LADISH

Controlled Quality

SEAMLESS WELDING FITTINGS

TO MARK PROGRESS

LADISH

SEAMLESS WELDING FITTINGS TABLE OF CONTENTS

HOW TO ORDER LADISH SEAMLESS WELDING FITTINGS

EXAMPLE OF INFORMATION REQUESTED

QUANTITY	NOMINAL PIPE SIZE	WEIGHT DESIGNATION	DESCRIPTION	MATERIAL SPECIFICATION*	PART NO.
10	6″	STD.	90° LR Seamless Welding Elbows +	ASTM A106-52T Grade B	940
8	10″	XH	45° Seamless Welding Elbows +	ASTM A106-52T Grade A	451
12	4″x2″†	STD.	90° LR Seamless Welding Reducing Elbows +	ASTM A106-52T Grade B	266
3	14″	Schedule 80 •	180° LR Seamless Welding Returns +	ASTM A335 P5c	959
4	8″	XXH	Seamless Welding Straight Tees	ASTM A312 Type 347	249
6	5″x5″x4″†	STD.	Seamless Welding Reducing Outlet Tees	ASTM B75-49T Type DLP	256
3	6″x3″†	Schedule 160 •	Eccentric Welding Reducers	ASTM A106-52T Grade B	229
7	10″	XH	Lap Joint Stub Ends	ASTM B221-49T Alloy MIA	47
6	8″x18″ ■		Welding Saddles	ASTM A285 Grade C	57

NOTES

* Always specify material by standard, grade and symbol. See pages 229-236 and 242.

† Always specify size of reduced outlet.

\+ Always specify degree of elbows and returns, and whether long radius, short radius, or extra long radius is required.

• Always specify schedule number or average wall thickness of special fittings.

■ Always specify both nozzle and header sizes.

When shipment is made, a shipping notice is forwarded to the destination of the shipment. For this reason correct post office address should be given.

"Delivery required BY....." This information proves helpful to Ladish Co. in processing orders in accord with your requirements.

If order is based on Ladish quotation, quotation number should be made part of the order.

Orders should be placed with your Authorized Ladish Co. Distributor. His ample stocks mean prompt service.

Always Supply Complete Information on Order

LADISH

SEAMLESS WELDING FITTINGS PICTORIAL INDEX

90° ELBOWS

LONG RADIUS

90° ELBOWS

SHORT RADIUS

SEAMLESS REDUCING ELBOWS

LONG RADIUS

45° ELBOWS

LONG RADIUS

180° RETURNS

LONG RADIUS

180° RETURNS

EXTRA LONG RADIUS

180° RETURNS

SHORT RADIUS

STRAIGHT TEES

REDUCING OUTLET TEES

CONCENTRIC REDUCERS

ECCENTRIC REDUCERS

LAP JOINT STUB ENDS

CAPS

SADDLES

SPLIT TEE

3-R ELBOWS

REDUCING-ON-RUN TEES

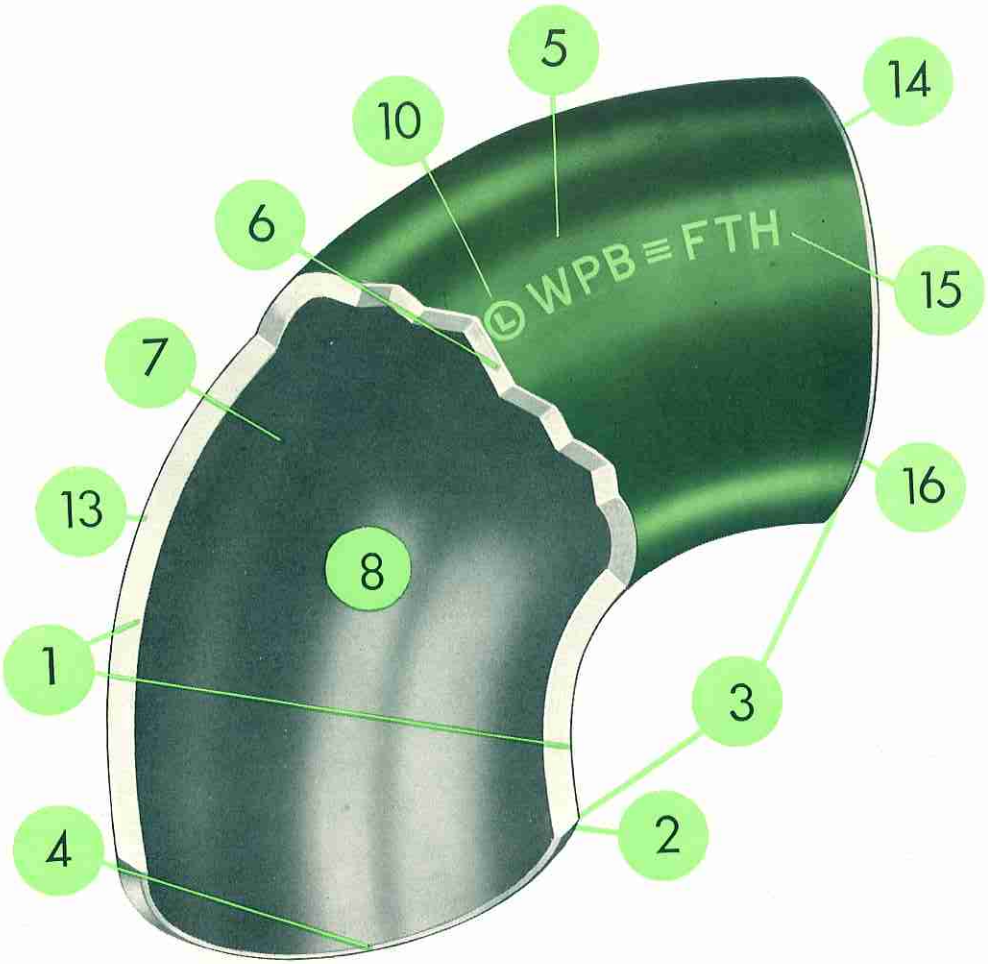
LIGHT GAUGE FITTINGS

HEAVY WALL FITTINGS

Always Supply Complete Information on Order

TO MARK PROGRESS

TO MARK PROGRESS



LADISH SEAMLESS WELDING FITTINGS

1 UNIFORM WALL THICKNESS

During Ladish forging processes, metal is scientifically distributed throughout wall sections . . . no upsetting of metal on the short inner curve, nor stretching or thinning of the long outer wall.

2 MACHINED BEVEL ENDS

Ends are machined with accurate bevels to facilitate quick, sound welds. Square, straight faces permit rapid, accurate alignment with pipe assuring complete contact throughout entire circumference.

3 ACCURATE INCLUDED ANGLE

Uniformly accurate included angles permit fabrication of large, complicated installations to exact measurement. Ladish Ells and Return Bends are geometrically true in all planes and dimensionally accurate.

4 EASE OF ALIGNMENT

Uniform wall thickness, true circularity, and accurately machined ends insure easy, accurate alignment. Interior surfaces align when outside surfaces are lined up.

5 PERMANENT IDENTIFICATION

Complete identification is permanently marked on each Ladish Fitting to simplify recognition in handling, storage and installation. Identification shows nominal size, pipe weight, material grade and Heat Code Identity.

6 REFINED GRAIN STRUCTURE

The fine, uniformly compact grain structure of Ladish Fittings provides maximum dynamic strength and toughness, while rigid control of metal properties gives added protection against brittleness at low temperatures and provides increased resistance to distortion at high temperatures.

7 SMOOTH INNER SURFACES

Uniformly smooth inner surfaces, free from buckling and irregularities, reduce turbulence and friction, thus minimizing resistance to flow.

8 FULL EFFECTIVE RADIUS

Full effective radius provides uniform, gradual change of direction. Pressure loss is thus held to a minimum.

GIVE YOU ALL THESE FEATURES • • •

9 TAPER TEE DESIGN

Taper design, achieved by scientific distribution of metal at the center section and at the crotch, distributes stresses and strains uniformly, thus providing greater mechanical strength.

10 CONTROLLED QUALITY

Ladish Controlled Quality—made effective by exacting metallurgical controls and rigid inspection of physical dimensions—is assurance that Ladish Fittings meet or exceed the requirements of all applicable standards and specifications.

11 LONG CROTCH RADIUS

Long crotch radius reduces turbulence and resistance to flow, at the points where friction and stress are normally greatest, minimizing pressure loss and erosion pockets.

12 FULL LENGTH OUTLETS

To insure welding accessibility and alignment, center to outlet length corresponds to center to end dimension in most sizes. This keeps high welding heats away from vital crotch zones.

13 FREEDOM FROM LOCKED-IN STRESSES

Ladish advanced forging methods control time-temperature cycles to avoid internal strains and residual stresses—providing advantages arising from completely neutral stress conditions.

14 TRUE CIRCULARITY

The Ladish forging process provides true circularity of cross-section at all points throughout a fitting. Freedom from internal flattening, stretching, and distortion permits accurate alignment and facilitates sound, uniformly strong joints.

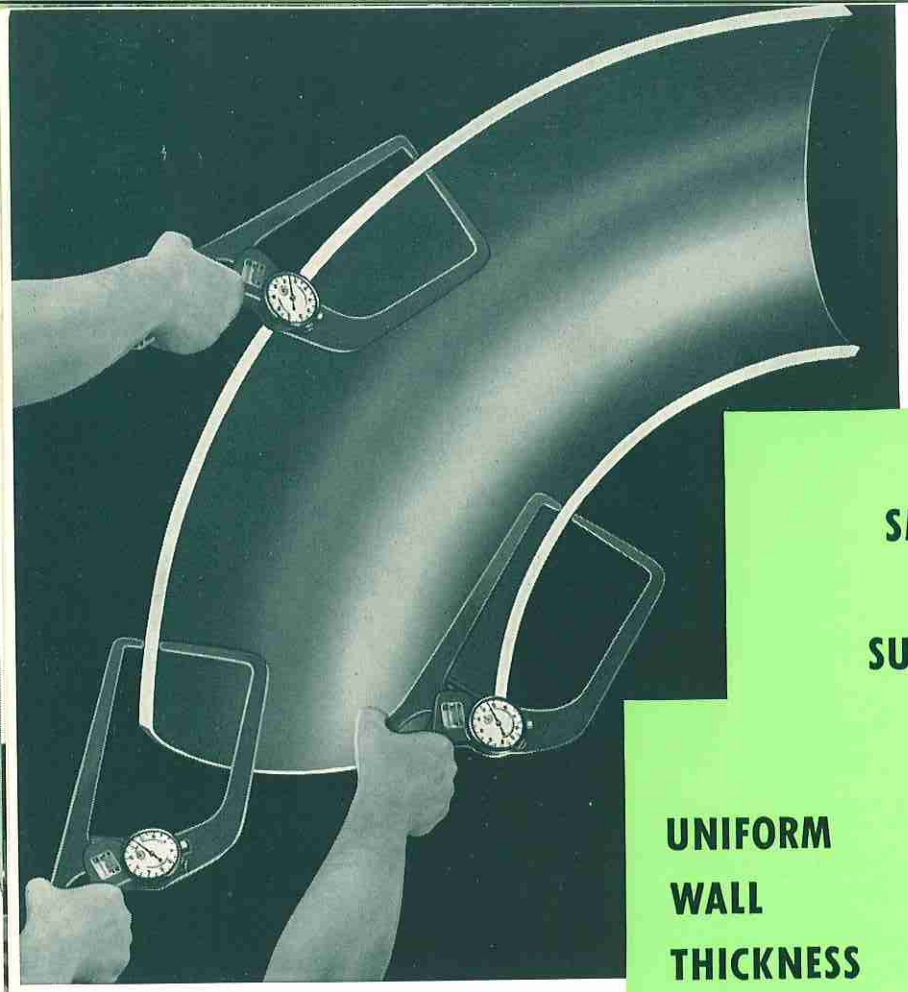
15 HEAT CODE PROTECTION

In addition to assuring highest quality and uniformity, the Ladish Heat Code is a pledge to supply any Ladish customer, upon request, with a certified metallurgical report of the chemical and physical properties of the steel from which any Ladish Fitting is made.

16 GEOMETRIC ACCURACY

True geometric accuracy permits rapid piping fabrication with maximum flow efficiency.

LADISH

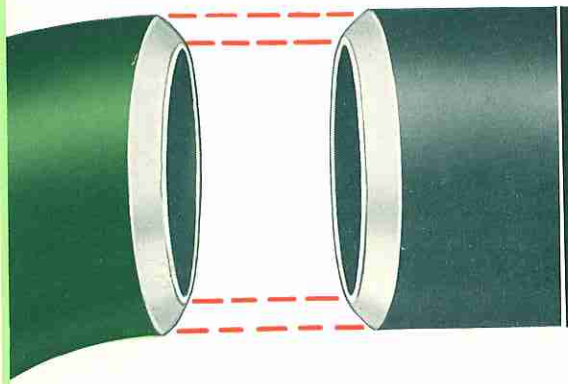


SMOOTH INNER SURFACES

Ladish Fittings increase piping efficiency because all inner walls and surfaces are uniformly smooth permitting free, unhampered flow throughout the piping system. These smooth inner surfaces, make it possible to maintain required pressures without the necessity of building up additional heads to overcome frictional resistance.

UNIFORM WALL THICKNESS

In the Ladish forging process, high quality seamless steel tubing is mechanically worked under compression at forging temperatures, during which the hot, plastic metal flows evenly throughout the entire wall area. Thus, there is no buckling of metal along the short inner curve; no stretching and weakening of the long outer wall. This scientific distribution of metal in Ladish Seamless Welding Fittings insures economical piping operation by safeguarding against premature failures.



EASE OF ALIGNMENT

Since Ladish Seamless Welding Fittings agree with pipe sizes in wall thickness, OD alignment automatically insures ID alignment. This feature facilitates the use of welding jigs, speeds up installation, and permits sound, uniform welds at lower cost. The elimination of offsets provides smooth, uninterrupted flow.

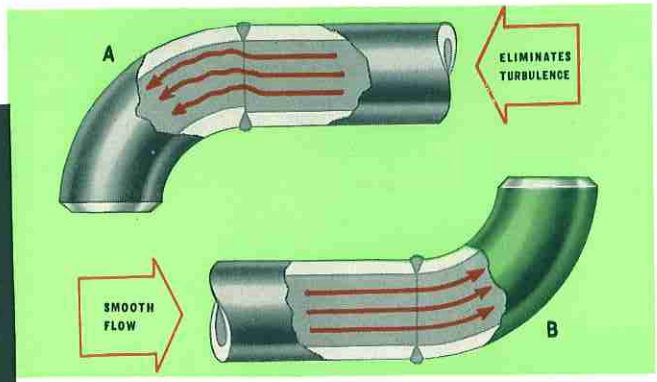
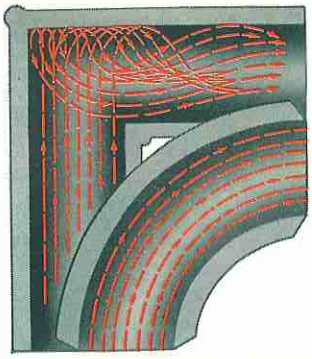


Illustration A shows what happens when fitting and pipe do not agree in wall thickness. Even though they line up on the outside, a harmful offset is created on the inside of the joint, causing turbulence and pressure loss. Eventually, dangerous erosion pockets form near the joint at points where abrupt directional change is encountered. By way of contrast, note in illustration B the smooth, unbroken flow lines provided by the Ladish Fitting which protects the user against the danger of offsets.

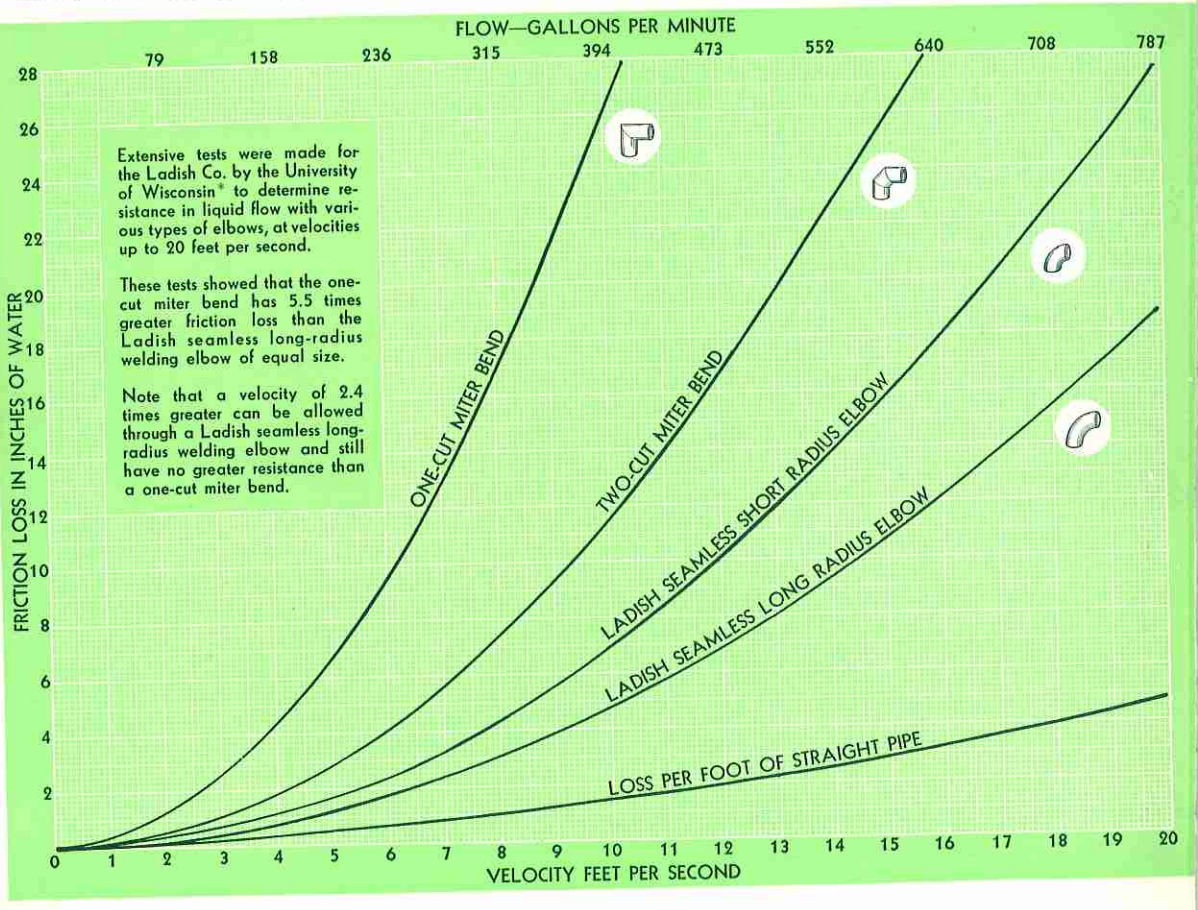
DESIGNED AND MANUFACTURED FOR *Maximum Flow Efficiency*



FULL EFFECTIVE RADIUS

Compare the free flow through a Ladish full radius elbow to the disrupted, turbulent conditions set up in the flow through a mitered joint. In addition to seriously lowering the flow efficiency of a piping system, miter welding presents the danger of premature failure and costly shutdowns because of the increased stresses and erosion that result from the abrupt change in the direction of flow.

CHARACTERISTIC TEST CURVES SHOWING COMPARATIVE ENERGY LOSSES OF LADISH 4" STANDARD 90° ELBOWS AND MITER BENDS



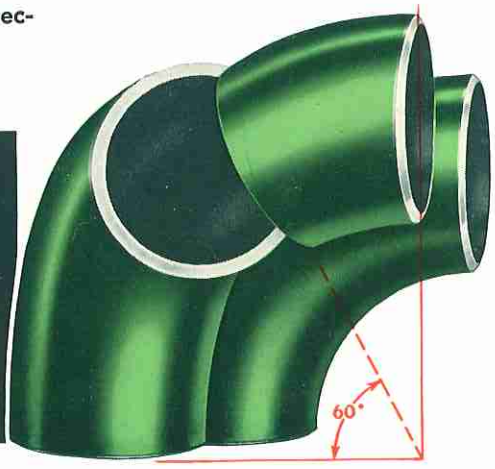
Extensive tests were made for the Ladish Co. by the University of Wisconsin* to determine resistance in liquid flow with various types of elbows, at velocities up to 20 feet per second.

These tests showed that the one-cut miter bend has 5.5 times greater friction loss than the Ladish seamless long-radius welding elbow of equal size.

Note that a velocity of 2.4 times greater can be allowed through a Ladish seamless long-radius welding elbow and still have no greater resistance than a one-cut miter bend.

*Reference: Caspary, Gerald T., "Energy Loss in Liquid Flow in Welding Pipe Fittings," M. S. Thesis, University of Wisconsin, 1951.

TRUE CIRCULARITY



Ladish Fittings are truly circular throughout their entire length. This feature insures accurate alignment whenever odd angle sections are cut for special piping make-up. Their gradual curves and unobstructed flow lines preserve pressure efficiency regardless of angle or length of section, while full diameter throughout protects users of Ladish Controlled Quality Fittings against pressure loss due to flattened or angular surfaces.

