

JAMES DUVA INC.



"Protecting Public Health and the Environment"

CONTRACT NO. B422-5

NORTH JERSEY WASTEWATER COOPERATIVE PRICING SYSTEM

**PASSAIC VALLEY SEWERAGE COMMISSION
600 WILSON AVENUE
NEWARK, NJ 07105**

CONTRACT AND SPECIFICATIONS

TO

**FURNISH AND DELIVER PIPE, FITTINGS, VALVES AND ACCESSORIES TO THE
PVSC WAREHOUSE FOR A ONE (1) YEAR PERIOD**

**PASSAIC VALLEY SEWERAGE COMMISSION
600 WILSON AVENUE
NEWARK, NEW JERSEY 07105**

CONTRACT AND SPECIFICATIONS

FOR

**B422-5, FURNISH AND DELIVER PIPE, FITTINGS, VALVES AND ACCESSORIES
TO THE PVSC WAREHOUSE FOR A ONE (1) YEAR PERIOD**

THIS AGREEMENT made and executed this **16 day of February 2025**, by and between the Passaic Valley Sewerage Commission, a public body of the County of Essex, State of New Jersey, hereinafter called the PVSC, and

JAMES DUVA INC., 663 COLUMBIA RD., BRANCBURG, NJ 08876,

a corporation chartered under the laws of the State of New Jersey,

with principal offices at, 663 Columbia Rd. Branchburg, NJ 08876,
hereinafter called the "Contractor".

WITNESSETH: That the said Contractor has agreed and by these presents does agree with the PVSC, for the Prices bid and stipulated in the Proposal herein contained or hereunto annexed and under the terms and conditions expressed in Bonds bearing even date with these presents, and herein contained or hereunto annexed, to furnish at his own cost and expense all the necessary materials, labor, superintendence, tools, and appliances and shall execute, construct, and finish and test in an expeditious and workmanlike manner all the work as described in the contract specifications commencing the work within ten (10) days unless stated otherwise in the bid documents, from the date of Notice to Proceed and executing the same within the time and proceed in the manner specified and in conformity with the requirements set forth in the Contract Documents herein contained or hereunto attached and in accordance with the Contract Specifications of said Work.

The Contractor shall proceed with the said Work in a prompt and diligent manner and shall do all parts thereof at such times in such order as the PVSC may approve. Further, he shall complete the whole of said Work in accordance with the Contract Documents to the satisfaction of the PVSC.

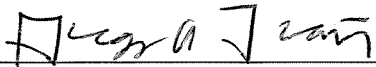
The PVSC shall not be liable to the Contractor for any neglect, default, delay or interference of or by another contractor, nor shall any such neglect, default, delay or interference of any other contractor, or alteration which may be required in said Work, release the Contractor from the obligation to finish the said Work within the time aforesaid or from the damages to be paid in default thereof.

It is hereby mutually agreed that the PVSC is to pay and the Contractor is to receive the amount bid (less retainage, if any) and stipulated in the proposal herein contained or hereto annexed, as full compensation for furnishing all work as described in the Contract Specification and for fully complying with the terms and conditions of this Contract.

Subject to the applicable provisions of law, the Contract shall be in full force and effect as a contract from and after the date when a fully executed and approved counterpart hereof is delivered to the Contractor at the address set forth above and shall remain and continue in full force and effect until after the expiration of the warranty period and the Contractor and the sureties are finally released by the PVSC.

In the event of a conflict between the bid specifications (request for proposal, invitation to bid, etc.) and the Contractors bid submission (proposal, response, etc.) the terms of the specifications (or otherwise as referenced) shall prevail in all cases and will govern in the award and agreement between the PVSC and the Contractor.

IN WITNESS WHEREOF: The parties hereto have executed this agreement the day and year first above mentioned.

BY: 
PASSAIC VALLEY SEWERAGE COMMISSION
GREGORY A. TRAMONTOZZI, EXECUTIVE DIRECTOR

(SEAL)

ATTEST BY: 
PASSAIC VALLEY SEWERAGE COMMISSION
ALBERT LUKIN, CLERK


CONTRACTOR NAME

BY: 
CONTRACTOR

(SEAL)

ATTEST BY: _____
CONTRACTOR

North Jersey Wastewater Cooperative Pricing System

Contract _____, has been designated as a Cooperative Pricing System Contract. Prospective bidders are invited to submit bids on the attached vendor bid list for the following North Jersey Wastewater Cooperative Pricing System members:

Lead Agency: Passaic Valley Sewerage Commission (PVSC)
600 Wilson Avenue
Newark, New Jersey
07105

Member Agencies:

Deliver to same location unless noted otherwise

Bergen County Utilities Authority	PO Box 9	Little Ferry, New Jersey 07643
Deliver to Location:	Foot of Mehrhof Road	Little Ferry, New Jersey 07643
Joint Meeting of Essex and Union Counties (JMEUC)	500 South First Street	Elizabeth, New Jersey 07202
The Pequannock, Lincoln Park, and Fairfield Sewerage Authority- Two Bridges (TBSA)	PO BOX 88	Lincoln Park, New Jersey 07035
Deliver to Location:	End of Lincoln Boulevard	Lincoln Park, New Jersey 07035
Northwest Bergen County Utilities Authority	30 Wyckoff Avenue	Waldwick, New Jersey 07463
Rahway Valley Sewerage Authority	1050 East Hazelwood Avenue	Rahway, New Jersey 07065
Town of Morristown	200 South Street	Morristown, New Jersey
Township of Wayne	475 Valley Road	Wayne, New Jersey 07470
City of Asbury Park	One Municipal Plaza	Asbury Park, New Jersey 07712
Deliver to Location:	9 Main Street	Asbury Park, New Jersey 07712
Linden Roselle Sewerage Authority	5005 South Wood Avenue	Linden, New Jersey 07036-8118
Sussex County Municipal Utilities Authority	34 South Route 94	Lafayette, New Jersey 07848
Township of Mine Hill	10 Baker Street	Mine Hill, New Jersey 07803
Musconetcong Sewerage Authority	110 Continental Drive	Budd Lake, New Jersey 07828
Borough of Fair Lawn	8-01 Fair Lawn Avenue	Fair Lawn, New Jersey 07410
Township of Morris	50 Woodland Avenue	Convent Station, NJ 07961
Village of Ridgewood	131 N. Maple Avenue	Ridgewood, New Jersey 07450
Rockaway Valley Sewerage Authority	RD #1, 99 Greenbank Road	Boonton, New Jersey 07005
Atlantic County Utilities Authority	6700 Delilah Road	Egg Harbor Township, N 08234
Township of Wall	2700 Allaire Road	Wall, New Jersey 07719
Township of Readington	509 Route 523	Whitehouse Station, NJ 08889
Borough of South Plainfield	2480 Plainfield Avenue	South Plainfield, NJ 07080
Borough of Lodi	One Memorial Drive	Lodi, New Jersey 07644
Borough of Madison	50 Kings Road	Madison, New Jersey 07940

ADDITIONAL COOPERATIVE MEMBER AGENCIES APPEAR ON THE NEXT PAGE

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Member Agencies continued:

Secaucus Municipal Utilities Authority	1100 Koëlle Boulevard	Secaucus, New Jersey 07094
Two Rivers Water Reclamation Authority	1 Highland Avenue	Monmouth Beach, NJ 07750
Borough of Point Pleasant	2233 Bridge Avenue	Point Pleasant, New Jersey 08742
Township of Branchburg	1077 US Highway 202 North	Branchburg, New Jersey 08876
Township of Parsippany-Troy Hills	1001 Parsippany Boulevard	Parsippany, New Jersey 07054
Township of Springfield	100 Mountain Avenue	Springfield, NJ 07081
Township of Neptune	25 Neptune Blvd	Neptune, NJ 07753
Township of Verona	600 Bloomfield Avenue	Verona, New Jersey 07044
Borough of Lindenwold	15 North White Horse Pike	Lindenwold, New Jersey 08021
North Bergen Utilities Authority	6200 Tonnelle Avenue	North Bergen, New Jersey 07047
Bayshore Regional Sewerage Authority	100 Oak Street	Union Beach, New Jersey 07735
Lacey Municipal Utilities Authority	34 R. Kennedy Boulevard	Forked River, New Jersey 08731
Cape May County Municipal Utilities Authority	1523 Route 9 North	Swainton, New Jersey 08210
Bernards Township Sewerage Authority	726 Martinsville Road	Liberty Corner, NJ 07938
South Monmouth Regional Sewerage Authority	1235 8 th Avenue	Belmar, New Jersey 07719
East Windsor Utilities Authority	7 Wiltshire Drive	East Windsor, New Jersey 08520
Township of Chatham	58 Meyersville Road	Chatham, New Jersey 07928
Toms River Municipal Utilities Authority	340 West Water Street	Toms River, New Jersey 08753
Township of Millburn	375 Millburn Avenue	Millburn, New Jersey 07041
Township of Howell	4567 Route 9 North	Howell, New Jersey 07731
Town of Newton	39 Trinity Street	Newton, New Jersey 07860
Jersey City Municipal Utilities Authority	555 Route 440	Jersey City, New Jersey 07305
Township of Mount Olive	204 Flanders-Drakestown Road	Budd Lake, New Jersey 07828
Borough of Sayreville	167 Main Street	Sayreville, New Jersey 08872
Somerset Raritan Valley Sewerage Authority	50 Polhemus Lane	Bridgewater, New Jersey 08807
Borough of Florham Park	111 Ridgedale Avenue	Florham Park, New Jersey 07932
Middlesex County Utilities Authority	257 Main Street	Sayreville, New Jersey 08872-0159
Washington Township Municipal Utilities Authority	46 East Mill Road	Long Valley, New Jersey 07853
Township of East Brunswick	1 Jean Walling Civic Center Drive	East Brunswick, New Jersey 08816
Jackson Township Municipal Utilities Authority	135 Manhattan Street	Jackson, New Jersey 08527

ADDITIONAL COOPERATIVE MEMBER AGENCIES APPEAR ON THE NEXT PAGE

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Member Agencies continued:

Borough of Stone Harbor	9508 Second Avenue	Stone Harbor, New Jersey 08247
Borough of Bloomingdale	101 Hamburg Turnpike	Bloomingdale, New Jersey 07403
Township of Livingston	357 South Livingston Avenue	Livingston, New Jersey 07039
Township of Roxbury	1715 Route 46	Ledgewood, New Jersey 07852
Township of Freehold	1 Municipal Plaza	Freehold, New Jersey 07728
Southeast Morris County Utilities Authority	19 Saddle Road	Cedar Knolls, New Jersey 07927
Township of Montville	195 Changebridge Road	Montville, New Jersey 07045
Manasquan River Regional Sewerage Authority	89 Havens Bridge Road	Farmingdale, New Jersey 07727
Cumberland Co. Utilities Authority	333 Water Street	Bridgeton, New Jersey 08302
Borough of Old Tappan	227 Old Tappan Road	Old Tappan, New Jersey 07675
Readington Lebanon Sewerage Authority	Old Route 28	Whitehouse, New Jersey 08888
Borough of Glen Rock	1 Harding Plaza	Glen Rock, New Jersey 07452
Warren Township Sewerage Authority	46 Mountain Boulevard	Warren, New Jersey 07059
Borough of Highlands	42 Shore Drive	Highlands, New Jersey 07732
Township of Denville	1 Saint Mary's Place	Denville, New Jersey 07834
Logan Township Municipal Utilities Authority	69 Jefferson Lane	Logan Township, New Jersey 08085
City of South Amboy	140 North Broadway	South Amboy, New Jersey 08879
Township of Nutley	One Kennedy Drive	Nutley, New Jersey 07110
Lambertville Municipal Utilities Authority	3 Bridge Street	Lambertville, New Jersey 08530
Camden County Municipal Utilities Authority	16445 Ferry Avenue	Camden, New Jersey 08101-1432
Western Monmouth Utilities Authority	103 Pension Road	Manalapan, New Jersey 07726
Borough of Spotswood	77 Summerhill Road	Spotswood, New Jersey 08884
Kearny Municipal Utilities Authority	39 Central Avenue	Kearny, New Jersey 07032
Borough of Totowa	537 Totowa Road	Totowa, New Jersey 07512
Township of Cranford	8 Springfield Avenue	Cranford, New Jersey 07016
East Orange Water Commission	99 South Grove Street	East Orange, New Jersey 07018
Township of Aberdeen	1 Aberdeen Square	Aberdeen, New Jersey 07747
Woodbridge Township	1 Main Street	Woodbridge, New Jersey 07095
Hackettstown Municipal Utilities Authority	424 Hurley Drive	Hackettstown, New Jersey 07840
Township of Bridgewater	100 Commons Way	Bridgewater, New Jersey 08807
Township of Rockaway	1 East Main Street	Rockaway, New Jersey 07866
Borough of Wildwood Crest	6101 Pacific Avenue	Wildwood Crest, New Jersey 08260
Borough of Tinton Falls	556 Tinton Avenue	Tinton Falls New Jersey 07724

Township of Piscataway	455 Hoes Lane	Piscataway, New Jersey 08854
Borough of Elmwood Park	182 Market Street	Elmwood Park, New Jersey 07407
County of Passaic	151 East 11 th Street	Paterson, New Jersey 07525
Township of Randolph	502 Millbrook Avenue	Randolph, New Jersey 07869
Township of Middletown	1 Kings Highway	Middletown, New Jersey 07748
Township of Edison	100 Municipal Boulevard	Edison, New Jersey 08817
Township of Hillside	1409 Liberty Avenue	Hillside, New Jersey 07205
Township of Neptune Sewerage Authority	634 Old Corlies Ave	Neptune City, NJ 07753
Borough of Milltown	39 Washington Avenue	Milltown, New Jersey 08850
Egg Harbor Twp. Municipal Utilities Authority	3515 Bargaintown Road	Egg Harbor, New Jersey 08234
Landis Sewerage Authority	1776 South Mill Road	Vineland, New Jersey 08360
Cinnaminson Sewerage Authority	1621 Riverton Road	Cinnaminson, NJ 08077
Township of South Orange Village	76 South Orange Avenue	South Orange, New Jersey 07079
Stony Brook Regional Sewerage Authority	290 River Road	Princeton, New Jersey 08540
Borough of Alpha	1001 East Boulevard	Alpha, New Jersey 08865
Pennsauken Sewerage Authority	1250 John Tipton Boulevard	Pennsauken, New Jersey 08110
Raritan Township Municipal Utilities Authority	365 Old York Rd	Flemington, New Jersey 08822
Borough of Peapack and Gladstone	One School Street	Peapack, New Jersey 07977
Township of Bedminster	One Miller Lane	Bedminster, New Jersey 07921
Borough of Franklin	46 Main Street	Franklin, New Jersey 07416
Town of Dover	100 Princeton Avenue	Dover, New Jersey 07801
Franklin Township Sewerage Authority	70 Commerce Drive	Somerset, New Jersey 08873
Borough of Sea Bright	1099 Ocean Avenue	Sea Bright, New Jersey 07760
Township of Hamilton	2090 Greenwood Avenue	Hamilton, New Jersey 08609
Borough of Bernardsville	166 Mine Brook Road	Bernardsville, New Jersey 07924
Wanaque Valley Regional Sewerage Authority	101 Warren Hagstrom Blvd.	Wanaque, New Jersey 07465
Borough of Pennington	30 North Main Street	Pennington, New Jersey 08534
Lakewood Township Sewerage Authority	390 New Hampshire Avenue	Lakewood, New Jersey 08701
Byram Township	10 Mansfield Drive	Stanhope, New Jersey 07874
Township of Pemberton	500 Pemberton-Browns Mills Road	Pemberton, New Jersey 08068
Borough of Avon by the Sea	301 Main Street	Avon by the Sea, New Jersey 07717
Township of Florence	711 Broad Street	Florence, New Jersey 08518
Hanover Park Regional High School District	75 Mount Pleasant Avenue	East Hanover, New Jersey 07936

ADDITIONAL COOPERATIVE MEMBER AGENCIES APPEAR ON THE NEXT PAGE

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Member Agencies continued

City of Somers Point	1 West New Jersey Avenue	Somers Point, New Jersey 08244
Township of Cedar Grove	525 Pompton Avenue	Cedar Grove, New Jersey 07009
Borough of New Providence	360 Elkwood Avenue	New Providence, New Jersey 07974
Township of Tewksbury	169 Old Turnpike Road	Califon, New Jersey 07830
Clinton Township Sewerage Authority	79 Beaver Avenue #5	Clinton, New Jersey 08809
City of Summit	512 Springfield Avenue	Summit, New Jersey 07901
Old Bridge Municipal Utilities Authority	71 Boulevard West	Cliffwood Beach, New Jersey 07735
Willingboro Municipal Utilities Authority	433 John F. Kennedy Way	Willingboro, New Jersey 08046
City of Wildwood	4400 New Jersey Avenue	Wildwood, New Jersey 08260
Borough of Newfield	18 Catawba Avenue	Newfield, New Jersey 08344
Borough of Rockaway	1 East Main Street	Rockaway, New Jersey 07866
Montville Township Board of Education	86 River Road	Montville, New Jersey 07045
Borough of Wenonah	1 South West Avenue	Wenonah, New Jersey 08090
Rockaway Township Board of Education	16 School Road	Rockaway, New Jersey 07866
Brick Township Municipal Utilities Authority	1551 Highway 88 West	Brick, New Jersey 08724-2399
Township of Montclair	205 Claremont Avenue	Montclair, New Jersey 0704266
Borough of Hightstown	156 Bank Street	Hightstown, New Jersey 08520
Borough of Manasquan	201 East Main Street	Manasquan, New Jersey 08736
Township of West Orange	66 Main Street	West Orange, New Jersey 07052
City of Perth Amboy	260 High Street	Perth Amboy, New Jersey 08861
North Plainfield Board of Education	33 Mountain Avenue	N. Plainfield, New Jersey 07060
County of Hudson	567 Pavonia Avenue, 3rd Floor	Jersey City, New Jersey 07306
Borough of Caldwell	1 Provost Square	Caldwell, New Jersey 07006
Municipality of Princeton	400 Witherspoon Street	Princeton, New Jersey 08540
Township of Monroe	1 Municipal Plaza	Monroe, New Jersey 08831
Bordentown Sewerage Authority	954 Farnsworth Avenue	Bordentown, New Jersey 08505
City of Plainfield	515 Watchung Avenue	Plainfield, New Jersey 07060
Borough of Red Bank	90 Monmouth Street	Red Bank, New Jersey 07701
Township of Allamuchy	15 Freeborn Lane	Allamuchy, New Jersey 07820
City of Trenton	319 East State Street	Trenton, New Jersey 08608
Borough of Rumson	80 East River Road	Rumson, New Jersey 07760
North Arlington-Lyndhurst Joint Meeting	214 Ridge Road	North Arlington, New Jersey 07031
County of Essex	465 Dr. Martin Luther King, Jr. Boulevard	Newark, New Jersey 07102
Evesham Municipal Utilities Authority	100 Sharp Road	Marlton, New Jersey 08053
Borough of Hopatcong	111 River Styx Road	Hopatcong, New Jersey 07843
Atlantic City Municipal Utilities Authority	401 North Virginia Avenue	Atlantic City, New Jersey 08404

ADDITIONAL COOPERATIVE MEMBER AGENCIES APPEAR ON THE NEXT PAGE

Pine Hill Borough Municipal Utilities Authority	907 Turnerville Road	Pine Hill, New Jersey 08021
Township of Holmdel	4 Crawfords Corner Road	Holmdel, New Jersey 07733
Township of Berkeley Heights	29 Park Avenue	Berkeley Heights, New Jersey 07922
Borough of Woodcliff Lake	188 Pascack Road	Woodcliff Lake, New Jersey 07677
Cumberland County Improvement Authority	745 Lebanon Road	Millville, New Jersey 08332
Borough of Deal	190 Norwood Avenue	Deal, New Jersey 07723
Borough of High Bridge	97 West Main Street	High Bridge, New Jersey 08829
Carlstadt Sewerage Authority	429 Hackensack Street	Carlstadt, New Jersey 07072
Pequannock Township	530 Newark-Pompton Turnpike	Pompton Plains, New Jersey 07444
Belleville Township	152 Washington Avenue	Belleville, New Jersey 07109
Borough of Metuchen	500 Main Street	Metuchen, New Jersey 08840
Mount Holly Municipal Utilities Authority	1 Park Drive	Mount Holly, New Jersey 08060
Borough of Freehold	30 Mechanic Street	Freehold, New Jersey 07728
City of Newark	47-63 Green Street	Newark, New Jersey 07102
Borough of Matawan	201 Broad Street	Matawan, New Jersey 07747
Township of Mantua	397 Main Street	Mantua, New Jersey 08051
Warren County Municipal Utility Authority	199 Foul Rift Road	Belvidere, New Jersey 07823
City of Brigantine	1417 West Brigantine Ave.	Brigantine, New Jersey 08203
Essex County College	303 University Avenue	Newark, New Jersey 07102
Mount Laurel Township Municipal Utilities Authority	1201 South Church Street	Mount Laurel, New Jersey 08054
Borough of Belmar	601 Main Street	Belmar, New Jersey 07719
Gloucester County Utilities Authority	2 Paradise Road	West Deptford, New Jersey 08066
Township of West Caldwell	30 Clinton Road	West Caldwell, New Jersey 07006
Borough of Berlin	59 South Whitehorse Pike	Berlin, New Jersey 08009
Township of Riverside	237 S. Pavilion Avenue	Riverside, New Jersey 08075
Township of Riverside Sewerage Authority	PO Box 188	Riverside, New Jersey 08075
Township of Hillsborough Municipal Utilities Authority	220 Triangle Road	Hillsborough, New Jersey 08844

ADDITIONAL COOPERATIVE REQUIREMENTS APPEAR ON THE NEXT PAGE

NJWWCPS-7**Member Agencies continued**

Borough of Fieldsboro	204 Washington Street	Fieldsboro, New Jersey 08505
Tenaflly Board of Education	500 Tenaflly Road	Tenaflly, New Jersey 07670
Borough of Paramus	One Jockish Square	Paramus, New Jersey 07652
City of Cape May	643 Washington Street	Cape May, New Jersey 08204
Township of Marlboro	1979 Township Drive	Marlboro, New Jersey 07746
Township of Boonton	155 Powerville Road	Boonton Township, N.J. 07005
Long Branch Sewerage Authority	150 Joline Avenue	Long Branch, New Jersey 07740
Township of Winslow	125 South Route 73	Braddock, New Jersey 08037
Borough of Stockton	2 South Main Street	Stockton, New Jersey 08559
Plumsted Municipal Utilities Authority	89 Havens Bridge Road	Farmingdale, New Jersey 07727
The New Brunswick Water Utility	78 Bayard Street	New Brunswick, New Jersey 08901
Lower Township Municipal Utilities Authority	2900 Bayshore Road	Villas, New Jersey 08251
North Jersey District Water Supply Commission	1 F. A. Orechio Drive	Wanaque, New Jersey 07465
Passaic Valley Water Commission	1525 Main Avenue	Clifton, New Jersey 07011
River Dell Regional School District	230 Woodland Avenue	River Edge, New Jersey 07661
Township of West Milford	1480 Union Valley Road	West Milford, New Jersey 07480
Livingston Township School District	11 Foxcroft Drive	Livingston, New Jersey 07039
Borough of Emerson	1 Municipal Place	Emerson, New Jersey 07630
Township of Hopewell (Mercer)	201 Washington Crossing Pennington Road	Titusville, New Jersey 08560
Borough of Pitman	110 South Broadway	Pitman, New Jersey 08071
Toms River Regional School District	1144 Hooper Avenue	Toms River, New Jersey 08753
Township of Lyndhurst	367 Valley Brook Road	Lyndhurst, New Jersey 07071
Hopewell Township (Cumberland)	590 Shiloh Pike	Bridgeton, New Jersey 08302
Town of Dover	37 North Sussex Street	Dover, New Jersey 07801
Borough of Lakehurst	5 Union Avenue	Lakehurst, New Jersey 08733
Borough of Buena Municipal Utilities Authority	616 Central Avenue	Minotola, NJ 08341
Township of Saddle Brook	55 Mayhill Street	Saddle Brook, New Jersey 07663
Township of Warren	46 Mountain Boulevard	Warren, New Jersey 07059
Township of Sparta	65 Main Street	Sparta, New Jersey 07871
Township of Middletown Sewerage Authority	100 Beverly Way	Belford, New Jersey 07718
County of Middlesex	75 Bayard Street	New Brunswick, New Jersey 08901
Norwood Public School System	177 Summit Street	Norwood, New Jersey 07648

**ADDITIONAL COOPERATIVE MEMBERS
APPEAR ON THE NEXT PAGE**

Township of Middle	33 Mechanic Street	Cape May Courthouse, New Jersey 08210
City of Ventnor	6201 Atlantic Avenue	Ventnor City, New Jersey 08406
Township of Cranbury	23-A North Main Street	Cranbury, New Jersey 08512
Borough of South River	48 Washington Street	South River, New Jersey 08882
City of Bridgeton	181 E. Commerce Street	Bridgeton, New Jersey 08302
Township of Greenwich	420 Washington Street	Gibbstown, New Jersey 08027
Borough of Frenchtown	29 Second Street	Frenchtown, New Jersey 08825
Borough of Waldwick	63 Franklin Turnpike	Waldwick, New Jersey 07463
Hanover Sewerage Authority	1000 Route 10	Whippany, New Jersey 07981

**CERTIFICATION OF EXTENSION OF CONTRACT TERMS AND CONDITIONS TO MEMBERS
OF THE NORTH JERSEY WASTEWATER COOPERATIVE PRICING SYSTEM
AS LISTED ABOVE OR APPROVED WITHIN CONTRACT TERM**

☒ Check here if willing to provide the goods or services herein bid upon to registered members of the North Jersey Wastewater Cooperative Pricing System (NJWWCPS) without substitution or deviation from specifications, size, features, quality, price, or availability as herein set forth. It is understood that orders will be placed directly by the registered members identified herein by separate contract, subject to the overall terms of the master contract to be awarded by the Passaic Valley Sewerage Commissioners, and that no additional service or delivery charges will be allowed except as permitted by these specifications.

☐ Check here if **not** willing to extend prices to registered members of the NJWWCPS who have submitted estimates as described above. It is understood that this will not adversely affect consideration of this bid with respect to the needs of the Passaic Valley Sewerage Commissioners.

The procedure by which Contract _____ will be awarded in the event that the lowest responsible bidder, in the bid document, declines to extend prices to the registered members who submitted estimates is as follows:

The contract for the needs of the lead agency will be awarded to the lowest responsible bidder and new bids will be sought, and a master contract subsequently awarded with respect to the needs of the registered members who have submitted estimates.

Bid prices may be extended to registered members who have not submitted estimates prior to the advertisement for bids upon written approval of the lead agency and the awarded contractor.

Insurance certificates and performance bonds will be required as per the enclosed bid specifications.

*****PLEASE NOTE FAILURE TO COMPLETE THIS FORM AND SUBMIT IT WITH THE BID
WILL RESULT IN REJECTION OF THE BID*****

CONTRACT NO. B422-5
FURNISH AND DELIVER PIPE, FITTINGS, VALVES AND ACCESSORIES TO THE
PVSC WAREHOUSE FOR A ONE (1) YEAR PERIOD
AWARD

NAME OF BIDDER: **JAMES KRONER**

BUSINESS NAME: **JAMES DUVA INC.**

ADDRESS: **663 COLUMBIA RD., BRANCBURG, NJ 08876**

TELEPHONE NO: **908-526-1222**

FAX NUMBER: **908-526-1222**

E-Mail Address: **james@jamesduva.com**

FEIN #: **81-3409504**

1. Pursuant to and in compliance with the Proposal, Invitation to Bid and the Instructions to the Bidders relating thereto, the vendor shall furnish and deliver the items listed on the bid to the PVSC Warehouse for a one year period, for all expenses incurred in the performance of the work, for all risk and liabilities in connection with the work, and in accordance with all the terms of the specifications, and this contract for the unit prices as shown on the attached vendors format list.

a. Total number items bid: **8** (From Vendor Format List).

b. Delivery Period **See award sheet and attached catalogues** Calendar Days.

NOTE: The delivery period must be completed, or the bid will be considered non-responsive.

2. The P.V.S.C. is exempt from paying any New Jersey State and Federal taxes.

3. Prices shall be net including all transportation charges fully prepaid by the vendor F.O.B. Destination.

4. The term of this contract is for a one (1) year period beginning **February 1, 2025** and extending thru **January 31, 2026**. All prices shall hold firm, and not subject to increase during the term of the contract.

5. The Commission does not warrant any minimum or maximum quantities, and no minimum delivery dollar amount shall be acceptable. Material will be ordered as needed, and the vendor will only be paid for the actual material delivered at the appropriate bid prices.

