	2 ⅛	1 11/16	2 11/32	1 ⅜	1 31/32
NPS 1	2 5/32	3	1 13/16	2 15/32	2 5/32	2 ⅞	1 ⅝	2 ½
NPS 1 ¼	2 21/32	3 23/32	2 ⅜	2 31/32	2 17/32	3 9/16	2 3/16	2 15/16
NPS 1 ½	2 31/32	4 7/32	2 ⅞	3 11/32	2 27/32	4 ⅛	2 11/16	3 ¼
NPS 2	3 ⅜	4 15/16	3 5/16	3 23/32	3 ¼	4 25/32	3 3/16	3 ⅝
NPS 3	4 19/32	7 1/16	5	4 15/16	4 17/32	6 13/16	4 ¾	4 31/32
NPS 4	5 21/32	8 23/32	6 ¼	6 1/32	5 9/16	8 ½	6	6

ELBOLET®

BUTT-WELD, THREADED & SOCKET-WELD 90° LONG RADIUS



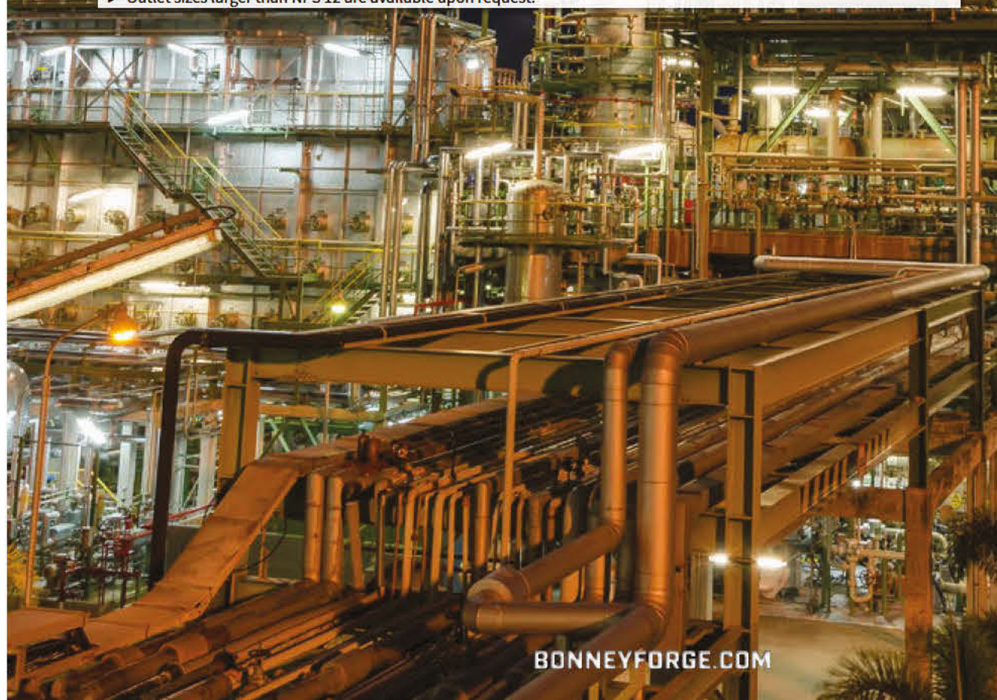
BUTT-WELD | THREADED | SOCKET-WELD

L = E + SQRT(B² - A² + ROOT GAP)

	Elbow Size	Outlet Size	DIMENSIONS C	E
CLASS 3000 - THREADED & SOCKET-WELD BUTT-WELD (STD & XS)	NPS 36 - ¾	NPS ¼	1 ½	1 19/32
	NPS 36 - ¾	NPS ⅜	1 ½	1 19/32
	NPS 36 - ¾	NPS ½	1 ½	1 19/32
	NPS 36 - 1	NPS ¾	1 23/32	1 ⅞
	NPS 36 - 2	NPS 1	2 ¼	2 ¼
	NPS 36 - 2	NPS 1 ¼	2 ⅞	2 ½
	NPS 36 - 2	NPS 1 ½	3 ⅛	2 11/16
	NPS 36 - 3	NPS 2	4 3/16	3 ¼
	ORDER TO SPECIFIC ELBOW SIZES	NPS 2 ½	4 3/16	3 ¼
		NPS 3	5 1/16	3 ⅞
		NPS 4	6 ⅝	4 13/16
		NPS 6	9 ⅜	6 ½
		NPS 8	13 5/16	8 1/16
		NPS 10	17 1/32	10 ⅜
		NPS 12	19 ⅝	11 ⅛