LARGER GRAIN OF ORIGINAL TUBING

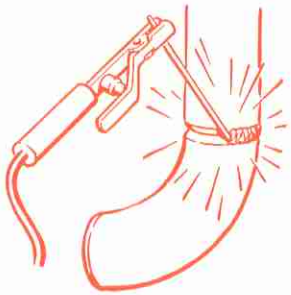
REFINED GRAIN OF LADISH FITTING

The representative photomicrographs illustrate the refinement in grain structure obtained in the forging of completed Ladish fittings as compared with the top quality seamless tubing from which they are made.

LADISH *Metallurgical Integrity* ASSURES

• *FREEDOM FROM POROSITY* • *UNIFORM WELDING RESPONSE*

Skill and care in the forging process plus exacting metallurgical control give complete assurance that the grain structure of Ladish Controlled Quality fittings is properly refined to prevent porosity and concealed defects . . . and thus improve service life.



Strong, sound welds to Ladish fittings result from the more complete absence of impurities such as slag, sulphur and other harmful elements. Uniform weldability resulting from exacting metallurgical standards saves installation costs and adds to the dependability of piping systems.

... A MORE REFINED GRAIN STRUCTURE

INCREASES STRENGTH AND TOUGHNESS

To assure maximum service life from Ladish Seamless Welding Fittings, metal properties and physical characteristics are maintained at their most effective levels by advanced manufacturing processes. Thorough hot working of metal in Ladish forging operations refines to a measurable degree the already uniform fine grain structure of the high quality seamless tubing from which Ladish fittings are produced. This grain refinement, illustrated on the facing page, improves both static and dynamic strength, toughness, yield point and fatigue resistance of Ladish fittings . . . improvement which is reflected in added durability.

ADDS RESISTANCE TO STRESS AND SHOCK

Increased strength and toughness of Ladish fittings are vital factors in assuring efficient, economical and trouble-free piping. The great variety of shocks, loads, stresses and strains imposed on modern piping installations are better resisted by the improved level of physical properties obtained in Ladish fittings.

FULLY KILLED STEELS GIVE ADDED RESISTANCE TO EROSION AND CORROSION

The ability of Ladish fittings to provide maximum resistance to the effects of erosion and corrosion results in great measure from the use of fully killed steels conforming to high standards of metallurgical quality.

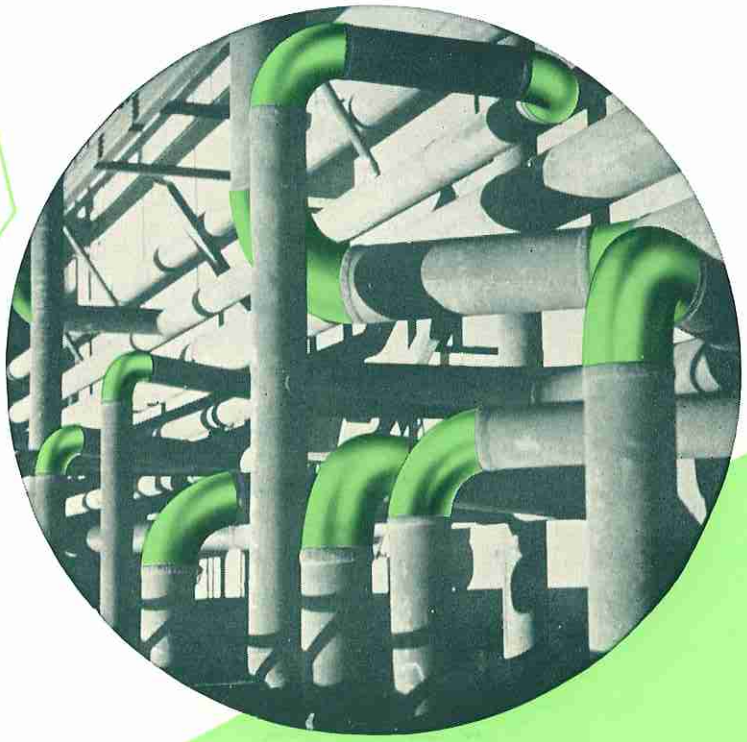
Each lot and heat of steel purchased to rigid Ladish specifications is subjected to thorough laboratory tests on arrival at the Ladish plant to verify compliance of chemical composition and physical requirements to these specifications. Only when such verification of metallurgical soundness is made, is the material released for manufacture.

4 IMPORTANT YOU GET FROM LADISH SEAMLESS WELDING

1

SIMPLIFIED PIPING MAKE-UP

Ladish Seamless Welding Fittings require only plain circumferential welds that any qualified welder can make in a minimum of time. Their close dimensional accuracy greatly simplifies alignment and make-up, assuring uniformly smooth interiors and neat, streamlined exteriors. When welded in place, Ladish Fittings become an integral part of the piping system, making it a continuous, unbroken unit of uniform strength throughout.



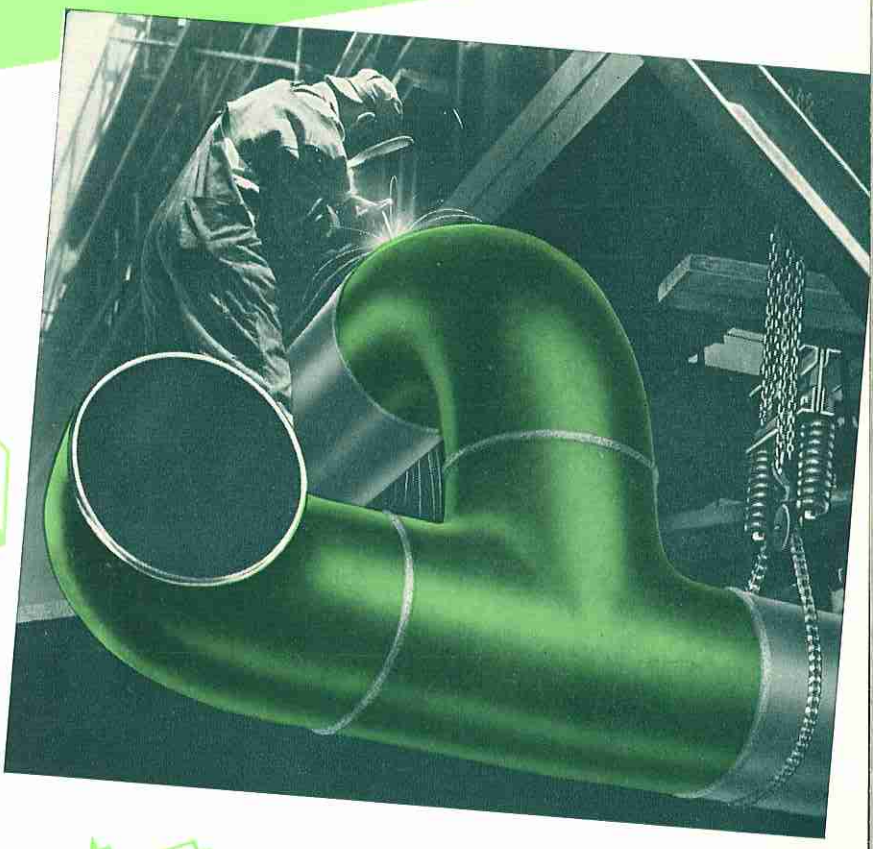
2

COMPACT PIPING LAYOUTS

Ladish Seamless Welding Fittings are adaptable to compact, space-saving layouts. Their smooth, clean lines facilitate the fitting of complex piping installations to existing space limitations, and permit close nesting in tunnels. Uniform wall thickness of all Ladish Elbows and Returns allows cutting to odd angles wherever necessary to clear obstructions or to follow wall and ceiling contours.

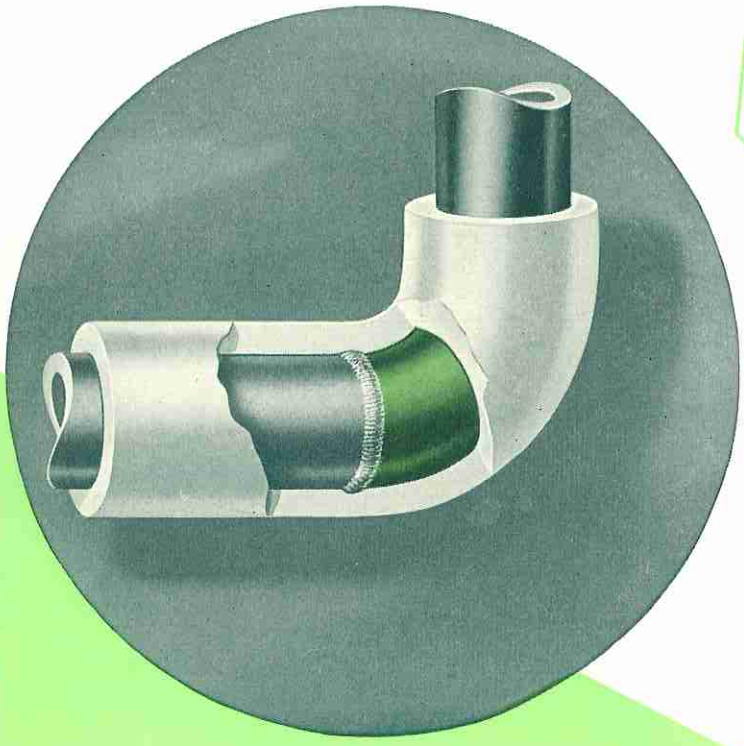
ADVANTAGES

Controlled Quality FITTINGS



3 LIGHT WEIGHT—EASY HANDLING

Ladish Seamless Welding Fittings combine maximum strength with light weight for ease of handling. Thus large, complicated sections can be made upon the ground, then installed in position. This procedure greatly speeds up installation by permitting the use of jigs and fixtures, and by reducing the amount of welding done in difficult or awkward positions. In addition, the light weight of Ladish Seamless Welding Fittings permits the use of fewer and lighter pipe supports.



4 EASY TO INSULATE

Ladish Seamless Welding Fittings are as easily and as readily insulated as the pipe itself. There are no uneven or broken surfaces to require special treatment or increase application costs. Since welded joints are permanent, no provision has to be made for removing the insulation to inspect, repair, or tighten the joint. Ease of insulation makes Ladish Seamless Welding Fittings particularly suitable to applications where temperature loss is an important factor.

ASA B16.9■

SEAMLESS WELDING FITTINGS

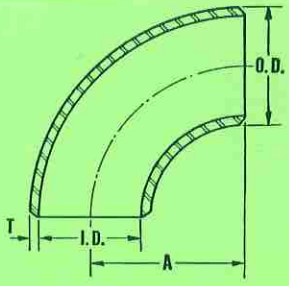
ASTM A234★

NOMINAL PIPE SIZE	CENTER TO FACE A	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	† PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
½	1½	.840	.622	.109	40	.18	
¾	1⅛	1.050	.824	.113	40	.19	
1	1½	1.315	1.049	.133	40	.40	
1¼	1⅞	1.660	1.380	.140	40	.60	
1½	2¼	1.900	1.610	.145	40	.90	
2	3	2.375	2.067	.154	40	1.60	
2½	3¾	2.875	2.469	.203	40	3.25	
3	4½	3.500	3.068	.216	40	5.00	
3½	5¼	4.000	3.548	.226	40	6.75	PRICES
4	6	4.500	4.026	.237	40	9.00	
5	7½	5.563	5.047	.258	40	15.50	ON
6	9	6.625	6.065	.280	40	24.50	
8	12	8.625	7.981	.322	40	50.00	APPLI-
10	15	10.750	10.020	.365	40	88.00	
12	18	12.750	12.000	.375	. .◆	125.00	CATION
14	21	14.000	13.250	.375	30	160.00	
16	24	16.000	15.250	.375	30	206.00	
18	27	18.000	17.250	.375	. .◆	260.00	
20	30	20.000	19.250	.375	20	320.00	
22‡	33	22.000	21.250	.375	. .◆	394.00	
24	36	24.000	23.250	.375	20	460.00	
26‡	39	26.000	25.250	.375	. .◆	550.00	
30‡	45	30.000	29.250	.375	. .◆	734.00	
36‡*	54	36.000	35.250	.375	. .◆	1062.00	

90° ELBOWS

Standard Weight ***Long Radius***

Part No. 940



All dimensions given in inches.

* Produced from X-rayed, stress relieved welded pipe. For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22", 26" and 36" sizes are not covered by ASA B36.10.

Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

‡22", 26", 30" and 36" sizes are not covered in ASA B16.9.

◆ This size and thickness does not correspond to any schedule number.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

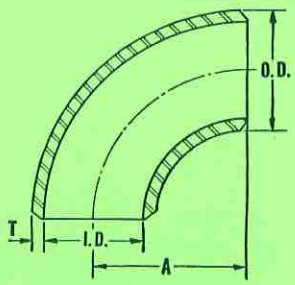
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9▪

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO FACE A	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
½	1½	.840	.546	.147	80	.25	
¾	1⅛	1.050	.742	.154	80	.25	
1	1½	1.315	.957	.179	80	.50	
1¼	1⅞	1.660	1.278	.191	80	.90	
1½	2¼	1.900	1.500	.200	80	1.15	
2	3	2.375	1.939	.218	80	2.20	
2½	3¾	2.875	2.323	.276	80	4.00	
3	4½	3.500	2.900	.300	80	6.50	
3½	5¼	4.000	3.364	.318	80	8.35	
4	6	4.500	3.826	.337	80	13.50	PRICES
5	7½	5.563	4.813	.375	80	22.00	ON
6	9	6.625	5.761	.432	80	35.00	
8	12	8.625	7.625	.500	80	71.00	APPLI-
10	15	10.750	9.750	.500	60	107.00	
12	18	12.750	11.750	.500	. .◆	160.00	CATION
14	21	14.000	13.000	.500	. .◆	205.00	
16	24	16.000	15.000	.500	40	276.00	
18	27	18.000	17.000	.500	. .◆	340.00	
20	30	20.000	19.000	.500	30	420.00	
22‡	33	22.000	21.000	.500	. .◆	520.00	
24	36	24.000	23.000	.500	. .◆	600.00	
26‡	39	26.000	25.000	.500	. .◆	729.00	
30‡	45	30.000	29.000	.500	20	975.00	
36‡*	54	36.000	35.000	.500	. .◆	1412.00	



All dimensions given in inches.

* Produced from X-rayed, stress relieved welded pipe.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22", 26" and 36" sizes are not covered by ASA B36.10.

Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

▪ For information on this standard, see page 239.

‡ 22", 26", 30" and 36" sizes are not covered in ASA B16.9.

◆ This size and thickness does not correspond to any schedule number.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

90° ELBOWS

Extra Strong — *Long Radius*

Part No. 941

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

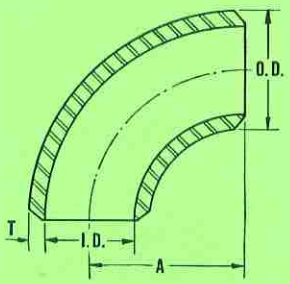
NOMINAL PIPE SIZE	CENTER TO FACE A	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	1½	1.315	.815	.250	.60	PRICES ON APPLICATION
1¼	1⅞	1.660	1.160	.250	1.00	
1½	2¼	1.900	1.338	.281	1.80	
2	3	2.375	1.689	.343	3.25	
2½	3¾	2.875	2.125	.375	5.13	
3	4½	3.500	2.624	.438	8.50	
4	6	4.500	3.438	.531	18.00	
5	7½	5.563	4.313	.625	32.00	
6	9	6.625	5.189	.718	57.00	
8	12	8.625	6.813	.906	120.00	
10	15	10.750	8.500	1.125	260.00	
12	18	12.750	10.126	1.312	450.00	
14	21	14.000	11.188	1.406	572.00	

90° ELBOWS

Schedule 160†

Long Radius

Part No. 942



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe Schedule Number is in accordance with ASA B36.10. Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For standard Welding Bevels, see page 239.

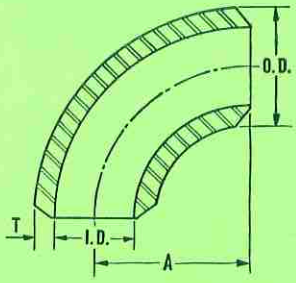
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO FACE A	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	1½	1.315	.599	.358	.75	PRICES ON APPLICATION
1¼	1⅞	1.660	.896	.382	1.38	
1½	2¼	1.900	1.100	.400	1.50	
2	3	2.375	1.503	.436	3.50	
2½	3¾	2.875	1.771	.552	7.00	
3	4½	3.500	2.300	.600	11.00	
3½	5¼	4.000	2.728	.636	16.00	
4	6	4.500	3.152	.674	20.00	
5	7½	5.563	4.063	.750	36.00	
6	9	6.625	4.897	.864	65.00	
8	12	8.625	6.875	.875	118.00	



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grade B are available from stock.

For standard Welding Bevels, see page 239.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

90° ELBOWS

Double Extra Strong

Long Radius

Part No. 943

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

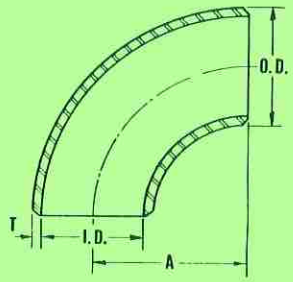
NOMINAL PIPE SIZE	†PIPE SCHEDULE NUMBERS	PART NUMBERS	CENTER TO FACE A	OUTSIDE DIAMETER O.D.	INSIDE DIAMETER I.D.	WALL THICKNESS T	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
4	120	214	6	4.500	3.624	.438	15.60	
6	120	214	9	6.625	5.501	.562	45.15	
8	30	930	12	8.625	8.071	.277	40.90	
8	120	214	12	8.625	7.189	.718	100.80	
10	30	930	15	10.750	10.136	.307	71.40	
10	80	956	15	10.750	9.564	.593	133.00	PRICES
10	120	214	15	10.750	9.064	.843	185.00	ON
12	80	956	18	12.750	11.376	.687	219.00	APPLI-
12	100	204	18	12.750	11.064	.843	268.00	CATION
12	120	214	18	12.750	10.750	1.000	311.00	
14	80	956	21	14.000	12.500	.750	310.00	
14	120	214	21	14.000	11.814	1.093	425.00	
18	60	179	27	18.000	16.500	.750	494.00	
20	60	179	30	20.000	18.376	.812	690.00	
24	60	179	36	24.000	22.064	.968	1188.00	

90° ELBOWS

Special Schedule Numbers

Long Radius

Part Nos. 179, 204, 214, 930, 956



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers are in accordance with ASA B36.10. Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grade B are available from stock.

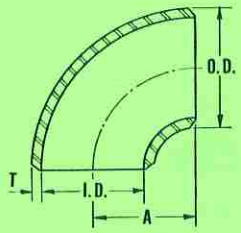
For standard Welding Bevels, see page 239.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO FACE A	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	1	1.315	1.049	.133	40	.25	
1¼	1¼	1.660	1.380	.140	40	.40	
1½	1½	1.900	1.610	.145	40	.56	
2	2	2.375	2.067	.154	40	1.00	
2½	2½	2.875	2.469	.203	40	2.13	
3	3	3.500	3.068	.216	40	3.00	
3½	3½	4.000	3.548	.226	40	4.50	PRICES
4	4	4.500	4.026	.237	40	6.25	
5	5	5.563	5.047	.258	40	9.60	ON
6	6	6.625	6.065	.280	40	18.00	
8	8	8.625	7.981	.322	40	34.00	APPLI-
10	10	10.750	10.020	.365	40	58.00	CATION
12	12	12.750	12.000	.375	. .•	80.00	
14	14	14.000	13.250	.375	30	105.00	
16	16	16.000	15.250	.375	30	132.00	
18	18	18.000	17.250	.375	. .•	167.00	
20	20	20.000	19.250	.375	20	210.00	
24	24	24.000	23.250	.375	20	298.00	
30	30	30.000	29.250	.375	. .•	464.00	



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designation are in accordance with ASA B36.10.

Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

• This size and thickness does not correspond to any schedule number.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

90° ELBOWS

Standard Weight

Short Radius

Part No. 946

SEAMLESS WELDING FITTINGS

ASTM A234★

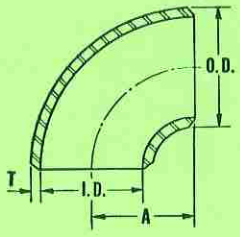
NOMINAL PIPE SIZE	CENTER TO FACE A	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1½	1½	1.900	1.500	.200	80	.75	
2	2	2.375	1.939	.218	80	1.50	
2½	2½	2.875	2.323	.276	80	2.80	
3	3	3.500	2.900	.300	80	4.25	
3½	3½	4.000	3.364	.318	80	6.00	
4	4	4.500	3.826	.337	80	8.50	
5	5	5.563	4.813	.375	80	14.00	PRICES
6	6	6.625	5.761	.432	80	23.00	ON
8	8	8.625	7.625	.500	80	47.50	APPLI-
10	10	10.750	9.750	.500	60	70.00	CATION
12	12	12.750	11.750	.500	. .◆	104.00	
14	14	14.000	13.000	.500	. .◆	140.00	
16	16	16.000	15.000	.500	40	174.00	
18	18	18.000	17.000	.500	. .◆	219.00	
20	20	20.000	19.000	.500	30	275.00	
24	24	24.000	23.000	.500	. .◆	392.00	
30	30	30.000	29.000	.500	20	618.00	

90° ELBOWS

Extra Strong

Short Radius

Part No. 947



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designation are in accordance with ASA B36.10.

Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

◆ This size and thickness does not correspond to any schedule number.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

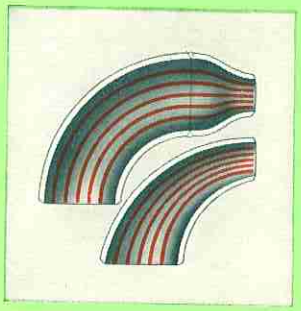
PATENT PENDING

LADISH Seamless REDUCING ELBOW

SAVES WELDING TIME | SAVES AN EXTRA FITTING | SAVES SPACE

SEAMLESS DESIGN

Ladish Seamless Reducing Elbows are formed from highest quality seamless tubing at forging temperatures by a process that scientifically distributes metal throughout the walls of the fitting. One-piece construction . . . assures maximum strength and safety.



FLOW EFFICIENCY

Uniform reduction of diameter from face to face of the fitting and full effective center line radius help maintain pressures and provide maximum flow efficiency. Compare the smooth, gradual taper of the Ladish Reducing Elbow with the abrupt change of diameter encountered when a straight elbow and reducer are used.

EASY TO INSTALL

Ladish Reducing Elbows save time and simplify installation by eliminating the extra weld necessary when separate elbow and reducer are used. The smooth, unbroken exterior also helps simplify insulating when required.

The Ladish 90° Seamless Reducing Elbow meets a long-standing piping need. Available in most sizes, this new fitting eliminates the necessity of using an elbow and a reducer in installations where a 90° change of direction is combined with a change of pipe size.

Besides saving erection time and eliminating the cost of an extra weld and an additional fitting, the Ladish Reducing Elbow adds to the flow efficiency of the system. Full effective center line radius and the gradual reduction in diameter throughout the arc of the fitting reduce turbulence and erosion, and hold flow resistance to a minimum.

Ladish Reducing Elbows are formed from a single piece of seamless tubing by a process that assures maximum metal properties. Each fitting is marked with the Ladish Heat Code symbol as visible proof of high physical and chemical quality and uniformity.

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO FACE A	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
2 x 1½	3	1.30	
2 x 1¼	3	1.20	
2 x 1	3	1.10	
2½ x 2	3¾	2.45	
2½ x 1½	3¾	2.20	
2½ x 1¼	3¾	2.10	
3 x 2½	4½	4.15	PRICES
3 x 2	4½	3.50	ON
3 x 1½	4½	3.20	APPLI-
3½ x 3	5¼	6.00	CATION
3½ x 2½	5¼	5.40	
3½ x 2	5¼	4.50	
4 x 3½	6	8.20	
4 x 3	6	7.50	
4 x 2½	6	10.50	
4 x 2	6	5.95	

NOMINAL PIPE SIZE	CENTER TO FACE A	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
5 x 4	7½	13.10	
5 x 3½	7½	12.20	
5 x 3	7½	11.40	
5 x 2½	7½	10.50	
6 x 5	9	20.75	
6 x 4	9	18.40	
6 x 3½	9	17.35	PRICES
6 x 3	9	16.40	ON
8 x 6 †	12	39.20	APPLI-
8 x 5 †	12	35.50	
8 x 4 †	12	32.40	CATION
10 x 8 †	15	71.20	
10 x 6 †	15	61.25	
10 x 5 †	15	56.75	
12 x 10†	18	111.50	
12 x 8 †	18	96.50	
12 x 6 †	18	84.75	

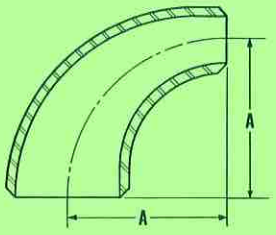
REDUCING ELBOWS

Standard Weight

Long Radius

PATENT PENDING

Part No. 266



All dimensions given in inches.

Refer to page 36 for dimensional data on O.D., I.D. and wall thickness.

† Sizes 8" and above are not being produced as seamless at issuance date of catalog.

For Pressure-Temperature Ratings, see pages 252 to 262.

See page 244 for data on schedule numbers and weight designations.

Details on additional sizes on request.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

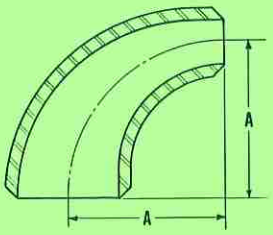
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO FACE A	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
2 x 1½	3	1.80	
2 x 1¼	3	1.65	
2 x 1	3	1.50	
2½ x 2	3¾	3.25	
2½ x 1½	3¾	2.90	
2½ x 1¼	3¾	2.75	
3 x 2½	4½	5.50	PRICES
3 x 2	4½	4.70	ON
3 x 1½	4½	4.30	APPLI-
3½ x 3	5¼	8.20	CATION
3½ x 2½	5¼	7.25	
3½ x 2	5¼	6.30	
4 x 3½	6	11.30	
4 x 3	6	10.40	
4 x 2½	6	9.30	
4 x 2	6	8.25	

NOMINAL PIPE SIZE	CENTER TO FACE A	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
5 x 4	7½	18.40	
5 x 3½	7½	17.10	
5 x 3	7½	16.00	
5 x 2½	7½	14.70	
6 x 5	9	30.50	
6 x 4	9	26.90	
6 x 3½	9	25.40	PRICES
6 x 3	9	24.00	ON
8 x 6 †	12	59.40	APPLI-
8 x 5 †	12	52.90	CATION
8 x 4 †	12	48.20	
10 x 8 †	15	101.25	
10 x 6 †	15	85.80	
10 x 5 †	15	77.75	
12 x 10†	18	149.10	
12 x 8 †	18	134.70	
12 x 6 †	18	116.00	



All dimensions given in inches.

Refer to page 37 for dimensional data on O.D., I.D. and wall thickness.

† Sizes 8" and above are not being produced as seamless at issuance date of catalog.

Sizes 6" and smaller can also be supplied in Schedule 160.

For Pressure-Temperature Ratings, see pages 252 to 262.

See page 244 for data on schedule numbers and weight designations.

Details on additional sizes on request.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

REDUCING ELBOWS

Extra Strong

Long Radius

PATENT PENDING

Part No. 267

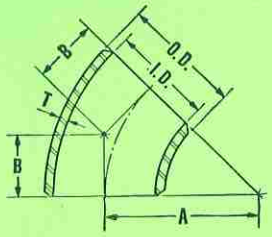
ASA B16.9■ **SEAMLESS WELDING FITTINGS** ASTM A234★

NOMINAL PIPE SIZE	CENTER TO FACE B	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	RADIUS A	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
½	⅝	.840	.622	.109	1½	40	.09	
¾	7/16	1.050	.824	.113	1⅛	40	.09	
1	⅞	1.315	1.049	.133	1½	40	.25	
1¼	1	1.660	1.380	.140	1⅞	40	.38	
1½	1⅛	1.900	1.610	.145	2¼	40	.40	
2	1⅜	2.375	2.067	.154	3	40	.81	
2½	1¾	2.875	2.469	.203	3¾	40	1.75	
3	2	3.500	3.068	.216	4½	40	2.63	
3½	2¼	4.000	3.548	.226	5¼	40	3.50	PRICES
4	2½	4.500	4.026	.237	6	40	4.50	
5	3⅛	5.563	5.047	.258	7½	40	7.50	ON
6	3¾	6.625	6.065	.280	9	40	12.00	
8	5	8.625	7.981	.322	12	40	23.00	APPLI-
10	6¼	10.750	10.020	.365	15	40	43.00	
12	7½	12.750	12.000	.375	18	. .◆	62.00	CATION
14	8¾	14.000	13.250	.375	21	30	80.00	
16	10	16.000	15.250	.375	24	30	100.00	
18	11¼	18.000	17.250	.375	27	. .◆	126.00	
20	12½	20.000	19.250	.375	30	20	160.00	
22‡	13½	22.000	21.250	.375	33	. .◆	197.00	
24	15	24.000	23.250	.375	36	20	238.00	
26‡	16	26.000	25.250	.375	39	. .◆	275.00	
30‡	18½	30.000	29.250	.375	45	. .◆	367.00	
36‡*	22¼	36.000	35.250	.375	54	. .◆	531.00	

45° ELBOWS

Standard Weight ***Long Radius***

Part No. 450



All dimensions given in inches.

* Produced from X-rayed, stress relieved welded pipe.
For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22", 26" and 36" sizes are not covered by ASA B36.10.
Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.
For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

‡ 22", 26", 30" and 36" sizes are not covered in ASA B16.9.

◆ This size and thickness does not correspond to any schedule number.

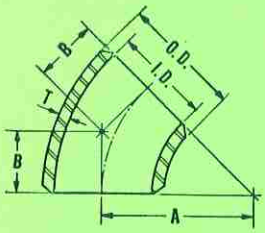
★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO FACE B	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	RADIUS A	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
½	5/8	.840	.546	.147	1½	80	.19	
¾	7/16	1.050	.742	.154	1⅛	80	.19	
1	⅞	1.315	.957	.179	1½	80	.31	
1¼	1	1.660	1.278	.191	1⅞	80	.50	
1½	1⅛	1.900	1.500	.200	2¼	80	.69	
2	1⅜	2.375	1.939	.218	3	80	1.19	
2½	1¾	2.875	2.323	.276	3¾	80	2.13	
3	2	3.500	2.900	.300	4½	80	3.50	
3½	2¼	4.000	3.364	.318	5¼	80	4.50	PRICES
4	2½	4.500	3.826	.337	6	80	6.10	
5	3⅛	5.563	4.813	.375	7½	80	10.75	ON
6	3¾	6.625	5.761	.432	9	80	17.50	
8	5	8.625	7.625	.500	12	80	35.00	APPLI-
10	6¼	10.750	9.750	.500	15	60	53.00	
12	7½	12.750	11.750	.500	18	. .◆	84.00	CATION
14	8¾	14.000	13.000	.500	21	. .◆	100.00	
16	10	16.000	15.000	.500	24	40	135.00	
18	11¼	18.000	17.000	.500	27	. .◆	167.00	
20	12½	20.000	19.000	.500	30	30	206.00	
22‡	13½	22.000	21.000	.500	33	. .◆	260.00	
24	15	24.000	23.000	.500	36	. .◆	300.00	
26‡	16	26.000	25.000	.500	39	. .◆	365.00	
30‡	18½	30.000	29.000	.500	45	20	488.00	
36‡*	22¼	36.000	35.000	.500	54	. .◆	706.00	



All dimensions given in inches.

* Produced from X-rayed, stress relieved welded pipe.
For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22", 26" and 36" sizes are not covered by ASA B36.10.
Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.
For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

‡ 22", 26", 30" and 36" sizes are not covered in ASA B16.9.

◆ This size and thickness does not correspond to any schedule number.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

45° ELBOWS

Extra Strong

Long Radius

Part No. 451

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

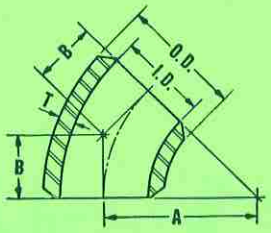
NOMINAL PIPE SIZE	CENTER TO FACE B	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	RADIUS A	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	⅞	1.315	.815	.250	1½	.35	PRICES ON APPLICATION
1¼	1	1.660	1.160	.250	1⅞	.50	
1½	1⅛	1.900	1.338	.281	2¼	1.00	
2	1⅜	2.375	1.689	.343	3	1.56	
2½	1¾	2.875	2.125	.375	3¾	3.00	
3	2	3.500	2.624	.438	4½	4.38	
4	2½	4.500	3.438	.531	6	8.75	
5	3⅛	5.563	4.313	.625	7½	16.00	
6	3¾	6.625	5.189	.718	9	30.00	
8	5	8.625	6.813	.906	12	62.00	
10	6¼	10.750	8.500	1.125	15	130.00	
12	7½	12.750	10.126	1.312	18	225.00	
14	8¾	14.000	11.188	1.406	21	286.00	

45° ELBOWS

Schedule 160†

Long Radius

Part No. 452



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252-262.

† Pipe Schedule Number is in accordance with ASA B36.10. Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For standard Welding Bevels, see page 239.

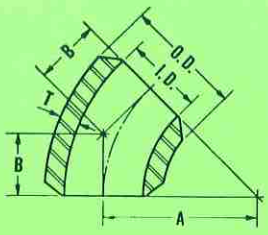
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO FACE B	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	RADIUS A	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	7/8	1.315	.599	.358	1½	.38	PRICES ON APPLICATION
1¼	1	1.660	.896	.382	1⅞	.75	
1½	1⅛	1.900	1.100	.400	2¼	1.13	
2	1⅜	2.375	1.503	.436	3	2.00	
2½	1¾	2.875	1.771	.552	3¾	3.75	
3	2	3.500	2.300	.600	4½	5.75	
3½	2¼	4.000	2.728	.636	5¼	8.50	
4	2½	4.500	3.152	.674	6	10.75	
5	3⅛	5.563	4.063	.750	7½	19.00	
6	3¾	6.625	4.897	.864	9	32.00	
8	5	8.625	6.875	.875	12	60.00	



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grade B are available from stock.

For standard Welding Bevels, see page 239.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

45° ELBOWS

Double Extra Strong

Long Radius

Part No. 453

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

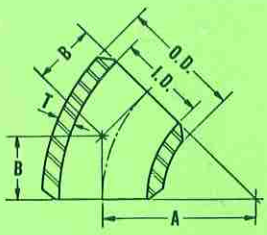
NOMINAL PIPE SIZE	†PIPE SCHEDULE NUMBERS	PART NUMBERS	CENTER TO FACE B	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	RADIUS A	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
4	120	216	2½	4.500	3.624	.438	6	7.80	PRICES ON APPLICATION
6	120	216	3¾	6.625	5.501	.562	9	22.60	
8	30	932	5	8.625	8.071	.277	12	20.40	
8	120	216	5	8.625	7.189	.718	12	50.40	
10	30	932	6¼	10.750	10.136	.307	15	35.70	
10	80	958	6¼	10.750	9.564	.593	15	66.70	
10	120	216	6¼	10.750	9.064	.843	15	92.40	
12	80	958	7½	12.750	11.376	.687	18	109.00	
12	100	206	7½	12.750	11.064	.843	18	134.00	
12	120	216	7½	12.750	10.750	1.000	18	155.00	
14	80	958	8¾	14.000	12.500	.750	21	154.00	
14	120	216	8¾	14.000	11.814	1.093	21	213.00	
18	60	459	11¼	18.000	16.500	.750	27	247.00	
20	60	459	12½	20.000	18.376	.812	30	345.00	
24	60	459	15	24.000	22.064	.968	36	594.00	

45° ELBOWS

Special Schedule Numbers

Long Radius

Part Nos. 206, 216, 459, 932, 958



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers are in accordance with ASA B36.10. Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

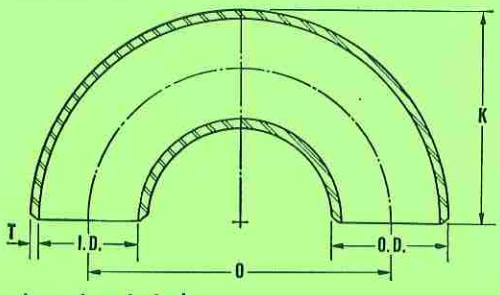
★ Fittings conforming physically and chemically to ASTM A106 Grade B are available from stock.

For standard Welding Bevels, see page 239.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9▪ **SEAMLESS WELDING FITTINGS** ASTM A234★

NOMINAL PIPE SIZE	CENTER TO CENTER O	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	BACK TO FACE K	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
½	3	.840	.622	.109	1⅞	40	.35	
¾	2¼	1.050	.824	.113	1 1⁄16	40	.40	
1	3	1.315	1.049	.133	2 3⁄16	40	.75	
1¼	3¾	1.660	1.380	.140	2¾	40	1.25	
1½	4½	1.900	1.610	.145	3¼	40	1.88	
2	6	2.375	2.067	.154	4 3⁄16	40	3.23	
2½	7½	2.875	2.469	.203	5 3⁄16	40	6.50	
3	9	3.500	3.068	.216	6¼	40	10.25	
3½	10½	4.000	3.548	.226	7¼	40	13.00	PRICES
4	12	4.500	4.026	.237	8¼	40	18.50	
5	15	5.563	5.047	.258	10 5⁄16	40	30.00	ON
6	18	6.625	6.065	.280	12 5⁄16	40	50.00	
8	24	8.625	7.981	.322	16 5⁄16	40	95.00	APPLI-
10	30	10.750	10.020	.365	20⅜	40	177.00	
12	36	12.750	12.000	.375	24⅜	. .◆	230.00	CATION
14	42	14.000	13.250	.375	28	30	325.00	
16	48	16.000	15.250	.375	32	30	412.00	
18	54	18.000	17.250	.375	36	. .◆	510.00	
20	60	20.000	19.250	.375	40	20	640.00	
22‡	66	22.000	21.250	.375	44	. .◆	787.00	
24	72	24.000	23.250	.375	48	20	890.00	
26‡	78	26.000	25.250	.375	52	. .◆	1100.00	
30‡	90	30.000	29.250	.375	60	. .◆	1465.00	



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22" and 26" sizes are not covered by ASA B36.10.

Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

▪ For information on this standard, see page 239.

‡ 22", 26" and 30" sizes are not carried in ASA B16.9.

◆ This size and thickness does not correspond to any schedule number.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

180° RETURNS

Standard Weight *Long Radius*

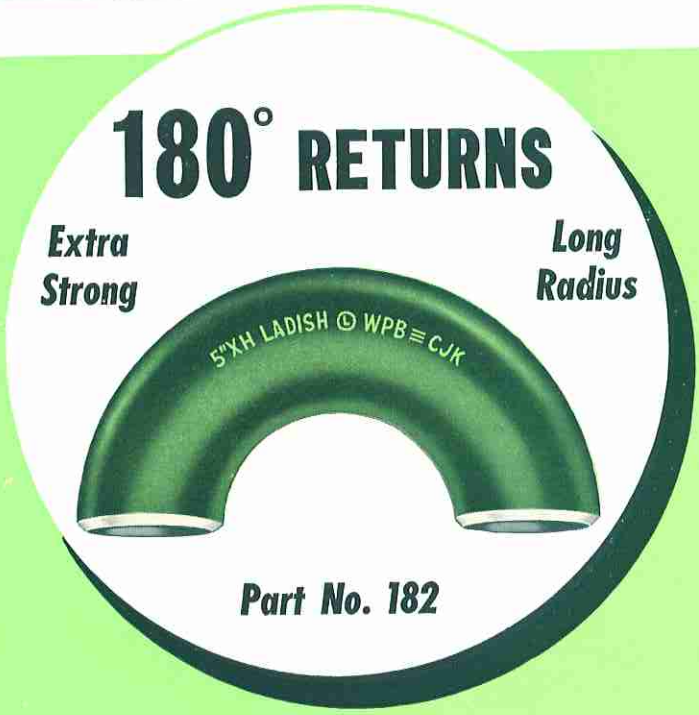
Part No. 181

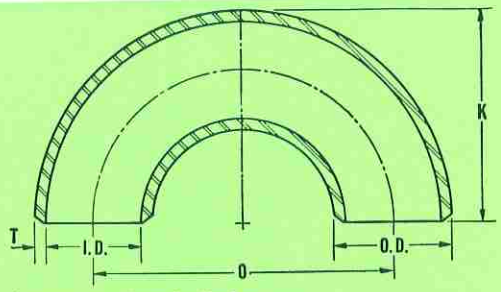
ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO CENTER O	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	BACK TO FACE K	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
¾	2¼	1.050	.742	.154	1 1/16	80	.65	PRICES ON APPLICATION
1	3	1.315	.957	.179	2 3/16	80	1.00	
1¼	3¾	1.660	1.278	.191	2¾	80	1.75	
1½	4½	1.900	1.500	.200	3¼	80	2.39	
2	6	2.375	1.939	.218	4 3/16	80	4.40	
2½	7½	2.875	2.323	.276	5 3/16	80	8.00	
3	9	3.500	2.900	.300	6¼	80	13.00	
3½	10½	4.000	3.364	.318	7¼	80	16.75	
4	12	4.500	3.826	.337	8¼	80	25.00	
5	15	5.563	4.813	.375	10 5/16	80	44.00	
6	18	6.625	5.761	.432	12 5/16	80	70.00	
8	24	8.625	7.625	.500	16 5/16	80	142.00	
10	30	10.750	9.750	.500	20 3/8	60	215.00	
12	36	12.750	11.750	.500	24 3/8	. .◆	320.00	
14	42	14.000	13.000	.500	28	. .◆	400.00	
16	48	16.000	15.000	.500	32	40	550.00	
18	54	18.000	17.000	.500	36	. .◆	690.00	
20	60	20.000	19.000	.500	40	30	830.00	
22‡	66	22.000	21.000	.500	44	. .◆	1040.00	
24	72	24.000	23.000	.500	48	. .◆	1200.00	
26‡	78	26.000	25.000	.500	52	. .◆	1458.00	
30‡	90	30.000	29.000	.500	60	20	1950.00	





All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22" and 26" sizes are not covered by ASA B36.10.

Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

‡ 22", 26" and 30" sizes are not carried in ASA B16.9.

◆ This size and thickness does not correspond to any schedule number.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

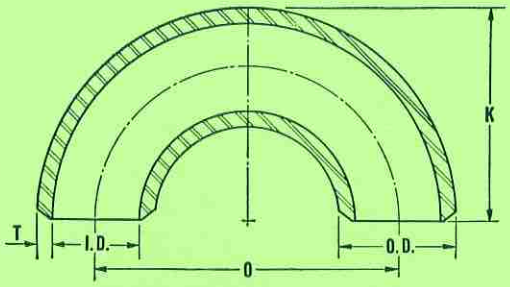
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO CENTER O	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	BACK TO FACE K	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	3	1.315	.815	.250	2 3/16	1.20	
1 1/4	3 3/4	1.660	1.160	.250	2 3/4	2.00	
1 1/2	4 1/2	1.900	1.338	.281	3 1/4	3.30	
2	6	2.375	1.689	.343	4 3/16	6.00	
2 1/2	7 1/2	2.875	2.125	.375	5 3/16	12.00	PRICES
3	9	3.500	2.624	.438	6 1/4	18.00	ON
4	12	4.500	3.438	.531	8 1/4	40.00	APPLI-
5	15	5.563	4.313	.625	10 5/16	65.00	CATION
6	18	6.625	5.189	.718	12 5/16	120.00	
8	24	8.625	6.813	.906	16 5/16	230.00	
10	30	10.750	8.500	1.125	20 3/8	530.00	
12	36	12.750	10.126	1.312	24 3/8	910.00	



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule number is in accordance with ASA B36.10. Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

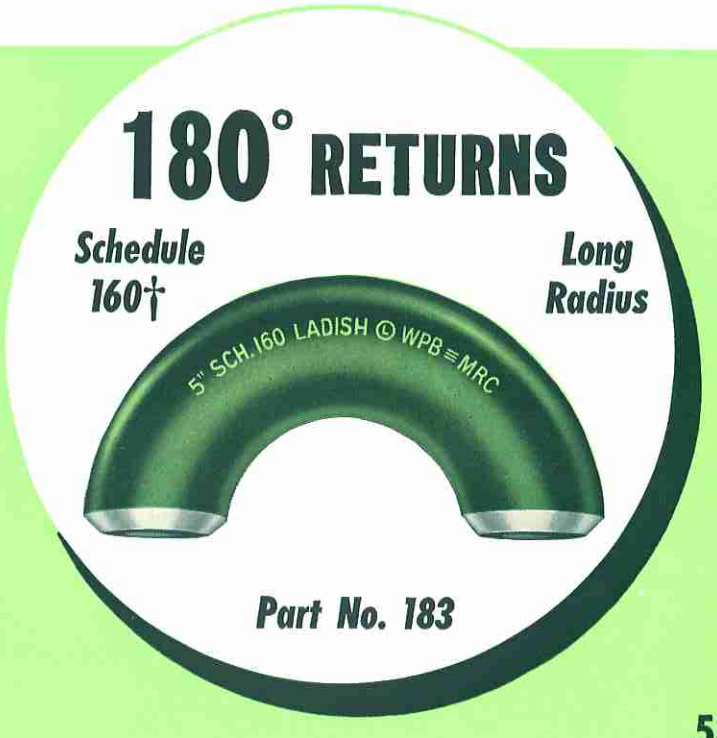
For Dimensional Tolerances, see page 239.

■ For information on this Standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For standard Welding Bevels, see page 239.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

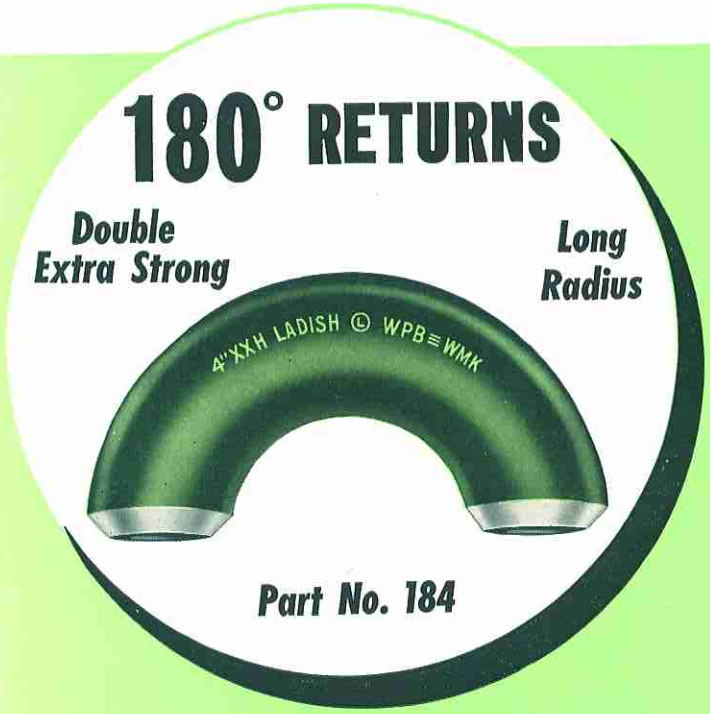


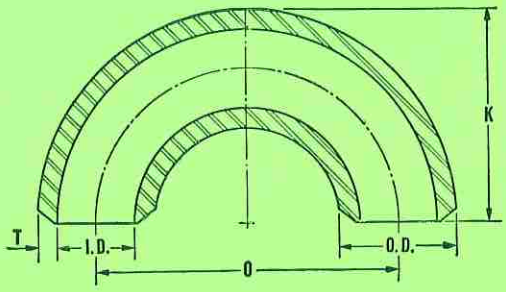
ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO CENTER O	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	BACK TO FACE K	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	3	1.315	.599	.358	2 3/16	1.50	PRICES ON APPLICATION
1 1/4	3 3/4	1.660	.896	.382	2 3/4	2.70	
1 1/2	4 1/2	1.900	1.100	.400	3 1/4	4.00	
2	6	2.375	1.503	.436	4 3/16	7.50	
2 1/2	7 1/2	2.875	1.771	.552	5 3/16	14.00	
3	9	3.500	2.300	.600	6 1/4	22.00	
3 1/2	10 1/2	4.000	2.728	.636	7 1/4	32.00	
4	12	4.500	3.152	.674	8 1/4	40.00	
5	15	5.563	4.063	.750	10 5/16	72.00	
6	18	6.625	4.897	.864	12 5/16	130.00	
8	24	8.625	6.875	.875	16 5/16	236.00	





All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this Standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grade B are available from stock.

For standard Welding Bevels, see page 239.

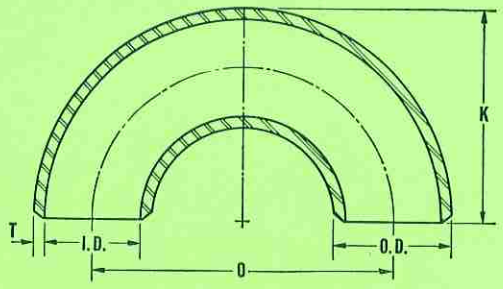
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	†PIPE SCHEDULE NUMBERS	PART NUMBERS	CENTER TO CENTER O	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	BACK TO FACE K	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
4	120	117	12	4.500	3.624	.438	8¼	31.30	
6	120	117	18	6.625	5.501	.562	12 5/16	90.30	
8	30	933	24	8.625	8.071	.277	16 5/16	81.90	
8	120	117	24	8.625	7.189	.718	16 5/16	202.00	
10	30	933	30	10.750	10.136	.307	20⅜	143.00	
10	80	959	30	10.750	9.564	.593	20⅜	267.00	PRICES
10	120	117	30	10.750	9.064	.843	20⅜	370.00	ON
12	80	959	36	12.750	11.376	.687	24⅜	439.00	APPLI-
12	100	208	36	12.750	11.064	.843	24⅜	535.00	
12	120	117	36	12.750	10.750	1.000	24⅜	622.00	CATION
14	80	959	42	14.000	12.500	.750	28	619.00	
14	120	117	42	14.000	11.814	1.093	28	850.00	
18	60	180	54	18.000	16.500	.750	36	989.00	
20	60	180	60	20.000	18.376	.812	40	1380.00	
24	60	180	72	24.000	22.064	.968	48	2377.00	



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers are in accordance with ASA B36.10. Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

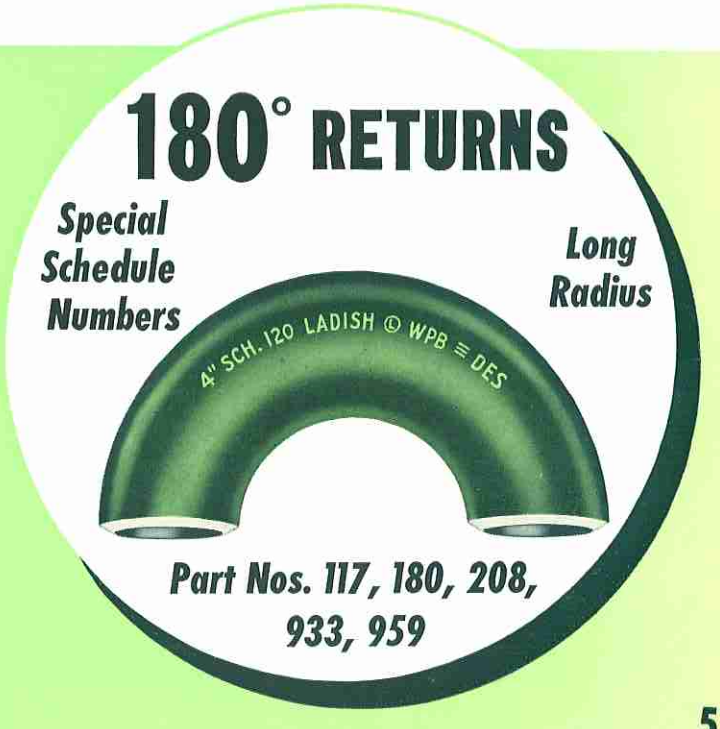
For Dimensional Tolerances, see page 239.

■ For information on this Standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grade B are available from stock.

For standard Welding Bevels, see page 239.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.



SEAMLESS WELDING FITTINGS

ASTM A234★

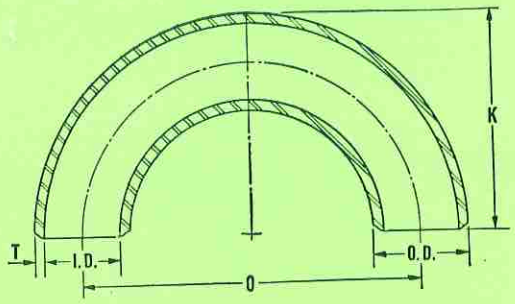
NOMINAL PIPE SIZE	CENTER TO CENTER O	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	BACK TO FACE K	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
PART No. 189			**STANDARD WEIGHT**					
1	4	1.315	1.049	.133	2⅝	40	.88	PRICES ON APPLICATION
1¼	5	1.660	1.380	.140	3 5/16	40	1.50	
1½	6	1.900	1.610	.145	3 15/16	40	2.13	
2	8	2.375	2.067	.154	5 3/16	40	3.88	
2½	10	2.875	2.469	.203	6 7/16	40	7.63	
PART No. 190			**EXTRA STRONG**					
1	4	1.315	.957	.179	2⅝	80	1.13	PRICES ON APPLICATION
1¼	5	1.660	1.278	.191	3 5/16	80	2.00	
1½	6	1.900	1.500	.200	3 15/16	80	2.88	
2	8	2.375	1.939	.218	5 3/16	80	5.25	
2½	10	2.875	2.323	.276	6 7/16	80	10.00	

180° RETURNS

Standard Weight and Extra Strong

Extra Long Radius

Part Nos. 189 and 190



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designation are in accordance with ASA B36.10.

See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grade A are available from stock.

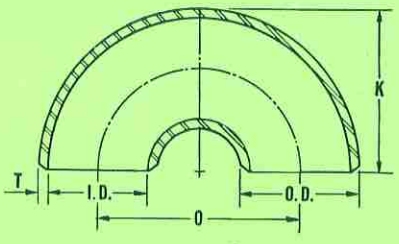
Extra long radius returns are designed for flat coil construction and hence are made only in sizes commonly used in this type of work.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO CENTER O	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	BACK TO FACE K	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	2	1.315	1.049	.133	1 5/8	40	.50	
1 1/4	2 1/2	1.660	1.380	.140	2 1/16	40	.80	
1 1/2	3	1.900	1.610	.145	2 7/16	40	1.13	
2	4	2.375	2.067	.154	3 3/16	40	2.00	
2 1/2	5	2.875	2.469	.203	3 15/16	40	4.25	
3	6	3.500	3.068	.216	4 3/4	40	6.00	
3 1/2	7	4.000	3.548	.226	5 1/2	40	9.00	
4	8	4.500	4.026	.237	6 1/4	40	12.50	PRICES
5	10	5.563	5.047	.258	7 3/4	40	19.00	ON
6	12	6.625	6.065	.280	9 5/16	40	35.00	APPLI-
8	16	8.625	7.981	.322	12 5/16	40	68.00	CATION
10	20	10.750	10.020	.365	15 3/8	40	115.00	
12	24	12.750	12.000	.375	18 3/8	. . ◆	155.00	
14	28	14.000	13.250	.375	21	30	210.00	
16	32	16.000	15.250	.375	24	30	260.00	
18	36	18.000	17.250	.375	27	. . ◆	330.00	
20	40	20.000	19.250	.375	30	20	410.00	
24	48	24.000	23.250	.375	36	20	590.00	
30	60	30.000	29.250	.375	45	20	930.00	



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designation are in accordance with ASA B36.10.

Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

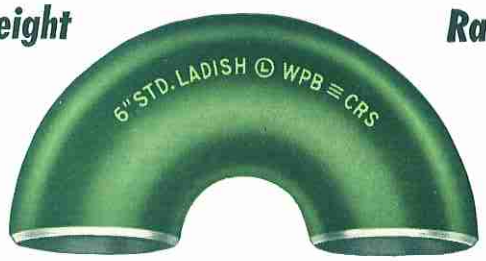
◆ This size and thickness does not correspond to any schedule number.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

180° RETURNS

Standard Weight ***Short Radius***

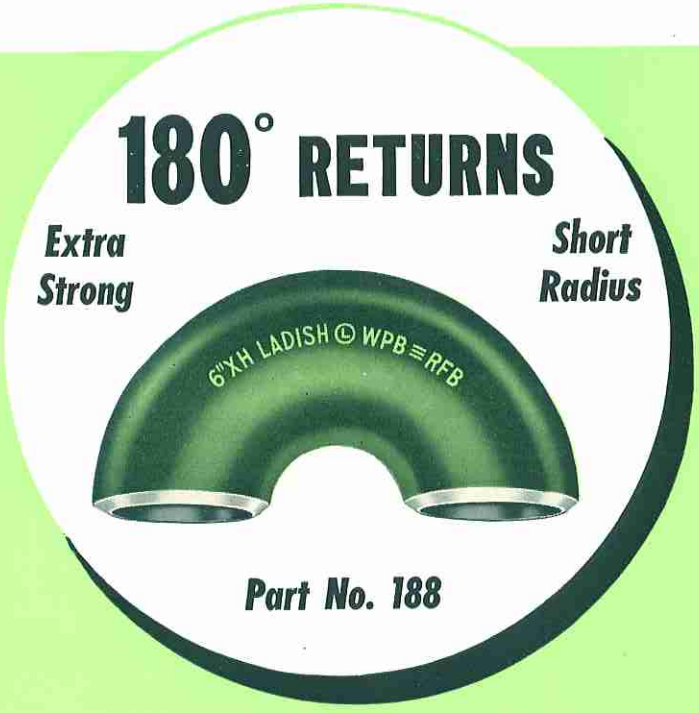


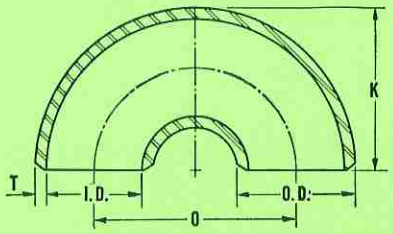
Part No. 187

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO CENTER O	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	BACK TO FACE K	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1½	3	1.900	1.500	.200	2 7/16	80	1.50	
2	4	2.375	1.939	.218	3 3/16	80	3.00	
2½	5	2.875	2.323	.276	3 15/16	80	5.60	
3	6	3.500	2.900	.300	4¾	80	8.50	
3½	7	4.000	3.364	.318	5½	80	12.00	
4	8	4.500	3.826	.337	6¼	80	17.00	
5	10	5.563	4.813	.375	7¾	80	28.00	PRICES
6	12	6.625	5.761	.432	9 5/16	80	46.00	ON
8	16	8.625	7.625	.500	12 5/16	80	100.00	APPLI-
10	20	10.750	9.750	.500	15⅜	60	140.00	CATION
12	24	12.750	11.750	.500	18⅜	. .◆	218.00	
14	28	14.000	13.000	.500	21	. .◆	275.00	
16	32	16.000	15.000	.500	24	40	340.00	
18	36	18.000	17.000	.500	27	. .◆	430.00	
20	40	20.000	19.000	.500	30	30	550.00	
24	48	24.000	23.000	.500	36	. .◆	780.00	
30	60	30.000	29.000	.500	45	20	1235.00	





All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designation are in accordance with ASA B36.10.

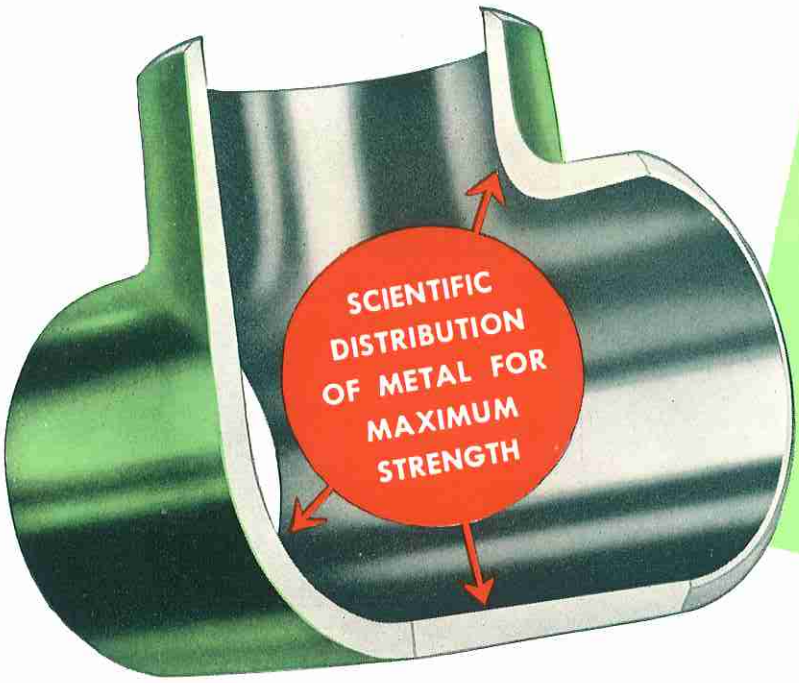
Other schedules, weights, thicknesses and radii are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

◆ This size and thickness does not correspond to any schedule number.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.



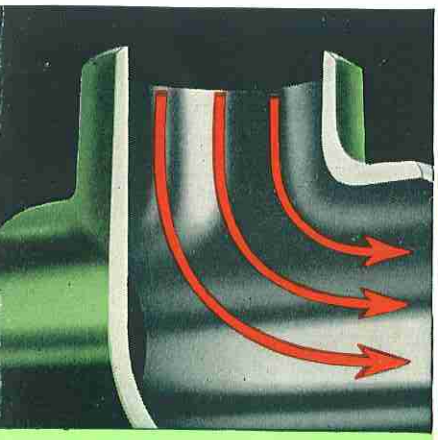
LADISH Tapered Tee DESIGN

Scientific Metal Distribution Increases Strength and Assures Dependable Service from Ladish Seamless Welding Fittings

Ladish Seamless Welding Tees effectively utilize tapered sections to distribute strains and stresses uniformly over the entire fitting. This taper design, achieved through scientific distribution of metal, provides increased capacity to withstand pressure and mechanical loads which vary in intensity at different sectional areas.

The long crotch radius, characteristic of Ladish Seamless Welding Tees, materially reduces resistance to flow and minimizes pressure loss. Moreover, their full length branch outlets provide greater ease in welding the pipe to fitting at this point, while keeping high welding heats safely away from the crotch zone.