6. The vendor shall submit bids to provide various instrumentation equipment, parts and supplies and or accessories in reference to the manufacturer's list price, and shall indicate a percentage off the manufacturer's list price for each item bid on.

a. Vendors shall supply two "2" numbered copies of each catalog and price lists representative of the items bid on by the vendor, or that bid will not be evaluated. If no printed catalog is available access to web based catalogs may be substituted. The "Bidders Exceptions" page (BE-1) may be used to provide proper written explanation in the event that a vendor wants to submit a bid without catalogs.

b. If no catalog is identified on the vendor's format list, the bidder shall bid on the current catalog, and clearly identify on his bid proposal which catalog he intends to use, and follow the same procedure as if a catalog had been listed. The intent of the contract is for procurement of instrumentation equipment, parts and supplies for the manufacturers listed on the bid.

c. The catalogs listed refer to the most current catalog on the date that the bid is due Vendors must submit the manufacturer's published suggested price list (list price) along with a catalog for evaluation. The Catalogues and Price lists must specifically coincide with the manufacturer's catalog indicated in the vendor's format list. Catalogues and Price list must be labeled "Item 1", "Item 2", etc. to correspond with the vendor's format list. Note: If the catalogues and price lists are not labeled correctly, the bid will not be evaluated!

d. Additional catalogs may be required by PVSC. The vendor should supply the catalogs needed, at no additional cost to the PVSC.

7. In the event of a conflict between the bid specifications (request for proposal, invitation to bid, etc.) and the Contractors bid submission (proposal, response, etc.) the terms of the specifications (or otherwise as referenced) shall govern the agreement between PVSC and the Contractor.

8. Upon notification of an order from the PVSC, the vendor guarantees that the items he bid on will be delivered or the services will be furnished within the specified days on the bid from said notification, unless prevented by strike or strikers which prevents delivery of materials or service. Should any order or orders be unfilled as of the agreed delivery date, the buyer reserves the right, upon notification to seller, to cancel this order or orders either in whole or in part without liability to the buyer other than for payments for that portion off order or orders already delivered and accepted. The Commission reserve the right to seek any redress for damages under the Default article of the contract.

9. After delivery and acceptance by the PVSC, the vendor shall submit a bill for the items delivered, and the Commission at its next scheduled monthly meeting will pay the amount due.

10. Any spillage caused by the Contractor, his subcontractor, his suppliers or his equipment while on P.V.S.C. property, shall be the Contractor's responsibility to properly clean up at the Contractor's expense. The cleanup shall meet all Federal and State requirements and regulations, including supplying all documentation. A copy of the vendor's/contractor's spill response plan shall be submitted to the P.V.S.C. upon award of this contract.

11. All hazardous material whether sold, delivered, and/or used to perform a service on the P.V.S.C. site, shall be properly labeled in accordance with the New Jersey Worker and Community Right to Know Act (P.L. 1983, C315, N.J.S.A. 34:5A-1 et seq.). The bidder shall include with his bid proposal the Material Safety Data Sheets, for all the products that he intends to deliver to the PVSC under this bid. The vendor shall comply with these terms otherwise his bid will be disqualified.

Hazardous materials not complying with this act will cause the P.V.S.C. to reject shipments or deny the use of such materials on its site. The vendor shall be responsible for any cost incurred for materials found not to be in compliance with the act. The P.V.S.C. will make the sole determination if this act is being violated, and the vendor shall abide by this decision. Violation of this act may be considered an abandonment of the contract, and the Commission may seek redress under the Default Article of the contract.

12. Providing a vendor is awarded a contract or any part thereof, he shall provide the Passaic Valley Sewerage Commission with a Certificate of Insurance indicating coverage for the following: General Liability Insurance; Automobile Insurance; Workmen's Compensation. These certificates of insurance shall exist for the term of contract.

CONTRACT NO. B442-5					
FURNISH AND DELIVER PIPE, FITTINGS, VALVES AND ACCESSORIES TO THE PVSC WAREHOUSE FOR A ONE (1) YEAR PERIOD					
AWARD					
James Duva Inc.,					
Line	Description	Catalog No.	Qty	% Disc.	Del Time Days
135	STAINLESS STEEL BUTTWELD FITTINGS (WELDED & SEAMLESS) (SIZES 1/2 -18"0) MANUFACTURER: TAYLOR FORGE STAINLESS, INC.	Catalog No. #1 #2	EA	x.2 WLD x.62 SMLS 1/2"-8"(x.65 14" W???)10" up	Stk/1 Wk
136	STAINLESS STEEL TYPE 316L, (SEAMLESS & WELDED) (SIZES 2"-8") MANUFACTURER: ALLIED GROUP	Catalog No. No industry STD. Pricing	EA	Market Price	Stk/1 Wk
137	HASTELLOY C-276 PIPE, (SIZES 2"-8") MANUFACTURER: ALLIED GROUP	Catalog No. No industry STD. Pricing	EA	Market Price	Stk/1 Wk
138	STAINLESS STEEL TYPE 316L, BUTT WELD FITTINGS & FLANGES MANUFACTURER: ALLIED GROUP	Catalog No. Fittings #1 + #2 Flanges #3	EA	line 135 applies x.43 flanges	Stk/1 Wk
139	STAINLESS STEEL TYPE 316L, SLIP ON FLANGES (SIZES 2"-8") MANUFACTURER: ALLIED GROUP	Catalog No. #3	EA	X.43	Stk/1 Wk
148	Stainless Steel Pipe Nipples Type 304/316 MANUFACTURER: STANDARD PIPE PRODUCTS, INC	Catalog No. #4	EA	x.04	STK
149	3000 lbs. Stainless Steel Fittings Pricing - Threaded & Socket Weld Type 316 MANUFACTURER: STANDARD PIPE PRODUCTS, INC	<u>Catalog No.</u>	EA	x.08	STK
150	Stainless Steel Pipe (Domestic) Type 304/316 MANUFACTURER: STANDARD PIPE PRODUCTS, INC	Catalog No. NO STD INDUSTRY PRICING	EA	market price	STK/1 WK

BIDDERS EXCEPTIONSItem No. Description (Including Manufacturer, Brand & Model Number)

- #135 - OFFERING, EQUAL TO TAYLOR FORGE
TAYLOR FORGE IS NOT IN BUSINESS
CAN BE FOREIGN OR DOMESTIC
- #136 - OFFERING, PRIMUS, TA CHEN, BRESTOL ON WLD PIPE
OFFERING, WALSEN, PEKCO, DMV, TURACED ON SMUS PIPE
- #137 - HAST PIPE WILL BE SALZGITTER, SPECIAL METAS, OR
EQUAL
- #138 - SEE #135 EXCEPTION FOR FITTINGS
FLANGES WILL BE SUPPLIED AS FELIX OR EQUAL
- #139 - WILL SUPPLY FELIX OR EQUAL
- #148 - WILL SUPPLY TA CHEN NEAPLES
MADE FROM TA CHEN PIPE FROM PIPE SUBMITTAL
- #149 - USE #5 SUBMITTAL FOR BOTH WELL FITTINGS
- #150 - WILL SUPPLY PRIMUS, OR BRESTOL

TAYLOR FORGE STAINLESS, INC.
WELDING FITTINGS



#1

SCH. 10S

Type of Stainless Steel	Nominal Pipe Size And Wall Thickness	90 Long Radius Elbows	45 Long Radius Elbows	90 Short Radius Elbows	Caps	Tees Straight	Type A Stub ends Short (MSS)
304/304L	1/2"	20.00	20.00	N/A	33.00	60.00	43.00
316/316L	.083"	29.00	29.00	N/A	46.00	87.00	46.00
304/304L	3/4"	20.00	20.00	N/A	38.00	60.00	46.00
316/316L	.083"	29.00	29.00	N/A	63.00	87.00	64.00
304/304L	1"	22.00	22.00	90.00	45.00	64.00	49.00
316/316L	.109"	32.00	32.00	129.00	64.00	92.00	72.00
304/304L	1 1/4"	29.00	29.00	97.00	109.00	56.00	86.00
316/316L	.109"	43.00	43.00	139.00	157.00	89.00	124.00
304/304L	1 1/2"	25.00	25.00	98.00	54.00	50.00	40.00
316/316L	.109"	36.00	36.00	140.00	78.00	73.00	58.00
304/304L	2"	29.00	29.00	108.00	50.00	53.00	47.00
316/316L	.109"	43.00	43.00	161.00	73.00	76.00	68.00
304/304L	2 1/2"	67.00	67.00	146.00	75.00	126.00	98.00
316/316L	.120"	97.00	97.00	209.00	108.00	189.00	141.00
304/304L	3"	63.00	50.00	135.00	66.00	99.00	66.00
316/316L	.120"	90.00	73.00	194.00	95.00	144.00	95.00
304/304L	3 1/2"	184.00	184.00	POA	156.00	POA	POA
316/316L	.120"	265.00	265.00	POA	234.00	POA	POA
304/304L	4"	105.00	85.00	168.00	80.00	143.00	94.00
316/316L	.120"	151.00	121.00	242.00	116.00	206.00	135.00
304/304L	5"	389.00	311.00	489.00	190.00	451.00	234.00
316/316L	.134"	644.00	444.00	700.00	274.00	650.00	337.00
304/304L	6"	300.00	211.00	378.00	128.00	356.00	174.00
316/316L	.134"	433.00	305.00	544.00	187.00	511.00	229.00
304/304L	8"	633.00	444.00	789.00	261.00	755.00	316.00
316/316L	.148"	912.00	733.00	689.00	376.00	1088.00	454.00
304/304L	10"	977.00	777.00	1177.00	307.00	1221.00	800.00
316/316L	.165"	1405.00	1122.00	1693.00	473.00	1759.00	1174.00
304/304L	12"	1388.00	972.00	1665.00	578.00	1699.00	1015.00
316/316L	.180"	1998.00	1399.00	2398.00	831.00	2442.00	1462.00

CROSSES, ASA STUB ENDS, & MSS/B STUB ENDS ARE POA
OTHER SIZES AND REDUCTIONS ON APPLICATION

TAYLOR FORGE STAINLESS, INC.



SCH. 10S

WELDING FITTINGS

Type of Stainless Steel	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet
		Concentric	Eccentric			Concentric	Eccentric			Concentric	Eccentric	
304/304L	3/4" x 1/2"	35.00	98.00	76.00	2 1/2" X 1"	147.00	196.00	262.00	6" X 2"	309.00	713.00	622.00
316/316L		52.00	144.00	114.00		174.00	312.00	393.00		508.00	1069.00	933.00
304/304L	1" x 1/2"	50.00	88.00	87.00	2 1/2" X 1 1/2"	116.00	171.00	257.00	6" X 2 1/2"	306.00	772.00	562.00
316/316L		75.00	134.00	130.00		136.00	255.00	387.00		425.00	1071.00	843.00
304/304L	1" x 3/4"	44.00	86.00	79.00	2 1/2" X 2"	80.00	106.00	196.00	6" X 3"	114.00	368.00	511.00
316/316L		65.00	126.00	118.00		100.00	147.00	294.00		170.00	609.00	766.00
304/304L	1 1/4" x 3/4"	93.00	102.00	155.00	3" X 1"	85.00	311.00	180.00	6" X 4"	107.00	227.00	433.00
316/316L		138.00	164.00	228.00		160.00	472.00	317.00		160.00	356.00	650.00
304/304L	1 1/4" x 1"	57.00	82.00	155.00	3" X 1 1/4"	143.00	322.00	413.00	6" X 5"	165.00	285.00	468.00
316/316L		85.00	128.00	269.00		186.00	480.00	573.00		247.00	395.00	650.00
304/304L	1 1/2" x 1/2"	63.00	203.00	106.00	3" X 1 1/2"	56.00	141.00	150.00	8" X 3"	677.00	1082.00	1241.00
316/316L		94.00	304.00	158.00		84.00	220.00	291.00		1078.00	1902.00	1722.00
304/304L	1 1/2" x 3/4"	47.00	171.00	100.00	3" X 2"	49.00	110.00	125.00	8" X 4"	311.00	668.00	1087.00
316/316L		70.00	264.00	150.00		74.00	168.00	187.00		371.00	1116.00	1630.00
304/304L	1 1/2" x 1"	28.00	66.00	80.00	3" X 2 1/2"	54.00	119.00	215.00	8" X 6"	208.00	396.00	906.00
316/316L		43.00	108.00	110.00		80.00	179.00	327.00		297.00	609.00	1359.00
304/304L	1 1/2" x 1 1/4"	37.00	80.00	136.00	4" X 1 1/2"	90.00	288.00	311.00	10" X 4"	686.00	POA	2260.00
316/316L		55.00	128.00	203.00		135.00	446.00	472.00		1068.00	POA	3136.00
304/304L	2" X 1/2"	99.00	276.00	134.00	4" X 2"	67.00	219.00	246.00	10" X 6"	467.00	899.00	2260.00
316/316L		148.00	383.00	216.00		100.00	330.00	341.00		700.00	1382.00	3136.00
304/304L	2" X 3/4"	74.00	196.00	92.00	4" X 2 1/2"	70.00	230.00	257.00	10" X 8"	422.00	688.00	2259.00
316/316L		110.00	271.00	150.00		105.00	353.00	357.00		633.00	954.00	3136.00
304/304L	2" X 1"	44.00	100.00	80.00	4" X 3"	62.00	110.00	178.00	12" X 6"	715.00	1707.00	3874.00
316/316L		66.00	141.00	116.00		92.00	168.00	294.00		1073.00	2878.00	5811.00
304/304L	2" X 1 1/4"	43.00	144.00	114.00	5" X 3"	255.00	296.00	623.00	12" X 8"	598.00	1265.00	3370.00
316/316L		64.00	233.00	183.00		345.00	410.00	934.00		896.00	2132.00	5055.00
304/304L	2" X 1 1/2"	36.00	46.00	72.00	5" X 4"	204.00	285.00	541.00	12" X 10"	500.00	750.00	2931.00
316/316L		54.00	87.00	170.00		282.00	395.00	811.00		750.00	1168.00	4396.00

OTHER SIZES AND REDUCTIONS ON APPLICATION

TAYLOR FORGE STAINLESS, INC.



SCH. 40S

WELDING FITTINGS

Type of Stainless Steel	Nominal Pipe Size And Wall Thickness	90 Long Radius Elbows	45 Long Radius Elbows	90 Short Radius Elbows	Caps	Tees Straight	Type A Stub ends Short (MSS)
304/304L	1/2"	24.00	24.00	N/A	36.00	60.00	43.00
316/316L	.109"	36.00	36.00	N/A	54.00	90.00	64.00
304/304L	3/4"	24.00	24.00	N/A	42.00	60.00	47.00
316/316L	.113"	36.00	36.00	N/A	63.00	90.00	70.00
304/304L	1"	25.00	25.00	80.00	50.00	64.00	50.00
316/316L	.133"	37.00	37.00	120.00	76.00	95.00	76.00
304/304L	1 1/4"	33.00	33.00	137.00	98.00	148.00	103.00
316/316L	.140"	49.00	49.00	205.00	147.00	221.00	154.00
304/304L	1 1/2"	26.00	26.00	94.00	73.00	68.00	50.00
316/316L	.145"	39.00	39.00	140.00	109.00	102.00	76.00
304/304L	2"	37.00	37.00	114.00	59.00	102.00	52.00
316/316L	.154"	56.00	56.00	170.00	88.00	151.00	77.00
304/304L	2 1/2"	70.00	70.00	164.00	97.00	128.00	107.00
316/316L	.203"	106.00	106.00	245.00	145.00	191.00	160.00
304/304L	3"	90.00	72.00	147.00	73.00	129.00	75.00
316/316L	.216"	136.00	109.00	220.00	108.00	194.00	113.00
304/304L	3 1/2"	333.00	333.00	POA	234.00	POA	POA
316/316L	.226"	500.00	500.00	POA	350.00	POA	POA
304/304L	4"	156.00	111.00	231.00	99.00	244.00	111.00
316/316L	.237"	234.00	167.00	371.00	148.00	365.00	167.00
304/304L	5"	522.00	367.00	744.00	203.00	562.00	272.00
316/316L	.258"	783.00	550.00	1116.00	304.00	843.00	409.00
304/304L	6"	456.00	322.00	611.00	226.00	538.00	244.00
316/316L	.280"	683.00	483.00	916.00	338.00	806.00	366.00
304/304L	8"	911.00	639.00	1138.00	350.00	1088.00	353.00
316/316L	.322"	1366.00	961.00	1639.00	524.00	1632.00	530.00
304/304L	10"	1914.00	1344.00	2135.00	452.00	2116.00	910.00
316/316L	.365"	2871.00	2010.00	3202.00	678.00	3174.00	1365.00
304/304L	12"	2442.00	1710.00	2820.00	693.00	2820.00	1308.00
316/316L	.375"	3663.00	2565.00	4230.00	1039.00	4230.00	1962.00

CROSSES, ASA STUB ENDS, & MSS/B STUB ENDS ARE POA
OTHER SIZES AND REDUCTIONS ON APPLICATION

TAYLOR FORGE STAINLESS, INC.
WELDING FITTINGS.



SCH. 40S

Type of Stainless Steel	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet
		Concentric	Eccentric			Concentric	Eccentric			Concentric	Eccentric	
304/304L	3/4" x 1/2"	45.00	95.00	87.00	2 1/2" X 1"	168.00	209.00	285.00	6" X 2"	412.00	779.00	977.00
316/316L		67.00	140.00	128.00		251.00	314.00	412.00		618.00	1077.00	1466.00
304/304L	1" x 1/2"	67.00	95.00	87.00	2 1/2" X 1 1/2"	134.00	167.00	257.00	6" X 2 1/2"	349.00	779.00	877.00
316/316L		100.00	140.00	130.00		200.00	250.00	386.00		523.00	1077.00	1283.00
304/304L	1" x 3/4"	47.00	94.00	80.00	2 1/2" X 2"	86.00	107.00	207.00	6" X 3"	181.00	368.00	744.00
316/316L		70.00	140.00	120.00		128.00	160.00	321.00		271.00	562.00	1116.00
304/304L	1 1/4" x 3/4"	115.00	143.00	224.00	3" X 1"	116.00	428.00	231.00	6" X 4"	149.00	280.00	644.00
316/316L		171.00	214.00	326.00		174.00	654.00	375.00		232.00	467.00	966.00
304/304L	1 1/4" x 1"	58.00	144.00	212.00	3" X 1 1/4"	168.00	328.00	447.00	6" X 5"	211.00	359.00	744.00
316/316L		87.00	226.00	308.00		251.00	483.00	658.00		317.00	587.00	1116.00
304/304L	1 1/2" x 1/2"	97.00	243.00	128.00	3" X 1 1/2"	59.00	202.00	194.00	8" X 3"	751.00	1082.00	1732.00
316/316L		145.00	365.00	177.00		88.00	314.00	290.00		1126.00	1851.00	2598.00
304/304L	1 1/2" x 3/4"	78.00	270.00	119.00	3" X 2"	56.00	174.00	161.00	8" X 4"	467.00	668.00	1501.00
316/316L		117.00	408.00	177.00		84.00	263.00	241.00		700.00	1022.00	2253.00
304/304L	1 1/2" x 1"	34.00	113.00	92.00	3" X 2 1/2"	59.00	188.00	227.00	8" X 6"	349.00	436.00	1306.00
316/316L		50.00	167.00	137.00		88.00	278.00	338.00		523.00	653.00	1765.00
304/304L	1 1/2" x 1 1/4"	45.00	102.00	136.00	4" X 1 1/2"	121.00	336.00	467.00	10" X 4"	800.00	POA	3508.00
316/316L		67.00	150.00	203.00		181.00	501.00	706.00		1199.00	POA	5262.00
304/304L	2" X 1/2"	143.00	296.00	200.00	4" X 2"	79.00	322.00	402.00	10" X 6"	650.00	899.00	2920.00
316/316L		214.00	434.00	300.00		118.00	496.00	603.00		974.00	1377.00	4379.00
304/304L	2" X 3/4"	97.00	276.00	175.00	4" X 2 1/2"	115.00	230.00	336.00	10" X 8"	540.00	674.00	2539.00
316/316L		145.00	412.00	261.00		171.00	352.00	503.00		810.00	1011.00	3808.00
304/304L	2" X 1"	45.00	154.00	151.00	4" X 3"	59.00	161.00	292.00	12" X 6"	999.00	2297.00	4474.00
316/316L		67.00	214.00	227.00		88.00	249.00	438.00		1499.00	3867.00	6710.00
304/304L	2" X 1 1/4"	54.00	156.00	246.00	5" X 3"	351.00	439.00	777.00	12" X 8"	917.00	1258.00	3891.00
316/316L		80.00	234.00	368.00		527.00	658.00	1175.00		1376.00	2084.00	6946.00
304/304L	2" X 1 1/2"	39.00	90.00	127.00	5" X 4"	284.00	355.00	674.00	12" X 10"	644.00	983.00	3384.00
316/316L		58.00	147.00	190.00		425.00	531.00	1011.00		986.00	1580.00	5075.00

OTHER SIZES AND REDUCTIONS ON APPLICATION

TAYLOR FORGE STAINLESS, INC.



SCH. 80S

WELDING FITTINGS

Type of Stainless Steel	Nominal Pipe Size And Wall Thickness	90 Long Radius Elbows	45 Long Radius Elbows	90 Short Radius Elbows	Caps	Tees Straight
304/304L	1/2"	55.00	69.00	N/A	78.00	96.00
316/316L	.147"	82.00	99.00	N/A	117.00	144.00
304/304L	3/4"	58.00	69.00	N/A	107.00	108.00
316/316L	.154"	87.00	99.00	N/A	160.00	161.00
304/304L	1"	60.00	70.00	151.00	106.00	131.00
316/316L	.179"	90.00	100.00	227.00	158.00	197.00
304/304L	1 1/2"	102.00	90.00	165.00	165.00	135.00
316/316L	.200"	151.00	124.00	247.00	247.00	201.00
304/304L	2"	150.00	122.00	189.00	89.00	173.00
316/316L	.218"	225.00	168.00	278.00	134.00	258.00
304/304L	2 1/2"	189.00	141.00	345.00	151.00	391.00
316/316L	.276"	278.00	208.00	517.00	217.00	587.00
304/304L	3"	214.00	160.00	311.00	167.00	289.00
316/316L	.300"	320.00	240.00	467.00	250.00	433.00
304/304L	4"	361.00	270.00	544.00	279.00	494.00
316/316L	.337"	541.00	406.00	816.00	300.00	742.00
304/304L	6"	1066.00	800.00	1554.00	329.00	1588.00
316/316L	.432"	1599.00	1421.00	2331.00	410.00	2376.00
304/304L	8"	1543.00	1155.00	1865.00	461.00	2431.00
316/316L	.500"	2315.00	1732.00	2664.00	689.00	3641.00
304/304L	10"	3364.00	2520.00	3663.00	650.00	3730.00
316/316L	.500"	5045.00	3774.00	4940.00	966.00	5595.00
304/304L	12"	4074.00	3053.00	4995.00	844.00	4452.00
316/316L	.500"	6178.00	4579.00	7493.00	1266.00	6660.00

CROSSES, ASA/A, MSS/A, AND MSS/B STUB ENDS ARE POA
OTHER SIZES AND REDUCTIONS ON APPLICATION



TAYLOR FORGE STAINLESS, INC.
WELDING FITTINGS

SCH. 80S

Type of Stainless Steel	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet
		Concentric	Eccentric			Concentric	Eccentric			Concentric	Eccentric	
304/304L	3/4" x 1/2"	60.00	89.00	135.00	2" X 1 1/2"	95.00	178.00	196.00	4" X 3"	248.00	389.00	618.00
316/316L		90.00	130.00	201.00		143.00	264.00	350.00		371.00	669.00	926.00
304/304L	1" x 1/2"	89.00	111.00	189.00	2 1/2" X 1"	190.00	267.00	666.00	6" X 3"	590.00	738.00	2193.00
316/316L		134.00	167.00	278.00		285.00	400.00	999.00		884.00	1421.00	2731.00
304/304L	1" x 3/4"	89.00	111.00	164.00	2 1/2" X 1 1/2"	190.00	237.00	533.00	6" X 4"	517.00	645.00	1905.00
316/316L		134.00	167.00	246.00		285.00	405.00	800.00		774.00	968.00	2858.00
304/304L	1 1/2" x 1/2"	146.00	220.00	231.00	2 1/2" X 2"	190.00	238.00	467.00	8" X 4"	675.00	926.00	3355.00
316/316L		218.00	279.00	324.00		285.00	386.00	700.00		1013.00	1534.00	5029.00
304/304L	1 1/2" x 3/4"	146.00	183.00	231.00	3" X 1 1/2"	251.00	352.00	433.00	8" X 6"	609.00	850.00	2918.00
316/316L		218.00	272.00	324.00		375.00	568.00	718.00		913.00	1281.00	4376.00
304/304L	1 1/2" x 1"	106.00	191.00	231.00	3" X 2"	139.00	275.00	361.00	10" X 6"	1093.00	1388.00	5145.00
316/316L		158.00	273.00	324.00		225.00	462.00	598.00		1639.00	2048.00	7715.00
304/304L	1 1/2" x 1 1/4"	125.00	228.00	231.00	3" X 2 1/2"	227.00	284.00	443.00	10" X 8"	986.00	1233.00	4529.00
316/316L		187.00	292.00	324.00		340.00	462.00	718.00		1479.00	1849.00	6714.00
304/304L	2" X 3/4"	181.00	263.00	251.00	4" X 2"	390.00	487.00	817.00	12" X 8"	1208.00	1523.00	6139.00
316/316L		271.00	389.00	364.00		584.00	731.00	1226.00		1829.00	2285.00	9213.00
304/304L	2" X 1"	124.00	209.00	248.00	4" X 2 1/2"	390.00	487.00	711.00	12" X 10"	1122.00	1401.00	5342.00
316/316L		185.00	292.00	364.00		584.00	731.00	851.00		1682.00	2098.00	8012.00

OTHER SIZES AND REDUCTIONS ON APPLICATION

TAYLOR FORGE STAINLESS, INC.