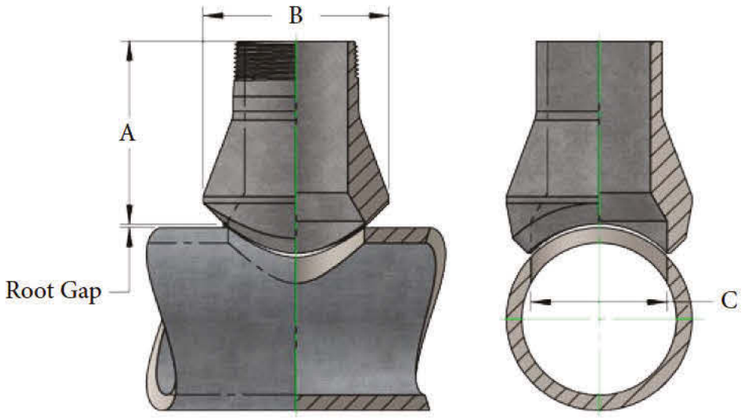
	Elbow Size	Outlet Size	DIMENSIONS C	E
CLASS 6000 - THREADED & SOCKET-WELD BUTT-WELD (SCH. 160 & XXS)	NPS 36 - ¾	NPS ¼	1 ½	1 19/32
	NPS 36 - ¾	NPS ⅜	1 ½	1 19/32
	NPS 36 - ¾	NPS ½	1 23/32	1 ⅞
	NPS 36 - 1	NPS ¾	2 ¼	2 ¼
	NPS 36 - 2	NPS 1	2 ⅞	2 ½
	NPS 36 - 2	NPS 1 ¼	3 ⅛	2 11/16
	NPS 36 - 2	NPS 1 ½	4 3/16	3 ¼
	ORDER TO SPECIFIC ELBOW SIZES	NPS 2	-	-
		NPS 2 ½	-	-
		NPS 3	-	-
		NPS 4	-	-
		NPS 6	-	-
		NPS 8	-	-
		NPS 10	-	-
		NPS 12	-	-

- Outlet sizes larger than NPS 2 are available as butt-weld fittings only.
- Outlet sizes larger than NPS 12 are available upon request.



NIPOLET®

THREADED & SOCKET-WELD EXTRA STRONG & DBL. EXTRA STRONG



	Outlet Size	Dimensions A	B	C
XS	NPS ½	SEE NOTES	1 ⅜	15/16
	NPS ¾		1 ¾	1 3/16
	NPS 1		2 ⅛	1 7/16
	NPS 1 ¼		2 9/16	1 ¾
	NPS 1 ½		2 ⅞	2
	NPS 2		3 ½	2 9/16
XXS	NPS ½	SEE NOTES	1 ⅜	9/16
	NPS ¾		1 ¾	¾
	NPS 1		2	1
	NPS 1 ¼		2 7/16	1 5/16
	NPS 1 ½		2 ¾	1 ½
	NPS 2		3 ¼	1 11/16

- Available in threaded or plain end (male socket-weld)
- Standard lengths: 3 ½", 4 ½", 5 ½", and 6 ½"
- Non standard lengths available upon request

RUN SIZE CONSOLIDATIONS - Extra Strong

Outlet Size	½	¾	1	1 ¼	1 ½	2
RUN SIZES	½	¾	1	1 ¼	1 ½	2
	¾	1	1 ¼	1 ½	2	2 ½
	1	1 ½ - 1 ¼	1 ½	2	2 ½	3
	1 ½ - 1 ¼	2 ½ - 2	2	2 ½	3	4 - 3 ½
	2 ½ - 2	5 - 3	2 ½	3 ½ - 3	4 - 3 ½	5
	8 - 3	12 - 6	3 ½ - 3	5 - 4	6 - 5	6
	36 - 10	36 - 14	5 - 4	8 - 6	12 - 8	10 - 8
	FLAT	FLAT	10 - 6	18 - 10	24 - 14	18 - 12
			36 - 12	36 - 20	36 - 26	36 - 20
			FLAT	FLAT	FLAT	FLAT