You Get These Significant Features in Ladish Tees

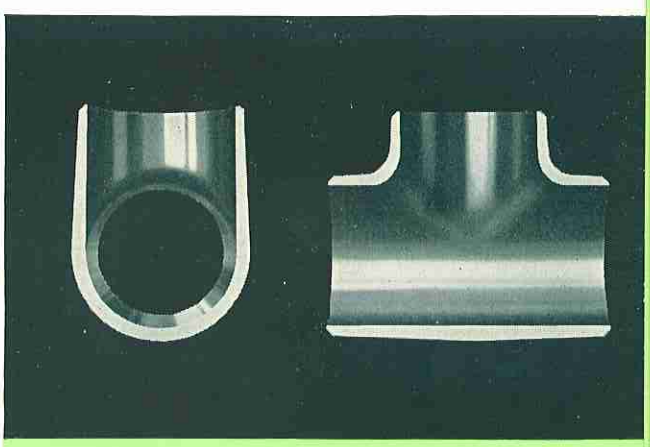


LONG CROTCH RADIUS

Reduces pressure loss and minimizes resistance to flow.

FULL LENGTH BRANCH

Makes welding easier and keeps high welding heats away from crotch.



MAXIMUM STRENGTH AT EVERY SECTION

Scientific metal distribution combined with tapered design provides maximum strength at every point.

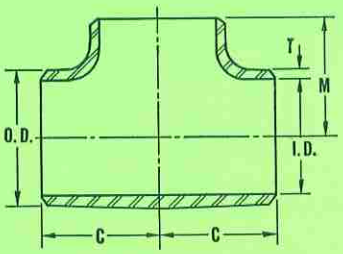
ASA B16.9▪ **SEAMLESS WELDING FITTINGS** ASTM A234★

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END M	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
½	1	1	.840	.622	.109	40	.35	
¾	1⅛	1⅛	1.050	.824	.113	40	.45	
1	1½	1½	1.315	1.049	.133	40	.75	
1¼	1⅞	1⅞	1.660	1.380	.140	40	1.30	
1½	2¼	2¼	1.900	1.610	.145	40	2.00	
2	2½	2½	2.375	2.067	.154	40	3.50	
2½	3	3	2.875	2.469	.203	40	6.00	
3	3⅜	3⅜	3.500	3.068	.216	40	7.00	
3½	3¾	3¾	4.000	3.548	.226	40	9.00	PRICES
4	4⅛	4⅛	4.500	4.026	.237	40	12.00	
5	4⅞	4⅞	5.563	5.047	.258	40	21.00	ON
6	5⅝	5⅝	6.625	6.065	.280	40	34.00	
8	7	7	8.625	7.981	.322	40	55.00	APPLI-
10	8½	8½	10.750	10.020	.365	40	85.00	
12	10	10	12.750	12.000	.375	. .◆	120.00	CATION
14	11	11	14.000	13.250	.375	30	165.00	
16	12	12	16.000	15.250	.375	30	195.00	
18	13½	13½	18.000	17.250	.375	. .◆	249.00	
20	15	15	20.000	19.250	.375	20	342.00	
22‡*	16½	16½	22.000	21.250	.375	. .◆	414.00	
24*	17	17	24.000	23.250	.375	20	528.00	
26‡*	19½	19½	26.000	25.250	.375	. .◆	770.00	
30‡*	22	22	30.000	29.250	.375	. .◆	1060.00	
36‡*	26½	26½	36.000	35.250	.375	. .◆	1490.00	

STRAIGHT TEES

Standard Weight

Part No. 246



All dimensions given in inches.

* Tees 22" and larger are produced from X-rayed, stress relieved welded pipe. When tee is formed, weld extends the length of the run opposite the seamless full branch outlet.
Information on intermediate or larger size tees furnished on request.
For Pressure-Temperature Ratings, see pages 252-262.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22", 26" and 36" sizes are not covered by ASA B36.10. Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.
For Dimensional Tolerances, see page 239.

▪ For information on this Standard, see page 239.

‡ 22", 26", 30" and 36" sizes are not covered by ASA B16.9.

◆ This size and thickness does not correspond to any schedule number.

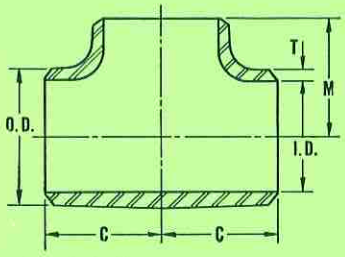
★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END M	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
½	1	1	.840	.546	.147	80	.45	
¾	1⅛	1⅛	1.050	.742	.154	80	.60	
1	1½	1½	1.315	.957	.179	80	.88	
1¼	1⅞	1⅞	1.660	1.278	.191	80	1.60	
1½	2¼	2¼	1.900	1.500	.200	80	2.25	
2	2½	2½	2.375	1.939	.218	80	4.00	
2½	3	3	2.875	2.323	.276	80	7.00	
3	3⅜	3⅜	3.500	2.900	.300	80	8.50	
3½	3¾	3¾	4.000	3.364	.318	80	12.00	PRICES
4	4⅛	4⅛	4.500	3.826	.337	80	15.75	
5	4⅞	4⅞	5.563	4.813	.375	80	26.00	ON
6	5⅝	5⅝	6.625	5.761	.432	80	40.00	
8	7	7	8.625	7.625	.500	80	75.00	APPLI-
10	8½	8½	10.750	9.750	.500	60	105.00	
12	10	10	12.750	11.750	.500	. .◆	160.00	CATION
14	11	11	14.000	13.000	.500	. .◆	240.00	
16	12	12	16.000	15.000	.500	40	280.00	
18	13½	13½	18.000	17.000	.500	. .◆	332.00	
20	15	15	20.000	19.000	.500	30	480.00	
22‡*	16½	16½	22.000	21.000	.500	. .◆	550.00	
24*	17	17	24.000	23.000	.500	. .◆	610.00	
26‡*	19½	19½	26.000	25.000	.500	. .◆	875.00	
30‡*	22	22	30.000	29.000	.500	20	1200.00	
36‡*	26½	26½	36.000	35.000	.500	. .◆	1700.00	



All dimensions given in inches.

* Tees 22″ and larger are produced from X-rayed, stress relieved welded pipe. When tee is formed, weld extends the length of the run opposite the seamless full branch outlet.
Information on intermediate or larger size tees furnished on request.
For Pressure-Temperature Ratings, see pages 252-262.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22″, 26″ and 36″ sizes are not covered by ASA B36.10. Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.
For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

‡ 22″, 26″, 30″ and 36″ sizes are not covered by ASA B16.9.

◆ This size and thickness does not correspond to any schedule number.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

STRAIGHT TEES

Extra Strong

Part No. 247

ASA B16.9■

SEAMLESS WELDING FITTINGS

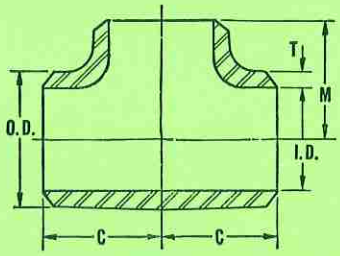
ASTM A234★

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END M	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
½	1	1	.840	.466	.187	.36	
¾	1⅛	1⅛	1.050	.614	.218	.58	
1	1½	1½	1.315	.815	.250	1.00	
1¼	1⅞	1⅞	1.660	1.160	.250	2.00	
1½	2¼	2¼	1.900	1.338	.281	3.00	
2	2½	2½	2.375	1.689	.343	5.00	PRICES
2½	3	3	2.875	2.125	.375	8.00	ON
3	3⅜	3⅜	3.500	2.624	.438	10.00	APPLI-
4	4⅛	4⅛	4.500	3.438	.531	25.00	CATION
5	4⅞	4⅞	5.563	4.313	.625	55.00	
6	5⅝	5⅝	6.625	5.189	.718	62.00	
8	7	7	8.625	6.813	.906	110.00	
10	8½	8½	10.750	8.500	1.125	260.00	
12	10	10	12.750	10.126	1.312	480.00	

STRAIGHT TEES

Schedule 160†

Part No. 248



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule number is in accordance with ASA B36.10. Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

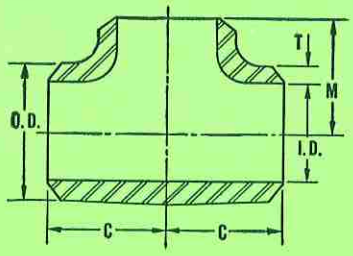
★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For standard Welding Bevels, see page 239.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■ **SEAMLESS WELDING FITTINGS** ASTM A234★

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END M	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	1½	1½	1.315	.599	.358	1.25	
1¼	1⅞	1⅞	1.660	.896	.382	2.50	
1½	2¼	2¼	1.900	1.100	.400	3.38	
2	2½	2½	2.375	1.503	.436	6.25	
2½	3	3	2.875	1.771	.552	10.50	PRICES ON APPLI-CATION
3	3⅜	3⅜	3.500	2.300	.600	13.50	
3½	3¾	3¾	4.000	2.728	.636	18.00	
4	4⅛	4⅛	4.500	3.152	.674	25.00	
5	4⅞	4⅞	5.563	4.063	.750	40.00	
6	5⅝	5⅝	6.625	4.897	.864	68.00	
8	7	7	8.625	6.875	.875	120.00	



All dimensions given in inches.
For Pressure-Temperature Ratings, see pages 252 to 262.
Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.
For Dimensional Tolerances, see page 239.
■ For information on this standard, see page 239.
★ Fittings conforming physically and chemically to ASTM A106 Grade B are available from stock.
For standard Welding Bevels, see page 239.
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

STRAIGHT TEES

Double Extra Strong

Part No. 249

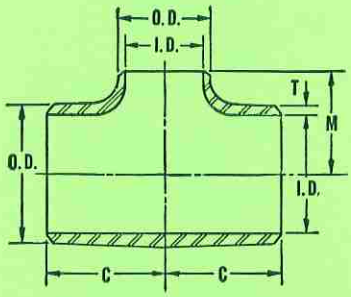
ASA B16.9■ **SEAMLESS WELDING FITTINGS** ASTM A234★

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END OF BRANCH M	DIMENSIONS OF RUN			†PIPE SCHEDULE NUMBER	DIMENSIONS OF BRANCH			APPROX. WEIGHT IN POUNDS	LIST PRICE
			OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK. T		OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK-NESS		
½x½x¼	1	1	.840	.622	.109	40	.540	.364	.088	.25	
½x½x⅜	1	1	.840	.622	.109	40	.675	.493	.091	.25	
¾x¾x⅜	1⅛	1⅛	1.050	.824	.113	40	.675	.493	.091	.50	
¾x¾x½	1⅛	1⅛	1.050	.824	.113	40	.840	.622	.109	.50	
1x1x⅜	1½	1½	1.315	1.049	.133	40	.675	.493	.091	.81	
1x1x½	1½	1½	1.315	1.049	.133	40	.840	.622	.109	.88	
1x1x¾	1½	1½	1.315	1.049	.133	40	1.050	.824	.113	.93	
1¼x1¼x½	1⅞	1⅞	1.660	1.380	.140	40	.840	.622	.109	1.50	
1¼x1¼x¾	1⅞	1⅞	1.660	1.380	.140	40	1.050	.824	.113	1.50	
1¼x1¼x1	1⅞	1⅞	1.660	1.380	.140	40	1.315	1.049	.133	1.50	PRICES
1½x1½x½	2¼	2¼	1.900	1.610	.145	40	.840	.622	.109	2.00	
1½x1½x¾	2¼	2¼	1.900	1.610	.145	40	1.050	.824	.113	2.13	ON
1½x1½x1	2¼	2¼	1.900	1.610	.145	40	1.315	1.049	.133	2.18	
1½x1½x1¼	2¼	2¼	1.900	1.610	.145	40	1.660	1.380	.140	2.25	APPLI-
2x2x¾	2½	1¾	2.375	2.067	.154	40	1.050	.824	.113	3.25	
2x2x1	2½	2	2.375	2.067	.154	40	1.315	1.049	.133	3.50	CATION
2x2x1¼	2½	2¼	2.375	2.067	.154	40	1.660	1.380	.140	3.60	
2x2x1½	2½	2⅜	2.375	2.067	.154	40	1.900	1.610	.145	3.75	
2½x2½x1	3	2¼	2.875	2.469	.203	40	1.315	1.049	.133	5.00	
2½x2½x1¼	3	2½	2.875	2.469	.203	40	1.660	1.380	.140	5.25	
2½x2½x1½	3	2⅝	2.875	2.469	.203	40	1.900	1.610	.145	5.50	
2½x2½x2	3	2¾	2.875	2.469	.203	40	2.375	2.067	.154	6.00	
3x3x1	3⅜	2⅝	3.500	3.068	.216	40	1.315	1.049	.133	6.25	
3x3x1¼	3⅜	2¾	3.500	3.068	.216	40	1.660	1.380	.140	6.15	
3x3x1½	3⅜	2⅞	3.500	3.068	.216	40	1.900	1.610	.145	6.25	

REDUCING OUTLET TEES

Standard Weight

Part No. 256



All dimensions given in inches.

For Pressure-Temperature Rating, see pages 252 to 262.

† Pipe schedule numbers and weight designation are in accordance with ASA B36.10.

Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

REDUCING OUTLET TEES, *Standard Weight, Part No. 256* (Continued)

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END OF BRANCH M	DIMENSIONS OF RUN			†PIPE SCHEDULE NUMBER	DIMENSIONS OF BRANCH			APPROX. WEIGHT IN POUNDS	LIST PRICE
			OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK. T		OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK-NESS		
3x3x2	3⅜	3	3.500	3.068	.216	40	2.375	2.067	.154	6.50	
3x3x2½	3⅜	3¼	3.500	3.068	.216	40	2.875	2.469	.203	6.75	
3½x3½x1½	3¾	3⅛	4.000	3.548	.226	40	1.900	1.610	.145	8.00	
3½x3½x2	3¾	3¼	4.000	3.548	.226	40	2.375	2.067	.154	8.30	
3½x3½x2½	3¾	3½	4.000	3.548	.226	40	2.875	2.469	.203	8.50	
3½x3½x3	3¾	3⅝	4.000	3.548	.226	40	3.500	3.068	.216	8.80	
4x4x1½	4⅛	3⅜	4.500	4.026	.237	40	1.900	1.610	.145	11.25	
4x4x2	4⅛	3½	4.500	4.026	.237	40	2.375	2.067	.154	11.15	
4x4x2½	4⅛	3¾	4.500	4.026	.237	40	2.875	2.469	.203	11.30	
4x4x3	4⅛	3⅞	4.500	4.026	.237	40	3.500	3.068	.216	11.60	
4x4x3½	4⅛	4	4.500	4.026	.237	40	4.000	3.548	.226	11.80	
5x5x2	4⅞	4⅛	5.563	5.047	.258	40	2.375	2.067	.154	19.00	
5x5x2½	4⅞	4¼	5.563	5.047	.258	40	2.875	2.469	.203	19.50	
5x5x3	4⅞	4⅜	5.563	5.047	.258	40	3.500	3.068	.216	20.00	
5x5x3½	4⅞	4½	5.563	5.047	.258	40	4.000	3.548	.226	20.50	
5x5x4	4⅞	4⅝	5.563	5.047	.258	40	4.500	4.026	.237	21.00	
6x6x2	5⅝	4¾	6.625	6.065	.280	40	2.375	2.067	.154	31.00	
6x6x2½	5⅝	4¾	6.625	6.065	.280	40	2.875	2.469	.203	32.00	PRICES
6x6x3	5⅝	4⅞	6.625	6.065	.280	40	3.500	3.068	.216	32.50	
6x6x3½	5⅝	5	6.625	6.065	.280	40	4.000	3.548	.226	33.00	ON
6x6x4	5⅝	5⅛	6.625	6.065	.280	40	4.500	4.026	.237	33.50	
6x6x5	5⅝	5⅜	6.625	6.065	.280	40	5.563	5.047	.258	34.50	APPLI-
8x8x3	7	6	8.625	7.981	.322	40	3.500	3.068	.216	50.00	
8x8x3½	7	6	8.625	7.981	.322	40	4.000	3.548	.226	50.75	CATION
8x8x4	7	6⅛	8.625	7.981	.322	40	4.500	4.026	.237	51.75	
8x8x5	7	6⅜	8.625	7.981	.322	40	5.563	5.047	.258	53.00	
8x8x6	7	6⅝	8.625	7.981	.322	40	6.625	6.065	.280	54.00	
10x10x3	8½	7¼	10.750	10.020	.365	40	3.500	3.068	.216	79.00	
10x10x4	8½	7¼	10.750	10.020	.365	40	4.500	4.026	.237	80.00	
10x10x5	8½	7½	10.750	10.020	.365	40	5.563	5.047	.258	81.00	
10x10x6	8½	7⅝	10.750	10.020	.365	40	6.625	6.065	.280	83.00	
10x10x8	8½	8	10.750	10.020	.365	40	8.625	7.981	.322	84.50	
12x12x4	10	8½	12.750	12.000	.375	. . ◆	4.500	4.026	.237	105.00	
12x12x5	10	8½	12.750	12.000	.375	. . ◆	5.563	5.047	.258	110.00	
12x12x6	10	8⅝	12.750	12.000	.375	. . ◆	6.625	6.065	.280	114.00	
12x12x8	10	9	12.750	12.000	.375	. . ◆	8.625	7.981	.322	117.00	
12x12x10	10	9½	12.750	12.000	.375	. . ◆	10.750	10.020	.365	119.00	
14x14x6	11	9⅜	14.000	13.250	.375	30	6.625	6.065	.280	151.00	
14x14x8	11	9¾	14.000	13.250	.375	30	8.625	7.981	.322	155.00	
14x14x10	11	10⅛	14.000	13.250	.375	30	10.750	10.020	.365	158.00	
14x14x12	11	10⅝	14.000	13.250	.375	30	12.750	12.000	.375	160.00	
16x16x6	12	10⅜	16.000	15.250	.375	30	6.625	6.065	.280	173.00	

◆ This size and thickness does not correspond to any schedule number.
Refer to other footnotes on opposite page.

REDUCING OUTLET TEES, *Standard Weight, Part No. 256* (Continued)

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END OF BRANCH M	DIMENSIONS OF RUN			†PIPE SCHEDULE NUMBER	DIMENSIONS OF BRANCH			APPROX. WEIGHT IN POUNDS	LIST PRICE
			OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK. T		OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK-NESS		
16x16x8	12	10¾	16.000	15.250	.375	30	8.625	7.981	.322	180.00	
16x16x10	12	11⅛	16.000	15.250	.375	30	10.750	10.020	.365	186.00	
16x16x12	12	11⅝	16.000	15.250	.375	30	12.750	12.000	.375	191.00	
16x16x14	12	12	16.000	15.250	.375	30	14.000	13.250	.375	194.00	
18x18x8	13½	11¾	18.000	17.250	.375	. . ◆	8.625	7.981	.322	211.00	
18x18x10	13½	12⅛	18.000	17.250	.375	. . ◆	10.750	10.020	.365	222.00	
18x18x12	13½	12⅝	18.000	17.250	.375	. . ◆	12.750	12.000	.375	230.00	
18x18x14	13½	13	18.000	17.250	.375	. . ◆	14.000	13.250	.375	236.00	
18x18x16	13½	13	18.000	17.250	.375	. . ◆	16.000	15.250	.375	241.00	
20x20x8	15	12¾	20.000	19.250	.375	20	8.625	7.981	.322	330.00	
20x20x10	15	13⅛	20.000	19.250	.375	20	10.750	10.020	.365	332.00	
20x20x12	15	13⅝	20.000	19.250	.375	20	12.750	12.000	.375	334.00	
20x20x14	15	14	20.000	19.250	.375	20	14.000	13.250	.375	336.00	
20x20x16	15	14	20.000	19.250	.375	20	16.000	15.250	.375	338.00	
20x20x18	15	14½	20.000	19.250	.375	20	18.000	17.250	.375	340.00	
22x22x10‡*	16½	14⅛	22.000	21.250	.375	. . ◆	10.750	10.020	.365	402.00	
22x22x12‡*	16½	14⅝	22.000	21.250	.375	. . ◆	12.750	12.000	.375	404.00	
22x22x14‡*	16½	15	22.000	21.250	.375	. . ◆	14.000	13.250	.375	406.00	PRICES
22x22x16‡*	16½	15	22.000	21.250	.375	. . ◆	16.000	15.250	.375	408.00	
22x22x18‡*	16½	15½	22.000	21.250	.375	. . ◆	18.000	17.250	.375	410.00	ON
22x22x20‡*	16½	16	22.000	21.250	.375	. . ◆	20.000	19.250	.375	412.00	
24x24x10*	17	15⅛	24.000	23.250	.375	20	10.750	10.020	.365	507.00	APPLI-
24x24x12*	17	15⅝	24.000	23.250	.375	20	12.750	12.000	.375	510.00	
24x24x14*	17	16	24.000	23.250	.375	20	14.000	13.250	.375	513.00	CATION
24x24x16*	17	16	24.000	23.250	.375	20	16.000	15.250	.375	516.00	
24x24x18*	17	16½	24.000	23.250	.375	20	18.000	17.250	.375	519.00	
24x24x20*	17	17	24.000	23.250	.375	20	20.000	19.250	.375	522.00	
24x24x22*	17	17	24.000	23.250	.375	20	22.000	21.250	.375	525.00	
26x26x12‡*	19½	16⅝	26.000	25.250	.375	. . ◆	12.750	12.000	.375	730.00	
26x26x14‡*	19½	17	26.000	25.250	.375	. . ◆	14.000	13.250	.375	735.00	
26x26x16‡*	19½	17	26.000	25.250	.375	. . ◆	16.000	15.250	.375	740.00	
26x26x18‡*	19½	17½	26.000	25.250	.375	. . ◆	18.000	17.250	.375	745.00	
26x26x20‡*	19½	18	26.000	25.250	.375	. . ◆	20.000	19.250	.375	750.00	
26x26x22‡*	19½	18½	26.000	25.250	.375	. . ◆	22.000	21.250	.375	755.00	
26x26x24‡*	19½	19	26.000	25.250	.375	. . ◆	24.000	23.250	.375	760.00	
30x30x16‡*	22	19	30.000	29.250	.375	. . ◆	16.000	15.250	.375	995.00	
30x30x18‡*	22	19½	30.000	29.250	.375	. . ◆	18.000	17.250	.375	1005.00	
30x30x20‡*	22	20	30.000	29.250	.375	. . ◆	20.000	19.250	.375	1015.00	
30x30x22‡*	22	20½	30.000	29.250	.375	. . ◆	22.000	21.250	.375	1025.00	
30x30x24‡*	22	21	30.000	29.250	.375	. . ◆	24.000	23.250	.375	1035.00	
30x30x26‡*	22	21½	30.000	29.250	.375	. . ◆	26.000	25.250	.375	1045.00	

* Reducing Outlet Tees 22" and larger are produced from X-rayed, stress relieved welded pipe. When tee is formed, weld extends the length of the run opposite the seamless outlet.