SCH. 160S

WELDING FITTINGS

Type of Stainless Steel	Nominal Pipe Size And Wall Thickness	90 Long Radius Elbows	45 Long Radius Elbows	90 Short Radius Elbows	Caps	Tees Straight
304/304L	1/2"	109.00	109.00	N/A	134.00	191.00
316/316L	.187"	164.00	164.00	N/A	200.00	278.00
304/304L	3/4"	128.00	128.00	N/A	134.00	191.00
316/316L	.218"	184.00	184.00	N/A	200.00	278.00
304/304L	1"	123.00	123.00	N/A	134.00	191.00
316/316L	.250"	184.00	184.00	N/A	200.00	278.00
304/304L	1 1/2"	160.00	160.00	POA	214.00	245.00
316/316L	.281"	240.00	240.00	POA	320.00	367.00
304/304L	2"	195.00	195.00	POA	235.00	367.00
316/316L	.343"	289.00	289.00	POA	351.00	544.00
304/304L	2 1/2"	356.00	356.00	POA	POA	POA
316/316L	.375"	533.00	533.00	POA	POA	POA
304/304L	3"	398.00	398.00	POA	322.00	744.00
316/316L	.438"	589.00	589.00	POA	483.00	1110.00
304/304L	4"	644.00	578.00	POA	389.00	1399.00
316/316L	.531"	966.00	866.00	POA	583.00	1998.00
304/304L	6"	1965.00	1466.00	POA	666.00	4707.00
316/316L	.718"	2886.00	2165.00	POA	999.00	6993.00

MSS & ASA STUB ENDS ARE POA
OTHER SIZES AND REDUCTIONS ON APPLICATION

TAYLOR FORGE STAINLESS, INC.
WELDING FITTINGS



SCH. 160S

Type of Stainless Steel	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet
		Concentric	Eccentric			Concentric	Eccentric			Concentric	Eccentric	
304/304L	3/4" x 1/2"	97.00	POA	POA	2" X 1"	190.00	POA	POA	4" X 2"	500.00	POA	POA
316/316L		145.00	POA	POA		285.00	POA	POA		750.00	POA	POA
304/304L	1" x 1/2"	114.00	POA	POA	2" X 1 1/2"	190.00	POA	POA	4" X 3"	454.00	POA	POA
316/316L		170.00	POA	POA		285.00	POA	POA		681.00	POA	POA
304/304L	1" x 3/4"	114.00	POA	POA	2 1/2" X 2"	295.00	POA	POA	6" X 3"	971.00	POA	POA
316/316L		170.00	POA	POA		441.00	POA	POA		1456.00	POA	POA
304/304L	1 1/2" x 3/4"	184.00	POA	POA	3" X 1 1/2"	470.00	POA	POA	6" X 4"	971.00	POA	POA
316/316L		272.00	POA	POA		705.00	POA	POA		1456.00	POA	POA
304/304L	1 1/2" x 1"	181.00	POA	POA	3" X 2"	285.00	POA	POA				
316/316L		173.00	POA	POA		427.00	POA	POA				

OTHER SIZES AND REDUCTIONS ON APPLICATION

TAYLOR FORGE STAINLESS, INC.
SEAMLESS WELDING FITTINGS



SCH. 10S

Type of Stainless Steel	Nominal Pipe Size And Wall Thickness	90 Long Radius Elbows	45 Long Radius Elbows	90 Short Radius Elbows	Tees Straight
304/304L	1/2"	20.00	20.00	N/A	60.00
316/316L	.083"	29.00	29.00	N/A	87.00
304/304L	3/4"	20.00	20.00	N/A	60.00
316/316L	.083"	29.00	29.00	N/A	87.00
304/304L	1"	22.00	22.00	100.00	64.00
316/316L	.109"	32.00	32.00	143.00	92.00
304/304L	1 1/4"	35.00	35.00	107.00	149.00
316/316L	.109"	53.00	53.00	145.00	224.00
304/304L	1 1/2"	45.00	45.00	109.00	96.00
316/316L	.109"	67.00	67.00	164.00	144.00
304/304L	2"	56.00	56.00	120.00	110.00
316/316L	.109"	67.00	67.00	178.00	160.00
304/304L	2 1/2"	98.00	98.00	161.00	232.00
316/316L	.120"	147.00	147.00	220.00	348.00
304/304L	3"	98.00	98.00	147.00	178.00
316/316L	.120"	147.00	147.00	220.00	267.00
304/304L	3 1/2"	POA	POA	POA	POA
316/316L	.120"	POA	POA	POA	POA
304/304L	4"	167.00	134.00	250.00	274.00
316/316L	.120"	250.00	200.00	375.00	410.00
304/304L	5"	436.00	349.00	653.00	937.00
316/316L	.134"	653.00	522.00	980.00	1406.00
304/304L	6"	461.00	346.00	691.00	689.00
316/316L	.134"	691.00	518.00	1036.00	1033.00
304/304L	8"	999.00	750.00	1499.00	1188.00
316/316L	.148"	1499.00	1124.00	2248.00	1782.00

OTHER SIZES AND REDUCTIONS ON APPLICATION

TAYLOR FORGE STAINLESS, INC.
SEAMLESS WELDING FITTINGS



SCH. 10S

Type of Stainless Steel	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet
		Concentric	Eccentric			Concentric	Eccentric			Concentric	Eccentric	
304/304L	3/4" x 1/2"	35.00	98.00	76.00	2 1/2" X 1"	176.00	245.00	368.00	6" X 2"	POA	POA	POA
316/316L		52.00	144.00	114.00		256.00	370.00	551.00		POA	POA	POA
304/304L	1" x 1/2"	50.00	88.00	87.00	2 1/2" X 1 1/2"	144.00	206.00	320.00	6" X 2 1/2"	POA	POA	POA
316/316L		75.00	134.00	130.00		201.00	302.00	479.00		POA	POA	POA
304/304L	1" x 3/4"	44.00	86.00	79.00	2 1/2" X 2"	107.00	134.00	278.00	6" X 3"	203.00	441.00	998.00
316/316L		65.00	126.00	118.00		163.00	216.00	418.00		246.00	725.00	1498.00
304/304L	1 1/4" x 3/4"	92.00	122.00	205.00	3" X 1"	167.00	444.00	320.00	6" X 4"	139.00	274.00	908.00
316/316L		137.00	194.00	307.00		231.00	639.00	458.00		199.00	422.00	1362.00
304/304L	1 1/4" x 1"	77.00	96.00	178.00	3" X 1 1/4"	174.00	388.00	490.00	6" X 5"	203.00	342.00	826.00
316/316L		113.00	144.00	268.00		269.00	569.00	666.00		258.00	474.00	1239.00
304/304L	1 1/2" x 1/2"	84.00	245.00	159.00	3" X 1 1/2"	76.00	170.00	288.00	8" X 3"	POA	POA	POA
316/316L		127.00	359.00	239.00		100.00	258.00	408.00		POA	POA	POA
304/304L	1 1/2" x 3/4"	60.00	206.00	139.00	3" X 2"	60.00	131.00	203.00	8" X 4"	398.00	806.00	1570.00
316/316L		103.00	314.00	207.00		80.00	197.00	320.00		661.00	1323.00	2355.00
304/304L	1 1/2" x 1"	35.00	87.00	120.00	3" X 2 1/2"	63.00	142.00	258.00	8" X 6"	298.00	478.00	1366.00
316/316L		54.00	130.00	179.00		92.00	212.00	387.00		453.00	725.00	2048.00
304/304L	1 1/2" x 1 1/4"	44.00	119.00	162.00	4" X 1 1/2"	158.00	348.00	417.00				
316/316L		70.00	162.00	240.00		210.00	526.00	623.00				
304/304L	2" X 1/2"	134.00	332.00	198.00	4" X 2"	100.00	263.00	378.00				
316/316L		210.00	360.00	214.00		130.00	392.00	564.00				
304/304L	2" X 3/4"	97.00	236.00	404.00	4" X 2 1/2"	140.00	276.00	361.00				
316/316L		143.00	339.00	210.00		200.00	418.00	540.00				
304/304L	2" X 1"	43.00	120.00	404.00	4" X 3"	80.00	132.00	328.00				
316/316L		59.00	179.00	107.00		113.00	197.00	491.00				
304/304L	2" X 1 1/4"	69.00	172.00	150.00	5" X 3"	333.00	528.00	1133.00				
316/316L		100.00	275.00	162.00		500.00	812.00	1700.00				
304/304L	2" X 1 1/2"	39.00	58.00	131.00	5" X 4"	278.00	347.00	1031.00				
316/316L		54.00	101.00	198.00		411.00	520.00	1546.00				

OTHER SIZES AND REDUCTIONS ON APPLICATION

TAYLOR FORGE STAINLESS, INC.
SEAMLESS WELDING FITTINGS



SCH. 40S

Type of Stainless Steel	Nominal Pipe Size And Wall Thickness	90 Long Radius Elbows	45 Long Radius Elbows	90 Short Radius Elbows	Tees Straight
304/304L	1/2"	24.00	24.00	N/A	60.00
316/316L	.109"	36.00	36.00	N/A	90.00
304/304L	3/4"	24.00	24.00	N/A	60.00
316/316L	.113"	36.00	36.00	N/A	90.00
304/304L	1"	25.00	25.00	89.00	64.00
316/316L	.133"	37.00	37.00	134.00	95.00
304/304L	1 1/4"	37.00	37.00	151.00	148.00
316/316L	.140"	55.00	55.00	227.00	221.00
304/304L	1 1/2"	44.00	44.00	105.00	96.00
316/316L	.145"	65.00	65.00	156.00	134.00
304/304L	2"	60.00	60.00	126.00	189.00
316/316L	.154"	90.00	90.00	189.00	284.00
304/304L	2 1/2"	106.00	106.00	181.00	200.00
316/316L	.203"	158.00	158.00	267.00	300.00
304/304L	3"	107.00	107.00	163.00	198.00
316/316L	.216"	160.00	160.00	245.00	291.00
304/304L	3 1/2"	POA	POA	POA	POA
316/316L	.226"	POA	POA	POA	POA
304/304L	4"	211.00	169.00	289.00	294.00
316/316L	.237"	317.00	254.00	428.00	440.00
304/304L	5"	540.00	406.00	822.00	874.00
316/316L	.258"	810.00	608.00	1239.00	1269.00
304/304L	6"	622.00	467.00	777.00	744.00
316/316L	.280"	933.00	700.00	1166.00	1116.00
304/304L	8"	1261.00	941.00	1568.00	1432.00
316/316L	.322"	1882.00	1411.00	2343.00	2148.00

OTHER SIZES AND REDUCTIONS ON APPLICATION

SCH. 40S

TAYLOR FORGE STAINLESS, INC
SEAMLESS WELDING FITTINGS

Type of Stainless Steel	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet	Nominal Pipe Size	Reducers		Tees Reducing Outlet
		Concentric	Eccentric			Concentric	Eccentric			Concentric	Eccentric	
304/304L	3/4" x 1/2"	45.00	95.00	87.00	2 1/2" X 1"	187.00	287.00	334.00	6" X 2"	POA	POA	POA
316/316L		67.00	140.00	128.00		279.00	388.00	488.00		POA	POA	POA
304/304L	1" x 1/2"	67.00	95.00	87.00	2 1/2" X 1 1/2"	138.00	202.00	305.00	6" X 2 1/2"	POA	POA	POA
316/316L		100.00	140.00	130.00		206.00	291.00	447.00		POA	POA	POA
304/304L	1" x 3/4"	47.00	94.00	80.00	2 1/2" X 2"	100.00	155.00	240.00	6" X 3"	266.00	407.00	1083.00
316/316L		70.00	140.00	120.00		150.00	255.00	360.00		339.00	677.00	1621.00
304/304L	1 1/4" x 3/4"	147.00	184.00	271.00	3" X 1"	217.00	518.00	350.00	6" X 4"	180.00	298.00	983.00
316/316L		220.00	275.00	407.00		300.00	753.00	418.00		258.00	470.00	1472.00
304/304L	1 1/4" x 1"	77.00	161.00	267.00	3" X 1 1/4"	194.00	402.00	461.00	6" X 5"	264.00	369.00	893.00
316/316L		117.00	245.00	370.00		290.00	632.00	658.00		403.00	596.00	1356.00
304/304L	1 1/2" x 1/2"	130.00	261.00	143.00	3" X 1 1/2"	94.00	221.00	305.00	8" X 3"	POA	POA	POA
316/316L		194.00	383.00	217.00		117.00	360.00	427.00		POA	POA	POA
304/304L	1-1/2" x 3/4"	104.00	327.00	141.00	3" X 2"	69.00	180.00	315.00	8" X 4"	517.00	723.00	1890.00
316/316L		160.00	488.00	213.00		94.00	266.00	389.00		774.00	1184.00	2835.00
304/304L	1 1/2" x 1"	39.00	136.00	116.00	3" X 2 1/2"	76.00	194.00	226.00	8" X 6"	362.00	453.00	1719.00
316/316L		57.00	196.00	171.00		104.00	279.00	356.00		542.00	680.00	2578.00
304/304L	1 1/2" x 1 1/4"	54.00	122.00	162.00	4" X 1 1/2"	191.00	344.00	399.00				
316/316L		79.00	177.00	240.00		234.00	507.00	557.00				
304/304L	2" X 1/2"	191.00	353.00	318.00	4" X 2"	120.00	330.00	428.00				
316/316L		271.00	516.00	350.00		153.00	503.00	502.00				
304/304L	2" X 3/4"	115.00	332.00	289.00	4" X 2 1/2"	158.00	260.00	389.00				
316/316L		144.00	490.00	429.00		220.00	390.00	579.00				
304/304L	2" X 1"	54.00	184.00	260.00	4" X 3"	93.00	164.00	351.00				
316/316L		78.00	266.00	391.00		138.00	252.00	528.00				
304/304L	2" X 1 1/4"	75.00	201.00	305.00	5" X 3"	390.00	534.00	977.00				
316/316L		107.00	255.00	453.00		584.00	808.00	1466.00				
304/304L	2" X 1 1/2"	47.00	117.00	227.00	5" X 4"	315.00	393.00	888.00				
316/316L		67.00	174.00	340.00		471.00	590.00	1332.00				

OTHER SIZES AND REDUCTIONS ON APPLICATION

#2



≈PICOR

≈TUBE LINE
STAINLESS

≈TUBE TEC

≈BRITE LINE

Stainless Steel Large Diameter Fittings

Types 304/304L, 316/316L
Fittings Schedules 10S thru 40S

Price Schedule CP-LD-03-12

Effective 03/01/2012
Subject to change without notice.

Please visit our website at:
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Fax 630-690-9701

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Phone 407-323-0940
Fax 321-257-1005



Price Schedule CP-LD-03-12

Effective 03/01/2012

Subject to change without notice.

Piping Solutions That Fit.

Large Diameter Fittings

www.corepipe.com

TYPE A-403 WPW 304/L

SCHEDULE 10S

Nominal Pipe Size (in.)	90 Elbows		45 LR Elbows	Tees	Caps		Stub Ends / MSS Type	
	Long Radius	Short Radius					A	
14	1,512.00	1,744.00	894.00	1,605.00	795.00		1,227.00	
16	1,740.00	2,247.00	1,131.00	1,879.00	920.00		1,485.00	
18	2,355.00	2,990.00	1,530.00	2,568.00	1,291.00		1,825.00	
20	4,015.00	4,412.00	2,610.00	6,415.00	1,540.00		2,090.00	
24	5,229.00	5,860.00	3,398.00	8,622.00	2,513.00		2,524.00	

TYPE A-403 WPW 316/L

SCHEDULE 10S

Nominal Pipe Size (in.)	90 Elbows		45 LR Elbows	Tees	Caps		Stub Ends / MSS Type	
	Long Radius	Short Radius					A	
14	2,225.00	2,413.00	1,377.00	2,319.00	985.00		1,645.00	
16	2,605.00	3,122.00	1,693.00	2,964.00	1,264.00		2,029.00	
18	3,459.00	3,859.00	2,248.00	3,744.00	1,885.00		2,349.00	
20	5,029.00	6,245.00	3,422.00	8,219.00	2,122.00		2,794.00	
24	6,518.00	6,890.00	4,247.00	11,952.00	3,480.00		3,200.00	

Prices for items, sizes and/or alloys not listed are on application.



Price Schedule CP-LD-03-12

Effective 03/01/2012

Subject to change without notice.

Piping Solutions That Fit.

Large Diameter Fittings

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TYPE A-403 WPW 304/L - 316/L

SCHEDULE 10S

Stainless Steel Type	Nominal Pipe Size	Reducers			Nominal Pipe Size	Reducers			Nominal Pipe Size	Reducers		
		Concentric	Eccentric	Tees		Concentric	Eccentric	Tees		Concentric	Eccentric	Tees
304/L					20 X 14	1,449.00	1,692.00					
316/L						1,809.00	1,975.00					
304/L	14 X 8	650.00	897.00		20 X 16	1,350.00	1,600.00					
316/L		812.00	1,122.00			1,785.00	1,915.00					
304/L	14 X 10	625.00	840.00		20 X 18	1,302.00	1,578.00					
316/L		792.00	1,048.00			1,705.00	1,849.00					
304/L	14 X 12	600.00	793.00									
316/L		760.00	992.00									
304/L												
316/L												
304/L	16 X 10	862.00	1,019.00		24 X 16	1,796.00	1,982.00					
316/L		1,087.00	1,265.00			2,245.00	2,470.00					
304/L	16 X 12	844.00	980.00		24 X 18	1,762.00	1,915.00					
316/L		1,055.00	1,240.00			2,160.00	2,350.00					
304/L	16 X 14	818.00	960.00		24 X 20	1,720.00	1,885.00					
316/L		985.00	1,226.00			2,009.00	2,244.00					
304/L												
316/L												
304/L	18 X 12	943.00	1,198.00									
316/L		1,282.00	1,468.00									
304/L	18 X 14	930.00	1,102.00									
316/L		1,240.00	1,390.00									
304/L	18 X 16	922.00	1,065.00									
316/L		1,210.00	1,318.00									
304/L												
316/L												
304/L												
316/L												

Prices for items, sizes and/or alloys not listed are on application.



Price Schedule CP-LD-03-12

Effective 03/01/2012

Subject to change without notice.

Piping Solutions That Fit.

Large Diameter Fittings

www.corepipe.com

TYPE A-403 WPW 304/L

SCHEDULE 40S

Nominal Pipe Size (in.)	90 Elbows		45 LR Elbows	Tees	Caps		Stub Ends / MSS Type	
	Long Radius	Short Radius					A	
14	3,245.00	4,214.00	1,902.00	5,419.00	1,029.00		1,420.00	
16	3,740.00	5,350.00	2,480.00	7,015.00	1,430.00		1,720.00	
18	4,619.00	6,890.00	3,009.00	8,812.00	2,245.00		1,948.00	
20	6,204.00	8,862.00	4,130.00	11,650.00	2,830.00		2,310.00	
24	8,408.00	11,450.00	5,819.00	14,200.00	4,150.00		2,816.00	

TYPE A-403 WPW 316/L

SCHEDULE 40S

Nominal Pipe Size (in.)	90 Elbows		45 LR Elbows	Tees	Caps		Stub Ends / MSS Type	
	Long Radius	Short Radius					A	
14	4,420.00	6,120.00	2,740.00	8,236.00	1,590.00		2,129.00	
16	5,422.00	7,742.00	3,522.00	10,700.00	2,185.00		2,580.00	
18	6,590.00	10,500.00	4,383.00	13,455.00	3,410.00		2,952.00	
20	8,762.00	13,150.00	5,790.00	17,800.00	4,360.00		3,410.00	
24	12,115.00	15,912.00	7,922.00	21,240.00	6,532.00		4,122.00	

Prices for items, sizes and/or alloys not listed are on application.

Price Schedule CP-LD-03-12
Effective 03/01/2012
Subject to change without notice.



Piping Solutions That Fit.

Large Diameter Fittings
www.corepipe.com

TYPE A-403 WPW 304/L - 316/L

SCHEDULE 40S

Stainless Steel Type	Nominal Pipe Size	Reducers			Nominal Pipe Size	Reducers			Nominal Pipe Size	Reducers		
		Concentric	Eccentric	Tees		Concentric	Eccentric	Tees		Concentric	Eccentric	Tees
304/L 316/L					18 X 16	1,540.00 2,019.00	1,884.00 2,570.00					
304/L 316/L	14 X 8	1,050.00 1,392.00	1,400.00 1,860.00									
304/L 316/L	14 X 10	1,025.00 1,360.00	1,380.00 1,834.00									
304/L 316/L	14 X 12	990.00 1,300.00	1,322.00 1,805.00		20 X 14	2,119.00 2,830.00	2,738.00 3,450.00					
304/L 316/L					20 X 16	2,033.00 2,705.00	2,690.00 3,364.00					
304/L 316/L					20 X 18	1,992.00 2,642.00	2,559.00 3,288.00					
304/L 316/L	16 X 10	1,240.00 1,654.00	1,729.00 2,310.00									
304/L 316/L	16 X 12	1,200.00 1,635.00	1,690.00 2,844.00									
304/L 316/L	16 X 14	1,172.00 1,590.00	1,650.00 2,792.00									
304/L 316/L					24 X 16	2,510.00 3,322.00	3,240.00 4,480.00					
304/L 316/L					24 X 18	2,449.00 3,219.00	3,019.00 4,377.00					
304/L 316/L					24 X 20	2,385.00 3,128.00	2,933.00 4,285.00					
304/L 316/L	18 X 12	1,615.00 2,140.00	2,015.00 2,730.00									
304/L 316/L	18 X 14	1,582.00 2,100.00	1,952.00 2,683.00									

Prices for items, sizes and/or alloys not listed are on application.

#3

GERLIN INC./ CORE PIPE PRODUCTS INC.
 170 TUBEWAY DRIVE
 CAROL STREAM, IL 60188
 630-690-7000 MAIN
 630-690-9701 FAX
 www.gerlin.com

PRICE SHEET
 NO. GL-2007-3
 STAINLESS
 FLANGES

EFFECTIVE:
 MARCH 1, 2007

TYPE 304/304L

150 LB					300 LB				
Nominal Size (in.)	WELD NECK & SOCKET WELD	SLIP-ON	BLIND	THREADED & LAP JOINT	Nominal Size (in.)	WELD NECK & SOCKET WELD	SLIP-ON	BLIND	THREADED & LAP JOINT
1/2	45.00	40.00	40.00	45.00	1/2	76.00	60.00	63.00	71.00
3/4	50.00	41.00	44.00	50.00	3/4	76.00	60.00	63.00	71.00
1	58.00	45.00	47.00	55.00	1	76.00	60.00	63.00	71.00
1 1/4	83.00	61.00	67.00	71.00	1 1/4	118.00	92.00	86.00	109.00
1 1/2	83.00	61.00	67.00	71.00	1 1/2	118.00	92.00	86.00	109.00
2	92.00	79.00	83.00	93.00	2	122.00	100.00	93.00	132.00
2 1/2	139.00	111.00	118.00	130.00	2 1/2	191.00	189.00	188.00	217.00
3	152.00	119.00	130.00	136.00	3	210.00	197.00	196.00	225.00
3 1/2					3 1/2				
4	212.00	162.00	182.00	186.00	4	348.00	270.00	264.00	323.00
5	293.00	212.00	222.00	286.00	5	520.00	460.00	510.00	562.00
6	366.00	247.00	266.00	334.00	6	651.00	552.00	604.00	734.00
8	620.00	467.00	487.00	644.00	8	1004.00	775.00	891.00	1168.00
10	915.00	725.00	846.00	881.00	10	1422.00	1035.00	1338.00	1581.00
12	1428.00	1071.00	1145.00	1381.00	12	2072.00	1709.00	1900.00	2218.00

TYPE 316/316/L

150 LB					300 LB				
Nominal Size (in.)	WELD NECK & SOCKET WELD	SLIP-ON	BLIND	THREADED & LAP JOINT	Nominal Size (in.)	WELD NECK & SOCKET WELD	SLIP-ON	BLIND	THREADED & LAP JOINT
1/2	68.00	52.00	52.00	63.00	1/2	106.00	80.00	89.00	97.00
3/4	73.00	59.00	61.00	73.00	3/4	106.00	80.00	89.00	97.00
1	84.00	67.00	70.00	78.00	1	106.00	80.00	89.00	97.00
1 1/4	117.00	85.00	85.00	104.00	1 1/4	159.00	131.00	120.00	159.00
1 1/2	117.00	85.00	85.00	104.00	1 1/2	159.00	131.00	120.00	159.00
2	127.00	107.00	113.00	129.00	2	172.00	145.00	125.00	176.00
2 1/2	198.00	153.00	165.00	182.00	2 1/2	277.00	276.00	281.00	316.00
3	205.00	170.00	182.00	203.00	3	291.00	286.00	288.00	326.00
3 1/2					3 1/2				
4	302.00	234.00	270.00	280.00	4	498.00	408.00	411.00	484.00
5	441.00	304.00	321.00	392.00	5	741.00	649.00	714.00	754.00
6	522.00	354.00	407.00	460.00	6	891.00	753.00	831.00	979.00
8	861.00	668.00	824.00	866.00	8	1383.00	982.00	1246.00	1279.00
10	1317.00	1027.00	1112.00	1348.00	10	2036.00	1895.00	2159.00	2466.00
12	1959.00	1475.00	1456.00	1912.00	12	2974.00	2303.00	2712.00	2997.00



SSN307
EFFECTIVE March 26, 2007
SUPERCEDES SSN 1006

STAINLESS STEEL NIPPLES

TYPE 304/304L SCHEDULE 40 WELDED

DIAMETER NIPPLE	LENGTH OF CLOSE	PRICE EACH CLOSE	Length in inches															
			1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"
1/8"	1/4"	14.96	19.57	23.36	27.02	30.76	34.53	38.31	42.06	45.84	49.63	53.38	61.88	69.43	76.97	84.51	92.03	99.58
1/4"	1/4"	16.86	20.91	25.11	29.77	34.41	39.02	44.03	48.69	53.32	57.96	62.60	73.13	82.36	91.63	100.88	110.15	119.42
3/8"	1/4"	20.27	24.62	29.78	35.46	41.11	46.81	52.45	58.15	63.78	69.45	75.16	88.31	99.65	110.98	122.30	133.67	144.99
1/2"	1/4"	26.15	31.54	37.79	45.28	52.73	60.24	67.94	75.45	82.93	90.38	97.89	114.20	129.17	144.11	159.08	174.02	188.97
3/4"	1/4"	35.26	37.54	44.99	54.02	63.09	72.15	81.20	90.21	99.28	108.34	117.39	136.42	154.52	172.63	190.75	208.86	226.96
1"	1/4"	48.35		58.06	68.93	80.60	92.26	103.91	115.57	127.24	138.93	150.57	176.34	199.66	222.96	246.29	269.64	292.96
1 1/4"	1/4"	62.29		73.38	86.92	101.72	116.50	131.29	146.06	160.83	175.59	190.38	220.75	250.32	279.86	309.42	338.95	368.52
1 1/2"	1/4"	76.29		83.62	101.06	118.50	135.99	153.42	170.87	188.32	205.76	223.22	260.02	294.93	329.85	364.75	399.63	434.53
2"	1/4"	118.40			131.89	152.67	175.43	198.14	220.88	243.63	266.35	289.12	338.97	384.47	429.94	475.38	520.87	566.32
2 1/2"	1/4"	240.13				275.83	311.56	347.20	378.32	414.04	449.71	485.44	564.96	636.35	707.77	779.19	850.60	921.99
3"	1/4"	337.82				373.08	420.06	467.04	487.97	534.95	581.91	628.90	752.72	846.67	940.61	1034.59	1128.55	1222.53
4"	1/4"	431.77						568.87	624.32	685.29	748.24	807.13	966.99	1088.85	1210.69	1332.58	1454.43	1576.30

TYPE 316/316L SCHEDULE 40 WELDED

DIAMETER NIPPLE	LENGTH OF CLOSE	PRICE EACH CLOSE	Length in inches															
			1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"
1/8"	1/4"	18.51	25.98	31.66	37.21	42.90	48.59	54.27	59.97	65.67	71.35	77.08	89.47	100.88	112.28	123.66	135.04	146.47
1/4"	1/4"	20.80	26.70	32.51	38.78	45.07	51.38	58.11	64.37	70.71	76.97	83.25	97.25	109.85	122.41	134.96	147.54	160.12
3/8"	1/4"	25.73	32.13	39.46	47.33	55.20	63.07	70.93	78.83	86.72	94.55	102.44	120.20	135.96	151.70	167.48	183.21	198.94
1/2"	1/4"	34.23	42.10	51.57	62.37	73.14	83.95	95.02	105.78	115.36	127.38	138.16	161.16	182.75	204.30	225.89	247.45	269.03
3/4"	1/4"	44.68	47.73	58.29	70.48	82.69	94.91	107.12	119.36	131.55	143.79	156.02	181.45	205.88	230.29	254.74	279.18	303.59
1"	1/4"	62.03		78.65	94.40	110.99	127.60	144.22	160.80	177.43	194.04	210.66	246.49	279.69	312.88	346.12	379.34	412.51
1 1/4"	1/4"	84.87		100.93	121.01	142.45	163.83	185.25	206.68	228.11	249.46	270.89	314.56	357.39	400.20	443.03	485.84	528.69
1 1/2"	1/4"	104.80		115.96	141.27	166.57	191.87	217.16	242.44	267.73	293.02	318.30	370.93	421.51	472.13	522.70	573.29	623.84
2"	1/4"	162.79			186.25	217.51	250.80	284.17	317.53	350.90	384.21	417.54	488.96	555.70	622.35	689.02	755.78	822.40
2 1/2"	1/4"	309.55				358.27	407.01	455.69	499.71	548.15	596.89	645.57	751.72	849.12	946.55	1043.88	1141.39	1238.77
3"	1/4"	438.45				487.17	552.05	616.94	683.94	748.83	813.75	878.62	1010.45	1140.25	1270.03	1399.83	1529.62	1659.45
4"	1/4"	592.16						789.71	871.72	959.52	1047.34	1135.15	1351.49	1527.09	1702.73	1878.31	2053.93	2229.54

LIST PRICES APPLY TO SCHEDULE 40 WELDED NIPPLES ONLY.

Schedule 80 SS Nipples will be available in Seamless ONLY at schedule 40 welded list price x 2.50.

Schedule 40 seamless nipples - list x 1.75. Standard stocking sizes include 1/8" - 2", close thru 6" lengths. Schedule 40 welded nipples are also available in 6" & 8" diameters. 1/8" thru 1" inclusive - packed 25/carton. 1-1/4", 1-1/2" and 2" diameters - packed 10/carton. 2-1/2", 3", 3-1/2" and 4" inclusive - packed/order.

List prices & corresponding discounts apply to stock items only. All other lengths, threads & thread one end nipples are considered "specials" and will be reviewed/quoted upon request.

Regular pricing applies to the above listed sizes with standard NPT threads each end. All prices subject to change without notice. Every precaution has been taken in preparing this sheet.

Merit Brass cannot be held responsible for omissions or typographical errors. Certain inventory limitations may apply.