RUN SIZE CONSOLIDATIONS - Double Extra Strong

Outlet Size	½	¾	1	1 ¼	1 ½	2
RUN SIZES	½	1 - ¾	1	1 ½ - 1 ¼	1 ½	2
	1 ¼ - ¾	2 - 1 ¼	2 ½ - 1 ¼	2 ½ - 2	2 ½ - 2	2 ½
	36 - 1 ½	6 - 2 ½	10 - 3	10 - 3	3 ½ - 3	3 ½ - 3
	FLAT	36 - 8	36 - 12	36 - 12	8 - 4	5 - 4
		FLAT	FLAT	FLAT	20 - 10	8 - 6
					22	18 - 10
					36 - 24	36 - 20
					FLAT	FLAT

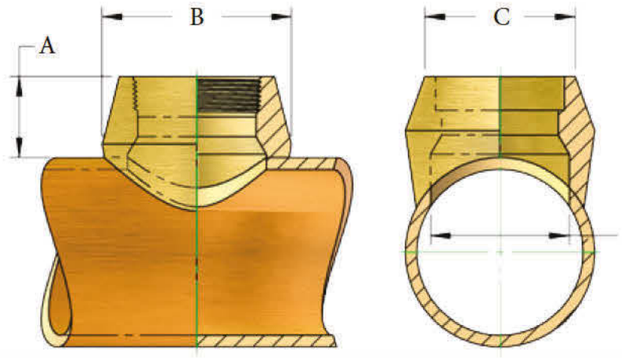
TAPER BORE

THREADED

PLAIN

BRAZOLET®

THREADED & BRAZING IPS PIPE & TYPE K, L, M TUBE



	Outlet Size	Dimensions A	B	C	Brazing Surface	F-Min. MIL-F-1183
IPS PIPE	NPS ¼	11/16	1	9/16	0.188	0.700
	NPS ⅜	13/16	1 ¼	¾	0.190	0.855
	NPS ½	1	1 7/16	⅞	0.220	1.020
	NPS ¾	1 1/16	1 11/16	1 ⅛	0.240	1.250
	NPS 1	1 ¼	2 ⅛	1 7/16	0.270	1.535
	NPS 1 ¼	1 5/16	2 ½	1 ¾	0.300	1.900
	NPS 1 ½	1 ⅜	2 ⅞	2	0.330	2.160
	NPS 2	1 ½	3 ½	2 9/16	0.360	2.675
	NPS 2 ½	1 13/16	4	3	0.384	3.215
	NPS 3	2	4 13/16	3 11/16	0.442	3.880
	NPS 4	2 ¼	6	4 ¾	0.476	4.940
	NPS 5	2 ⅝	7 1/16	5 9/16	0.656	6.163
TYPE K, L, M TUBE	NPS ¼	11/16	1	9/16	0.188	0.700
	NPS ⅜	11/16	1	9/16	0.190	0.855
	NPS ½	¾	1 ¼	¾	0.190	0.855
	NPS ¾	1	1 7/16	⅞	0.220	1.020
	NPS 1	1 1/16	1 11/16	1 ⅛	0.240	1.250
	NPS 1 ¼	1 ¼	2 ⅛	1 7/16	0.270	1.535
	NPS 1 ½	1 5/16	2 ½	1 ¾	0.300	1.900
	NPS 2	1 ⅜	2 ⅞	2	0.330	2.160
	NPS 2 ½	1 ½	3 ½	2 9/16	0.360	2.675
	NPS 3	1 ⅝	4 ⅛	3	0.384	3.215
	NPS 4	2 ⅛	5 ½	4 5/16	0.437	4.400

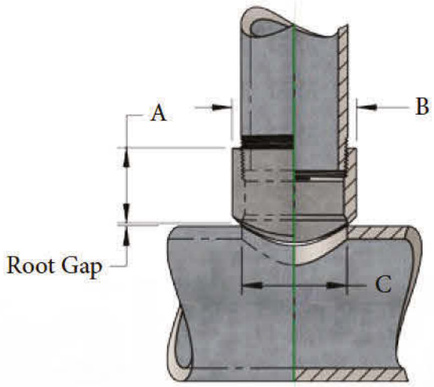
TAPER BORE

THREADED

SOCKET-WELD

COUPOLET®

THREADED 300 LBS. RATING



Outlet Size	Dimensions A	B	C
NPS ½	15/16	0.745	1.188
NPS ¾	1	0.958	1.441
NPS 1	1 3/16	1.250	1.562
NPS 1 ¼	1 5/16	1.625	1.906
NPS 1 ½	1 7/16	1.780	2.188
NPS 2	1 11/16	2.375	2.750
NPS 2 ½	1 13/16	2.890	3.386
NPS 3	2 ½	3.400	4.000
NPS 4	3	4.380	5.000