Refer to other footnotes on page 64.

Information on intermediate or larger size reducing outlet tees furnished on request.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22" and 26" sizes are not covered by ASA B36.10.

◆ This size and thickness does not correspond to any schedule number.

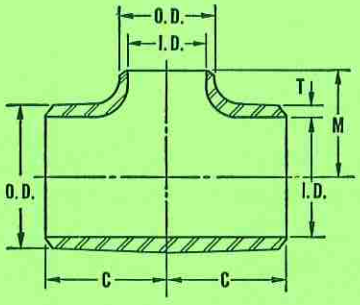
‡ 22", 26" and 30" sizes are not carried in ASA B16.9.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END OF BRANCH M	DIMENSIONS OF RUN			†PIPE SCHEDULE NUMBER	DIMENSIONS OF BRANCH			APPROX. WEIGHT IN POUNDS	LIST PRICE
			OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK. T		OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK-NESS		
½x½x¼	1	1	.840	.546	.147	80	.540	.302	.119	.28	
½x½x⅜	1	1	.840	.546	.147	80	.675	.423	.126	.28	
¾x¾x⅜	1⅛	1⅛	1.050	.742	.154	80	.675	.423	.126	.50	
¾x¾x½	1⅛	1⅛	1.050	.742	.154	80	.840	.546	.147	.50	
1x1x⅜	1½	1½	1.315	.957	.179	80	.675	.423	.126	1.00	
1x1x½	1½	1½	1.315	.957	.179	80	.840	.546	.147	1.00	
1x1x¾	1½	1½	1.315	.957	.179	80	1.050	.742	.154	1.00	
1¼x1¼x½	1⅞	1⅞	1.660	1.278	.191	80	.840	.546	.147	1.75	
1¼x1¼x¾	1⅞	1⅞	1.660	1.278	.191	80	1.050	.742	.154	1.75	
1¼x1¼x1	1⅞	1⅞	1.660	1.278	.191	80	1.315	.957	.179	1.75	
1½x1½x½	2¼	2¼	1.900	1.500	.200	80	.840	.546	.147	2.50	PRICES
1½x1½x¾	2¼	2¼	1.900	1.500	.200	80	1.050	.742	.154	2.50	
1½x1½x1	2¼	2¼	1.900	1.500	.200	80	1.315	.957	.179	2.50	ON
1½x1½x1¼	2¼	2¼	1.900	1.500	.200	80	1.660	1.278	.191	2.50	
2x2x¾	2½	1¾	2.375	1.939	.218	80	1.050	.742	.154	4.00	APPLI-
2x2x1	2½	2	2.375	1.939	.218	80	1.315	.957	.179	4.10	
2x2x1¼	2½	2¼	2.375	1.939	.218	80	1.660	1.278	.191	4.13	CATION
2x2x1½	2½	2⅜	2.375	1.939	.218	80	1.900	1.500	.200	4.25	
2½x2½x1	3	2¼	2.875	2.323	.276	80	1.315	.957	.179	7.00	
2½x2½x1¼	3	2½	2.875	2.323	.276	80	1.660	1.278	.191	7.06	
2½x2½x1½	3	2⅝	2.875	2.323	.276	80	1.900	1.500	.200	7.13	
2½x2½x2	3	2¾	2.875	2.323	.276	80	2.375	1.939	.218	7.19	
3x3x1	3⅜	2⅝	3.500	2.900	.300	80	1.315	.957	.179	7.50	
3x3x1¼	3⅜	2¾	3.500	2.900	.300	80	1.660	1.278	.191	7.60	
3x3x1½	3⅜	2⅞	3.500	2.900	.300	80	1.900	1.500	.200	7.50	
3x3x2	3⅜	3	3.500	2.900	.300	80	2.375	1.939	.218	8.00	
3x3x2½	3⅜	3¼	3.500	2.900	.300	80	2.875	2.323	.276	8.25	



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designation are in accordance with ASA B36.10.

Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

REDUCING OUTLET TEES

Extra Strong

Part No. 257

REDUCING OUTLET TEES, *Extra Strong, Part No. 257* (Continued)

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END OF BRANCH M	DIMENSIONS OF RUN			†PIPE SCHEDULE NUMBER	DIMENSIONS OF BRANCH			APPROX. WEIGHT IN POUNDS	LIST PRICE
			OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK. T		OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK-NESS		
3½x3½x1½	3¾	3⅛	4.000	3.364	.318	80	1.900	1.500	.200	11.50	
3½x3½x2	3¾	3¼	4.000	3.364	.318	80	2.375	1.939	.218	11.80	
3½x3½x2½	3¾	3½	4.000	3.364	.318	80	2.875	2.323	.276	12.20	
3½x3½x3	3¾	3⅝	4.000	3.364	.318	80	3.500	2.900	.300	12.60	
4x4x1½	4⅛	3⅜	4.500	3.826	.337	80	1.900	1.500	.200	15.25	
4x4x2	4⅛	3½	4.500	3.826	.337	80	2.375	1.939	.218	15.50	
4x4x2½	4⅛	3¾	4.500	3.826	.337	80	2.875	2.323	.276	15.00	
4x4x3	4⅛	3⅞	4.500	3.826	.337	80	3.500	2.900	.300	15.25	
4x4x3½	4⅛	4	4.500	3.826	.337	80	4.000	3.364	.318	15.60	
5x5x2	4⅞	4⅛	5.563	4.813	.375	80	2.375	1.939	.218	23.50	
5x5x2½	4⅞	4¼	5.563	4.813	.375	80	2.875	2.323	.276	24.00	
5x5x3	4⅞	4⅜	5.563	4.813	.375	80	3.500	2.900	.300	24.50	
5x5x3½	4⅞	4½	5.563	4.813	.375	80	4.000	3.364	.318	25.00	
5x5x4	4⅞	4⅝	5.563	4.813	.375	80	4.500	3.826	.337	25.50	
6x6x2	5⅝	4¾	6.625	5.761	.432	80	2.375	1.939	.218	35.00	
6x6x2½	5⅝	4¾	6.625	5.761	.432	80	2.875	2.323	.276	36.00	
6x6x3	5⅝	4⅞	6.625	5.761	.432	80	3.500	2.900	.300	37.00	
6x6x3½	5⅝	5	6.625	5.761	.432	80	4.000	3.364	.318	38.25	PRICES
6x6x4	5⅝	5⅛	6.625	5.761	.432	80	4.500	3.826	.337	39.25	
6x6x5	5⅝	5⅜	6.625	5.761	.432	80	5.563	4.813	.375	40.00	ON
8x8x3	7	6	8.625	7.625	.500	80	3.500	2.900	.300	70.00	
8x8x3½	7	6	8.625	7.625	.500	80	4.000	3.364	.318	70.50	APPLI-
8x8x4	7	6⅛	8.625	7.625	.500	80	4.500	3.826	.337	71.75	
8x8x5	7	6⅜	8.625	7.625	.500	80	5.563	4.813	.375	73.00	CATION
8x8x6	7	6⅝	8.625	7.625	.500	80	6.625	5.761	.432	74.00	
10x10x3	8½	7¼	10.750	9.750	.500	60	3.500	2.900	.300	102.00	
10x10x4	8½	7¼	10.750	9.750	.500	60	4.500	3.826	.337	104.00	
10x10x5	8½	7½	10.750	9.750	.500	60	5.563	4.813	.375	106.00	
10x10x6	8½	7⅝	10.750	9.750	.500	60	6.625	5.761	.432	108.00	
10x10x8	8½	8	10.750	9.750	.500	60	8.625	7.625	.500	109.00	
12x12x4	10	8½	12.750	11.750	.500	60	4.500	3.826	.337	155.00	
12x12x5	10	8½	12.750	11.750	.500	. . ◆	5.563	4.813	.375	160.00	
12x12x6	10	8⅝	12.750	11.750	.500	. . ◆	6.625	5.761	.432	165.00	
12x12x8	10	9	12.750	11.750	.500	. . ◆	8.625	7.625	.500	175.00	
12x12x10	10	9½	12.750	11.750	.500	. . ◆	10.750	9.750	.500	184.00	
14x14x6	11	9⅜	14.000	13.000	.500	. . ◆	6.625	5.761	.432	218.00	
14x14x8	11	9¾	14.000	13.000	.500	. . ◆	8.625	7.625	.500	225.00	
14x14x10	11	10⅛	14.000	13.000	.500	. . ◆	10.750	9.750	.500	233.00	
14x14x12	11	10⅝	14.000	13.000	.500	. . ◆	12.750	11.750	.500	237.00	
16x16x6	12	10⅜	16.000	15.000	.500	40	6.625	5.761	.432	255.00	

◆ This size and thickness does not correspond to any schedule number.

Refer to other footnotes on page 67.

REDUCING OUTLET TEES, *Extra Strong, Part No. 257* (Continued)

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END OF BRANCH M	DIMENSIONS OF RUN			†PIPE SCHEDULE NUMBER	DIMENSIONS OF BRANCH			APPROX. WEIGHT IN POUNDS	LIST PRICE
			OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK. T		OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK-NESS		
16x16x8	12	10¾	16.000	15.000	.500	40	8.625	7.625	.500	260.00	
16x16x10	12	11⅛	16.000	15.000	.500	40	10.750	9.750	.500	266.00	
16x16x12	12	11⅝	16.000	15.000	.500	40	12.750	11.750	.500	270.00	
16x16x14	12	12	16.000	15.000	.500	40	14.000	13.000	.500	275.00	
18x18x8	13½	11¾	18.000	17.000	.500	. . ◆	8.625	7.625	.500	281.00	
18x18x10	13½	12⅛	18.000	17.000	.500	. . ◆	10.750	9.750	.500	296.00	
18x18x12	13½	12⅝	18.000	17.000	.500	. . ◆	12.750	11.750	.500	307.00	
18x18x14	13½	13	18.000	17.000	.500	. . ◆	14.000	13.000	.500	315.00	
18x18x16	13½	13	18.000	17.000	.500	. . ◆	16.000	15.000	.500	321.00	
20x20x8	15	12¾	20.000	19.000	.500	30	8.625	7.625	.500	463.00	
20x20x10	15	13⅛	20.000	19.000	.500	30	10.750	9.750	.500	466.00	
20x20x12	15	13⅝	20.000	19.000	.500	30	12.750	11.750	.500	469.00	
20x20x14	15	14	20.000	19.000	.500	30	14.000	13.000	.500	472.00	
20x20x16	15	14	20.000	19.000	.500	30	16.000	15.000	.500	475.00	
20x20x18	15	14½	20.000	19.000	.500	30	18.000	17.000	.500	477.00	
22x22x10‡*	16½	14⅛	22.000	21.000	.500	. . ◆	10.750	9.750	.500	532.00	
22x22x12‡*	16½	14⅝	22.000	21.000	.500	. . ◆	12.750	11.750	.500	535.00	
22x22x14‡*	16½	15	22.000	21.000	.500	. . ◆	14.000	13.000	.500	538.00	PRICES
22x22x16‡*	16½	15	22.000	21.000	.500	. . ◆	16.000	15.000	.500	541.00	
22x22x18‡*	16½	15½	22.000	21.000	.500	. . ◆	18.000	17.000	.500	544.00	ON
22x22x20‡*	16½	16	22.000	21.000	.500	. . ◆	20.000	19.000	.500	547.00	
24x24x10*	17	15⅛	24.000	23.000	.500	. . ◆	10.750	9.750	.500	589.00	APPLI-
24x24x12*	17	15⅝	24.000	23.000	.500	. . ◆	12.750	11.750	.500	592.00	
24x24x14*	17	16	24.000	23.000	.500	. . ◆	14.000	13.000	.500	595.00	CATION
24x24x16*	17	16	24.000	23.000	.500	. . ◆	16.000	15.000	.500	598.00	
24x24x18*	17	16½	24.000	23.000	.500	. . ◆	18.000	17.000	.500	601.00	
24x24x20*	17	17	24.000	23.000	.500	. . ◆	20.000	19.000	.500	604.00	
24x24x22*	17	17	24.000	23.000	.500	. . ◆	22.000	21.000	.500	607.00	
26x26x12‡*	19½	16⅝	26.000	25.000	.500	. . ◆	12.750	11.750	.500	830.00	
26x26x14‡*	19½	17	26.000	25.000	.500	. . ◆	14.000	13.000	.500	835.00	
26x26x16‡*	19½	17	26.000	25.000	.500	. . ◆	16.000	15.000	.500	840.00	
26x26x18‡*	19½	17½	26.000	25.000	.500	. . ◆	18.000	17.000	.500	845.00	
26x26x20‡*	19½	18	26.000	25.000	.500	. . ◆	20.000	19.000	.500	850.00	
26x26x22‡*	19½	18½	26.000	25.000	.500	. . ◆	22.000	21.000	.500	860.00	
26x26x24‡*	19½	19	26.000	25.000	.500	. . ◆	24.000	23.000	.500	865.00	
30x30x16‡*	22	19	30.000	29.000	.500	20	16.000	15.000	.500	1130.00	
30x30x18‡*	22	19½	30.000	29.000	.500	20	18.000	17.000	.500	1140.00	
30x30x20‡*	22	20	30.000	29.000	.500	20	20.000	19.000	.500	1150.00	
30x30x22‡*	22	20½	30.000	29.000	.500	20	22.000	21.000	.500	1160.00	
30x30x24‡*	22	21	30.000	29.000	.500	20	24.000	23.000	.500	1170.00	
30x30x26‡*	22	21½	30.000	29.000	.500	20	26.000	25.000	.500	1180.00	

* Reducing Outlet Tees 22" and larger are produced from X-rayed, stress relieved welded pipe. When tee is formed, weld extends the length of the run opposite the seamless outlet.

Refer to other footnotes on page 67.

Information on intermediate or larger size reducing outlet tees furnished on request.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22" and 26" sizes are not covered by ASA B36.10.

◆ This size and thickness does not correspond to any schedule number.

‡ 22", 26" and 30" sizes are not carried in ASA B16.9.

ASA B16.9■

SEAMLESS WELDING FITTINGS

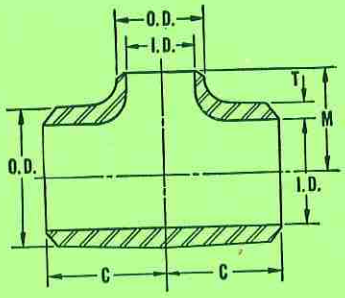
ASTM A234★

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END OF BRANCH M	DIMENSIONS OF RUN			DIMENSIONS OF BRANCH			APPROX. WEIGHT IN POUNDS	LIST PRICE
			OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK. T	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK-NESS		
¾x¾x⅜	1⅛	1⅛	1.050	.614	.218	.675	*	*	.75	
¾x¾x½	1⅛	1⅛	1.050	.614	.218	.840	.465	.187	.75	
1x1x⅜	1½	1½	1.315	.815	.250	.675	*	*	1.13	
1x1x½	1½	1½	1.315	.815	.250	.840	.465	.187	1.13	
1x1x¾	1½	1½	1.315	.815	.250	1.050	.614	.218	1.13	
1¼x1¼x½	1⅞	1⅞	1.660	1.160	.250	.840	.465	.187	2.00	
1¼x1¼x¾	1⅞	1⅞	1.660	1.160	.250	1.050	.614	.218	2.00	
1¼x1¼x1	1⅞	1⅞	1.660	1.160	.250	1.315	.815	.250	2.00	PRICES
1½x1½x½	2¼	2¼	1.900	1.338	.281	.840	.465	.187	2.75	
1½x1½x¾	2¼	2¼	1.900	1.338	.281	1.050	.614	.218	2.75	ON
1½x1½x1	2¼	2¼	1.900	1.338	.281	1.315	.815	.250	2.75	APPLI-
1½x1½x1¼	2¼	2¼	1.900	1.338	.281	1.660	1.160	.250	2.75	
2x2x¾	2½	1¾	2.375	1.689	.343	1.050	.614	.218	5.00	CATION
2x2x1	2½	2	2.375	1.689	.343	1.315	.815	.250	5.13	
2x2x1¼	2½	2¼	2.375	1.689	.343	1.660	1.160	.250	5.25	
2x2x1½	2½	2⅜	2.375	1.689	.343	1.900	1.338	.281	5.50	
2½x2½x1	3	2¼	2.875	2.125	.375	1.315	.815	.250	6.50	
2½x2½x1¼	3	2½	2.875	2.125	.375	1.660	1.160	.250	6.75	
2½x2½x1½	3	2⅝	2.875	2.125	.375	1.900	1.338	.281	6.88	
2½x2½x2	3	2¾	2.875	2.125	.375	2.375	1.689	.343	7.00	

REDUCING OUTLET TEES

Schedule 160†

Part No. 258



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

* Not listed. Can furnish same thickness as ½ inch Schedule 160 pipe.

† Pipe schedule number is in accordance with ASA B36.10. Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

For standard Welding Bevels, see page 239.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

REDUCING OUTLET TEES, *Schedule 160†, Part No. 258* (Continued)

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END OF BRANCH M	DIMENSIONS OF RUN			DIMENSIONS OF BRANCH			APPROX. WEIGHT IN POUNDS	LIST PRICE
			OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK. T	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK-NESS		
3x3x1¼	3⅜	2¾	3.500	2.624	.438	1.660	1.160	.250	9.25	
3x3x1½	3⅜	2⅞	3.500	2.624	.438	1.900	1.338	.281	9.15	
3x3x2	3⅜	3	3.500	2.624	.438	2.375	1.689	.343	9.25	
3x3x2½	3⅜	3¼	3.500	2.624	.438	2.875	2.125	.375	9.50	
4x4x1½	4⅛	3⅜	4.500	3.438	.531	1.900	1.338	.281	20.00	
4x4x2	4⅛	3½	4.500	3.438	.531	2.375	1.689	.343	20.50	
4x4x2½	4⅛	3¾	4.500	3.438	.531	2.875	2.125	.375	20.75	
4x4x3	4⅛	3⅞	4.500	3.438	.531	3.500	2.624	.438	21.00	
5x5x2	4⅞	4⅛	5.563	4.313	.625	2.375	1.689	.343	34.00	
5x5x2½	4⅞	4¼	5.563	4.313	.625	2.875	2.125	.375	35.00	
5x5x3	4⅞	4⅜	5.563	4.313	.625	3.500	2.624	.438	36.00	
5x5x4	4⅞	4⅝	5.563	4.313	.625	4.500	3.438	.531	37.00	
6x6x2	5⅝	4¾	6.625	5.189	.718	2.375	1.689	.343	56.00	PRICES
6x6x2½	5⅝	4¾	6.625	5.189	.718	2.875	2.125	.375	57.00	
6x6x3	5⅝	4⅞	6.625	5.189	.718	3.500	2.624	.438	58.00	ON
6x6x4	5⅝	5⅛	6.625	5.189	.718	4.500	3.438	.531	60.00	APPLI-
6x6x5	5⅝	5⅜	6.625	5.189	.718	5.563	4.313	.625	61.00	
8x8x4	7	6⅛	8.625	6.813	.906	4.500	3.438	.531	102.00	CATION
8x8x5	7	6⅜	8.625	6.813	.906	5.563	4.313	.625	106.00	
8x8x6	7	6⅝	8.625	6.813	.906	6.625	5.189	.718	108.00	
10x10x3	8½	7¼	10.750	8.500	1.125	3.500	2.624	.438	180.00	
10x10x4	8½	7¼	10.750	8.500	1.125	4.500	3.438	.531	200.00	
10x10x5	8½	7½	10.750	8.500	1.125	5.563	4.313	.625	220.00	
10x10x6	8½	7⅝	10.750	8.500	1.125	6.625	5.189	.718	240.00	
10x10x8	8½	8	10.750	8.500	1.125	8.625	6.813	.906	250.00	
12x12x4	10	8½	12.750	10.126	1.312	4.500	3.438	.531	310.00	
12x12x5	10	8½	12.750	10.126	1.312	5.563	4.313	.625	320.00	
12x12x6	10	8⅝	12.750	10.126	1.312	6.625	5.189	.718	330.00	
12x12x8	10	9	12.750	10.126	1.312	8.625	6.813	.906	350.00	
12x12x10	10	9½	12.750	10.126	1.312	10.750	8.500	1.125	365.00	

Refer to footnotes on opposite page.