ASP FORGED TYPE 304/304L
(DUAL-CERTIFIED)**2000 LB. SCREWED FITTINGS**

I.P.S.	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
90° Elbows	~	43.16	53.46	72.34	83.98	111.34	181.40	291.16	409.07	"A"	"A"	~
Tees	~	55.81	71.70	92.11	104.38	144.16	243.13	404.82	561.81	"A"	"A"	~
45° Elbows	~	90.02	112.70	112.70	124.23	148.03	258.69	346.44	399.11	"A"	"A"	~
Crosses	99.72	99.72	99.72	162.62	191.59	311.06	"A"	"A"	"A"	~	~	~

3000 LB. SCREWED FITTINGS

I.P.S.	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
90° Elbows	"A"	51.54	69.75	81.01	107.37	171.83	270.90	380.18	504.70	2742.10	3272.33	~
Tees	"A"	69.14	88.83	100.66	139.00	230.31	375.96	522.73	607.62	3161.17	3689.29	~
45° Elbows	"A"	108.69	108.69	108.69	142.72	245.07	328.30	371.15	465.74	"A"	~	~
90° St Elbows	"A"	97.86	123.48	127.02	171.69	265.48	827.03	1183.35	2087.28	~	~	~
Crosses	"A"	98.01	162.80	191.78	314.62	436.69	665.71	1002.45	~	~	~	~
Couplings	~	18.53	21.57	26.02	34.71	58.80	142.37	166.81	219.70	509.05	720.25	1185.79
Red Couplings	~	28.47	35.33	45.97	64.66	85.63	175.03	219.69	281.33	783.68	932.59	1318.71
Half Couplings	~	16.05	19.89	21.40	29.26	49.05	82.51	111.05	146.34	360.98	510.57	816.90
Caps	18.65	18.65	19.77	25.71	33.87	60.24	91.38	109.61	148.67	358.56	516.54	1144.77
Unions†	130.52	130.52	139.57	139.57	171.08	263.45	486.42	548.88	733.84	"A"	"A"	~

3000 LB. SOCKET WELD FITTINGS

BORED FOR SCHEDULE 40 OR 80 PIPE

I.P.S.	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
90° Elbows	"A"	43.96	57.20	62.50	71.85	108.37	188.82	229.36	370.16	1562.17	2455.12	~
Tees	"A"	57.93	69.17	84.95	98.05	131.87	234.20	335.19	508.27	2092.70	3022.40	~
45° Elbows	"A"	78.66	78.66	82.75	93.94	135.94	224.02	225.11	409.02	1717.72	2595.23	~
Crosses	"A"	"A"	"A"	213.58	300.80	396.06	474.38	646.44	896.37	~	~	~
Couplings	"A"	27.46	29.68	29.07	40.91	56.28	110.48	128.50	191.50	409.75	575.57	902.36
Red Couplings	~	"A"	"A"	48.03	55.67	92.03	151.20	153.06	228.79	"A"	"A"	"A"
Inserts*	~	"A"	"A"	41.34	40.08	50.89	86.51	92.65	133.48	"A"	"A"	"A"
Caps	"A"	27.74	27.74	37.17	47.00	53.85	86.00	90.25	137.50	399.56	489.82	794.59
Unions†	"A"	130.52	139.57	139.57	171.08	263.45	486.42	548.88	733.84	"A"	"A"	~

† UNION DIMENSIONS CONFORM TO MSS-SP-83

REDUCING ELLS and TEES Add 100% To Largest Size List Price

"A" — AVAILABLE IN SIZES SHOWN Price On Application

6000 LB. SCREWED AND SOCKET WELD FITTINGS

(EXCEPT ALL UNIONS; 2" SCREWED 90° ELBOWS, TEES & 45° ELBOWS) Double 3000 Lb. List Price

HALF COUPLINGS — SOCKET WELD Same Price as full Socket Weld Couplings

SCHEDULES — 10-80-160 AND XXH SOCKET WELD FITTINGS Price On Application

CERTIFICATION AND/OR TEST CHARGES Price On Application

*INSERT DIMENSIONS CONFORM TO MSS-SP-79

UNIT WEIGHTS ON PAGES 14 & 15

ASP FORGED TYPE 316/316L
(DUAL-CERTIFIED)**2000 LB. SCREWED FITTINGS**

I.P.S.	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
90° Elbows	~	53.85	62.92	81.57	99.88	148.60	269.52	310.06	527.51	"A"	"A"	~
Tees	~	68.46	83.32	104.17	128.81	196.73	318.66	456.96	729.93	"A"	"A"	~
45° Elbows	~	113.93	113.93	113.93	128.60	194.06	277.12	379.61	464.37	"A"	"A"	~
Crosses	123.20	123.20	123.20	175.64	242.14	372.70	"A"	"A"	"A"	~	~	~

3000 LB. SCREWED FITTINGS

I.P.S.	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
90° Elbows	"A"	60.99	74.53	94.88	141.48	263.55	299.33	509.98	710.07	3141.84	3597.65	~
Tees	"A"	78.10	101.70	121.79	187.71	318.11	416.94	665.91	890.90	3466.21	3902.69	~
45° Elbows	"A"	143.70	143.70	143.70	185.37	258.77	329.11	423.12	563.31	"A"	~	~
90° St Elbows	"A"	122.33	138.59	161.29	197.54	317.41	875.34	1254.99	2212.12	~	~	~
Crosses	"A"	121.07	175.82	242.38	366.27	517.31	916.99	1378.39	~	~	~	~
Couplings	19.22	21.64	23.20	32.89	48.34	80.99	181.51	211.55	292.60	807.01	1092.10	"A"
Red Couplings	~	41.27	44.89	57.02	77.96	129.55	247.82	310.48	397.73	1047.18	1290.51	1949.15
Half Couplings	18.18	18.18	24.66	27.19	39.06	57.00	115.27	147.60	208.45	499.46	743.67	1175.18
Caps	25.63	25.63	30.37	37.10	47.11	73.85	133.24	143.18	223.90	557.73	696.49	1175.20
Union†	143.34	143.34	166.02	166.23	216.76	342.01	597.37	738.65	939.13	"A"	"A"	~

3000 LB. SOCKET WELD FITTINGS

BORED FOR SCHEDULE 40 OR 80 PIPE

I.P.S.	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
90° Elbows	"A"	53.85	62.92	75.74	99.88	141.85	252.74	285.55	485.89	2074.93	2999.54	~
Tees	"A"	73.20	89.27	99.42	122.97	187.79	298.85	420.85	672.30	2404.71	3330.12	~
45° Elbows	"A"	103.85	103.85	108.72	120.56	181.90	259.91	291.96	435.51	2105.63	2783.53	~
Crosses	"A"	"A"	"A"	256.20	349.93	459.20	502.13	910.06	1308.44	~	~	~
Couplings	"A"	35.52	49.65	40.27	52.59	74.84	142.86	189.51	258.79	551.23	787.37	"A"
Red Couplings	~	"A"	"A"	63.37	85.97	101.69	213.91	257.30	374.29	"A"	"A"	"A"
Inserts*	~	"A"	"A"	47.42	56.49	78.15	115.17	145.04	210.78	"A"	"A"	"A"
Caps	"A"	33.50	39.62	44.72	54.33	69.32	102.73	134.26	217.61	554.58	665.75	1186.26
Union†	"A"	143.34	166.02	166.23	216.76	342.01	597.37	738.65	939.13	"A"	"A"	~

† UNION DIMENSIONS CONFORM TO MSS-SP-83

REDUCING ELLS and TEES Add 100% To Largest Size List Price

"A" — AVAILABLE IN SIZES SHOWN Price On Application

6000 LB. SCREWED AND SOCKET WELD FITTINGS

(EXCEPT ALL UNIONS; 2" SCREWED 90° ELBOWS, TEES & 45° ELBOWS) Double 3000 Lb. List Price

HALF COUPLINGS — SOCKET WELD Same Price as full Socket Weld Couplings

SCHEDULES — 10-80-160 AND XXH SOCKET WELD FITTINGS Price On Application

CERTIFICATION AND/OR TEST CHARGES Price On Application

*INSERT DIMENSIONS CONFORM TO MSS-SP-79

UNIT WEIGHTS ON PAGES 14 & 15

Plugs & Bushings

(SUITABLE FOR UP TO 6,000 # P.S.I.)

T-304/304L

(DUAL-CERTIFIED)

I.P.S.	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
Hex .Hd. Plugs	9.70	11.08	12.76	15.28	22.71	32.34	60.70	78.47	120.19	"A"	"A"	"A"
Hex Bushings	~	15.22	15.71	19.89	27.40	39.65	69.67	90.92	125.62	"A"	"A"	"A"
Round Hd. Plugs	"A"	"A"	"A"	21.77	25.62	38.79	"A"	"A"	"A"	"A"	"A"	"A"
Square Hd. Plugs	10.91	10.91	14.78	15.19	23.81	45.58	85.64	99.11	121.11	"A"	"A"	"A"

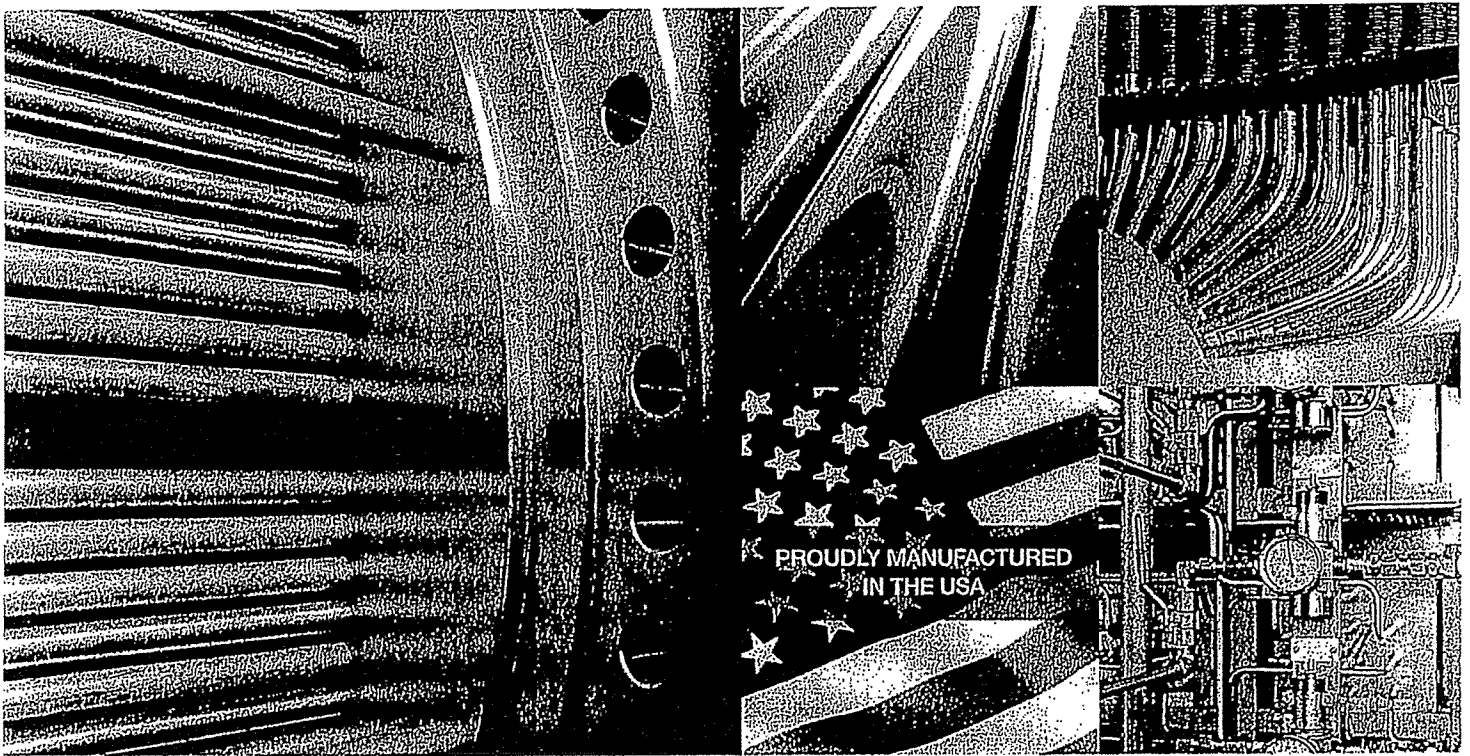
Plugs & Bushings

(SUITABLE FOR UP TO 6,000 # P.S.I.)

T-316/316L

(DUAL-CERTIFIED)

I.P.S.	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
Hex .Hd. Plugs	12.47	12.53	15.60	18.96	28.49	44.72	84.13	109.46	156.57	"A"	"A"	"A"
Hex Bushings	~	17.40	18.29	25.05	33.93	52.72	96.11	113.76	161.58	"A"	"A"	"A"
Round Hd. Plugs	"A"	"A"	"A"	26.35	30.89	49.00	"A"	"A"	"A"	"A"	"A"	"A"
Square Hd. Plugs	12.27	12.53	16.62	18.38	29.81	59.79	102.22	119.02	155.20	"A"	"A"	"A"



Houston TX
Stainless Steel and Nickel Alloy Tube & Pipe



MANNESMANN
STAINLESS TUBES

A Member of the Salzgitter Group



Profiles & Components: Adding value, Adding service.

Complementing our local production with specialist products from our global facilities.

delivery needs. Invention of the seamless steel tube

min	0.25	6.35
max	4	101.6

WT range	lach	mm
min	0.035	0.89
max	0.5	12.7

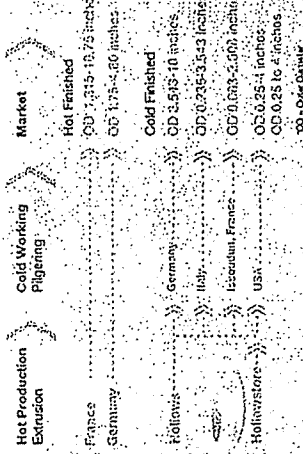
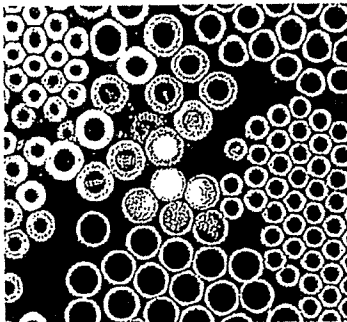


OD range	Inch	mm
min	0.25	6.35
max	4	101.6

WT range	Inch	mm
min	0.035	0.89
max	0.5	12.7

Grades

Production



Quality: Zero Accident - our goal, our focus, our culture.

Across our Global manufacturing locations the health & safety of everyone on our sites is paramount. The wellbeing of employees, contractors and visitors remains our number one priority.

At Mannesmann Stainless Tubes we take pride in meeting and exceeding our Customer's Quality Expectations

We encourage and seek feedback on our performance and from this how we may learn and continuously improve. In our most recent Customer Survey we obtained a 100% Quality Score across our Global Manufacturing plants.

We have Quality Management Systems which are approved by the world's leading organisations such as: ASME, ISO, TUV, DNV, JIS and Lloyd's Register.

All of Houston, US manufactured products have the assurance of being quality tested and certified in our in-house laboratory.

GENUINE QUALITY

MSR QR code system to fight fake products
All of our items are shipped with QR code visible on container. Expect a genuine Mannesmann quality tubes only when you look at QR code.

Production

With complete process control from extrusion to cold pilgering to final NDT and certification we assure the integrity of our products.



Hot Extrusion

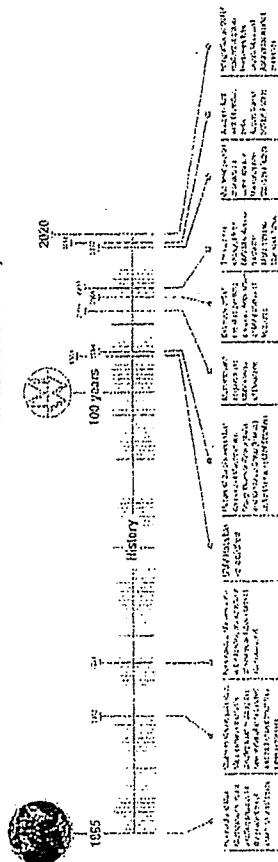
Cold Pilgering

Our Heritage

The industrial production of seamless steel tubes by the rolling process dates back to the ground-breaking invention by the Mannesmann Brothers, with a patent being granted in 1886.

Cold Pilgering, the key transformation technology in the production of cold finished tubes was invented by the Mannesmann Brothers in the 1890's.

The very same production site, that was used by Max and Reinhard Mannesmann in the late 19th century, is still delivering seamless stainless steel tubes today.



Our Markets

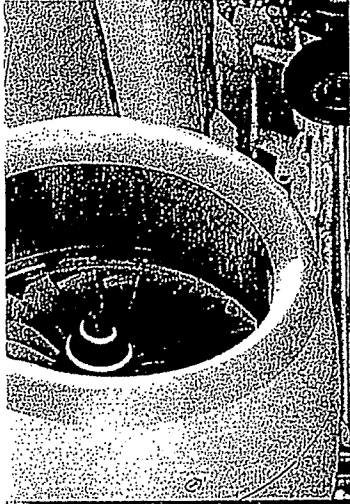
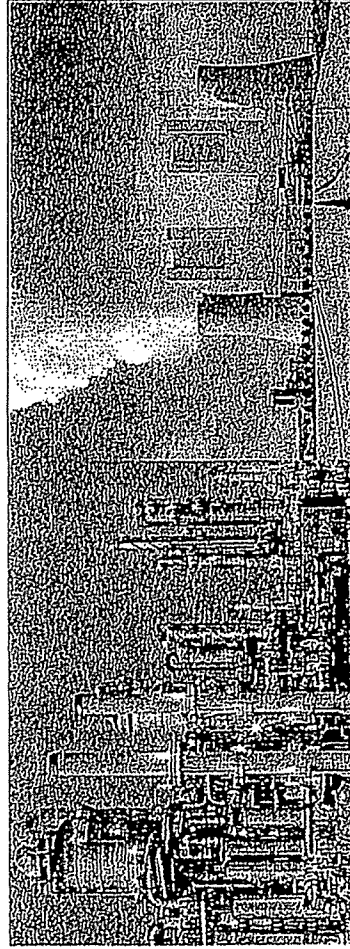
Products and Applications

Powergen

Boiler Tubes
Heat Exchanger & Precision Instrumentation tubing
Advanced USC Conventional Power
Solar, Nuclear Power

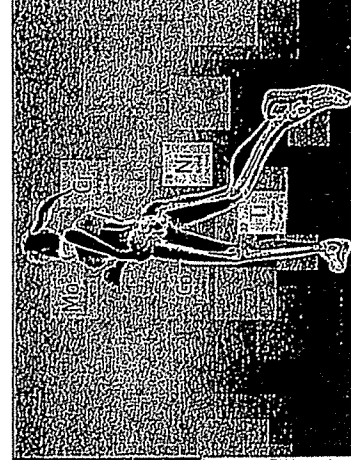
Oil and Gas

OCTG tubing & casing
Unibical, Subsea, Flowlines tubes
Heat Exchanger &
Instrumentation tubing



Petrochemical

Process pipe
Heat Exchanger tubing
Precision Instrumentation & Flow measurement
Fertilizer, Chemical & Pharmaceutical



Aerospace

Airframe hydraulic control
Actuation systems and flow measurement
Engine fuel systems, air bleed instrumentation tubes,
Structural tubes and profiles

General Engineering

Mechanical tubing, Hollow Bar
Heat Exchanger tube
Instrumentation & Process control tubes
Profiles.

Medical

Exacting raw materials for Cardio & Trauma applications
Surgical equipment tubes

Salzgitter Mannesmann Stainless Tubes USA, Inc.

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Fax: +49 (0) 208 458 2640



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www.mannesmann.com

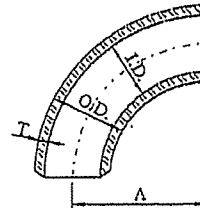
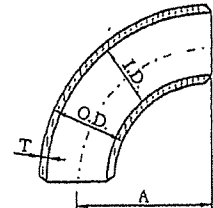
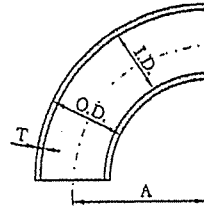
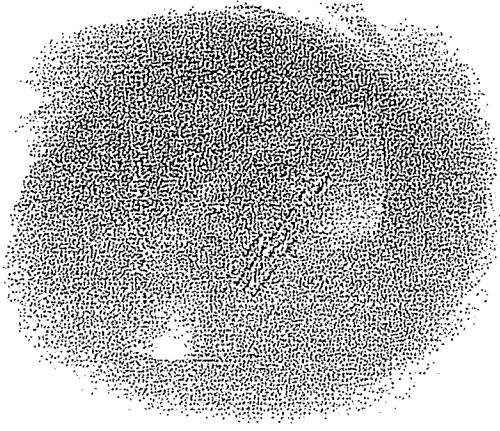
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ASTM A403 WELDED FITTINGS

90° LONG RADIUS ELBOWS



DIMENSIONS

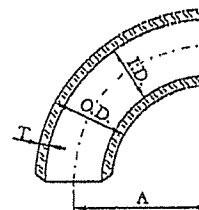
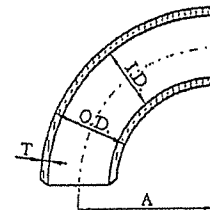
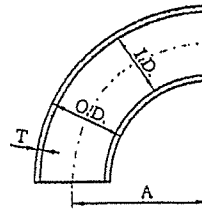
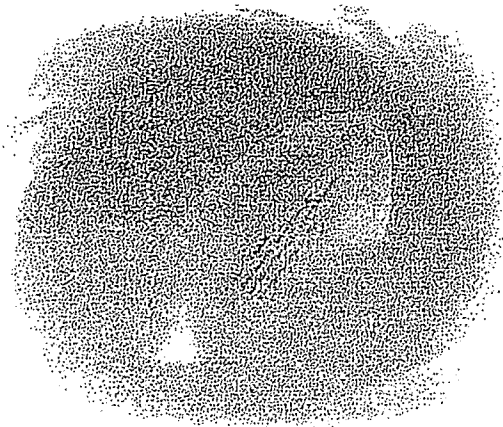
unit : inch

Nominal pipe size	Outside diameter (O.D.)	Center to face (A)	Schedule 5S			Schedule 10S			Schedule 40S		
			Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •
1/2	.840	1-1/2	.710	.065	.12	.674	.083	.14	.622	.109	.18
3/4	1.050	1-1/2	.920	.065	.13	.884	.083	.15	.824	.113	.19
1	1.315	1-1/2	1.185	.065	.19	1.097	.109	.30	1.049	.133	.35
1-1/4	1.660	1-7/8	1.530	.065	.31	1.442	.109	.50	1.380	.140	.56
1-1/2	1.900	2-1/4	1.770	.065	.38	1.682	.109	.69	1.610	.145	.88
2	2.375	3	2.245	.065	.64	2.157	.109	1.13	2.067	.154	1.56
2-1/2	2.875	3-3/4	2.709	.083	1.50	2.635	.120	1.88	2.469	.203	3.00
3	3.500	4-1/2	3.334	.083	2.00	3.260	.120	2.69	3.068	.216	4.81
3-1/2	4.000	5-1/4	3.834	.083	2.62	3.760	.120	3.75	3.548	.226	6.25
4	4.500	6	4.334	.083	3.31	4.260	.120	4.75	4.026	.237	9.19
5	5.563	7-1/2	5.345	.109	6.50	5.295	.134	8.00	5.047	.258	15.13
6	6.625	9	6.407	.109	10.00	6.357	.134	12.00	6.065	.280	24.00
8	8.625	12	8.407	.109	17.30	8.329	.148	23.50	7.981	.322	47.50
10	10.750	15	10.482	.134	32.00	10.420	.165	43.00	10.020	.365	85.00
12	12.750	18	12.438	.156	51.00	12.390	.180	60.00	12.000	.375	131.00
14	14.000	21	13.688	.156	68.00	13.624	.188	80.00	13.250	.375	155.00
16	16.000	24	15.670	.165	100.00	15.624	.188	105.00	15.250	.375	202.00
18	18.000	27	17.670	.165	125.00	17.624	.188	132.00	17.250	.375	269.00
20	20.000	30	19.624	.188	165.00	19.564	.218	220.00	19.250	.375	330.00
24	24.000	36	23.564	.218	280.00	23.500	.250	310.00	23.250	.375	464.00



ASTM A403 WELDED FITTINGS

90° LONG RADIUS ELBOWS



DIMENSIONS

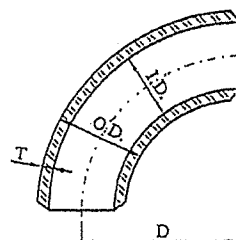
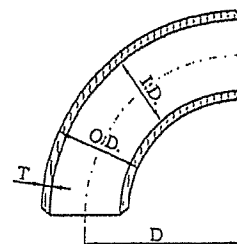
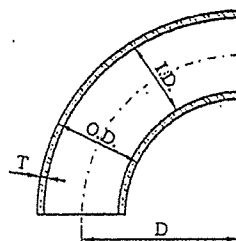
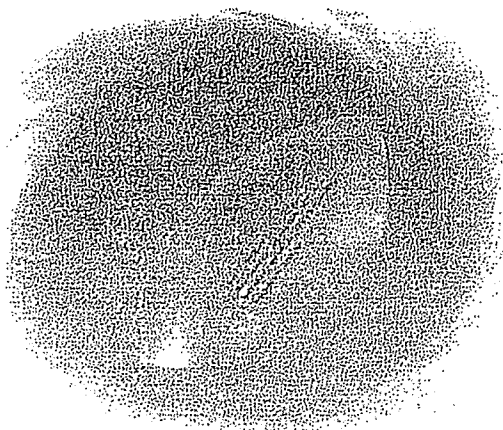
unit : inch / lb

Nominal pipe size	Outside diameter (O.D.)	Center to face (A)	Schedule 80S			Schedule 160			XX Strong Wall		
			Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *
1/2	.840	1-1/2	.546	.147	.23	.464	.188	.29	.252	.294	.46
3/4	1.050	1-1/2	.742	.154	.25	.612	.219	.35	.434	.308	.50
1	1.315	1-1/2	.957	.179	.48	.815	.250	.67	.599	.358	.96
1-1/4	1.660	1-7/8	1.278	.191	.88	1.160	.250	1.15	.896	.382	1.76
1-1/2	1.900	2-1/4	1.500	.200	1.13	1.338	.281	1.59	1.100	.400	2.26
2	2.375	3	1.939	.218	2.00	1.689	.343	3.14	1.503	.436	4.00
2-1/2	2.875	3-3/4	2.323	.276	4.00	2.125	.375	5.44	1.771	.552	8.00
3	3.500	4-1/2	2.900	.300	6.56	2.624	.438	9.58	2.300	.600	13.12
3-1/2	4.000	5-1/4	3.364	.318	8.80	-----	-----	-----	2.728	.636	17.60
4	4.500	6	3.826	.337	13.63	3.438	.531	21.53	3.152	.674	27.26
5	5.563	7-1/2	4.813	.375	21.13	4.313	.625	35.29	4.063	.750	42.26
6	6.625	9	5.761	.432	36.00	5.187	.719	59.76	4.897	.864	72.00
8	8.625	12	7.625	.500	73.00	6.813	.906	132.00	6.875	.875	127.00
10	10.750	15	9.750	.500	114.00	8.500	1.125	256.00	-----	-----	-----
12	12.750	18	11.750	.500	175.00	10.126	1.312	458.00	-----	-----	-----
14	14.000	21	13.000	.500	206.00	11.188	1.406	-----	-----	-----	-----
16	16.000	24	15.000	.500	269.00	12.812	1.594	-----	-----	-----	-----
18	18.000	27	17.000	.500	350.00	14.438	1.781	-----	-----	-----	-----
20	20.000	30	19.000	.500	439.00	16.062	1.969	-----	-----	-----	-----
24	24.000	36	23.000	.500	617.00	19.312	2.344	-----	-----	-----	-----



ASTM A403 WELDED FITTINGS

90° SHORT RADIUS ELBOWS



DIMENSIONS

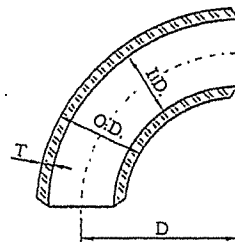
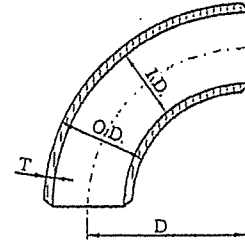
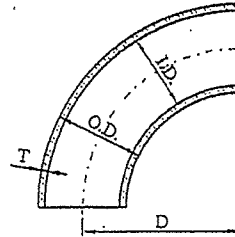
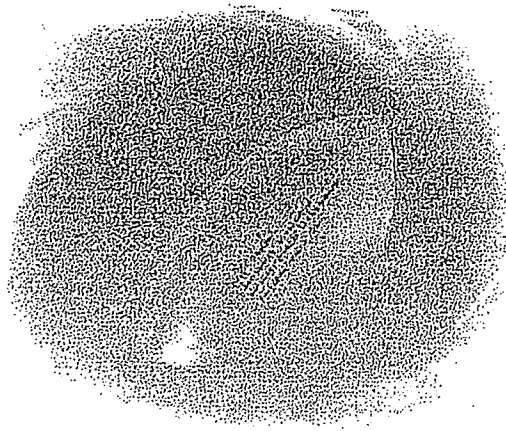
unit : inch / lb