► In order to eliminate "Blind Holes" cut hole prior to welding

UL CERTIFIED SAFETY US EX2796

FM APPROVED

PROUDLY MANUFACTURED IN THE USA

STB STRAIGHT BORE

THREADED

RUN SIZE CONSOLIDATIONS - 300 lbs.
Outlet Size

RUN SIZES	½	¾	1	1 ¼	1 ½	2	2 ½	3	4
	½	¾	1	1 ¼	1 ½	2	2 ½	3	5
	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½	6
	1 ¼ - 1	2 - 1 ¼	2 - 1 ½	2 ½ - 2	2 ½	3	3 ½	4	8
	2 ½ - 1 ½	6 - 2 ½	4 - 2 ½	4 - 3	4 - 3	3 ½	4	5	10
	8 - 3	36 - 8	8 - 5	8 - 5	8 - 5	4	5	6	14 - 12
	36 - 10		36 - 10	36 - 10	16 - 10	5	6	8	16
					36 - 18	6	8	10	18
						8	12 - 10	12	20
						10	16 - 14	14	24
						16 - 12	36 - 18	18 - 16	36
						36 - 18		36 - 20	

GENERAL TERMS AND CONDITIONS OF SALE: BONNEY FORGE (HEREAFTER REFERRED TO AS "BF")