ASA B16.9■

SEAMLESS WELDING FITTINGS

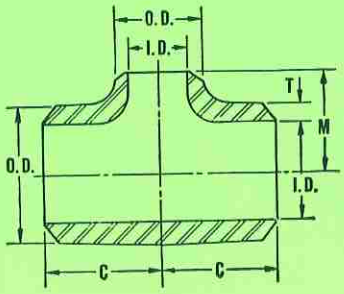
ASTM A234★

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END OF BRANCH M	DIMENSIONS OF RUN			DIMENSIONS OF BRANCH			APPROX. WEIGHT IN POUNDS	LIST PRICE
			OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK. T	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK-NESS		
¾x¾x½	1⅛	1⅛	1.050	.434	.308	.840	.252	.294	1.15	
1x1x⅜	1½	1½	1.315	.599	.358	.675	.171	.252	1.25	
1x1x½	1½	1½	1.315	.599	.358	.840	.252	.294	1.25	
1x1x¾	1½	1½	1.315	.599	.358	1.050	.434	.308	1.25	
1¼x1¼x½	1⅞	1⅞	1.660	.896	.382	.840	.252	.294	2.38	
1¼x1¼x¾	1⅞	1⅞	1.660	.896	.382	1.050	.434	.308	2.50	
1¼x1¼x1	1⅞	1⅞	1.660	.896	.382	1.315	.599	.358	2.63	
1½x1½x½	2¼	2¼	1.900	1.100	.400	.840	.252	.294	3.00	PRICES
1½x1½x¾	2¼	2¼	1.900	1.100	.400	1.050	.434	.308	3.13	ON
1½x1½x1	2¼	2¼	1.900	1.100	.400	1.315	.599	.358	3.25	APPLI-
1½x1½x1¼	2¼	2¼	1.900	1.100	.400	1.660	.896	.382	3.38	CATION
2x2x¾	2½	1¾	2.375	1.503	.436	1.050	.434	.308	5.13	
2x2x1	2½	2	2.375	1.503	.436	1.315	.599	.358	5.38	
2x2x1¼	2½	2¼	2.375	1.503	.436	1.660	.896	.382	5.75	
2x2x1½	2½	2⅜	2.375	1.503	.436	1.900	1.100	.400	6.00	
2½x2½x1	3	2¼	2.875	1.771	.552	1.315	.599	.358	8.50	
2½x2½x1¼	3	2½	2.875	1.771	.552	1.660	.896	.382	8.75	
2½x2½x1½	3	2⅝	2.875	1.771	.552	1.900	1.100	.400	9.25	
2½x2½x2	3	2¾	2.875	1.771	.552	2.375	1.503	.436	9.50	

REDUCING OUTLET TEES

Double Extra Strong

Part No. 259



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grade B are available from stock.

For standard Welding Bevels, see page 239.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

REDUCING OUTLET TEES, *Double Extra Strong, Part No. 259* (Continued)

NOMINAL PIPE SIZE	CENTER TO END C	CENTER TO END OF BRANCH M	DIMENSIONS OF RUN			DIMENSIONS OF BRANCH			APPROX. WEIGHT IN POUNDS	LIST PRICE
			OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK. T	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICK-NESS		
3x3x1¼	3⅜	2¾	3.500	2.300	.600	1.660	.896	.382	12.00	
3x3x1½	3⅜	2⅞	3.500	2.300	.600	1.900	1.100	.400	12.50	
3x3x2	3⅜	3	3.500	2.300	.600	2.375	1.503	.436	12.75	
3x3x2½	3⅜	3¼	3.500	2.300	.600	2.875	1.771	.552	13.00	
3½x3½x1½	3¾	3⅛	4.000	2.728	.636	1.900	1.100	.400	14.00	
3½x3½x2	3¾	3¼	4.000	2.728	.636	2.375	1.503	.436	15.00	
3½x3½x2½	3¾	3½	4.000	2.728	.636	2.875	1.771	.552	15.50	
3½x3½x3	3¾	3⅝	4.000	2.728	.636	3.500	2.300	.600	16.00	
4x4x1½	4⅛	3⅜	4.500	3.152	.674	1.900	1.100	.400	20.00	
4x4x2	4⅛	3½	4.500	3.152	.674	2.375	1.503	.436	21.50	
4x4x2½	4⅛	3¾	4.500	3.152	.674	2.875	1.771	.552	22.50	
4x4x3	4⅛	3⅞	4.500	3.152	.674	3.500	2.300	.600	23.25	
4x4x3½	4⅛	4	4.500	3.152	.674	4.000	2.728	.636	24.00	PRICES ON APPLI-CATION
5x5x2	4⅞	4⅛	5.563	4.063	.750	2.375	1.503	.436	34.00	
5x5x2½	4⅞	4¼	5.563	4.063	.750	2.875	1.771	.552	35.00	
5x5x3	4⅞	4⅜	5.563	4.063	.750	3.500	2.300	.600	36.00	
5x5x3½	4⅞	4½	5.563	4.063	.750	4.000	2.728	.636	37.00	
5x5x4	4⅞	4⅝	5.563	4.063	.750	4.500	3.152	.674	38.00	
6x6x2	5⅝	4¾	6.625	4.897	.864	2.375	1.503	.436	53.00	
6x6x2½	5⅝	4¾	6.625	4.897	.864	2.875	1.771	.552	54.00	
6x6x3	5⅝	4⅞	6.625	4.897	.864	3.500	2.300	.600	55.00	
6x6x3½	5⅝	5	6.625	4.897	.864	4.000	2.728	.636	56.00	
6x6x4	5⅝	5⅛	6.625	4.897	.864	4.500	3.152	.674	57.00	
6x6x5	5⅝	5⅜	6.625	4.897	.864	5.563	4.063	.750	58.00	
8x8x3½	7	6	8.625	6.875	.875	4.000	2.728	.636	113.00	
8x8x4	7	6⅛	8.625	6.875	.875	4.500	3.152	.674	114.00	
8x8x5	7	6⅜	8.625	6.875	.875	5.563	4.063	.750	116.00	
8x8x6	7	6⅝	8.625	6.875	.875	6.625	4.897	.864	118.00	

Refer to footnotes on opposite page.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
¾x⅜	1½	.15	
¾x½	1½	.17	
1x⅜	2	.40	
1x½	2	.40	
1x¾	2	.40	
1¼x½	2	.40	
1¼x¾	2	.40	
1¼x1	2	.50	
1½x½	2½	.50	PRICES
1½x¾	2½	.54	
1½x1	2½	.62	ON
1½x1¼	2½	.70	
2x¾	3	.70	APPLI-
2x1	3	.76	
2x1¼	3	.84	CATION
2x1½	3	.90	
2½x1	3½	1.25	
2½x1¼	3½	1.25	
2½x1½	3½	1.38	
2½x2	3½	1.50	
3x1	3½	1.50	
3x1¼	3½	1.60	
3x1½	3½	1.70	

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
3x2	3½	1.80	
3x2½	3½	2.00	
3½x1¼	4	2.40	
3½x1½	4	2.50	
3½x2	4	2.75	
3½x2½	4	2.88	
3½x3	4	3.15	
4x1	4	2.75	
4x1¼	4	2.75	PRICES
4x1½	4	2.88	
4x2	4	3.00	ON
4x2½	4	3.25	
4x3	4	3.38	APPLI-
4x3½	4	3.50	
5x2	5	5.00	CATION
5x2½	5	5.25	
5x3	5	5.50	
5x3½	5	5.75	
5x4	5	6.00	
6x2	5½	7.00	
6x2½	5½	7.25	
6x3	5½	8.00	
6x3½	5½	8.25	

CONCENTRIC REDUCERS

Standard Weight

Part No. 260

ECCENTRIC REDUCERS

Standard Weight

Part No. 263

See footnotes on opposite page.

ASA B16.9■

SEAMLESS WELDING FITTINGS

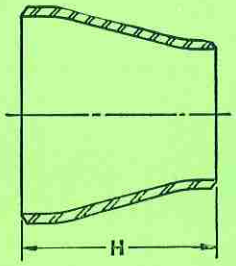
ASTM A234★

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
6x4	5½	8.25	
6x5	5½	8.50	
8x3	6	11.00	
8x3½	6	11.00	
8x4	6	11.00	
8x5	6	12.00	
8x6	6	13.25	
10x3	7	18.00	
10x4	7	20.00	
10x5	7	21.00	
10x6	7	21.50	PRICES
10x8	7	22.00	
12x4	8	29.50	ON
12x5	8	30.00	
12x6	8	31.00	
12x8	8	32.00	APPLI-
12x10	8	34.00	
14x6	13	58.00	CATION
14x8	13	58.50	
14x10	13	59.25	
14x12	13	60.00	
16x8	14	68.50	
16x10	14	69.50	
16x12	14	70.00	
16x14	14	71.00	
18x10	15	82.00	
18x12	15	83.00	
18x14	15	84.00	

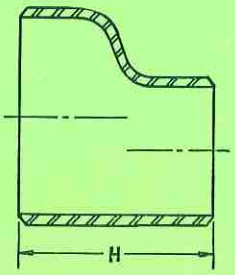
NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
18x16	15	85.00	
20x12	20	120.00	
20x14	20	122.00	
20x16	20	124.00	
20x18	20	125.00	
22x14‡	20	123.00	
22x16‡	20	131.00	
22x18‡	20	138.00	
22x20‡	20	142.00	
24x16	20	145.00	
24x18	20	148.00	PRICES
24x20	20	150.00	
26x18‡*	24†	182.00	ON
26x20‡*	24†	190.00	
26x22‡*	24†	200.00	
26x24‡*	24†	207.00	APPLI-
28x20‡*	24†	199.00	
28x22‡*	24†	210.00	CATION
28x24‡*	24†	216.00	
28x26‡*	24†	224.00	
30x20‡*	24†	220.00	
30x22‡*	24†	220.00	
30x24‡*	24†	224.00	
30x26‡*	24†	232.00	
30x28‡*	24†	241.00	
36x20‡*	24	300.00	
36x24‡*	24	320.00	
36x30‡*	24	340.00	

REDUCERS

Standard Weight



Concentric



Eccentric

All dimensions given in inches.

† 24" on eccentric reducers only, 20" on concentric reducers.
For Pressure-Temperature Ratings, see pages 252 to 262.
Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.
For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

‡ 22", 26", 28", 30" and 36" sizes are not covered in ASA B16.9.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

* Unless otherwise specified lap welded or electric welded pipe will be used at our option in producing reducers 26" and larger. Ends agree in O.D., I.D., and wall thickness with pipe they are to match.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9▪ **SEAMLESS WELDING FITTINGS** ASTM A234★

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
¾x⅜	1½	.20	
¾x½	1½	.22	
1x⅜	2	.45	
1x½	2	.45	
1x¾	2	.45	
1¼x½	2	.50	
1¼x¾	2	.50	
1¼x1	2	.50	
1½x½	2½	.65	PRICES
1½x¾	2½	.70	
1½x1	2½	.75	ON
1½x1¼	2½	.78	
2x¾	3	1.00	APPLI-
2x1	3	1.10	
2x1¼	3	1.15	CATION
2x1½	3	1.20	
2½x1	3½	1.75	
2½x1¼	3½	1.85	
2½x1½	3½	1.90	
2½x2	3½	2.00	
3x1	3½	2.25	
3x1¼	3½	2.40	
3x1½	3½	2.50	

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
3x2	3½	2.60	
3x2½	3½	2.75	
3½x1¼	4	3.25	
3½x1½	4	3.25	
3½x2	4	3.50	
3½x2½	4	3.50	
3½x3	4	4.00	
4x1	4	3.50	
4x1¼	4	3.75	PRICES
4x1½	4	4.00	
4x2	4	4.25	ON
4x2½	4	4.38	
4x3	4	4.50	APPLI-
4x3½	4	4.75	
5x2	5	6.50	CATION
5x2½	5	7.00	
5x3	5	7.50	
5x3½	5	7.75	
5x4	5	8.25	
6x2	5½	9.50	
6x2½	5½	10.00	
6x3	5½	10.50	
6x3½	5½	11.00	

CONCENTRIC REDUCERS

Extra Strong

Part No. 261

ECCENTRIC REDUCERS

Extra Strong

Part No. 264

See footnotes on opposite page

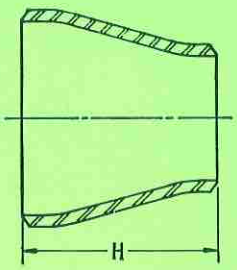
ASA B16.9▪ **SEAMLESS WELDING FITTINGS** ASTM A234★

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
6x4	5½	11.50	
6x5	5½	12.00	
8x3	6	16.00	
8x3½	6	16.50	
8x4	6	17.00	
8x5	6	18.00	
8x6	6	18.75	
10x3	7	23.00	
10x4	7	25.50	
10x5	7	28.00	
10x6	7	29.50	PRICES
10x8	7	29.50	
12x4	8	38.00	ON
12x5	8	39.00	
12x6	8	40.00	
12x8	8	42.00	APPLI-
12x10	8	43.50	
14x6	13	78.00	CATION
14x8	13	78.50	
14x10	13	79.25	
14x12	13	80.00	
16x8	14	88.50	
16x10	14	89.00	
16x12	14	90.00	
16x14	14	91.00	
18x10	15	112.00	
18x12	15	113.00	
18x14	15	114.00	

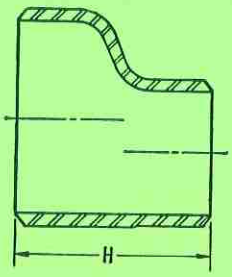
NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
18x16	15	115.00	
20x12	20	167.00	
20x14	20	168.00	
20x16	20	169.00	
20x18	20	170.00	
22x14‡	20	163.00	
22x16‡	20	173.00	
22x18‡	20	182.00	
22x20‡	20	186.00	
24x16	20	190.00	
24x18	20	195.00	PRICES
24x20	20	200.00	
26x18‡*	24†	242.00	ON
26x20‡*	24†	253.00	
26x22‡*	24†	272.00	APPLI-
26x24‡*	24†	276.00	
28x20‡*	24†	264.00	CATION
28x22‡*	24†	250.00	
28x24‡*	24†	288.00	
28x26‡*	24†	299.00	
30x20‡*	24†	274.00	
30x22‡*	24†	285.00	
30x24‡*	24†	299.00	
30x26‡*	24†	310.00	
30x28‡*	24†	322.00	
36x24‡*	24	350.00	
36x30‡*	24	360.00	

REDUCERS

Extra Strong



Concentric



Eccentric

All dimensions given in inches.

† 24" on eccentric reducers only, 20" on concentric reducers.

For Pressure-Temperature Ratings, see pages 252 to 262.

Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

▪ For information on this standard, see page 239.

‡ 22", 26", 28", 30" and 36" sizes are not covered in ASA B16.9.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

* Unless otherwise specified lap welded or electric welded pipe will be used at our option in producing reducers 26" and larger. Ends agree in O.D., I.D., and wall thickness with pipe they are to match.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9▪

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
¾x⅜	1½	.24	PRICES ON APPLICATION
¾x½	1½	.28	
1x⅜	2	.33	
1x½	2	.50	
1x¾	2	.50	
1¼x½	2	.60	
1¼x¾	2	.65	
1¼x1	2	.65	
1½x½	2½	.73	
1½x¾	2½	.75	
1½x1	2½	.80	
1½x1¼	2½	.95	
2x¾	3	1.45	
2x1	3	1.50	
2x1¼	3	1.50	

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
2x1½	3	1.60	PRICES ON APPLICATION
2½x1	3½	2.20	
2½x1¼	3½	2.25	
2½x1½	3½	2.25	
2½x2	3½	2.50	
3x1¼	3½	3.10	
3x1½	3½	3.20	
3x2	3½	3.40	
3x2½	3½	3.70	
3½x1¼	4	....	
3½x1½	4	....	
3½x2	4	....	
3½x2½	4	....	
3½x3	4	....	
4x1½	4	5.25	

CONCENTRIC REDUCERS

Schedule 160†

Part No. 225

ECCENTRIC REDUCERS

Schedule 160†

Part No. 229

See footnotes on opposite page.

ASA B16.9■

SEAMLESS WELDING FITTINGS

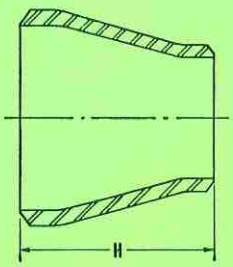
ASTM A234★

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
4x2	4	5.40	PRICES ON APPLICATION
4x2½	4	5.50	
4x3	4	6.40	
5x2	5	10.00	
5x2½	5	10.50	
5x3	5	11.00	
5x4	5	12.50	
6x2½	5½	15.00	
6x3	5½	15.50	
6x4	5½	16.50	
6x5	5½	18.75	

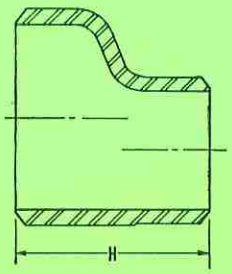
NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
8x4	6	23.50	PRICES ON APPLICATION
8x5	6	27.25	
8x6	6	31.00	
10x4	7	50.00	
10x5	7	52.00	
10x6	7	54.00	
10x8	7	57.50	
12x5	8	80.00	
12x6	8	83.00	
12x8	8	87.00	
12x10	8	96.00	

REDUCERS

Schedule 160†



Concentric



Eccentric

All dimensions given in inches.
For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe Schedule Number is in accordance with ASA B36.10.
Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.
For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.
Ends agree in O.D., I.D., and wall thickness with pipe they are to match.
For standard Welding Bevels, see page 239.
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1x3/8	2	.75	
1x1/2	2	.75	
1x3/4	2	.80	
1 1/4x1/2	2	1.00	
1 1/4x3/4	2	1.00	
1 1/4x1	2	1.00	PRICES
1 1/2x1/2	2 1/2	1.25	ON
1 1/2x3/4	2 1/2	1.38	APPLI-
1 1/2x1	2 1/2	1.50	CATION
1 1/2x1 1/4	2 1/2	1.50	
2x3/4	3	2.00	
2x1	3	2.15	
2x1 1/4	3	2.25	
2x1 1/2	3	2.38	

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
2 1/2x1	3 1/2	3.50	
2 1/2x1 1/4	3 1/2	3.60	
2 1/2x1 1/2	3 1/2	3.90	
2 1/2x2	3 1/2	4.00	
3x1 1/4	3 1/2	4.75	
3x1 1/2	3 1/2	4.90	PRICES
3x2	3 1/2	5.00	ON
3x2 1/2	3 1/2	6.00	APPLI-
3 1/2x1 1/4	4	7.00	CATION
3 1/2x1 1/2	4	7.00	
3 1/2x2	4	7.00	
3 1/2x2 1/2	4	8.00	
3 1/2x3	4	8.00	
4x1 1/2	4	8.00	

CONCENTRIC REDUCERS

Double Extra Strong

Part No. 262

ECCENTRIC REDUCERS

Double Extra Strong

Part No. 265

See footnotes on opposite page.