Nominal pipe size	Outside diameter (O.D.)	Center to face (D)	Schedule 5S			Schedule 10S			Schedule 40S		
			Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •
1	1.315	1	1.185	.065	.17	1.097	.109	.23	1.049	.133	.26
1-1/4	1.660	1-1/4	1.530	.065	.31	1.442	.109	.38	1.380	.140	.45
1-1/2	1.900	1-1/2	1.770	.065	.43	1.682	.109	.49	1.610	.145	.63
2	2.375	2	2.245	.065	.63	2.157	.109	.81	2.067	.154	1.13
2-1/2	2.875	2-1/2	2.709	.083	1.25	2.635	.120	1.36	2.469	.203	2.25
3	3.500	3	3.334	.083	1.75	3.260	.120	2.17	3.068	.216	3.31
3-1/2	4.000	3-1/2	3.834	.083	2.35	3.760	.120	3.05	3.548	.226	4.54
4	4.500	4	4.334	.083	3.12	4.260	.120	3.79	4.026	.237	6.88
5	5.563	5	5.345	.109	4.94	5.295	.134	6.12	5.047	.258	11.63
6	6.625	6	6.407	.109	7.75	6.357	.134	9.15	6.065	.280	17.50
8	8.625	8	8.407	.109	15.44	8.329	.148	17.63	7.981	.322	37.60
10	10.750	10	10.482	.134	27.40	10.420	.165	35.00	10.020	.365	63.00
12	12.750	12	12.438	.156	35.00	12.390	.180	40.00	12.000	.375	80.00
14	14.000	14	13.688	.156	44.00	13.624	.188	52.00	13.250	.375	101.00
16	16.000	16	15.670	.165	65.00	15.624	.188	68.00	15.250	.375	131.00
18	18.000	18	17.670	.165	81.00	17.624	.188	86.00	17.250	.375	175.00
20	20.000	20	19.624	.188	107.00	19.564	.218	143.00	19.250	.375	215.00
24	24.000	24	23.564	.218	182.00	23.500	.250	202.00	23.250	.375	302.00



ASTM A403 WELDED FITTINGS

90° SHORT RADIUS ELBOWS



DIMENSIONS

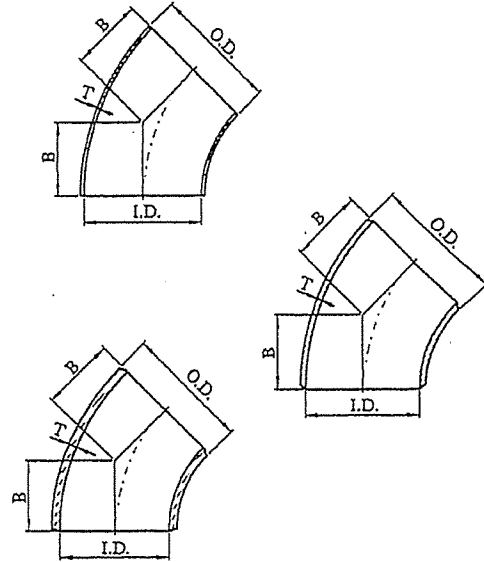
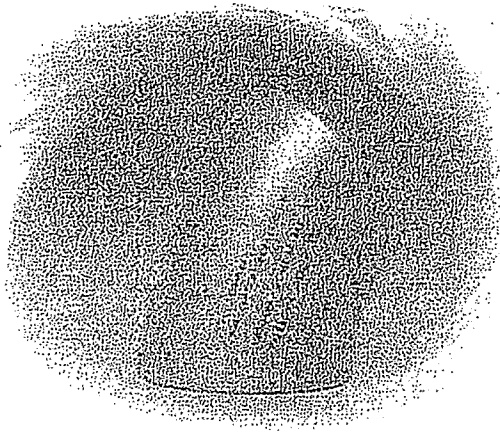
unit : inch / lb

Nominal pipe size	Outside diameter (O.D.)	Center to face (D)	Schedule 80S			Schedule 160			XX Strong Wall		
			Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •
1	1.315	1	.957	.179	.38	.815	.250	.53	.599	.358	.76
1-1/4	1.660	1-1/4	1.278	.191	.63	1.160	.250	.82	.896	.382	1.26
1-1/2	1.900	1-1/2	1.500	.200	.88	1.338	.281	1.23	1.100	.400	1.76
2	2.375	2	1.939	.218	1.55	1.689	.343	2.43	1.503	.436	3.10
2-1/2	2.875	2-1/2	2.323	.276	2.88	2.125	.375	3.88	1.771	.552	5.76
3	3.500	3	2.900	.300	4.20	2.624	.438	6.09	2.300	.600	8.40
3-1/2	4.000	3-1/2	3.364	.318	5.35	-----	-----	-----	2.728	.636	10.70
4	4.500	4	3.826	.337	9.06	3.438	.531	14.22	3.152	.674	18.12
5	5.563	5	4.813	.375	16.10	4.313	.625	26.72	4.063	.750	32.20
6	6.625	6	5.761	.432	26.00	5.187	.719	43.16	4.897	.864	52.00
8	8.625	8	7.625	.500	54.80	6.813	.906	99.18	6.875	.875	109.00
10	10.750	10	9.750	.500	99.80	8.500	1.125	224.00	-----	-----	-----
12	12.750	12	11.750	.500	125.00	10.126	1.312	327.00	-----	-----	-----
14	14.000	14	13.000	.500	135.00	11.188	1.406	-----	-----	-----	-----
16	16.000	16	15.000	.500	175.00	12.812	1.594	-----	-----	-----	-----
18	18.000	18	17.000	.500	228.00	14.438	1.781	-----	-----	-----	-----
20	20.000	20	19.000	.500	285.00	16.062	1.969	-----	-----	-----	-----
24	24.000	24	23.000	.500	401.00	19.312	2.344	-----	-----	-----	-----



ASTM A403 WELDED FITTINGS

45° LONG RADIUS ELBOWS



DIMENSIONS

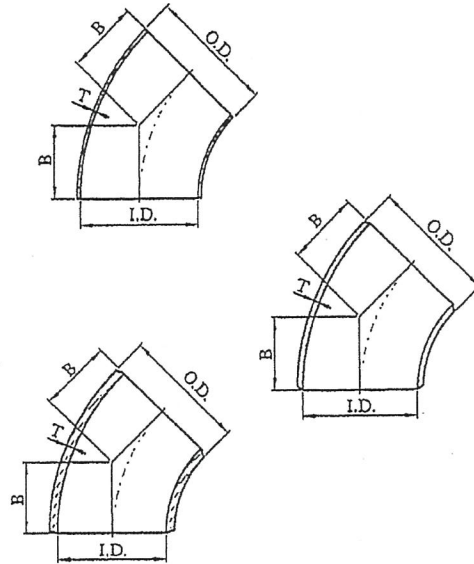
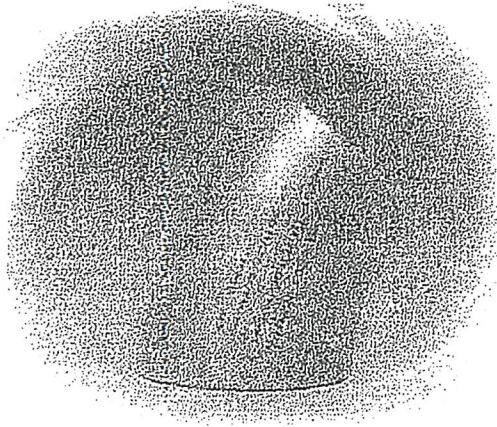
unit : inch / lb

Nominal pipe size	Outside diameter (O.D.)	Center to face (B)	Schedule 5S			Schedule 10S			Schedule 40S		
			Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *
1/2	.840	5/8	.710	.065	.06	.674	.083	.07	.622	.109	.09
3/4	1.050	7/16	.920	.065	.06	.884	.083	.07	.824	.113	.09
1	1.315	7/8	1.185	.065	.12	1.097	.109	.19	1.049	.133	.25
1-1/4	1.660	1	1.530	.065	.19	1.442	.109	.25	1.380	.140	.38
1-1/2	1.900	1-1/8	1.770	.065	.25	1.682	.109	.38	1.610	.145	.50
2	2.375	1-3/8	2.245	.065	.31	2.157	.109	.56	2.067	.154	.88
2-1/2	2.875	1-3/4	2.709	.083	.75	2.635	.120	1.06	2.469	.203	1.69
3	3.500	2	3.334	.083	1.06	3.260	.120	1.38	3.068	.216	2.38
3-1/2	4.000	2-1/4	3.834	.083	1.16	3.760	.120	1.66	3.548	.226	3.13
4	4.500	2-1/2	4.334	.083	1.66	4.260	.120	2.38	4.026	.237	4.60
5	5.563	3-1/8	5.345	.109	3.25	5.295	.134	4.00	5.047	.258	7.57
6	6.625	3-3/4	6.407	.109	5.00	6.357	.134	6.00	6.065	.280	12.00
8	8.625	5	8.407	.109	8.65	8.329	.148	11.75	7.981	.322	23.75
10	10.750	6-1/4	10.482	.134	16.00	10.420	.165	21.50	10.020	.365	42.50
12	12.750	7-1/2	12.438	.156	25.50	12.390	.180	30.00	12.000	.375	65.50
14	14.000	8-3/4	13.688	.156	34.00	13.624	.188	40.00	13.250	.375	77.50
16	16.000	10	15.670	.165	50.00	15.624	.188	52.50	15.250	.375	101.00
18	18.000	11-1/4	17.670	.165	62.50	17.624	.188	66.00	17.250	.375	131.00
20	20.000	12-1/2	19.624	.188	82.50	19.564	.218	110.00	19.250	.375	165.00
24	24.000	15	23.564	.218	140.00	23.500	.250	155.00	23.250	.375	232.00



ASTM A403 WELDED FITTINGS

45° LONG RADIUS ELBOWS



DIMENSIONS

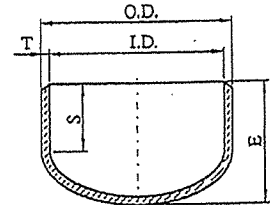
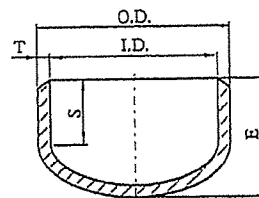
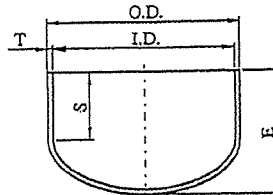
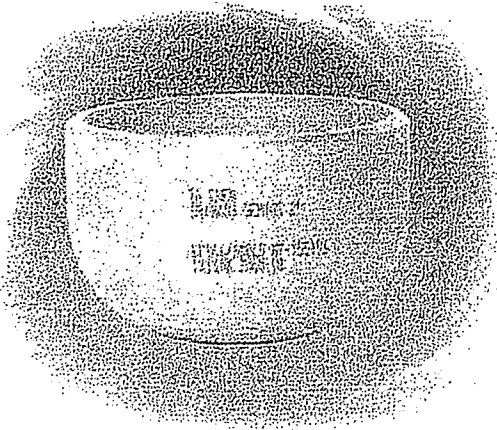
unit : inch / lb

Nominal pipe size	Outside diameter (O.D.)	Center to face (B)	Schedule 80S			Schedule 160			XX Strong Wall		
			Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *
1/2	.840	5/8	.546	.147	.12	.464	.188	.16	.252	.294	.24
3/4	1.050	7/16	.742	.154	.12	.612	.219	.16	.434	.308	.24
1	1.315	7/8	.957	.179	.31	.815	.250	.43	.599	.358	.62
1-1/4	1.660	1	1.278	.191	.50	1.160	.250	.85	.896	.382	1.00
1-1/2	1.900	1-1/8	1.500	.200	.63	1.338	.281	.88	1.100	.400	1.26
2	2.375	1-3/8	1.939	.218	1.13	1.689	.343	1.77	1.503	.436	2.26
2-1/2	2.875	1-3/4	2.323	.276	2.19	2.125	.375	2.95	1.771	.552	4.38
3	3.500	2	2.900	.300	3.31	2.624	.438	4.80	2.300	.600	6.62
3-1/2	4.000	2-1/4	3.364	.318	4.40	-----	-----	-----	2.728	.636	8.80
4	4.500	2-1/2	3.826	.337	6.82	3.438	.531	10.87	3.152	.674	13.64
5	5.563	3-1/8	4.813	.375	10.56	4.313	.625	17.52	4.063	.750	21.12
6	6.625	3-3/4	5.761	.432	18.00	5.187	.719	20.88	4.897	.864	36.00
8	8.625	5	7.625	.500	36.50	6.813	.906	64.24	6.875	.875	63.87
10	10.750	6-1/4	9.750	.500	57.00	8.500	1.125	127.00	-----	-----	-----
12	12.750	7-1/2	11.750	.500	87.50	10.126	1.312	229.00	-----	-----	-----
14	14.000	8-3/4	13.000	.500	103.00	11.188	1.406	-----	-----	-----	-----
16	16.000	10	15.000	.500	134.00	12.812	1.594	-----	-----	-----	-----
18	18.000	11-1/4	17.000	.500	175.00	14.438	1.781	-----	-----	-----	-----
20	20.000	12-1/2	19.000	.500	219.00	16.062	1.969	-----	-----	-----	-----
24	24.000	15	23.000	.500	308.00	19.312	2.344	-----	-----	-----	-----



ASTM A403 WELDED FITTINGS

CAPS



DIMENSIONS

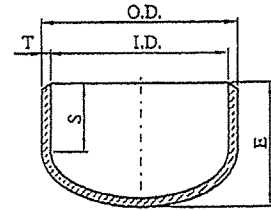
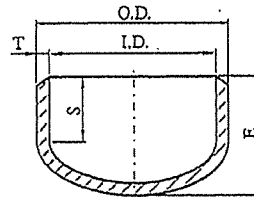
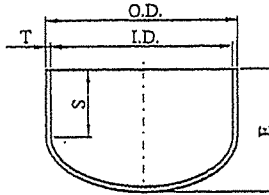
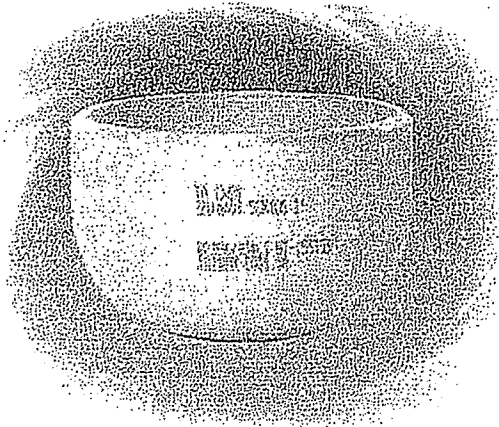
unit : inch / lb

Nominal pipe size	Outside diameter (O.D.)	Length (E)	Tangent Length (S)	Schedule 5S			Schedule 10S			Schedule 40S		
				Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •
1/2	.840	1	.74	.710	.065	.08	.674	.083	.09	.622	.109	.10
3/4	1.050	1	.68	.920	.065	.11	.884	.083	.12	.824	.113	.13
1	1.315	1-1/2	1.10	1.185	.065	.18	1.097	.109	.19	1.049	.133	.28
1-1/4	1.660	1-1/2	1.02	1.530	.065	.20	1.442	.109	.28	1.380	.140	.38
1-1/2	1.900	1-1/2	.95	1.770	.065	.22	1.682	.109	.31	1.610	.145	.50
2	2.375	1-1/2	.83	2.245	.065	.36	2.157	.109	.38	2.067	.154	.60
2-1/2	2.875	1-1/2	.68	2.709	.083	.50	2.635	.120	.56	2.469	.203	1.00
3	3.500	2	1.02	3.334	.083	.86	3.260	.120	.88	3.068	.216	1.56
3-1/2	4.000	2-1/2	1.40	3.834	.083	1.20	3.760	.120	1.25	3.548	.226	2.25
4	4.500	2-1/2	1.26	4.334	.083	1.25	4.260	.120	1.44	4.026	.237	2.69
5	5.563	3	1.48	5.345	.109	2.00	5.295	.134	2.25	5.047	.258	4.06
6	6.625	3-1/2	1.70	6.407	.109	2.75	6.357	.134	3.00	6.065	.280	7.12
8	8.625	4	1.68	8.407	.109	4.50	8.329	.148	5.50	7.981	.322	12.50
10	10.750	5	2.13	10.482	.134	9.50	10.420	.165	10.80	10.020	.365	20.30
12	12.750	6	2.63	12.438	.156	14.00	12.390	.180	14.40	12.000	.375	28.80
14	14.000	6-1/2	2.81	13.688	.156	17.00	13.624	.188	18.00	13.250	.375	35.70
16	16.000	7	2.81	15.670	.165	30.00	15.624	.188	32.00	15.250	.375	48.50
18	18.000	8	3.31	17.670	.165	38.00	17.624	.188	39.60	17.250	.375	59.40
20	20.000	9	3.81	19.624	.188	55.00	19.564	.218	60.00	19.250	.375	75.00
24	24.000	10-1/2	4.31	23.564	.218	75.00	23.500	.250	76.00	23.250	.375	98.00



ASTM A403 WELDED FITTINGS

CAPS



DIMENSIONS

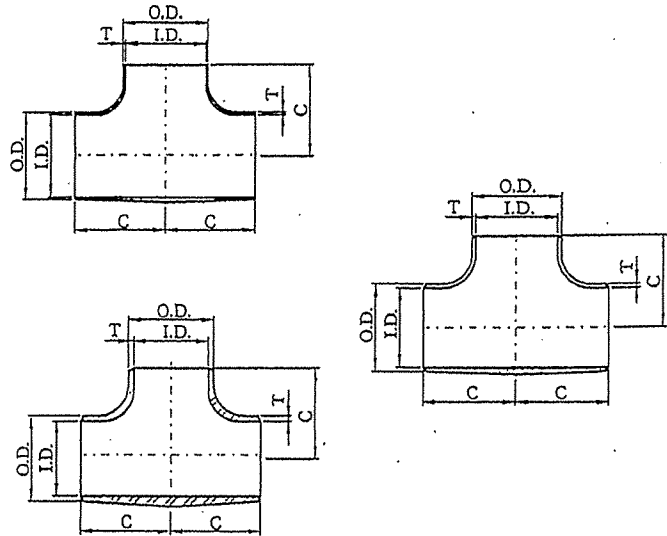
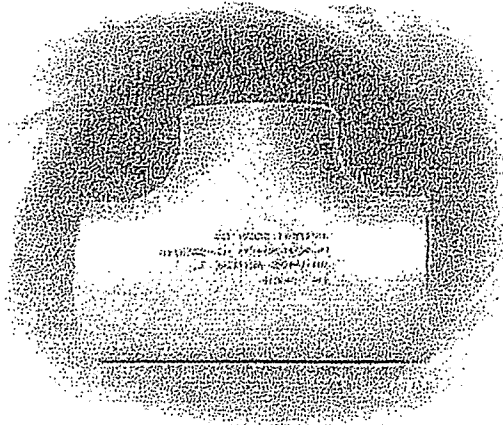
unit : inch / lb

Nominal pipe size	Outside diameter (O.D.)	Length (E) Tangent Length (S)	Length (E1) Tangent Length (S)	Schedule 80S			Schedule 160			XX Strong Wall		
				Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight * *
1/2	.840	E 1 S .72	E1 1 S .64	.546	.147	.11	.464	.188	.14	.252	.294	.22
3/4	1.050	E 1 S .86	E1 1 S .58	.742	.154	.14	.612	.219	.20	.434	.308	.28
1	1.315	E 1-1/2 S 1.08	E1 1-1/2 S .99	.957	.179	.29	.815	.250	.40	.599	.358	.58
1-1/4	1.660	E 1-1/2 S .99	E1 1-1/2 S .89	1.278	.191	.39	1.160	.250	.50	.896	.382	.78
1-1/2	1.900	E 1-1/2 S .93	E1 1-1/2 S .83	1.500	.200	.54	1.338	.281	.75	1.100	.400	1.08
2	2.375	E 1-1/2 S .80	E1 1-3/4 S .95	1.939	.218	.75	1.689	.343	1.17	1.503	.436	1.50
2-1/2	2.875	E 1-1/2 S .84	E1 2 S 1.01	2.323	.276	1.12	2.125	.375	1.48	1.771	.552	2.24
3	3.500	E 2 S .98	E1 2-1/2 S 1.32	2.900	.300	1.87	2.624	.438	2.71	2.300	.600	3.74
3-1/2	4.000	E 2-1/2 S 1.34	E1 3 S 1.70	3.364	.318	2.50	-----	-----	-----	2.728	.636	5.00
4	4.500	E 2-1/2 S 1.21	E1 3 S 1.60	3.826	.337	3.54	3.438	.531	5.55	3.152	.674	7.08
5	5.563	E 3 S 1.42	E1 3-1/2 S 1.73	4.813	.375	5.63	4.313	.625	9.34	4.063	.750	11.26
6	6.625	E 3-1/2 S 1.63	E1 4 S 1.91	5.761	.432	10.00	5.187	.719	16.00	4.897	.864	20.00
8	8.625	E 4 S 1.59	E1 5 S 2.41	7.625	.500	16.38	6.813	.906	29.64	6.875	.875	22.76
10	10.750	E 5 S 2.00	E1 6 S 2.75	9.750	.500	27.30	8.500	1.125	61.42	-----	-----	-----
12	12.750	E 6 S 2.56	E1 7 S 3.16	11.750	.500	36.60	10.126	1.312	95.00	-----	-----	-----
14	14.000	E 6-1/2 S 2.76	-----	13.000	.500	48.00	11.188	1.406	-----	-----	-----	-----
16	16.000	E 7 S 2.76	-----	15.000	.500	65.00	12.812	1.594	-----	-----	-----	-----
18	18.000	E 8 S 3.25	-----	17.000	.500	79.20	14.438	1.781	-----	-----	-----	-----
20	20.000	E 9 S 3.75	-----	19.000	.500	88.00	16.062	1.969	-----	-----	-----	-----
24	24.000	E 10-1/2 S 4.25	-----	23.000	.500	135.00	19.312	2.344	-----	-----	-----	-----



ASTM A403 WELDED FITTINGS

STRAIGHT TEES



DIMENSIONS

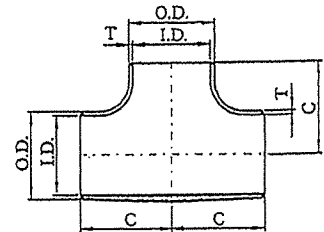
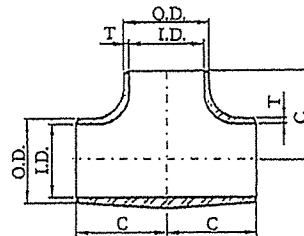
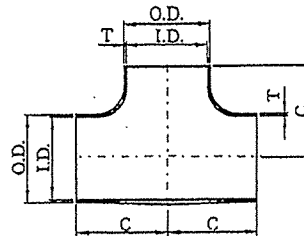
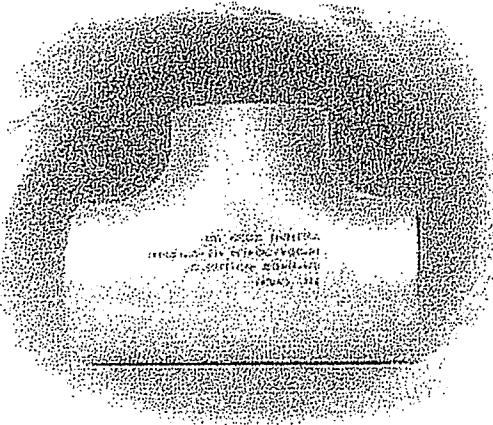
unit : inch / lb

Nominal pipe size	Outside diameter (O.D.)	Center to end (C)	Schedule 5S			Schedule 10S			Schedule 40S		
			Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight • •
1/2	.840	1	.710	.065	.19	.674	.083	.21	.622	.109	.23
3/4	1.050	1-1/8	.920	.065	.22	.884	.083	.28	.824	.113	.38
1	1.315	1-1/2	1.185	.065	.40	1.097	.109	.63	1.049	.133	.65
1-1/4	1.660	1-7/8	1.530	.065	.75	1.442	.109	1.10	1.380	.140	1.31
1-1/2	1.900	2-1/4	1.770	.065	.95	1.682	.109	1.50	1.610	.145	1.90
2	2.375	2-1/2	2.245	.065	1.20	2.157	.109	1.87	2.067	.154	2.83
2-1/2	2.875	3	2.709	.083	2.15	2.635	.120	3.10	2.469	.203	4.85
3	3.500	3-3/8	3.334	.083	3.40	3.260	.120	3.90	3.068	.216	7.30
3-1/2	4.000	3-3/4	3.834	.083	5.50	3.760	.120	5.88	3.548	.226	9.00
4	4.500	4-1/8	4.334	.083	7.20	4.260	.120	7.63	4.026	.237	11.63
5	5.563	4-7/8	5.345	.109	13.00	5.295	.134	13.45	5.047	.258	20.75
6	6.625	5-5/8	6.407	.109	17.20	6.357	.134	17.80	6.065	.280	24.25
8	8.625	7	8.407	.109	31.00	8.329	.148	34.50	7.981	.322	46.10
10	10.750	8-1/2	10.482	.134	55.00	10.420	.165	59.00	10.020	.365	78.00
12	12.750	10	12.438	.156	83.00	12.390	.180	87.00	12.000	.375	137.00
14	14.000	11	13.688	.156	89.00	13.624	.188	107.00	13.250	.375	175.00
16	16.000	12	15.670	.165	115.00	15.624	.188	130.00	15.250	.375	220.00
18	18.000	13-1/2	17.670	.165	149.00	17.624	.188	169.00	17.250	.375	286.00
20	20.000	15	19.624	.188	171.00	19.564	.218	228.00	19.250	.375	358.00
24	24.000	17	23.564	.218	298.00	23.500	.250	343.00	23.250	.375	498.00



ASTM A403 WELDED FITTINGS

STRAIGHT TEES



DIMENSIONS

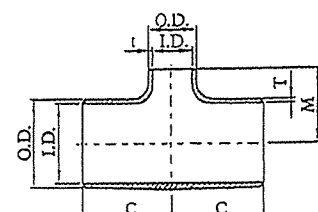
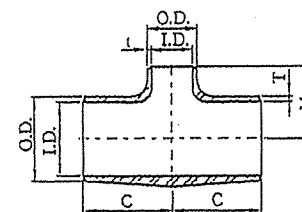
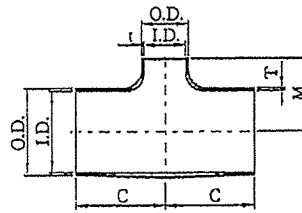
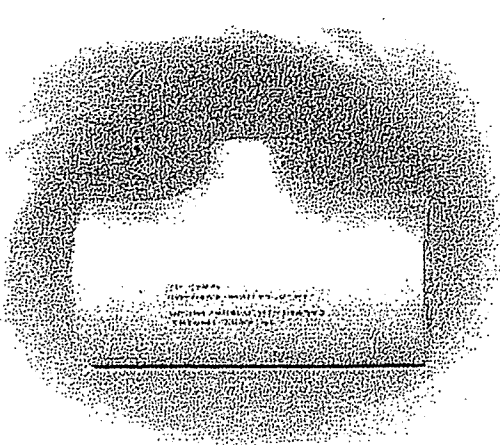
unit : inch / lb