WARRANTY	BF expressly warrants to the Purchaser (the "Purchaser") that all BF products (each, a "Product") will be free from manufacturing defects for the one (1) year period immediately following the date of shipment (the "Warranty Period"). BF HEREBY DISCLAIMS ALL OTHER WARRANTIES WITH RESPECT TO BOTH THE PRODUCTS AND THIS AGREEMENT, INCLUDING THESE TERMS AND CONDITIONS, WHETHER EXPRESS OR IMPLIED INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF DEALING OR COURSE OF PERFORMANCE. The forgoing warranty shall not apply: (1) to any use of a Product in aircraft or aerospace applications ("Prohibited Applications"), (2) if a Product was not used as recommended and in accordance with approved installation and operating practices, (3) if the failure of a Product results from any cause other than a manufacturing defect, including but not limited to damage due to corrosive, abrasive or other wear normally to be expected in the use of the Product, (4) if the Product was modified or changed (unless written approval was given in advance by BF), and (5) if Purchaser fails to deliver written notice of such defect to BF during the Warranty Period.
EXCLUSIONS	Do not use BF Products in aircraft or aerospace applications. Purchaser assumes all risk of loss that arises from or relates to any use of Product in a Prohibited Application and Purchaser shall, at its own expense, indemnify, defend and hold BF harmless against all claims or losses (including legal and accounting fees) that arise from or relate to the use of any Product in a Prohibited Application.
PURCHASER'S REMEDIES	Purchaser's remedies with respect to any Product furnished by BF hereunder that is found not to be in conformity with the terms and conditions of the contract because of breach of contract, breach of express or implied warranty, or negligence shall be limited exclusively to the right of replacement of such defective Product or, at the option of BF, repayment of the sale price for the particular Product that gives rise to the claim. BF shall have no liability to Purchaser or to any other person, in tort, contract or otherwise, for claims losses, damages or injuries arising out of this purchase or use of any Product, except for the return by BF of an amount not in excess of the payments made by the Purchaser to BF for the particular Products giving rise to Purchaser's claim. No action, whether based on contract, tort or otherwise, arising out of or related to Products furnished pursuant to the Agreement may be brought by Purchaser more than one year after the cause of action has accrued and no claims for breach of warranty may be brought by Purchaser unless Purchaser notifies the BF in writing within 10 days of discovery of the breach. Any claim made after the time periods specified in the foregoing sentence shall be deemed to be null and void. UNDER NO CIRCUMSTANCES WILL BF BE LIABLE TO PURCHASER FOR DAMAGES IN EXCESS OF THE AMOUNTS PAID BY PURCHASER TO BF UNDER THE AGREEMENT OR FOR INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL OR EXEMPLARY DAMAGES (EVEN IF BF HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES), SUCH AS, BUT NOT LIMITED TO, LOSS OF REVENUE OR ANTICIPATED PROFITS OR LOST BUSINESS.
PRICES	Prices, and other terms of sale and payment, are subject to change by BF without notice. Unless a contrary provision appears in this price schedule, quotation, or order acknowledgment, prices may be withdrawn without notice at any time. Stenographic or clerical errors are subject to correction.
ACCEPTANCE OF ORDERS	All orders are subject to BF credit department approval prior to acceptance by BF.
REMITTANCES	All accounts are payable in United States funds, free of exchange, collection, or any other charges. If, in the sole discretion of BF, the financial condition of the Purchaser at any time so requires, BF retains the right to require full or partial payment in advance.
PARTIAL SHIPMENTS AND PAYMENTS	BF reserves the right to make partial shipments from time to time, and to render invoices therefore which shall be due and payable as provided in said invoices and the paragraph entitled "REMITTANCES". If the Purchaser becomes overdue in any such partial payment, BF shall be entitled to suspend work and/or avail itself of other legal remedies.
TAXES	Unless otherwise specifically noted, the amount of any federal, state or local sales, use, occupancy, excise tax, or other tax of any nature, for which BF is legally liable, either intentionally or through failure of payment by Purchaser, shall be added or be in addition to the price quoted and Purchaser agrees to pay same to BF.
SHORTAGES AND DAMAGES IN TRANSIT	All claims for loss, damages, shortages, etc. must be made by Purchaser in writing within 10 days after receipt of shipment. Loss or damage to materials in transit is the responsibility of the carrier and not BF.
FREIGHT POLICY TITLE AND RISK OF LOSS	Unless otherwise specifically negotiated with the customer, BF's standard freight policy is to ship all product FCA (plant of manufacture) with BF's responsibility ceasing after delivery to the carrier. Title to and all risk of loss or damage to the Products vests in Purchaser at the time BF delivers the Products to the carrier regardless of any shipping and insurance arrangements made by BF on Purchaser's behalf. However, BF reserves and Purchaser grants, until full payment is received, a purchase money security interest in each of the Products delivered. Purchaser hereby authorizes BF to file such financing statements and deliver such notices as BF may reasonably require to perfect such purchase money security interest. BF shall have all rights and may exercise all remedies of a secured creditor under Article 9 of the Uniform Commercial Code as adopted from time to time in the Commonwealth of Pennsylvania. The remedies reserved herein shall be cumulative and in addition to any other remedies provided in law or equity. No waiver of the remedy for any breach of any provision in these terms shall constitute a waiver of any other remedy.
DELAYS	All shipping dates are good faith estimates by BF. BF makes no guarantee to ship on any date. BF shall assume no obligation to ship Products on any date and BF shall not be liable for the failure to ship Product on any date. Materials slated to be in stock are subject to prior sales.