ASA B16.9■

SEAMLESS WELDING FITTINGS

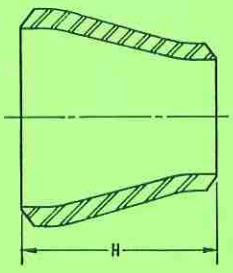
ASTM A234★

NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
4x2	4	8.25	PRICES ON APPLICATION
4x2½	4	8.50	
4x3	4	9.00	
4x3½	4	9.00	
5x2	5	14.00	
5x2½	5	13.75	
5x3	5	14.50	
5x3½	5	15.00	
5x4	5	16.00	

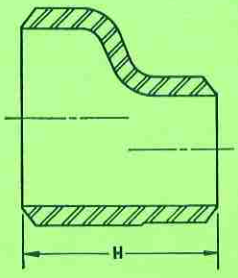
NOMINAL PIPE SIZE	LENGTH H	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
6x2½	5½	19.00	PRICES ON APPLICATION
6x3	5½	20.00	
6x3½	5½	21.00	
6x4	5½	22.00	
6x5	5½	23.00	
8x3½	6	32.00	
8x4	6	33.00	
8x5	6	35.00	
8x6	6	36.00	

REDUCERS

Double Extra Strong



Concentric



Eccentric

All dimensions given in inches.
For Pressure-Temperature Ratings, see pages 252 to 262.
Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.
For Dimensional Tolerances, see page 239.
Beyond 8" size, Schedule 160 reducers are furnished.
■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grade B are available from stock.
Ends agree in O.D., I.D., and wall thickness with pipe they are to match.
For standard Welding Bevels, see page 239.
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

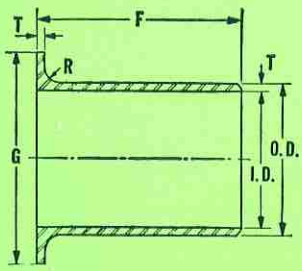
ASA B16.9■ **SEAMLESS WELDING FITTINGS** ASTM A234

NOMINAL PIPE SIZE	▲LENGTH F	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL and LAP● THICKNESS T	DIAMETER G	RADIUS R	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
½	3	.840	.622	.109	1⅜	⅛	40	.24	
¾	3	1.050	.824	.113	1 11/16	⅛	40	.34	
1	4	1.315	1.049	.133	2	⅛	40	.75	
1¼	4	1.660	1.380	.140	2½	3/16	40	1.10	
1½	4	1.900	1.610	.145	2⅞	¼	40	1.25	
2	6	2.375	2.067	.154	3⅝	5/16	40	2.25	
2½	6	2.875	2.469	.203	4⅛	5/16	40	3.50	
3	6	3.500	3.068	.216	5	⅜	40	4.75	PRICES
3½	6	4.000	3.548	.226	5½	⅜	40	5.50	
4	6	4.500	4.026	.237	6 3/16	7/16	40	7.25	ON
5	8	5.563	5.047	.258	7 5/16	7/16	40	11.75	
6	8	6.625	6.065	.280	8½	½	40	15.50	APPLI-
8	8	8.625	7.981	.322	10⅝	½	40	23.50	CATION
10	10	10.750	10.020	.365	12¾	½	40	36.50	
12	10	12.750	12.000	.375	15	½	..◆	47.00	
14	12	14.000	13.250	.375	16¼	½	30	60.00	
16	12	16.000	15.250	.375	18½	½	30	70.00	
18	12	18.000	17.250	.375	21	½	..◆	94.00	
20	12	20.000	19.250	.375	23	½	20	105.00	
24	12	24.000	23.250	.375	27¼	½	20	126.00	

LAP JOINT STUB ENDS

Standard Weight

Part No. 46



All dimensions given in inches.
For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designation are in accordance with ASA B36.10.
Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

◆ This size and thickness does not correspond to any schedule number.

▲ Length "F" applies to pipe thicknesses listed. In some sizes and thicknesses longer stub ends are required for use with heavier flanges having higher hubs. Additional thickness required for special facings shall be in addition to the basic length "F." Phonographic face is standard. Other facings are available. Welding chamfer is machine faced and beveled.

● The basic minimum lap thickness shall not be less than nominal pipe wall thickness.

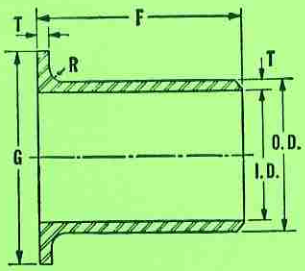
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234

NOMINAL PIPE SIZE	▲LENGTH F	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL and LAP● THICKNESS T	DIAMETER G	RADIUS R	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
½	3	.840	.546	.147	1⅜	⅛	80	.32	
¾	3	1.050	.742	.154	1 11/16	⅛	80	.44	
1	4	1.315	.957	.179	2	⅛	80	1.00	
1¼	4	1.660	1.278	.191	2½	3/16	80	1.25	
1½	4	1.900	1.500	.200	2⅞	¼	80	1.74	
2	6	2.375	1.939	.218	3⅝	5/16	80	3.00	
2½	6	2.875	2.323	.276	4⅛	5/16	80	4.50	
3	6	3.500	2.900	.300	5	⅜	80	6.75	PRICES
3½	6	4.000	3.364	.318	5½	⅜	80	7.75	
4	6	4.500	3.826	.337	6 3/16	7/16	80	9.50	ON
5	8	5.563	4.813	.375	7 5/16	7/16	80	17.00	
6	8	6.625	5.761	.432	8½	½	80	21.50	APPLI-
8	8	8.625	7.625	.500	10⅝	½	80	32.00	CATION
10	10	10.750	9.750	.500	12¾	½	60	53.00	
12	10	12.750	11.750	.500	15	½	. .◆	62.00	
14	12	14.000	13.000	.500	16¼	½	. .◆	80.00	
16	12	16.000	15.000	.500	18½	½	40	93.00	
18	12	18.000	17.000	.500	21	½	. .◆	124.00	
20	12	20.000	19.000	.500	23	½	30	138.00	
24	12	24.000	23.000	.500	27¼	½	. .◆	167.00	



All dimensions given in inches.
For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designation are in accordance with ASA B36.10.
Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.
For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

◆ This size and thickness does not correspond to any schedule number.

▲ Length "F" applies to pipe thicknesses listed. In some sizes and thicknesses longer stub ends are required for use with heavier flanges having higher hubs. Additional thickness required for special facings shall be in addition to the basic length "F."
Phonographic face is standard. Other facings are available. Welding chamfer is machine faced and beveled.

● The basic minimum lap thickness shall not be less than nominal pipe wall thickness.
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

LAP JOINT STUB ENDS

Extra Strong

Part No. 47

ASA B16.9■

SEAMLESS WELDING FITTINGS

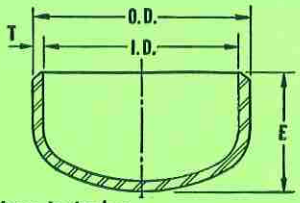
ASTM A234★

NOMINAL PIPE SIZE	LENGTH E	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	1½	1.315	1.049	.133	40	.20	
1¼	1½	1.660	1.380	.140	40	.30	
1½	1½	1.900	1.610	.145	40	.40	
2	1½	2.375	2.067	.154	40	.60	
2½	1½	2.875	2.469	.203	40	.90	
3	2	3.500	3.068	.216	40	1.50	
3½	2½	4.000	3.548	.226	40	2.00	
4	2½	4.500	4.026	.237	40	2.50	PRICES
5	3	5.563	5.047	.258	40	4.50	
6	3½	6.625	6.065	.280	40	6.50	ON
8	4	8.625	7.981	.322	40	12.00	
10	5	10.750	10.020	.365	40	20.00	APPLI-
12	6	12.750	12.000	.375	. .◆	30.00	CATION
14	6½	14.000	13.250	.375	30	36.00	
16	7	16.000	15.250	.375	30	40.00	
18	8	18.000	17.250	.375	. .◆	54.00	
20	9	20.000	19.250	.375	20	75.00	
22‡	10½	22.000	21.250	.375	. .◆	94.00	
24	10½	24.000	23.250	.375	20	96.00	
26‡	10½	26.000	25.250	.375	. .◆	119.00	
30‡	10½	30.000	29.250	.375	. .◆	172.00	

CAPS

Standard Weight

Part No. 48



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22" and 26" sizes are not covered by ASA B36.10.

Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

‡ 22", 26" and 30" sizes are not carried in ASA B16.9.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

◆ This size and thickness does not correspond to any schedule number.

Welding caps are formed from steel plate and are stress relieved after working. They are semi-ellipsoidal in shape in which the minor axis is equal to at least half the major axis.

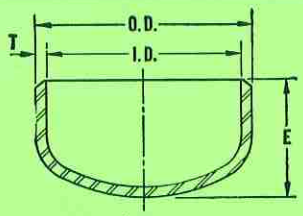
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	LENGTH E	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	†PIPE SCHEDULE NUMBERS	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	1½	1.315	.957	.179	80	.30	
1¼	1½	1.660	1.278	.191	80	.40	
1½	1½	1.900	1.500	.200	80	.50	
2	1½	2.375	1.939	.218	80	.75	
2½	1½	2.875	2.323	.276	80	1.00	
3	2	3.500	2.900	.300	80	1.75	
3½	2½	4.000	3.364	.318	80	2.50	
4	2½	4.500	3.826	.337	80	3.00	PRICES
5	3	5.563	4.813	.375	80	5.50	
6	3½	6.625	5.761	.432	80	9.00	ON
8	4	8.625	7.625	.500	80	16.00	
10	5	10.750	9.750	.500	60	25.00	APPLI-
12	6	12.750	11.750	.500	. .	36.00	
14	6½	14.000	13.000	.500	. .◆	45.00	CATION
16	7	16.000	15.000	.500	40	54.00	
18	8	18.000	17.000	.500	. .◆	72.00	
20	9	20.000	19.000	.500	30	86.00	
22‡	10½	22.000	21.000	.500	. .◆	125.00	
24	10½	24.000	23.000	.500	. .◆	130.00	
26‡	10½	26.000	25.000	.500	. .◆	159.00	
30‡	10½	30.000	29.000	.500	20	229.00	



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe schedule numbers and weight designations are in accordance with ASA B36.10. 22" and 26" sizes are not covered by ASA B36.10.

Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

‡ 22", 26" and 30" sizes are not carried in ASA B16.9.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

◆ This size and thickness does not correspond to any schedule number.

Welding caps are formed from steel plate and are stress relieved after working. They are semi-ellipsoidal in shape in which the minor axis is equal to at least half the major axis.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

CAPS

Extra Strong

Part No. 49

ASA B16.9■

SEAMLESS WELDING FITTINGS

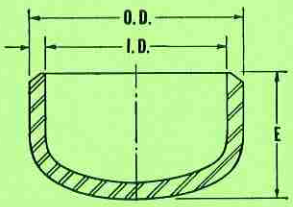
ASTM A234★

NOMINAL PIPE SIZE	LENGTH E	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	1½	1.315	.815	.250	.40	
1¼	1½	1.660	1.160	.250	.50	
1½	1½	1.900	1.337	.281	.60	
2	1¾	2.375	1.689	.343	1.25	
2½	2	2.875	2.125	.375	1.75	PRICES
3	2½	3.500	2.624	.438	2.90	ON
4	3	4.500	3.438	.531	5.90	APPLI-
5	3½	5.563	4.313	.625	10.00	CATION
6	4	6.625	5.189	.718	15.00	
8	5	8.625	6.813	.906	31.00	
10	6	10.750	8.500	1.125	57.00	
12	7	12.750	10.126	1.312	95.00	

CAPS

Schedule 160†

Part No. 167



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

† Pipe Schedule Number is in accordance with ASA B36.10. Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

Welding caps are formed from steel plate and are stress relieved after working. They are semi-ellipsoidal in shape in which the minor axis is equal to at least half the major axis.

For standard Welding Bevels, see page 239.

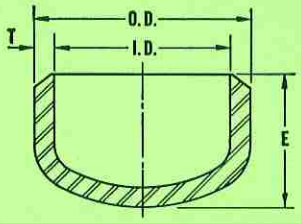
For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

ASA B16.9■

SEAMLESS WELDING FITTINGS

ASTM A234★

NOMINAL PIPE SIZE	LENGTH E	OUTSIDE DIAMETER O. D.	INSIDE DIAMETER I. D.	WALL THICKNESS T	APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
1	1½	1.315	.599	.358	.50	PRICES ON APPLICATION
1¼	1½	1.660	.896	.382	.75	
1½	1½	1.900	1.100	.400	.90	
2	1¾	2.375	1.503	.436	1.50	
2½	2	2.875	1.771	.552	2.50	
3	2½	3.500	2.300	.600	4.00	
3½	3	4.000	2.728	.636	6.00	
4	3	4.500	3.152	.674	7.50	
5	3½	5.563	4.063	.750	12.00	
6	4	6.625	4.897	.864	18.00	
8	5	8.625	6.875	.875	30.00	



All dimensions given in inches.

For Pressure-Temperature Ratings, see pages 252 to 262.

Other schedules, weights and thicknesses are also available. See page 244 for data on schedule numbers and weight designations.

For Dimensional Tolerances, see page 239.

■ For information on this standard, see page 239.

★ Fittings conforming physically and chemically to ASTM A106 Grades A and B are available from stock.

Welding caps are formed from steel plate and are stress relieved after working. They are semi-ellipsoidal in shape in which the minor axis is equal to at least half the major axis.

For standard Welding Bevels, see page 239.

For information on stainless steel, alloy steel and non-ferrous metal fittings—pages 225-236. Material Specifications—page 242.

CAPS

Double Extra Strong

Part No. 50

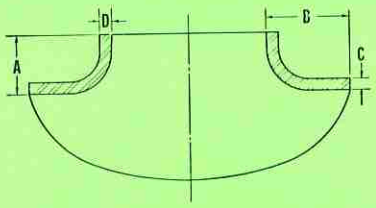
SEAMLESS WELDING FITTINGS

ASTM A234

NOMINAL SIZE OF NOZZLE	NOMINAL HEADER SIZES	APPROXIMATE DIMENSIONS				APPROXIMATE WEIGHT IN POUNDS	LIST PRICE
		A	B	C	D		
2	2 to 24	1½	2⅛	¼	5/16	3.00	
2½	2½ to 24	1⅝	2⅛	9/32	5/16	4.00	
3	3 to 24	1¾	2¼	5/16	13/32	5.00	
3½	3½ to 24	1¾	2¼	5/16	13/32	6.00	
4	4 to 24	1¾	2½	11/32	13/32	7.00	
5	5 to 24	2	2¾	⅜	7/16	12.00	PRICES
6	6 to 24	2⅜	3¾	7/16	½	22.00	ON
8	8 to 24	2¾	4¼	7/16	½	33.00	APPLI-
10	10 to 24	3	5	7/16	½	45.00	CATION
12	12 to 24	3¾	6	7/16	½	57.00	
14	14 to 24	4	6	7/16	½	76.00	
16	16 to 24	4¼	7¼	7/16	½	107.00	
18	18 to 24	4¼	7¼	9/16	⅝	152.00	
20	20 to 24	5¼	7¾	9/16	⅝	163.00	
24	24	6	9½	9/16	⅝	248.00	

SADDLES

Part No. 57



All dimensions are in inches.

Saddles are used to reinforce welded outlet connections on headers or branch pipes and are not intended to retain internal pressure. A vent hole prevents build-up of pressure under the saddle during welding.

See opposite page for information on a Ladish development for reinforcing branch connections.

LADISH SPLIT TEES

This Ladish development meets a long standing demand for a practicable means to make a safe hot tap branch connection . . . and to reinforce the entire area of the branch with greater strength than has previously been possible.

Past experience with saddles indicates that while they reinforced the area immediately adjacent to the outlet, undesirable rigidity developed in the crotch and side wall portions of the line. Further, the restriction of geometric adjustment of the line caused stress peaks which have undoubtedly contributed to many of the past failures which have been associated with saddles.

The unique design of the Ladish Split Tee eliminates such faults. Consisting of two half tee sections, its area of reinforcement extends completely around both line and branch pipes and for a generous distance along the line pipe on each side of the branch connection. The two halves are welded together along the line of bisection with heat kept safely away from direct contact with the main line.

Additional support is gained by welding the branch outlet of the Split Tee to the branch line. The joint opposite the branch is made with an exterior overlapping reinforcement strip which provides ample adjustment within the permissible range of dimensional tolerances to fit around the main line. Cutting and fitting on the job site are eliminated. The connection is completed by welding the overlapping strip to the mating half of the Split Tee. Welding to the line pipe as well as total weld deposition for the entire connection is held to a minimum.

With no restraining welds between the main line pipe and the Ladish Split Tee, stresses imposed by expansion of the pipe under pressure are distributed with greater uniformity over the entire reinforced area, thus assuring greater usable strength and more dependable operation.

Prices and dimensional data on application.

Field photographs showing progressive stages of making branch connection to an in-service line and reinforcing it with the Ladish Split Tee

SPLIT TEES

The Split Tee illustrated on this page is a design used successfully by prominent pipe line firms. Data on other designs that are available will be furnished on request.

Split Tees provide essential mechanical reinforcement and are not intended to retain internal pressure in themselves.

Ladish Split Tees are available in sizes from 14" through 36" in a wide range of reducing outlet sizes.

For reducing branch connections on original installations, use Ladish Seamless Reducing Outlet Tees, see pages 64-73.

REDUCING-ON-RUN TEES

Reducing-on-run tees can be fabricated readily on the job by welding appropriate Ladish reducers to straight tees. Center-to-face dimension of the run can be calculated by adding the length of reducer to the center-to-face dimension of the tee. When desired, factory-fabricated Ladish Reducing-on-run Tees can be supplied. Prices available on request.

3R ELBOWS

RADIUS EQUAL TO 3 TIMES NOMINAL PIPE SIZE

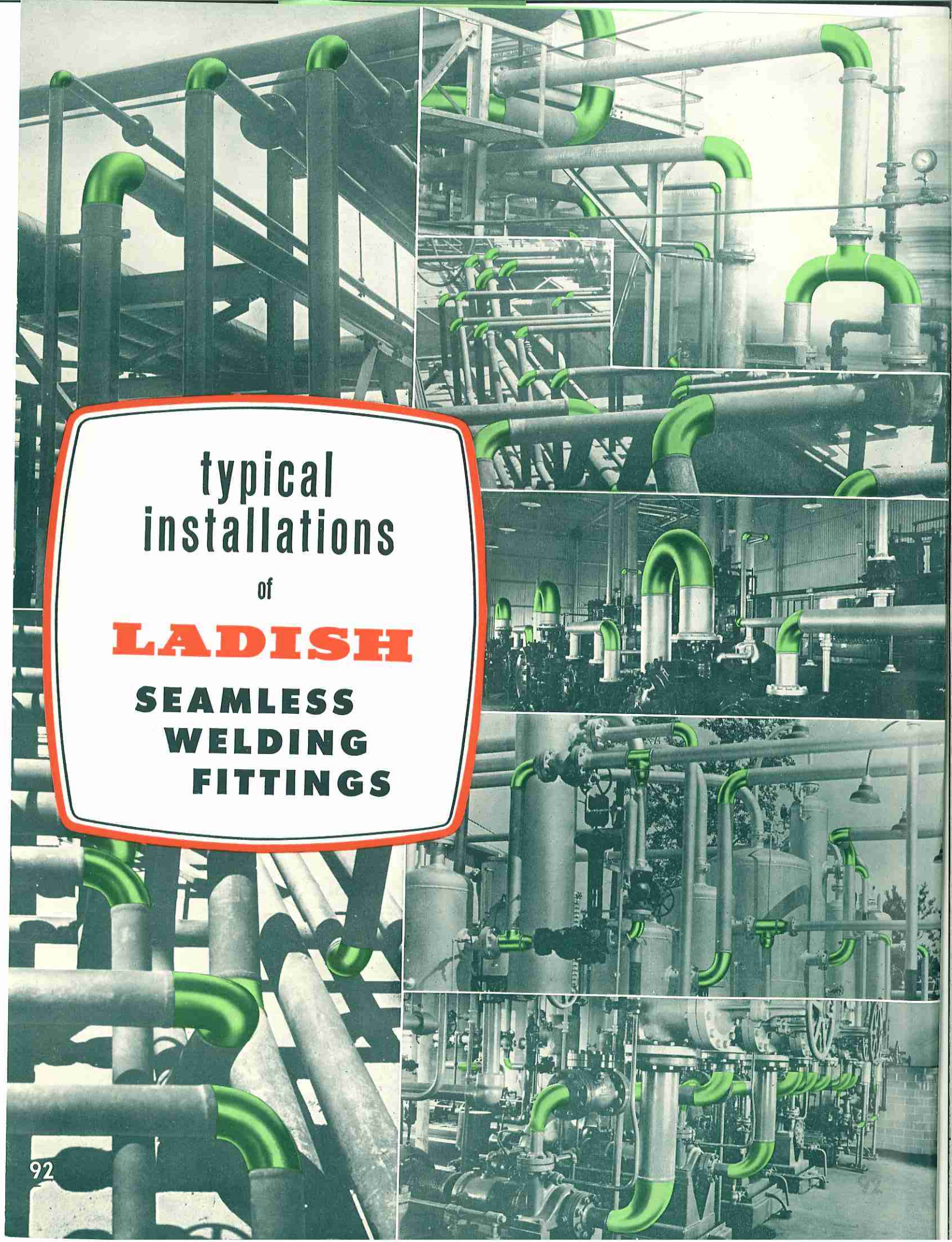
The Ladish 90° 3R Elbow with a radius twice that of the conventional Long Radius fitting, facilitates pipe line cleaning operations and materially reduces pressure and frictional losses. The long sweeping radius of the 3R elbow permits such cleaning devices as "go-devils" or "pigs" to travel through the line at a uniform velocity under normal pressure without jamming. Accurately formed throughout, they can be cut to desired segments to meet odd angle requirements. Available in sizes 8 inches through 30 inches. Prices and dimensional data on application.

LIGHT GAUGE FITTINGS

Ladish Light Gauge Fittings are intended for use in piping systems where there is a requirement for permanent light weight fittings which will not be subjected to pressures, temperatures or factors of corrosion or erosion . . . Ladish Elbows, Returns and Tees are available in Light Gauge weights in sizes from ¾ inch through 24 inches. Prices and dimensional data on application.

SPECIAL HEAVY WALL FITTINGS

Fittings of special design, wall thickness and materials for elevated temperature and pressure service are produced by Ladish to customer specifications in a virtually unlimited variety of designs, sizes and wall thicknesses. Forged to assure homogeneous grain structure and maximum strength . . . then machined to desired contours and bores, these fittings are capable of withstanding the most severe operating conditions. A typical example is illustrated. Complete drawings and specifications required before quotation can be made.



typical installations of LADISH SEAMLESS WELDING FITTINGS

TO MARK PROGRESS

LADISH CATALOG NO. 55

Printed in the United States