Nominal pipe size	Outside diameter (O.D.)	Center to end (C)	Schedule 80S			Schedule 160S			XX Strong Wall		
			Inside diameter (I.D.)	Wall thickness (T)	Approx. weight **	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight **	Inside diameter (I.D.)	Wall thickness (T)	Approx. weight **
1/2	.840	1	.546	.147	.30	.464	.188	.38	.252	.294	.60
3/4	1.050	1-1/8	.742	.154	.45	.612	.219	.64	.434	.308	.90
1	1.315	1-1/2	.957	.179	.85	.815	.250	1.19	.599	.358	1.70
1-1/4	1.660	1-7/8	1.278	.191	1.50	1.160	.250	1.97	.896	.382	3.00
1-1/2	1.900	2-1/4	1.500	.200	2.25	1.338	.281	3.15	1.100	.400	4.50
2	2.375	2-1/2	1.939	.218	3.50	1.689	.343	5.50	1.503	.436	7.00
2-1/2	2.875	3	2.323	.276	6.90	2.125	.375	9.38	1.771	.552	13.80
3	3.500	3-3/8	2.900	.300	9.80	2.624	.438	14.31	2.300	.600	19.60
3-1/2	4.000	3-3/4	3.364	.318	12.00	-----	-----	-----	2.728	.636	24.00
4	4.500	4-1/8	3.826	.337	17.00	3.438	.531	26.86	3.152	.674	34.00
5	5.563	4-7/8	4.813	.375	25.00	4.313	.625	41.75	4.063	.750	50.00
6	6.625	5-5/8	5.761	.432	30.00	5.187	.719	49.80	4.897	.864	60.00
8	8.625	7	7.625	.500	62.00	6.813	.906	112.00	6.875	.875	108.00
10	10.750	8-1/2	9.750	.500	110.00	8.500	1.125	247.00	-----	-----	-----
12	12.750	10	11.750	.500	185.00	10.126	1.312	484.00	-----	-----	-----
14	14.000	11	13.000	.500	210.00	11.188	1.406	590.00	-----	-----	-----
16	16.000	12	15.000	.500	265.00	12.812	1.594	812.00	-----	-----	-----
18	18.000	13-1/2	17.000	.500	344.00	14.438	1.781	1097.00	-----	-----	-----
20	20.000	15	19.000	.500	430.00	16.062	1.969	1690.00	-----	-----	-----
24	24.000	17	23.000	.500	600.00	19.312	2.344	2950.00	-----	-----	-----



ASTM A403 WELDED FITTINGS

REDUCING OUTLET TEES



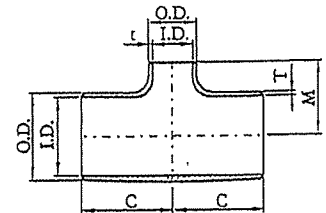
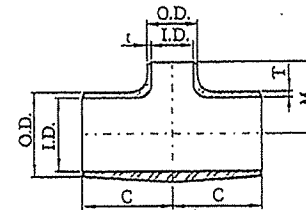
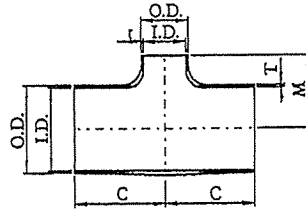
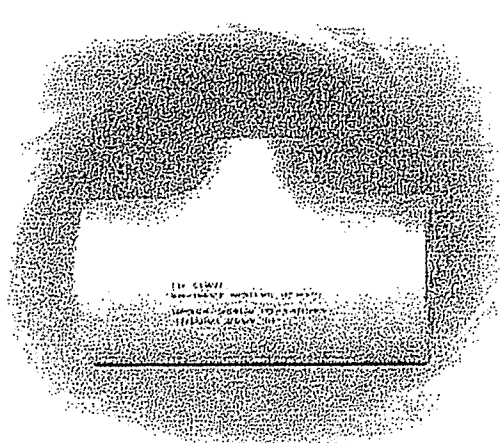
DIMENSIONS

unit : inch / lb

Nominal Pipe Size Run X Outlet	Outside Diameter Run (O.D.)	Outside Diameter Outlet (O.D.)	Center to End Run (C)	Center to End Outlet (M)	Schedule 5S					Schedule 10S					Schedule 40S				
					Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (t)	Wall Thickness Outlet (t)	Approx. Weight **	Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (t)	Wall Thickness Outlet (t)	Approx. Weight **	Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (t)	Wall Thickness Outlet (t)	Approx. Weight **
1/2x1/4	.840	.540	1	1	.710	.410	.065	.065	.16	.674	.410	.083	.065	.18	.622	.364	.109	.088	.20
1/2x3/8	.840	.675	1	1	.710	.545	.065	.065	.17	.674	.545	.083	.065	.19	.622	.493	.109	.091	.21
3/4x3/8	1.050	.675	1-1/8	1-1/8	.920	.545	.065	.065	.19	.884	.545	.083	.065	.24	.824	.493	.113	.091	.32
3/4x1/2	1.050	.840	1-1/8	1-1/8	.920	.710	.065	.065	.20	.884	.674	.083	.083	.25	.824	.622	.113	.109	.34
1x3/8	1.315	.675	1-1/2	1-1/2	1.185	.545	.065	.065	.34	1.097	.545	.109	.065	.54	1.049	.403	.133	.091	.56
1x1/2	1.315	.840	1-1/2	1-1/2	1.185	.710	.065	.065	.35	1.097	.674	.109	.083	.55	1.049	.622	.133	.109	.57
1x3/4	1.315	1.050	1-1/2	1-1/2	1.185	.920	.065	.065	.36	1.097	.804	.109	.083	.56	1.049	.824	.133	.113	.59
1-1/4x1/2	1.660	.840	1-7/8	1-7/8	1.530	.710	.065	.065	.64	1.442	.674	.109	.083	.85	1.380	.622	.140	.109	1.12
1-1/4x3/4	1.660	1.050	1-7/8	1-7/8	1.530	.920	.065	.065	.66	1.442	.884	.109	.083	.97	1.380	.824	.140	.113	1.15
1-1/4x1	1.660	1.315	1-7/8	1-7/8	1.530	1.185	.065	.065	.68	1.442	1.097	.109	.109	.99	1.380	1.049	.140	.133	1.17
1-1/2x1/2	1.900	.840	2-1/4	2-1/4	1.770	.710	.065	.065	.81	1.682	.674	.109	.083	1.27	1.610	.622	.145	.109	1.61
1-1/2x3/4	1.900	1.050	2-1/4	2-1/4	1.770	.920	.065	.065	.82	1.682	.884	.109	.083	1.29	1.610	.824	.145	.113	1.63
1-1/2x1	1.900	1.315	2-1/4	2-1/4	1.770	1.185	.065	.065	.83	1.682	1.097	.109	.109	1.32	1.610	1.049	.145	.133	1.67
1-1/2x1-1/4	1.900	1.660	2-1/4	2-1/4	1.770	1.530	.065	.065	.85	1.682	1.442	.109	.109	1.35	1.610	1.380	.145	.140	1.71
2x1/2	2.375	.840	2-1/2	1-3/4						2.157	.674	.109	.083	1.12	2.067	.622	.154	.109	1.68
2x3/4	2.375	1.050	2-1/2	1-3/4	2.245	.920	.065	.065	1.02	2.157	.884	.109	.083	1.59	2.067	.824	.154	.113	2.40
2x1	2.375	1.315	2-1/2	2	2.245	1.185	.065	.065	1.03	2.157	1.097	.109	.109	1.60	2.067	1.049	.154	.133	2.43
2x1-1/4	2.375	1.660	2-1/2	2-1/4	2.245	1.530	.065	.065	1.05	2.157	1.442	.109	.109	1.64	2.067	1.380	.154	.140	2.49
2x1-1/2	2.375	1.900	2-1/2	2-3/8	2.245	1.770	.065	.065	1.08	2.157	1.682	.109	.109	1.68	2.067	1.610	.154	.145	2.54
2-1/2x1	2.875	1.315	3	2-1/4	2.709	1.185	.083	.065	1.83	2.635	1.097	.120	.109	2.63	2.469	1.049	.203	.133	4.12
2-1/2x1-1/4	2.875	1.660	3	2-1/2	2.709	1.530	.083	.065	1.85	2.635	1.442	.120	.109	2.66	2.469	1.380	.203	.140	4.17
2-1/2x1-1/2	2.875	1.900	3	2-5/8	2.709	1.770	.083	.065	1.89	2.635	1.682	.120	.109	2.73	2.469	1.610	.203	.145	4.27
2-1/2x2	2.875	2.375	3	2-3/4	2.709	2.245	.083	.065	1.93	2.635	2.157	.120	.109	2.79	2.469	2.067	.203	.154	4.36
3x1	3.500	1.315	3-3/8	2-5/8	3.334	1.185	.083	.065	2.85	3.260	1.097	.120	.109	3.27	3.068	1.049	.216	.133	6.13
3x1-1/4	3.500	1.660	3-3/8	2-3/4	3.334	1.530	.083	.065	2.89	3.260	1.442	.120	.109	3.31	3.068	1.380	.216	.140	6.20
3x1-1/2	3.500	1.900	3-3/8	2-7/8	3.334	1.770	.083	.065	2.93	3.260	1.682	.120	.109	3.35	3.068	1.610	.216	.145	6.28
3x2	3.500	2.375	3-3/8	3	3.334	2.245	.083	.065	2.99	3.260	2.157	.120	.109	3.43	3.068	2.067	.216	.154	6.42
3x2-1/2	3.500	2.875	3-3/8	3-1/4	3.334	2.709	.083	.083	3.06	3.260	2.635	.120	.120	3.51	3.068	2.469	.216	.203	6.57
3-1/2x1-1/2	4.000	1.900	3-3/4	3-1/8	3.834	1.770	.083	.065	4.67	3.760	1.682	.120	.109	4.99	3.548	1.610	.226	.145	7.65
3-1/2x2	4.000	2.375	3-3/4	3-1/4	3.834	2.245	.083	.065	4.73	3.760	2.157	.120	.109	5.05	3.548	2.067	.226	.154	7.74
3-1/2x2-1/2	4.000	2.875	3-3/4	3-1/2	3.834	2.709	.083	.083	4.84	3.760	2.635	.120	.120	5.17	3.548	2.469	.226	.203	8.07
3-1/2x3	4.000	3.500	3-3/4	3-5/8	3.834	3.334	.083	.083	4.95	3.760	3.260	.120	.120	5.29	3.548	3.068	.226	.216	9.10
4x1-1/2	4.500	1.900	4-1/8	3-3/8	4.334	1.770	.083	.065	6.05	4.260	1.682	.120	.109	6.40	4.026	1.610	.237	.145	9.76
4x2	4.500	2.375	4-1/8	3-1/2	4.334	2.245	.083	.065	6.12	4.260	2.157	.120	.109	6.46	4.026	2.067	.237	.154	9.88
4x2-1/2	4.500	2.875	4-1/8	3-3/4	4.334	2.709	.083	.083	6.19	4.260	2.635	.120	.120	6.56	4.026	2.469	.237	.203	10.00
4x3	4.500	3.500	4-1/8	3-7/8	4.334	3.334	.083	.083	6.33	4.260	3.260	.120	.120	6.71	4.026	3.068	.237	.216	10.23
4x3-1/2	4.500	4.000	4-1/8	4	4.334	3.834	.083	.083	6.48	4.260	3.760	.120	.120	6.89	4.026	3.548	.237	.226	10.40

ASTM A403 WELDED FITTINGS

REDUCING OUTLET TEES



DIMENSIONS

unit : inch / lb

Nominal Pipe Size Run X Outlet	Outside Diameter Run (O.D.)	Outside Diameter Outlet (O.D.)	Center to End Run (C)	Center to End Outlet (M)	Schedule 80S					Schedule 160					XX Strong Wall				
					Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (T)	Wall Thickness Outlet (t)	Approx ale Weight **	Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (T)	Wall Thickness Outlet (t)	Approx ale Weight **	Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (T)	Wall Thickness Outlet (t)	Approx ale Weight **
1/2 x 1/4	.840	.540	1	1	.546	.302	.147	.119	.25										
1/2 x 3/8	.840	.675	1	1	.546	.423	.147	.120	.27										
3/4 x 3/8	1.050	.675	1-1/8	1-1/8	.742	.423	.164	.126	.38	.612	.301	.219	.187	.55					
3/4 x 1/2	1.050	.840	1-1/8	1-1/8	.742	.546	.154	.147	.40	.612	.486	.219	.187	.57	.434	.252	.308	.294	.81
1 x 3/8	1.315	.675	1-1/2	1-1/2	.957	.423	.179	.120	.73	.815	.301	.250	.187	1.02					
1 x 1/2	1.315	.840	1-1/2	1-1/2	.957	.546	.179	.147	.75	.815	.486	.250	.187	1.04	.599	.252	.358	.294	1.49
1 x 3/4	1.315	1.050	1-1/2	1-1/2	.957	.742	.179	.154	.78	.815	.614	.250	.218	1.07	.599	.434	.358	.308	1.53
1-1/4 x 1/2	1.660	.840	1-7/8	1-7/8	1.278	.546	.191	.147	1.29	1.160	.486	.250	.187	1.69	.896	.252	.382	.294	2.58
1-1/4 x 3/4	1.660	1.050	1-7/8	1-7/8	1.278	.742	.191	.154	1.32	1.160	.614	.250	.218	1.73	.896	.434	.382	.308	2.64
1-1/4 x 1	1.660	1.315	1-7/8	1-7/8	1.278	.957	.191	.179	1.35	1.160	.815	.250	.250	1.77	.896	.599	.382	.358	2.70
1-1/2 x 1/2	1.900	.840	2-1/4	2-1/4	1.500	.546	.200	.147	1.91	1.338	.486	.281	.187	2.67	1.100	.252	.400	.308	3.82
1-1/2 x 3/4	1.900	1.050	2-1/4	2-1/4	1.500	.742	.200	.154	1.93	1.338	.614	.281	.218	2.71	1.100	.434	.400	.308	3.87
1-1/2 x 1	1.900	1.315	2-1/4	2-1/4	1.500	.957	.200	.179	1.98	1.338	.815	.281	.250	2.77	1.100	.599	.400	.358	3.96
1-1/2 x 1-1/4	1.900	1.660	2-1/4	2-1/4	1.500	1.278	.200	.191	2.02	1.338	1.160	.281	.250	2.83	1.100	.896	.400	.382	4.05
2 x 3/4	2.375	1.050	2-1/2	1-3/4	1.939	.742	.218	.154	2.97	1.689	.614	.343	.218	4.67	1.503	.434	.436	.308	5.95
2 x 1	2.375	1.315	2-1/2	2	1.939	.957	.218	.179	3.01	1.689	.815	.343	.250	4.73	1.503	.599	.436	.358	6.02
2 x 1-1/4	2.375	1.660	2-1/2	2-1/4	1.939	1.278	.218	.191	3.08	1.689	1.160	.343	.250	4.84	1.503	.896	.436	.382	6.16
2 x 1-1/2	2.375	1.900	2-1/2	2-5/8	1.939	1.500	.218	.200	3.15	1.689	1.338	.343	.281	4.95	1.503	1.100	.436	.400	6.30
2-1/2 x 1	2.875	1.315	3	2-1/4	2.323	.957	.276	.179	5.86	2.125	.815	.375	.250	7.97	1.771	.599	.552	.358	11.73
2-1/2 x 1-1/4	2.875	1.660	3	2-1/2	2.323	1.278	.276	.191	5.93	2.125	1.160	.375	.250	8.06	1.771	.896	.552	.382	11.87
2-1/2 x 1-1/2	2.875	1.900	3	2-5/8	2.323	1.500	.276	.200	6.07	2.125	1.338	.375	.281	8.25	1.771	1.100	.552	.400	12.14
2-1/2 x 2	2.875	2.375	3	2-3/4	2.323	1.939	.276	.218	6.21	2.125	1.689	.375	.343	8.44	1.771	1.503	.552	.436	12.42
3 x 1	3.500	1.315	3-3/8	2-5/8	2.900	.957	.300	.179	8.23	2.624	.815	.438	.250	12.02	2.300	.599	.600	.358	16.46
3 x 1-1/4	3.500	1.660	3-3/8	2-3/4	2.900	1.278	.300	.191	8.33	2.624	1.160	.438	.250	12.16	2.300	.896	.600	.382	16.66
3 x 1-1/2	3.500	1.900	3-3/8	2-7/8	2.900	1.500	.300	.200	8.43	2.624	1.338	.438	.281	12.30	2.300	1.100	.600	.400	16.85
3 x 2	3.500	2.375	3-3/8	3	2.900	1.939	.300	.218	8.62	2.624	1.689	.438	.343	12.59	2.300	1.503	.600	.436	17.24
3 x 2-1/2	3.500	2.875	3-3/8	3-1/4	2.900	2.323	.300	.276	8.82	2.624	2.125	.438	.375	12.88	2.300	1.771	.600	.552	17.64
3-1/2 x 1-1/2	4.000	1.900	3-3/4	3-1/8	3.364	1.500	.318	.200	10.20						2.728	1.100	.636	.400	20.40
3-1/2 x 2	4.000	2.375	3-3/4	3-1/4	3.364	1.939	.318	.218	10.32						2.728	1.503	.636	.436	20.64
3-1/2 x 2-1/2	4.000	2.875	3-3/4	3-1/2	3.364	2.323	.318	.276	10.55						2.728	1.771	.636	.552	21.12
3-1/2 x 3	4.000	3.500	3-3/4	3-5/8	3.364	2.900	.318	.300	10.80						2.728	2.300	.636	.600	21.60
4 x 1-1/2	4.500	1.900	4-1/8	3-3/8	3.826	1.500	.337	.200	14.28	3.438	1.338	.531	.281	22.56	3.152	1.100	.674	.400	28.56
4 x 2	4.500	2.375	4-1/8	3-1/2	3.826	1.939	.337	.218	14.45	3.438	1.689	.531	.343	22.83	3.152	1.503	.674	.436	28.90
4 x 2-1/2	4.500	2.875	4-1/8	3-3/4	3.826	2.323	.337	.276	14.62	3.438	2.125	.531	.375	23.10	3.152	1.771	.674	.552	29.24
4 x 3	4.500	3.500	4-1/8	3-7/8	3.826	2.900	.337	.300	14.96	3.438	2.624	.531	.438	23.63	3.152	2.300	.674	.600	29.92
4 x 3-1/2	4.500	4.000	4-1/8	4	3.826	3.364	.337	.318	15.30						3.152	2.728	.674	.636	30.60



ASTM A403 WELDED FITTINGS

REDUCING OUTLET TEES

DIMENSIONS

unit : inch / lb

Nominal Pipe Size Run X Outlet	Outside Diameter Run (O.D.)	Outside Diameter Outlet (O.D.)	Center to End Run (C)	Center to End Outlet (M)	Schedule 5S					Schedule 10S					Schedule 40S				
					Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (T)	Wall Thickness Outlet (t)	Approx. Weight ¹⁾	Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (T)	Wall Thickness Outlet (t)	Approx. Weight ¹⁾	Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (T)	Wall Thickness Outlet (t)	Approx. Weight ¹⁾
5 x 2	5.563	2.375	4.7/8	4.1/8	5.345	2.245	.109	.065	10.92	5.295	2.157	.134	.109	11.29	5.047	2.087	.258	.154	17.43
5 x 2-1/2	5.563	2.875	4.7/8	4.1/4	5.345	2.709	.109	.083	11.05	5.295	2.635	.134	.120	11.43	5.047	2.469	.258	.203	17.63
5 x 3	5.563	3.500	4.7/8	4.3/8	5.345	3.334	.109	.083	11.18	5.295	3.260	.134	.120	11.56	5.047	3.068	.258	.216	17.84
5 x 3-1/2	5.563	4.000	4.7/8	4.1/2	5.345	3.834	.109	.083	11.44	5.295	3.760	.134	.120	11.83	5.047	3.548	.258	.226	18.25
5 x 4	5.563	4.500	4.7/8	4.5/8	5.345	4.334	.109	.083	11.70	5.295	4.260	.134	.120	12.10	5.047	4.026	.258	.237	18.67
6 x 2	6.625	2.375	5-5/8	4-5/8	6.407	2.245	.109	.065	14.48	6.357	2.157	.134	.109	14.95	6.065	2.087	.280	.154	20.37
6 x 2-1/2	6.625	2.875	5-5/8	4-3/4	6.407	2.709	.109	.083	14.48	6.357	2.635	.134	.120	14.95	6.065	2.469	.280	.203	20.37
6 x 3	6.625	3.500	5-5/8	4-7/8	6.407	3.334	.109	.083	14.62	6.357	3.260	.134	.120	15.13	6.065	3.068	.280	.216	20.37
6 x 3-1/2	6.625	4.000	5-5/8	5	6.407	3.834	.109	.083	14.79	6.357	3.760	.134	.120	15.31	6.065	3.548	.280	.226	20.85
6 x 4	6.625	4.500	5-5/8	5-1/8	6.407	4.334	.109	.083	15.13	6.357	4.260	.134	.120	15.66	6.065	4.026	.280	.237	21.34
6 x 5	6.625	5.563	5-5/8	5-3/8	6.407	5.345	.109	.109	15.48	6.357	5.295	.134	.134	16.02	6.065	5.047	.280	.258	21.82
8 x 3	8.625	3.500	7	6	8.407	3.334	.109	.083	26.04	8.329	3.260	.148	.120	29.00	7.981	3.068	.322	.216	38.72
8 x 3-1/2	8.625	4.000	7	6	8.407	3.834	.109	.083	26.35	8.329	3.760	.148	.120	29.32	7.981	3.548	.322	.220	39.18
8 x 4	8.625	4.500	7	6-1/8	8.407	4.334	.109	.083	26.66	8.329	4.260	.148	.120	29.67	7.981	4.026	.322	.237	39.64
8 x 5	8.625	5.563	7	6-3/8	8.407	5.345	.109	.109	27.28	8.329	5.295	.148	.134	30.36	7.981	5.047	.322	.258	40.56
8 x 6	8.625	6.625	7	6-5/8	8.407	6.407	.109	.109	27.90	8.329	6.357	.148	.134	31.05	7.981	6.065	.322	.280	41.49
10 x 4	10.750	4.500	8-1/2	7-1/4	10.482	4.334	.134	.083	46.75	10.420	4.260	.165	.120	50.15	10.020	4.026	.365	.237	66.30
10 x 5	10.750	5.563	8-1/2	7-1/2	10.482	5.345	.134	.109	47.30	10.420	5.295	.165	.134	50.74	10.020	5.047	.365	.258	67.08
10 x 6	10.750	6.625	8-1/2	7-5/8	10.482	6.407	.134	.109	48.40	10.420	6.357	.165	.134	51.92	10.020	6.065	.365	.280	68.04
10 x 8	10.750	8.625	8-1/2	8	10.482	8.407	.134	.109	49.50	10.420	8.329	.165	.148	53.10	10.020	7.981	.365	.322	70.20
12 x 5	12.750	5.563	10	8-1/2	12.438	5.345	.156	.109	70.55	12.390	5.295	.180	.134	73.95	12.000	5.047	.375	.258	110.00
12 x 6	12.750	6.625	10	8-5/8	12.438	6.407	.156	.109	71.38	12.390	6.357	.180	.134	74.82	12.000	6.065	.375	.280	118.00
12 x 8	12.750	8.625	10	9	12.438	8.407	.156	.109	73.04	12.390	8.329	.180	.148	78.56	12.000	7.981	.375	.322	120.00
12 x 10	12.750	10.750	10	9-1/2	12.438	10.482	.156	.134	74.70	12.390	10.420	.180	.165	78.30	12.000	10.020	.375	.365	123.00
14 x 8	14.000	6.625	11	9-3/8	13.688	6.407	.156	.109	76.65	13.624	6.357	.188	.134	90.95	13.250	6.065	.375	.280	148.00
14 x 8	14.000	8.625	11	9-3/4	13.688	8.407	.156	.109	76.54	13.624	8.329	.188	.148	92.02	13.250	7.981	.375	.322	150.00
14 x 10	14.000	10.750	11	10-1/8	13.688	10.482	.156	.134	78.32	13.624	10.420	.188	.165	94.16	13.250	10.020	.375	.365	154.00
14 x 12	14.000	12.750	11	10-5/8	13.688	12.438	.156	.156	80.10	13.624	12.390	.188	.180	96.30	13.250	12.000	.375	.375	157.00
16 x 6	16.000	6.625	12	10-3/8	15.670	6.407	.165	.109	90.00	15.624	6.357	.188	.134	109.00	15.250	6.065	.375	.280	184.00
16 x 8	16.000	8.625	12	10-3/4	15.670	8.407	.165	.109	97.75	15.624	8.329	.188	.148	110.00	15.250	7.981	.375	.322	187.00
16 x 10	16.000	10.750	12	11-1/8	15.670	10.482	.165	.134	98.90	15.624	10.420	.188	.165	112.00	15.250	10.020	.375	.365	189.00
16 x 12	16.000	12.750	12	11-5/8	15.670	12.438	.165	.156	101.00	15.624	12.390	.188	.180	114.00	15.250	12.000	.375	.375	193.00
16 x 14	16.000	14.000	12	12	15.670	13.688	.165	.156	103.00	15.624	13.624	.188	.188	117.00	15.250	13.250	.375	.375	198.00
18 x 8	18.000	8.625	13-1/2	11-3/4	17.670	8.407	.165	.109	125.00	17.624	8.329	.188	.148	142.00	17.250	7.981	.375	.322	240.00
18 x 10	18.000	10.750	13-1/2	12-1/8	17.670	10.482	.165	.134	126.00	17.624	10.420	.188	.165	143.00	17.250	10.020	.375	.365	243.00
18 x 12	18.000	12.750	13-1/2	12-5/8	17.670	12.438	.165	.156	128.00	17.624	12.390	.188	.180	145.00	17.250	12.000	.375	.375	246.00
18 x 14	18.000	14.000	13-1/2	13	17.670	13.688	.165	.156	131.00	17.624	13.624	.188	.188	148.00	17.250	13.250	.375	.375	251.00
18 x 16	18.000	16.000	13-1/2	13	17.670	15.670	.165	.165	134.00	17.624	15.624	.188	.188	152.00	17.250	15.250	.375	.375	257.00
20 x 8	20.000	8.625	15	12-3/4	19.624	8.407	.188	.109	141.00	19.564	8.329	.218	.148	169.00	19.250	7.981	.375	.322	297.00
20 x 10	20.000	10.750	15	13-1/8	19.624	10.482	.188	.134	143.00	19.564	10.420	.218	.165	161.00	19.250	10.020	.375	.365	300.00
20 x 12	20.000	12.750	15	13-5/8	19.624	12.438	.188	.156	145.00	19.564	12.390	.218	.180	193.00	19.250	12.000	.375	.375	304.00
20 x 14	20.000	14.000	15	14	19.624	13.688	.188	.156	147.00	19.564	13.624	.218	.188	196.00	19.250	13.250	.375	.375	308.00
20 x 16	20.000	16.000	15	14	19.624	15.670	.188	.165	150.00	19.564	15.624	.218	.188	200.00	19.250	15.250	.375	.375	315.00
20 x 18	20.000	18.000	15	14-1/2	19.624	17.670	.188	.165	154.00	19.564	17.624	.218	.188	205.00	19.250	17.250	.375	.375	322.00
24 x 10	24.000	10.750	17	15-1/8	23.564	10.482	.218	.134	247.00	23.500	10.420	.250	.165	284.00	23.250	10.020	.375	.365	413.00
24 x 12	24.000	12.750	17	15-5/8	23.564	12.438	.218	.156	250.00	23.500	12.390	.250	.180	288.00	23.250	12.000	.375	.375	410.00
24 x 14	24.000	14.000	17	16	23.564	13.688	.218	.156	253.00	23.500	13.624	.250	.188	291.00	23.250	13.250	.375	.375	423.00
24 x 16	24.000	16.000	17	16	23.564	15.670	.218	.165	256.00	23.500	15.624	.250	.188	295.00	23.250	15.250	.375	.375	428.00
24 x 18	24.000	18.000	17	16-1/2	23.564	17.670	.218	.165	262.00	23.500	17.624	.250	.188	302.00	23.250	17.250	.375	.375	438.00
24 x 20	24.000	20.000	17	17	23.564	19.624	.218	.188	268.00	23.500	19.564	.250	.218	308.00	23.250	19.250	.375	.375	448.00



ASTM A403 WELDED FITTINGS

REDUCING OUTLET TEES

DIMENSIONS

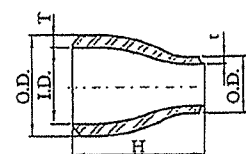
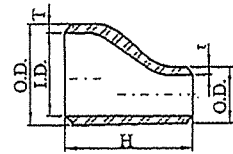
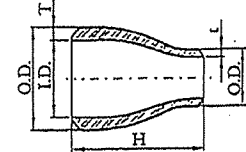
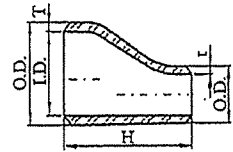
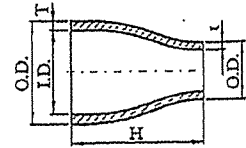
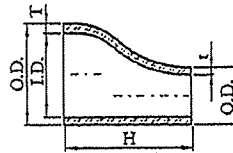
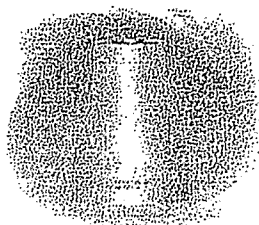
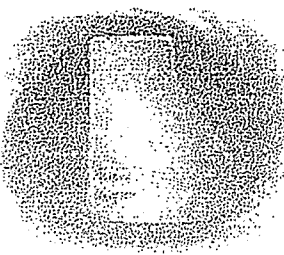
unit : Inch / lb