CANCELLATIONS AND SUSPENSIONS	Purchaser may cancel this order or contract, or delay work or delivery, only upon receipt of written notification by BF from Purchaser and with BF's prior consent, and upon agreement to pay BF's adjustment charge. Orders for special products (usually "price on application items") may be changed and/or canceled only upon receipt of written instructions by BF from Purchaser and with BF's prior consent, and Purchaser shall make payment to BF for material used and work already performed.
RETURN OF MATERIAL	No Product may be returned without the prior written consent of BF. All goods returned are subject to a handling charge plus freight in both directions and charges for any required reconditioning, unless otherwise specified in writing by BF.
INDEMNITY	Purchaser shall defend, indemnify and hold BF and its affiliates harmless from any and all loss or damage sustained by BF and from and against all claims asserted against BF with respect to the Products covered hereunder arising in whole or in part out of (1) failure of Purchaser, its agents, employees, or customers to follow specifications, instructions, warnings or recommendations furnished by BF or others; (2) failure of Purchaser, its agents, employees or customers to comply with all applicable legal requirements; (3) misuse of the Products by Purchaser, its agents, employees or customers; (4) misrepresentation by Purchaser, its agents, employees or customers; (5) the full extent of the negligence of Purchaser, its agents, employees or customers; or, (6) alleged infringement of any patent, trademark, trade secret, copyright, or other intellectual property or proprietary right of Purchaser or a third party as a result of BF's performance in accordance with Purchaser's designs, plans or specifications. Purchaser hereby waives and releases BF and its affiliates from all rights of contribution or indemnity to which it may otherwise be entitled.
GOVERNING LAW	The contract shall be governed by, construed, and enforced in accordance with the laws of the Commonwealth of Pennsylvania without regard to the conflict-of-law principles of any jurisdiction. Purchaser and BF (i) agree that all actions and proceedings arising out of or relating to this Agreement shall be litigated exclusively in the state courts located in Huntingdon County, Pennsylvania and/or the United States District Court for the Middle District of Pennsylvania; (ii) consent to the jurisdiction and venue of such courts; and (iii) waive any and all rights to object to the jurisdiction and venue of such courts, to transfer or change the venue of any such action or proceeding, including but not limited to upon the basis of forum non conveniens. PURCHASER AND BF FURTHER EACH WAIVE THE RIGHT TO TRIAL BY JURY IN ANY ACTION OR PROCEEDING BASED UPON, ARISING OUT OF, OR IN ANY WAY RELATING TO, THIS AGREEMENT.
NO WAIVER	The failure of BF to exercise any of its rights under this Agreement for a breach thereof shall not be deemed to be a waiver of such rights nor shall the same be deemed to be a waiver of any subsequent breach.
DIES, TOOLS AND PATTERNS	Dies, tools and patterns used by BF to produce any Product (collectively, the "Material") shall be and remain the exclusive property of BF. Payment by Purchaser of any preparation charge with respect to such Material shall not give the Purchaser any right, title or interest in or to such Material. BF shall not be responsible for retention of dies or patterns on which no orders are received for two years or more.
FORCE MAJEURE	Neither party shall be liable to the other under this Agreement if delayed or prevented from performance by causes beyond its control including, but not limited to, fires, floods, strikes, acts of God, war, insurrection, government restrictions, or other causes of a like or different nature.
ASSIGNMENT	No assignment of the Purchaser's rights or obligations may be made without the prior, written consent of BF.
PURCHASER'S ACCEPTANCE OF BF'S TERMS	BF is not bound by any terms on the Purchaser's order form or any other document emanating from the Purchaser which attempts to impose any condition at variance with BF's terms and conditions of sale included herein or stated on BF's packages, invoices, technical data sheets or any other BF documents. BF's failure to object to provisions contained in the aforementioned forms of the Purchaser shall not be deemed a waiver of the provisions of BF's terms and conditions of sale which shall constitute the entire contract between BF and the Purchaser. No waiver, alteration, or modification of the terms and conditions of this document shall be binding unless in writing and signed by an authorized representative of BF. These BF terms and conditions constitute the entire understanding between the parties with respect to the subject matter hereof and supersede any and all prior understandings, statements, warranties, representations and agreements, oral and written, relating hereto. In the event of any discrepancy or inconsistency between these terms and conditions and any other purchase order or acceptance form used by the Purchaser in connection herewith, these BF terms and conditions shall govern, and such Purchaser purchase order, or acceptance form shall not amend, modify or add to the BF terms and conditions stated herein.
PROPRIETARY INFORMATION	Any Purchaser information provided to BF shall not be considered confidential unless otherwise agreed to by BF in a separate agreement. All drawings, works of authorship, trade secrets, inventions, improvements or other items made or developed by or for BF in connection with the performance of its obligations hereunder (the "Works") shall be BF's property. Purchaser hereby assigns all right and title in and to such Works to BF. Purchaser shall not use or disclose any of BF's trade secrets or other confidential information, whether or not designated as such, except as required in connection with the use of the Products covered hereunder.
SEVERABILITY	If any provisions of this Agreement are held to be invalid or unenforceable, such invalidity or unenforceability shall not affect the validity or enforceability of the other portions hereof, all of which provisions are hereby declared severable.

► The material in this catalog is for general information. For specific performance data and proper material selection, consult your Bonney Forge representative. Although every attempt has been made to ensure that the information contained in this catalog is correct, Bonney Forge reserves the right to change designs, materials or specifications without notice.