Nominal Pipe Size Run X Outlet	Outside Diameter Run (O.D.)	Outside Diameter Outlet (O.D.)	Center to End Run (C)	Center to End Outlet (M)	Schedule 80S					Schedule 160					XX Strong Wall				
					Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (T)	Wall Thickness Outlet (t)	Approx. Weight **	Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (T)	Wall Thickness Outlet (t)	Approx. Weight **	Inside Diameter Run (I.D.)	Inside Diameter Outlet (I.D.)	Wall Thickness Run (T)	Wall Thickness Outlet (t)	Approx. Weight **
5 x 2	5.563	2.375	4-7/8	4-1/8	4.813	1.939	.375	.218	21.00	4.313	1.689	.625	.343	35.07	4.083	1.503	.750	.436	42.00
5 x 2-1/2	5.563	2.875	4-7/8	4-1/4	4.813	2.323	.375	.276	21.25	4.313	2.125	.625	.375	35.48	4.083	1.771	.750	.552	42.50
5 x 3	5.563	3.500	4-7/8	4-3/8	4.813	2.900	.375	.300	21.50	4.313	2.624	.625	.438	35.90	4.083	2.300	.750	.600	43.00
5 x 3-1/2	5.563	4.000	4-7/8	4-1/2	4.813	3.364	.375	.318	22.00	4.313	3.438	.625	.531	37.57	4.083	3.152	.750	.674	45.00
5 x 4	5.563	4.500	4-7/8	4-5/8	4.813	3.826	.375	.337	22.50	4.313	3.826	.625	.531	37.57	4.083	3.152	.750	.674	45.00
6 x 2-1/2	6.625	2.875	5-5/8	4-3/4	5.761	2.323	.432	.276	25.20	5.187	2.125	.719	.375	41.83	4.897	1.771	.864	.552	50.40
6 x 3	6.625	3.500	5-5/8	4-7/8	5.761	2.900	.432	.300	25.50	5.187	2.624	.719	.438	42.33	4.897	2.300	.864	.600	51.00
6 x 3-1/2	6.625	4.000	5-5/8	5	5.761	3.364	.432	.318	25.80	5.187	3.000	.719	.438	42.33	4.897	2.728	.864	.636	51.60
6 x 4	6.625	4.500	5-5/8	5-1/8	5.761	3.826	.432	.337	26.40	5.187	3.438	.719	.531	43.82	4.897	3.152	.864	.674	52.80
8 x 5	8.625	5.563	5-5/8	6-3/8	7.761	4.813	.500	.375	27.00	5.187	4.313	.719	.625	44.82	4.897	4.083	.864	.750	54.00
8 x 3	8.625	3.500	7	6	7.625	2.900	.500	.300	52.08	6.813	2.624	.906	.438	94.00	6.875	2.300	.875	.600	90.70
8 x 3-1/2	8.625	4.000	7	6	7.625	3.364	.500	.318	52.70	6.813	3.000	.906	.438	94.00	6.875	2.728	.875	.636	91.80
8 x 4	8.625	4.500	7	6-1/8	7.625	3.826	.500	.337	53.32	6.813	3.438	.906	.531	96.30	6.875	3.152	.875	.674	92.90
8 x 5	8.625	5.563	7	6-3/8	7.625	4.813	.500	.375	54.56	6.813	4.313	.906	.625	98.50	6.875	4.083	.875	.750	95.00
8 x 6	8.625	6.625	7	6-5/8	7.625	5.761	.500	.432	55.80	6.813	5.187	.906	.719	101.00	6.875	4.897	.875	.864	97.20
10 x 4	10.750	4.500	8-1/2	7-1/4	9.750	3.826	.500	.337	93.50	8.500	3.438	1.125	.531	210.00	8.500	3.152	1.125	.674	210.00
10 x 5	10.750	5.563	8-1/2	7-1/2	9.750	4.813	.500	.375	94.60	8.500	4.313	1.125	.625	212.00	8.500	4.083	1.125	.750	212.00
10 x 6	10.750	6.625	8-1/2	7-5/8	9.750	5.761	.500	.432	96.80	8.500	5.187	1.125	.719	217.00	8.500	4.897	1.125	.864	217.00
10 x 8	10.750	8.625	8-1/2	8	9.750	7.625	.500	.500	99.00	8.500	6.813	1.125	.906	222.00	8.500	6.625	1.125	1.125	222.00
12 x 5	12.750	5.563	10	8-1/2	11.750	4.813	.500	.375	157.00	10.126	4.313	1.312	.625	411.00	10.126	4.083	1.312	.750	411.00
12 x 6	12.750	6.625	10	8-5/8	11.750	5.761	.500	.432	159.00	10.126	5.187	1.312	.719	416.00	10.126	4.897	1.312	.864	416.00
12 x 8	12.750	8.625	10	9	11.750	7.625	.500	.500	163.00	10.126	6.813	1.312	.906	426.00	10.126	6.625	1.312	1.125	426.00
12 x 10	12.750	10.750	10	9-1/2	11.750	9.750	.500	.500	166.00	10.126	8.500	1.312	1.125	435.00	10.126	8.250	1.312	1.312	435.00
14 x 6	14.000	6.625	11	9-3/8	13.000	5.761	.500	.432	178.00	11.188	5.187	1.406	.719	444.00	11.188	4.897	1.406	.864	444.00
14 x 8	14.000	8.625	11	9-3/4	13.000	7.625	.500	.500	180.00	11.188	6.813	1.406	.906	448.00	11.188	6.625	1.406	1.125	448.00
14 x 10	14.000	10.750	11	10-1/8	13.000	9.750	.500	.500	185.00	11.188	8.500	1.406	1.125	453.00	11.188	8.250	1.406	1.312	453.00
14 x 12	14.000	12.750	11	10-5/8	13.000	11.750	.500	.600	189.00	11.188	10.126	1.406	1.312	458.00	11.188	9.875	1.406	1.500	458.00
16 x 6	16.000	6.625	12	10-3/8	15.000	5.761	.500	.432	222.00	12.812	5.187	1.594	.719	468.00	12.812	4.897	1.594	.864	468.00
16 x 8	16.000	8.625	12	10-3/4	15.000	7.625	.500	.500	225.00	12.812	6.813	1.594	.906	473.00	12.812	6.625	1.594	1.125	473.00
16 x 10	16.000	10.750	12	11-1/8	15.000	9.750	.500	.500	228.00	12.812	8.500	1.594	1.125	478.00	12.812	8.250	1.594	1.312	478.00
16 x 12	16.000	12.750	12	11-5/8	15.000	11.750	.500	.600	233.00	12.812	10.126	1.594	1.312	483.00	12.812	9.875	1.594	1.500	483.00
16 x 14	16.000	14.000	12	12	15.000	13.000	.500	.500	238.00	12.812	11.188	1.594	1.406	488.00	12.812	10.875	1.594	1.600	488.00
18 x 8	18.000	8.625	13-1/2	11-3/4	17.000	7.625	.500	.500	288.00	14.438	6.813	1.781	.906	508.00	14.438	6.625	1.781	1.125	508.00
18 x 10	18.000	10.750	13-1/2	12-1/8	17.000	9.750	.500	.500	292.00	14.438	8.500	1.781	1.125	513.00	14.438	8.250	1.781	1.312	513.00
18 x 12	18.000	12.750	13-1/2	12-5/8	17.000	11.750	.500	.500	296.00	14.438	10.126	1.781	1.312	518.00	14.438	9.875	1.781	1.500	518.00
18 x 14	18.000	14.000	13-1/2	13	17.000	13.000	.500	.500	303.00	14.438	11.188	1.781	1.406	523.00	14.438	10.875	1.781	1.600	523.00
18 x 16	18.000	16.000	13-1/2	13	17.000	15.000	.500	.500	309.00	14.438	12.812	1.781	1.594	528.00	14.438	12.500	1.781	1.800	528.00
20 x 6	20.000	6.625	15	12-3/4	19.000	7.625	.500	.500	357.00	16.062	6.813	1.969	.906	548.00	16.062	6.625	1.969	1.125	548.00
20 x 10	20.000	10.750	15	13-1/8	19.000	9.750	.500	.500	361.00	16.062	8.500	1.969	1.125	553.00	16.062	8.250	1.969	1.312	553.00
20 x 12	20.000	12.750	15	13-5/8	19.000	11.750	.500	.500	365.00	16.062	10.126	1.969	1.312	558.00	16.062	9.875	1.969	1.500	558.00
20 x 14	20.000	14.000	15	14	19.000	13.000	.500	.500	370.00	16.062	11.188	1.969	1.406	563.00	16.062	10.875	1.969	1.600	563.00
20 x 16	20.000	16.000	15	14	19.000	15.000	.500	.500	378.00	16.062	12.812	1.969	1.594	568.00	16.062	12.500	1.969	1.800	568.00
20 x 18	20.000	18.000	15	14-1/2	19.000	17.000	.500	.500	387.00	16.062	14.438	1.969	1.781	573.00	16.062	14.125	1.969	2.000	573.00
24 x 10	24.000	10.750	17	15-1/8	23.000	9.750	.500	.500	498.00	19.312	8.500	2.344	1.125	608.00	19.312	8.250	2.344	1.312	608.00
24 x 12	24.000	12.750	17	15-5/8	23.000	11.750	.500	.500	504.00	19.312	10.126	2.344	1.312	613.00	19.312	9.875	2.344	1.500	613.00
24 x 14	24.000	14.000	17	16	23.000	13.000	.500	.500	510.00	19.312	11.188	2.344	1.406	618.00	19.312	10.875	2.344	1.600	618.00
24 x 16	24.000	16.000	17	16	23.000	15.000	.500	.500	516.00	19.312	12.812	2.344	1.594	623.00	19.312	12.500	2.344	1.800	623.00
24 x 18	24.000	18.000	17	16-1/2	23.000	17.000	.500	.500	528.00	19.312	14.438	2.344	1.781	628.00	19.312	14.125	2.344	2.000	628.00
24 x 20	24.000	20.000	17	17	23.000	19.000	.500	.500	540.00	19.312	16.062	2.344	1.969	633.00	19.312	16.000	2.344	2.200	633.00



ASTM A403 WELDED FITTINGS

CON / ECC REDUCERS



DIMENSIONS

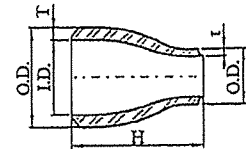
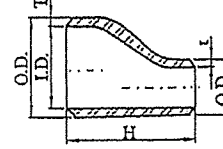
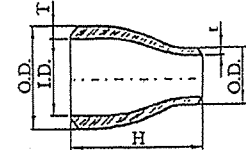
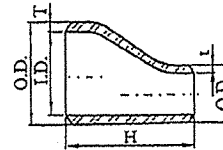
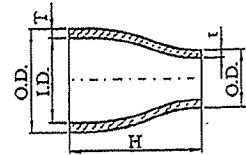
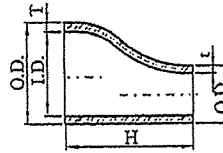
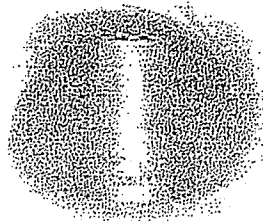
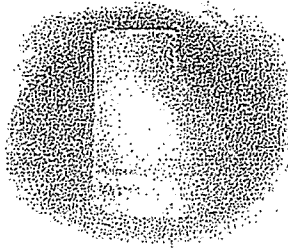
unit : inch / lb

Nominal Pipe Size Large End x Small End	Outside Diameter Large End (O.D.)	Outside Diameter Small End (O.D.)	Length (H)	Schedule 5S					Schedule 10S					Schedule 40S				
				Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (t)	Wall Thickness Small End (t)	Approximate Weight**	Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (t)	Wall Thickness Small End (t)	Approximate Weight**	Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (t)	Wall Thickness Small End (t)	Approximate Weight**
3/4 x 3/8	1.050	.675	1-1/2	.920	.545	.065	.065	.15	.884	.545	.083	.065	.20	.824	.493	.113	.091	.27
3/4 x 1/2	1.050	.840	1-1/2	.920	.710	.065	.065	.17	.884	.674	.083	.083	.22	.824	.622	.113	.109	.31
1 x 3/8	1.315	.675	2	1.185	.545	.065	.065	.16	1.097	.545	.109	.065	.21	1.049	.493	.133	.091	.33
1 x 1/2	1.315	.840	2	1.185	.710	.065	.065	.16	1.097	.674	.109	.083	.27	1.049	.622	.133	.109	.34
1 x 3/4	1.315	1.050	2	1.185	.920	.065	.065	.17	1.097	.884	.109	.083	.29	1.049	.824	.133	.113	.36
1-1/4 x 1/2	1.660	.840	2	1.530	.710	.065	.065	.21	1.442	.674	.109	.083	.35	1.380	.622	.140	.109	.46
1-1/4 x 3/4	1.660	1.050	2	1.530	.920	.065	.065	.22	1.442	.884	.109	.083	.39	1.380	.824	.140	.113	.49
1-1/4 x 1	1.660	1.315	2	1.530	1.185	.065	.065	.22	1.442	1.097	.109	.109	.39	1.380	1.049	.140	.133	.49
1-1/2 x 1/2	1.900	.840	2-1/2	1.770	.710	.065	.065	.23	1.682	.674	.109	.083	.37	1.610	.622	.145	.109	.50
1-1/2 x 3/4	1.900	1.050	2-1/2	1.770	.920	.065	.065	.24	1.682	.884	.109	.083	.39	1.610	.824	.145	.113	.52
1-1/2 x 1	1.900	1.315	2-1/2	1.770	1.185	.065	.065	.25	1.682	1.097	.109	.109	.43	1.610	1.049	.145	.133	.58
1-1/2 x 1-1/4	1.900	1.660	2-1/2	1.770	1.530	.065	.065	.27	1.682	1.442	.109	.109	.46	1.610	1.380	.145	.140	.62
2 x 3/4	2.375	1.050	3	2.245	.920	.065	.065	.33	2.157	.884	.109	.083	.56	2.067	.824	.154	.113	.80
2 x 1	2.375	1.315	3	2.245	1.185	.065	.065	.37	2.157	1.097	.109	.109	.62	2.067	1.049	.154	.133	.89
2 x 1-1/4	2.375	1.660	3	2.245	1.530	.065	.065	.40	2.157	1.442	.109	.109	.67	2.067	1.380	.154	.140	.96
2 x 1-1/2	2.375	1.900	3	2.245	1.770	.065	.065	.41	2.157	1.682	.109	.109	.69	2.067	1.610	.154	.145	.99
2-1/2 x 1	2.875	1.315	3-1/2	2.709	1.185	.083	.065	.56	2.635	1.097	.120	.109	.83	2.469	1.049	.203	.133	1.42
2-1/2 x 1-1/4	2.875	1.660	3-1/2	2.709	1.530	.083	.065	.64	2.635	1.442	.120	.109	.95	2.469	1.380	.203	.140	1.61
2-1/2 x 1-1/2	2.875	1.900	3-1/2	2.709	1.770	.083	.065	.67	2.635	1.682	.120	.109	.98	2.469	1.610	.203	.145	1.67
2-1/2 x 2	2.875	2.375	3-1/2	2.709	2.245	.083	.065	.70	2.635	2.157	.120	.109	1.03	2.469	2.067	.203	.154	1.76
3 x 1	3.500	1.315	3-1/2	3.334	1.185	.083	.065	.70	3.260	1.097	.120	.109	1.03	3.068	1.049	.216	.133	1.81
3 x 1-1/4	3.500	1.660	3-1/2	3.334	1.530	.083	.065	.70	3.260	1.442	.120	.109	1.03	3.068	1.380	.216	.140	1.86
3 x 1-1/2	3.500	1.900	3-1/2	3.334	1.770	.083	.065	.78	3.260	1.682	.120	.109	1.13	3.068	1.610	.216	.145	2.07
3 x 2	3.500	2.375	3-1/2	3.334	2.245	.083	.065	.83	3.260	2.157	.120	.109	1.21	3.068	2.067	.216	.154	2.20
3 x 2-1/2	3.500	2.875	3-1/2	3.334	2.709	.083	.083	.90	3.260	2.635	.120	.120	1.30	3.068	2.469	.216	.203	2.38
3-1/2 x 1-1/4	4.000	1.660	4	3.834	1.530	.083	.065	.93	3.760	1.442	.120	.109	1.37	3.548	1.380	.226	.140	2.60
3-1/2 x 1-1/2	4.000	1.900	4	3.834	1.770	.083	.065	.99	3.760	1.682	.120	.109	1.46	3.548	1.610	.226	.145	2.76
3-1/2 x 2	4.000	2.375	4	3.834	2.245	.083	.065	1.06	3.760	2.157	.120	.109	1.57	3.548	2.067	.226	.154	2.97
3-1/2 x 2-1/2	4.000	2.875	4	3.834	2.709	.083	.083	1.17	3.760	2.635	.120	.120	1.72	3.548	2.469	.226	.203	3.25
3-1/2 x 3	4.000	3.500	4	3.834	3.334	.083	.083	1.20	3.760	3.260	.120	.120	1.77	3.548	3.068	.226	.216	3.35
4 x 1-1/2	4.500	1.900	4	4.334	1.770	.083	.065	1.05	4.260	1.682	.120	.109	1.50	4.026	1.610	.237	.145	3.00
4 x 2	4.500	2.375	4	4.334	2.245	.083	.065	1.21	4.260	2.157	.120	.109	1.73	4.026	2.067	.237	.154	3.47
4 x 2-1/2	4.500	2.875	4	4.334	2.709	.083	.083	1.28	4.260	2.635	.120	.120	1.83	4.026	2.469	.237	.203	3.66
4 x 3	4.500	3.500	4	4.334	3.334	.083	.083	1.34	4.260	3.260	.120	.120	1.92	4.026	3.068	.237	.216	3.84
4 x 3-1/2	4.500	4.000	4	4.334	3.834	.083	.083	1.38	4.260	3.760	.120	.120	1.98	4.026	3.548	.237	.226	3.97



ASTM A403 WELDED FITTINGS

CON / ECC REDUCERS



DIMENSIONS

unit : inch / lb

Nominal Pipe Size Large End X Small End	Outside Diameter Large End (O.D.)	Outside Diameter Small End (O.D.)	Length (L)	Schedule 80S					Schedule 160					XX Strong Wall				
				Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (T)	Wall Thickness Small End (t)	Approximate Weight **	Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (T)	Wall Thickness Small End (t)	Approximate Weight **	Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (T)	Wall Thickness Small End (t)	Approximate Weight **
3/4 x 3/8	1.050	.875	1-1/2	.742	.423	.154	.126	.37	.612	.466	.219	.187	.55	.434	.252	.308	.294	.80
3/4 x 1/2	1.050	.840	1-1/2	.742	.546	.154	.147	.40	.612	.466	.219	.187	.55	.434	.252	.308	.294	.80
1 x 3/8	1.315	.875	2	.957	.423	.179	.126	.42	.815	.466	.250	.187	.57	.699	.252	.358	.294	.88
1 x 1/2	1.315	.840	2	.957	.546	.179	.147	.44	.815	.466	.250	.187	.57	.699	.252	.358	.294	.88
1 x 3/4	1.315	1.050	2	.957	.742	.179	.154	.49	.815	.612	.250	.219	.61	.599	.434	.358	.308	.98
1-1/4 x 1/2	1.660	.840	2	1.278	.546	.191	.147	.52	1.160	.466	.250	.187	.67	.896	.252	.382	.294	1.04
1-1/4 x 3/4	1.660	1.050	2	1.278	.742	.191	.154	.56	1.160	.612	.250	.219	.73	.896	.434	.382	.308	1.12
1-1/4 x 1	1.660	1.315	2	1.278	.957	.191	.179	.59	1.160	.815	.250	.250	.82	.896	.599	.382	.358	1.18
1-1/2 x 1/2	1.900	.840	2-1/2	1.500	.546	.200	.147	.68	1.338	.466	.281	.187	.95	1.100	.252	.400	.294	1.36
1-1/2 x 3/4	1.900	1.050	2-1/2	1.500	.742	.200	.154	.71	1.338	.612	.281	.219	.99	1.100	.434	.400	.308	1.42
1-1/2 x 1	1.900	1.315	2-1/2	1.500	.957	.200	.179	.74	1.338	.815	.281	.250	1.03	1.100	.599	.400	.358	1.48
1-1/2 x 1-1/4	1.900	1.660	2-1/2	1.500	1.278	.200	.191	.80	1.338	1.160	.281	.260	1.12	1.100	.896	.400	.382	1.60
2 x 3/4	2.375	1.050	3	1.939	.742	.218	.154	1.11	1.689	.612	.343	.219	1.74	1.503	.434	.436	.308	2.22
2 x 1	2.375	1.315	3	1.939	.957	.218	.179	1.18	1.689	.815	.343	.250	1.85	1.503	.599	.436	.358	2.36
2 x 1-1/4	2.375	1.660	3	1.939	1.278	.218	.191	1.27	1.689	1.160	.343	.250	1.99	1.503	.896	.436	.382	2.54
2 x 1-1/2	2.375	1.900	3	1.939	1.500	.218	.200	1.30	1.689	1.338	.343	.281	2.04	1.503	1.100	.436	.400	2.60
2-1/2 x 1	2.875	1.315	3-1/2	2.323	.957	.276	.179	1.92	2.125	.815	.375	.250	2.59	1.771	.599	.552	.358	3.84
2-1/2 x 1-1/4	2.875	1.660	3-1/2	2.323	1.278	.276	.191	1.98	2.125	1.160	.375	.250	2.67	1.771	.896	.552	.382	3.96
2-1/2 x 1-1/2	2.875	1.900	3-1/2	2.323	1.500	.276	.200	2.07	2.125	1.338	.375	.281	2.79	1.771	1.100	.552	.400	4.14
2-1/2 x 2	2.875	2.375	3-1/2	2.323	1.939	.276	.218	2.26	2.125	1.689	.375	.343	3.05	1.771	1.503	.552	.436	4.52
3 x 1	3.500	1.315	3-1/2	2.900	.957	.300	.179	2.39	2.624	.815	.438	.250	3.32	2.300	.599	.600	.358	4.76
3 x 1-1/4	3.500	1.660	3-1/2	2.900	1.278	.300	.191	2.51	2.624	1.160	.438	.250	3.63	2.300	.896	.600	.382	5.02
3 x 1-1/2	3.500	1.900	3-1/2	2.900	1.500	.300	.200	2.66	2.624	1.338	.438	.281	3.85	2.300	1.100	.600	.400	5.32
3 x 2	3.500	2.375	3-1/2	2.900	1.939	.300	.218	2.85	2.624	1.689	.438	.343	4.13	2.300	1.503	.600	.436	5.70
3 x 2-1/2	3.500	2.875	3-1/2	2.900	2.323	.300	.276	3.28	2.624	2.125	.438	.375	4.75	2.300	1.771	.600	.552	6.56
3-1/2 x 1-1/4	4.000	1.660	4	3.364	1.278	.318	.191	3.53	3.438	1.160	.531	.281	6.56	3.152	1.100	.674	.400	8.36
3-1/2 x 1-1/2	4.000	1.900	4	3.364	1.500	.318	.200	3.69	3.438	1.338	.531	.312	6.76	3.152	1.300	.674	.436	8.62
3-1/2 x 2	4.000	2.375	4	3.364	1.939	.318	.218	3.87	3.438	1.689	.531	.343	7.58	3.152	1.771	.674	.552	9.66
3-1/2 x 2-1/2	4.000	2.875	4	3.364	2.323	.318	.276	4.21	3.438	2.125	.531	.375	8.07	3.152	2.300	.674	.600	10.28
3-1/2 x 3	4.000	3.500	4	3.364	2.900	.318	.300	4.46	3.438	2.624	.531	.438	8.07	3.152	2.728	.674	.636	10.66
4 x 1-1/2	4.500	1.900	4	3.826	1.500	.337	.200	4.18	3.438	1.338	.531	.312	6.56	3.152	1.100	.674	.400	8.36
4 x 2	4.500	2.375	4	3.826	1.939	.337	.218	4.31	3.438	1.689	.531	.343	6.76	3.152	1.300	.674	.436	8.62
4 x 2-1/2	4.500	2.875	4	3.826	2.323	.337	.276	4.83	3.438	2.125	.531	.375	7.58	3.152	1.771	.674	.552	9.66
4 x 3	4.500	3.500	4	3.826	2.900	.337	.300	5.14	3.438	2.624	.531	.438	8.07	3.152	2.300	.674	.600	10.28
4 x 3-1/2	4.500	4.000	4	3.826	3.364	.337	.318	5.33	3.438	3.152	.531	.438	8.07	3.152	2.728	.674	.636	10.66



ASTM A403 WELDED FITTINGS

CON / ECC REDUCERS

DIMENSIONS

unit : inch / lb

Nominal Pipe Size (NOMINAL SIZE)	Outside Diameter Large End (O.D.)	Outside Diameter Small End (O.D.)	Length (ft)	Schedule 5S					Schedule 10S					Schedule 40S				
				Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (T)	Wall Thickness Small End (t)	Approximate Weight**	Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (T)	Wall Thickness Small End (t)	Approximate Weight**	Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (T)	Wall Thickness Small End (t)	Approximate Weight**
5 x 2	5.563	2.375	5	5.345	2.245	.109	.065	2.33	5.295	2.157	.134	.109	2.83	5.047	2.067	.258	.154	5.55
5 x 2-1/2	5.563	2.875	5	5.345	2.709	.109	.083	2.55	5.295	2.635	.134	.120	3.09	5.047	2.469	.258	.203	6.07
5x3	5.563	3.500	5	5.345	3.334	.109	.083	2.64	5.295	3.260	.134	.120	3.20	5.047	3.088	.258	.216	6.29
5x3-1/2	5.563	4.000	5	5.345	3.834	.109	.083	2.71	5.295	3.760	.134	.120	3.28	5.047	3.548	.258	.226	6.45
5x 4	5.563	4.500	5	5.345	4.334	.109	.083	2.76	5.295	4.260	.134	.120	3.29	5.047	4.028	.258	.237	6.57
6x2-1/2	6.625	2.875	5-1/2	6.407	2.709	.109	.083	3.18	6.357	2.635	.134	.120	3.35	6.065	2.469	.280	.203	8.37
6x3	6.625	3.500	5-1/2	6.407	3.334	.109	.083	3.33	6.357	3.260	.134	.120	4.01	6.065	3.088	.280	.216	8.77
6x3-1/2	6.625	4.000	5-1/2	6.407	3.834	.109	.083	3.30	6.357	3.760	.134	.120	4.20	6.065	3.548	.280	.226	8.93
6x 4	6.625	4.500	5-1/2	6.407	4.334	.109	.083	3.41	6.357	4.260	.134	.120	4.31	6.065	4.028	.280	.237	8.99
6x 5	6.625	5.563	5-1/2	6.407	5.345	.109	.109	3.60	6.357	5.295	.134	.134	4.45	6.065	5.047	.280	.258	9.48
8 x 3-1/2	8.625	4.000	6	8.407	3.834	.109	.083	4.65	8.329	3.760	.148	.120	6.48	7.981	3.548	.322	.226	14.10
8 x 4	8.625	4.500	6	8.407	4.334	.109	.083	4.78	8.329	4.260	.148	.120	6.64	7.981	4.028	.322	.237	14.44
8x5	8.625	5.563	6	8.407	5.345	.109	.109	4.87	8.329	5.295	.148	.134	6.79	7.981	5.047	.322	.258	14.78
8x6	8.625	6.625	6	8.407	6.407	.109	.109	5.05	8.329	6.357	.148	.134	7.04	7.981	6.065	.322	.280	15.31
10x 4	10.750	4.500	7	10.482	4.334	.134	.083	8.34	10.420	4.260	.165	.120	10.43	10.020	4.028	.365	.237	23.19
10x5	10.750	5.563	7	10.482	5.345	.134	.109	8.82	10.420	5.295	.165	.134	10.78	10.020	5.047	.365	.258	23.96
10x6	10.750	6.625	7	10.482	6.407	.134	.109	8.82	10.420	6.357	.165	.134	11.03	10.020	6.065	.365	.280	24.52
10x8	10.750	8.625	7	10.482	8.407	.134	.109	9.17	10.420	8.329	.165	.148	11.46	10.020	7.981	.365	.322	25.48
12x5	12.750	5.563	8	12.438	5.345	.156	.109	13.72	12.390	5.295	.180	.134	16.07	12.000	5.047	.375	.258	33.48
12x6	12.750	6.625	8	12.438	6.407	.156	.109	14.01	12.390	6.357	.180	.134	16.38	12.000	6.065	.375	.280	34.13
12x8	12.750	8.625	8	12.438	8.407	.156	.109	14.45	12.390	8.329	.180	.148	16.91	12.000	7.981	.375	.322	35.24
12x10	12.750	10.750	8	12.438	10.482	.156	.134	15.03	12.390	10.420	.180	.165	17.60	12.000	10.020	.375	.365	36.67
14x6	14.000	6.625	13	13.688	6.407	.156	.109	23.78	13.624	6.357	.188	.134	29.00	13.250	6.065	.375	.280	58.00
14x8	14.000	8.625	13	13.688	8.407	.156	.109	25.10	13.624	8.329	.188	.148	30.61	13.250	7.981	.375	.322	61.22
14x10	14.000	10.750	13	13.688	10.482	.156	.134	26.05	13.624	10.420	.188	.165	31.77	13.250	10.020	.375	.365	63.55
14x12	14.000	12.750	13	13.688	12.438	.156	.156	27.64	13.624	12.390	.188	.188	33.71	13.250	12.000	.375	.375	67.42
16x8	16.000	8.625	14	15.670	8.407	.165	.109	32.39	15.624	8.329	.188	.148	36.81	15.250	7.981	.375	.322	73.62
16x10	16.000	10.750	14	15.670	10.482	.165	.134	34.37	15.624	10.420	.188	.165	39.06	15.250	10.020	.375	.365	78.12
16x12	16.000	12.750	14	15.670	12.438	.165	.156	35.60	15.624	12.390	.188	.180	40.46	15.250	12.000	.375	.375	80.91
16x14	16.000	14.000	14	15.670	13.688	.165	.156	36.48	15.624	13.624	.188	.188	41.46	15.250	13.250	.375	.375	82.92
18x10	18.000	10.750	15	17.670	10.482	.165	.134	40.78	17.624	10.420	.188	.165	46.34	17.250	10.020	.375	.365	92.69
18x12	18.000	12.750	15	17.670	12.438	.165	.156	41.66	17.624	12.390	.188	.180	47.35	17.250	12.000	.375	.375	94.70
18x14	18.000	14.000	15	17.670	13.688	.165	.156	42.48	17.624	13.624	.188	.188	48.28	17.250	13.250	.375	.375	96.56
18x16	18.000	16.000	15	17.670	15.670	.165	.165	43.64	17.624	15.624	.188	.188	49.80	17.250	15.250	.375	.375	99.20
20x12	20.000	12.750	20	19.624	12.438	.188	.156	71.50	19.564	12.390	.218	.180	71.50	19.250	12.000	.375	.375	143.00
20x14	20.000	14.000	20	19.624	13.688	.188	.156	72.50	19.564	13.624	.218	.188	84.10	19.250	13.250	.375	.375	145.00
20x16	20.000	16.000	20	19.624	15.670	.188	.165	73.00	19.564	15.624	.218	.188	84.68	19.250	15.250	.375	.375	146.00
20x18	20.000	18.000	20	19.624	17.670	.188	.165	75.50	19.564	17.624	.218	.188	87.58	19.250	17.250	.375	.375	151.00
24x16	24.000	16.000	20	23.564	15.670	.218	.165	98.02	23.500	15.624	.250	.188	98.02	23.250	15.250	.375	.375	169.00
24x18	24.000	18.000	20	23.564	17.670	.218	.165	100.00	23.500	17.624	.260	.188	100.00	23.250	17.250	.375	.375	173.00
24x20	24.000	20.000	20	23.564	19.624	.218	.188	103.00	23.500	19.564	.250	.218	103.00	23.250	19.250	.375	.375	179.00



ASTM A403 WELDED FITTINGS

CON. / ECC. REDUCERS

DIMENSIONS

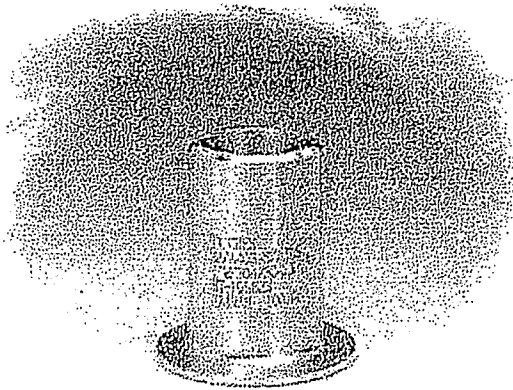
unit : Inch / lb

Nominal Pipe Size Large End & Small End	Outside Diameter Large End (O.D.)	Outside Diameter Small End (O.D.)	Length (ft)	Schedule 80S					Schedule 160					XX Strong Wall				
				Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (t)	Wall Thickness Small End (t)	Approximate Weight **	Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (t)	Wall Thickness Small End (t)	Approximate Weight **	Inside Diameter Large End (I.D.)	Inside Diameter Small End (I.D.)	Wall Thickness Large End (t)	Wall Thickness Small End (t)	Approximate Weight **
5 x 2	5.563	2.375	5	4.813	1.939	.375	.218	7.25	4.313	1.689	.625	.343	12.03	4.063	1.503	.750	.436	14.50
5 x 2-1/2	5.563	2.875	5	4.813	2.323	.375	.276	7.93	4.313	2.125	.625	.375	13.16	4.063	1.771	.750	.552	15.86
5x3	5.563	3.600	5	4.813	2.900	.375	.300	8.55	4.313	2.824	.625	.438	14.19	4.063	2.300	.750	.600	17.10
5x3-1/2	5.563	4.000	5	4.813	3.364	.375	.318	8.80	4.313	3.438	.625	.531	15.12	4.063	2.728	.750	.636	17.60
5x 4	5.563	4.500	5	4.813	3.826	.375	.337	9.11	4.313	3.438	.625	.531	15.12	4.063	3.152	.750	.674	18.22
6x2-1/2	6.625	2.875	5-1/2	5.761	2.323	.432	.276	10.88	5.187	2.125	.719	.375	18.06	4.897	1.771	.864	.552	21.76
6x3	6.625	3.500	5-1/2	5.761	2.900	.432	.300	12.15	5.187	2.824	.719	.438	20.17	4.897	2.300	.864	.600	24.30
6x3-1/2	6.625	4.000	5-1/2	5.761	3.364	.432	.318	12.67	5.187	3.438	.719	.531	21.81	4.897	2.728	.864	.636	25.34
6x 4	6.625	4.500	5-1/2	5.761	3.826	.432	.337	13.14	5.187	3.438	.719	.531	21.81	4.897	3.152	.864	.674	26.28
6x 5	6.625	5.563	5-1/2	5.761	4.813	.432	.375	13.79	5.187	4.313	.719	.625	22.89	4.897	4.063	.864	.750	27.68
8 x3-1/2	8.625	4.000	6	7.625	3.364	.500	.318	17.61	6.813	3.438	.906	.531	36.85	6.875	3.152	.875	.674	35.63
8x 4	8.625	4.500	6	7.625	3.826	.500	.337	20.36	6.813	3.438	.906	.531	36.85	6.875	3.152	.875	.674	35.63
8x5	8.625	5.563	6	7.625	4.813	.500	.375	21.32	6.813	4.313	.906	.625	38.50	6.875	4.063	.875	.750	37.31
8x6	8.625	6.625	6	7.625	5.761	.500	.432	22.32	6.813	5.187	.906	.719	40.30	6.875	4.897	.875	.864	39.06
10x 4	10.750	4.500	7	9.750	3.826	.500	.337	27.68	8.500	3.438	1.125	.531	62.30	8.500	3.152	.875	.674	60.81
10x5	10.750	5.563	7	9.750	4.813	.500	.375	31.40	8.500	4.313	1.125	.625	70.60	8.500	4.063	.875	.750	69.31
10x6	10.750	6.625	7	9.750	5.761	.500	.432	32.61	8.500	5.187	1.125	.719	73.30	8.500	4.897	.875	.864	72.06
10x8	10.750	8.625	7	9.750	7.625	.500	.500	34.34	8.500	6.813	1.125	.906	77.10	8.500	6.875	.875	.864	75.81
12x5	12.750	5.563	8	11.750	4.813	.500	.375	42.78	10.126	4.313	1.312	.625	112.00	10.126	4.063	.875	.750	110.51
12x6	12.750	6.625	8	11.750	5.761	.500	.432	44.42	10.126	5.187	1.312	.719	116.00	10.126	4.897	.875	.864	114.51
12x8	12.750	8.625	8	11.750	7.625	.500	.500	46.06	10.126	6.813	1.312	.906	120.00	10.126	6.875	.875	.864	118.51
12x10	12.750	10.750	8	11.750	9.750	.500	.500	47.70	10.126	8.500	1.312	1.125	124.00	10.126	8.500	.875	.864	122.51
14x6	14.000	6.625	13	13.000	5.761	.500	.432	77.81	11.188	5.187	1.406	.719	140.00	11.188	4.897	.875	.864	138.51
14x8	14.000	8.625	13	13.000	7.625	.500	.500	81.22	11.188	6.813	1.406	.906	144.00	11.188	6.875	.875	.864	142.51
14x10	14.000	10.750	13	13.000	9.750	.500	.500	85.40	11.188	8.500	1.406	1.125	148.00	11.188	8.500	.875	.864	146.51
14x12	14.000	12.750	13	13.000	11.750	.500	.500	88.97	11.188	10.126	1.406	1.312	152.00	11.188	10.126	.875	.864	150.51
16x8	16.000	8.625	14	15.000	7.625	.500	.500	97.49	12.812	6.813	1.594	.906	160.00	12.812	6.875	.875	.864	158.51
16x10	16.000	10.750	14	15.000	9.750	.500	.500	102.00	12.812	8.500	1.594	1.125	164.00	12.812	8.500	.875	.864	162.51
16x12	16.000	12.750	14	15.000	11.750	.500	.500	105.00	12.812	10.126	1.594	1.312	168.00	12.812	10.126	.875	.864	166.51
16x14	16.000	14.000	14	15.000	13.000	.500	.500	108.00	12.812	11.188	1.594	1.406	172.00	12.812	11.188	.875	.864	170.51
18x10	18.000	10.750	15	17.000	9.750	.500	.500	120.00	14.438	8.500	1.781	1.125	180.00	14.438	8.500	.875	.864	178.51
18x12	18.000	12.750	15	17.000	11.750	.500	.500	126.00	14.438	10.126	1.781	1.312	184.00	14.438	10.126	.875	.864	182.51
18x14	18.000	14.000	15	17.000	13.000	.500	.500	127.00	14.438	11.188	1.781	1.406	188.00	14.438	11.188	.875	.864	186.51
18x16	18.000	16.000	15	17.000	15.000	.500	.500	130.00	14.438	12.812	1.781	1.594	192.00	14.438	12.812	.875	.864	190.51
20x12	20.000	12.750	20	19.000	11.750	.500	.500	189.00	16.062	10.126	1.969	1.312	200.00	16.062	10.126	.875	.864	198.51
20x14	20.000	14.000	20	19.000	13.000	.500	.500	192.00	16.062	11.188	1.969	1.406	204.00	16.062	11.188	.875	.864	202.51
20x16	20.000	16.000	20	19.000	15.000	.500	.500	195.00	16.062	12.812	1.969	1.594	208.00	16.062	12.812	.875	.864	206.51
20x18	20.000	18.000	20	19.000	17.000	.500	.500	198.00	16.062	14.438	1.969	1.781	212.00	16.062	14.438	.875	.864	210.51
24x16	24.000	16.000	20	23.000	15.000	.500	.500	228.00	19.312	12.812	2.344	1.594	240.00	19.312	12.812	.875	.864	238.51
24x18	24.000	18.000	20	23.000	17.000	.500	.500	230.00	19.312	14.438	2.344	1.781	244.00	19.312	14.438	.875	.864	242.51
24x20	24.000	20.000	20	23.000	19.000	.500	.500	234.00	19.312	16.062	2.344	1.969	248.00	19.312	16.062	.875	.864	246.51

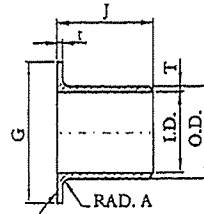


ASTM A403 WELDED FITTINGS

LAP JOINT STUB END / SHORT TYPE "A" OR "B"

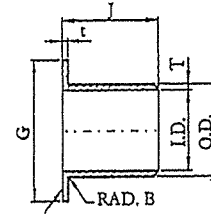


Stub Ends are supplied in Type A or Type B.
Type A is more readily available.



SERRATED FACE IN
ACCORDANCE WITH ASME B16.5

TYPE A



SERRATED FACE IN
ACCORDANCE WITH ASME B16.5

TYPE B

Schedules 5S and 10S Stub Ends are usually
supplied in Short Lengths; Long Lengths are
available on special order.

Schedule 40S Stub Ends are supplied in either
Short or Long Lengths.

DIMENSIONS

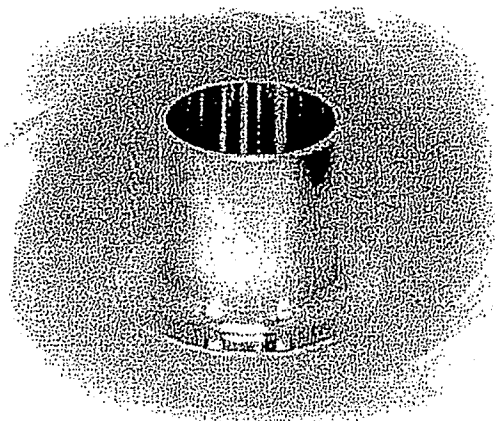
unit : inch / lb

Nominal Pipe Size	Outside diameter (O.D.)	Diameter (G)	Length (J)		Radius (A)		Schedule 40S			
			Short	Long	A	B	Inside Diameter (I.D.)	Wall Thickness (T)	Lap Thickness (t)	Approx. weight
1/2	.840	1.375	2	3	1/8	1/32	.622	.109	.109	.19
3/4	1.050	1.688	2	3	1/8	1/32	.824	.113	.113	.26
1	1.315	2.000	2	4	1/8	1/32	1.049	.133	.133	.38
1-1/4	1.660	2.500	2	4	3/16	1/32	1.380	.140	.140	.55
1-1/2	1.900	2.875	2	4	1/4	1/32	1.610	.145	.145	.69
2	2.375	3.625	2-1/2	6	5/16	1/32	2.067	.154	.154	1.35
2-1/2	2.875	4.125	2-1/2	6	5/16	1/32	2.469	.203	.203	1.77
3	3.500	5.000	2-1/2	6	3/8	1/32	3.068	.216	.216	2.50
3-1/2	4.000	5.500	3	6	3/8	1/32	3.548	.226	.226	3.58
4	4.500	6.188	3	6	7/16	1/32	4.026	.237	.237	4.13
5	5.563	7.313	3	8	7/16	1/16	5.047	.258	.258	6.15
6	6.625	8.500	3-1/2	8	1/2	1/16	6.065	.280	.280	7.88
8	8.625	10.625	4	8	1/2	1/16	7.981	.322	.322	13.38
10	10.750	12.750	5	10	1/2	1/16	10.020	.365	.365	22.20
12	12.750	15.000	6	10	1/2	1/16	12.000	.375	.375	31.50
14	14.000	16.250	6	12	1/2	1/16	13.250	.375	.375	37.80
16	16.000	18.500	6	12	1/2	1/16	15.250	.375	.375	45.00
18	18.000	21.000	6	12	1/2	1/16	17.250	.375	.375	60.00
20	20.000	23.000	6	12	1/2	1/16	19.250	.375	.375	66.00
24	24.000	27.250	6	12	1/2	1/16	23.250	.375	.375	85.00

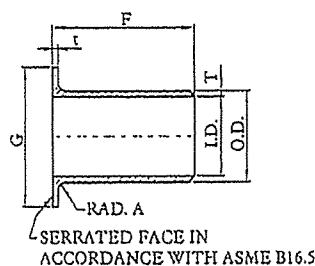


ASTM A403 WELDED FITTINGS

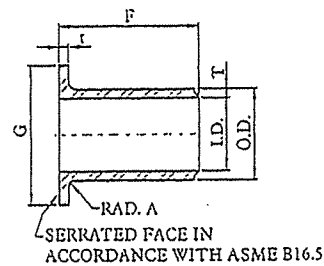
LAP JOINT STUB END / STUB ENDS LONG TYPE "A"



All schedules of Long (ANSI Length)
Stub Ends are usually supplied in Type A.



TYPE A



TYPE A

Schedules 80S 160 and XX Strong Wall
Stub Ends are supplied in Long Lengths.
Short Lengths are available on special order.

DIMENSIONS

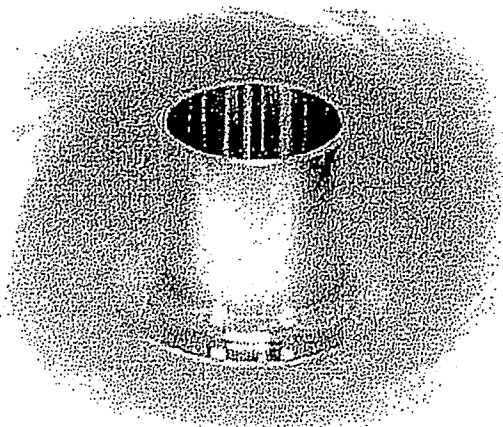
unit : inch / lb

Nominal Pipe Size	Outside diameter (O.D.)	Diameter (G)	Length (L)	Radius (A)	Schedule 10S				Schedule 40S				Schedule 80S			
					Inside Diameter (I.D.)	Wall Thickness (T)	Lap Thickness (L)	Approx. weight**	Inside Diameter (I.D.)	Wall Thickness (T)	Lap Thickness (L)	Approx. weight**	Inside Diameter (I.D.)	Wall Thickness (T)	Lap Thickness (L)	Approx. weight**
1/2	.840	1.375	3	1/8	.674	.083	.083	.16	.622	.109	.109	.26	.546	.147	.147	.34
3/4	1.050	1.688	3	1/8	.884	.083	.083	.21	.824	.113	.113	.36	.742	.154	.154	.47
1	1.315	2.000	4	1/8	1.097	.109	.109	.35	1.049	.133	.133	.68	.957	.179	.179	.88
1-1/4	1.660	2.500	4	3/16	1.442	.109	.109	.49	1.380	.140	.140	.97	1.278	.191	.191	1.26
1-1/2	1.900	2.875	4	1/4	1.682	.109	.109	.56	1.610	.145	.145	1.20	1.500	.200	.200	1.49
2	2.375	3.625	6	5/16	2.157	.109	.109	.94	2.067	.154	.154	2.25	1.939	.218	.218	3.05
2-1/2	2.875	4.125	6	5/16	2.635	.120	.120	1.25	2.469	.203	.203	3.40	2.323	.276	.276	4.40
3	3.500	5.000	6	3/8	3.260	.120	.120	1.60	3.068	.216	.216	4.65	2.900	.300	.300	6.50
3-1/2	4.000	5.500	6	3/8	3.760	.120	.120	1.90	3.548	.226	.226	5.89	3.364	.318	.318	7.75
4	4.500	6.188	6	7/16	4.260	.120	.120	2.40	4.026	.237	.237	6.83	3.826	.337	.337	9.65
5	5.563	7.313	8	7/16	5.295	.134	.134	3.25	5.047	.258	.258	11.88	4.813	.375	.375	16.33
6	6.625	8.500	8	1/2	6.357	.134	.134	4.75	6.065	.280	.280	15.18	5.761	.432	.432	22.63
8	8.625	10.625	8	1/2	8.329	.148	.148	7.10	7.981	.322	.322	23.81	7.625	.500	.500	34.12
10	10.750	12.750	10	1/2	10.420	.165	.165	11.30	10.020	.365	.365	39.50	9.750	.500	.500	54.00
12	12.750	15.000	10	1/2	12.390	.180	.180	18.00	12.000	.375	.375	48.50	11.750	.500	.500	64.50
14	14.000	16.250	12	1/2	13.624	.188	.188	24.00	13.250	.375	.375	63.00	13.000	.500	.500	84.00
16	16.000	18.500	12	1/2	15.624	.188	.188	28.00	15.250	.375	.375	73.50	15.000	.500	.500	98.00
18	18.000	21.000	12	1/2	17.624	.188	.188	38.00	17.250	.375	.375	99.00	17.000	.500	.500	136.00
20	20.000	23.000	12	1/2	19.564	.218	.218	48.00	19.250	.375	.375	108.00	19.000	.500	.500	157.00
24	24.000	27.250	12	1/2	23.500	.250	.250	60.00	23.250	.375	.375	139.00	23.000	.500	.500	178.00

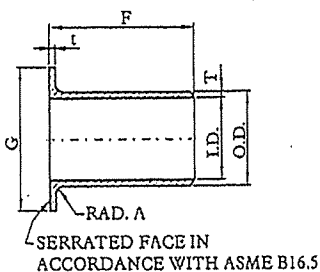


ASTM A403 WELDED FITTINGS

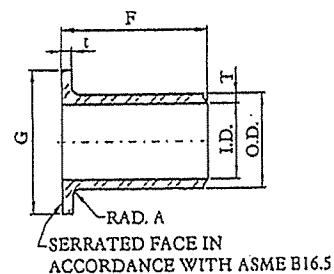
LAP-JOINT STUB END / STUB ENDS LONG TYPE "A"



All schedules of Long (ANSI Length)
Stub Ends are usually supplied in Type A.



TYPE A



TYPE A

Schedules 80S 160 and XX Strong Wall
Stub Ends are supplied in Long Lengths.
Short Lengths are available on special order.

DIMENSIONS

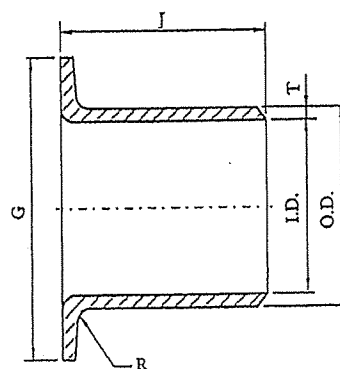
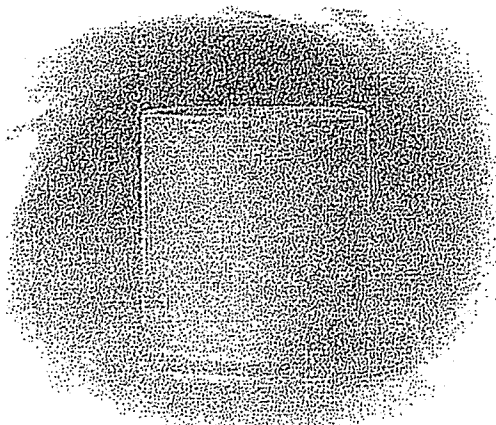
unit : Inch / lb

Nominal Pipe Size	Outside diameter (O.D.)	Diameter (G)	Length (F)		Radius (A)	Schedule 160				XX Strong Wall			
			Short	Long		Inside Diameter (I.D.)	Wall Thickness (T)	Lap Thickness (t)	Approx. weight **	Inside Diameter (I.D.)	Wall Thickness (T)	Lap Thickness (t)	Approx. weight **
1/2	.840	1.375	2	3	1/8	.464	.188	.187	.43	.252	.294	.294	.68
3/4	1.050	1.688	2	3	1/8	.612	.219	.218	.66	.434	.308	.308	.94
1	1.315	2.000	2	4	1/8	.815	.250	.250	1.22	.599	.358	.358	1.76
1-1/4	1.660	2.500	2	4	3/16	1.160	.250	.250	1.64	.896	.382	.382	2.52
1-1/2	1.900	2.875	2	4	1/4	1.338	.281	.281	2.08	1.100	.400	.400	2.98
2	2.375	3.625	2-1/2	6	5/16	1.689	.343	.343	4.79	1.503	.436	.436	6.10
2-1/2	2.875	4.125	2-1/2	6	5/16	2.125	.375	.375	5.94	1.771	.552	.552	8.80
3	3.500	5.000	2-1/2	6	3/8	2.624	.438	.438	7.10	2.300	.600	.600	9.80
3-1/2	4.000	5.500	3	6	3/8	-----	-----	-----	-----	2.728	.636	.636	15.50
4	4.500	6.188	3	6	7/16	3.438	.531	.531	15.15	3.152	.674	.674	19.30
5	5.563	7.313	3	8	7/16	4.313	.625	.625	27.10	4.063	.750	.750	32.66
6	6.625	8.500	3-1/2	8	1/2	5.187	.719	.718	37.56	4.897	.864	.864	45.26
8	8.625	10.625	4	8	1/2	6.813	.906	.906	61.75	6.875	.875	.875	59.71
10	10.750	12.750	5	10	1/2	8.500	1.125	1.125	121.50	-----	-----	-----	-----
12	12.750	15.000	6	10	1/2	10.126	1.312	1.312	169.00	-----	-----	-----	-----



ASTM A403 WELDED FITTINGS

LAP-JOINT STUB END / STUB ENDS SHORT TYPE "C"



TYPE C

DIMENSIONS

unit : inch / lb

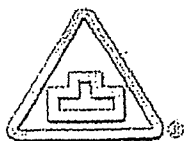
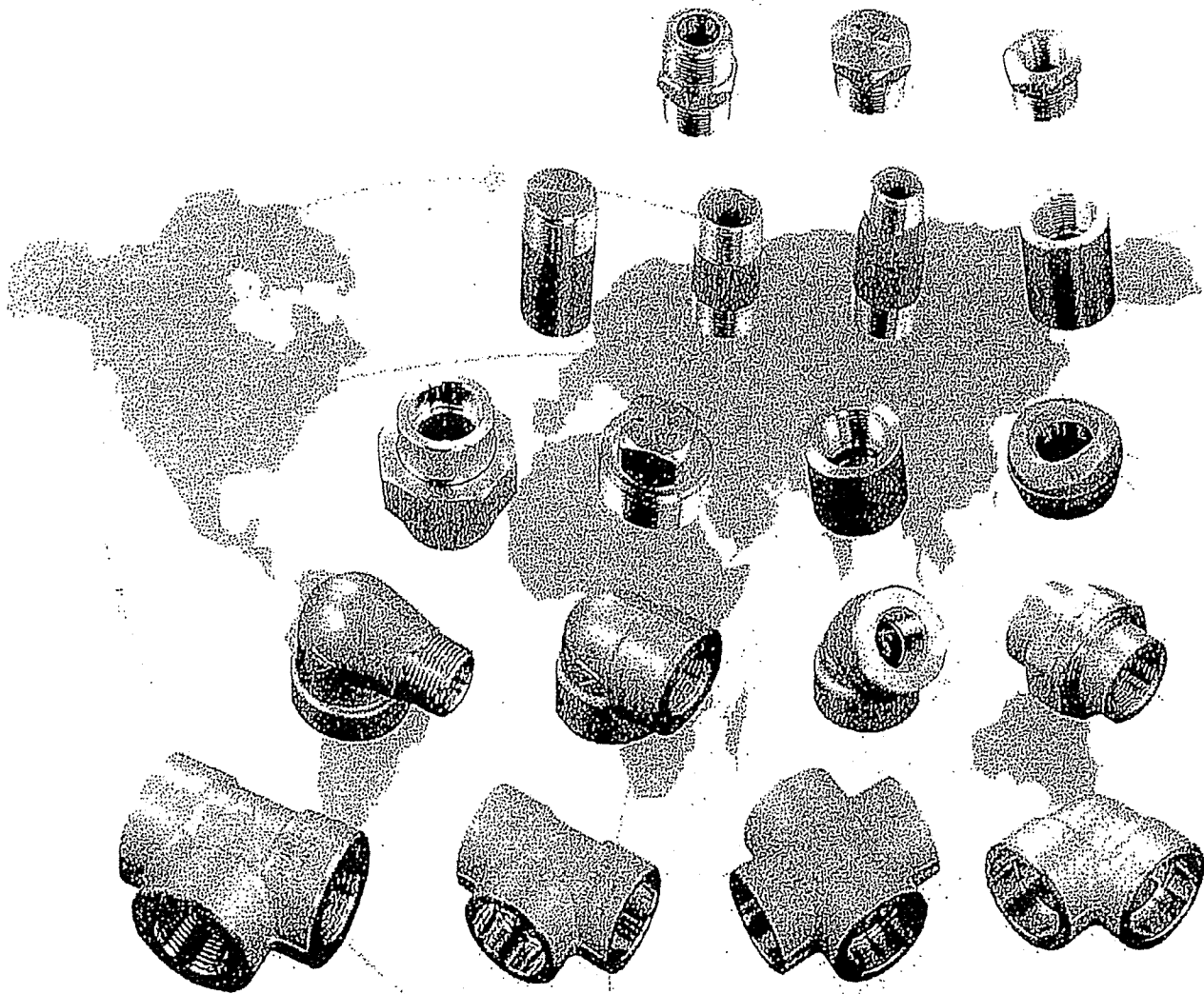
Nominal Pipe Size	Outside diameter (O.D.)	Diameter (G)	Length (J)	Radius (R)	Schedule 5S			Schedule 10S		
					Inside Diameter (I.D.)	Wall Thickness (T)	Approx. weight **	Inside Diameter (I.D.)	Wall Thickness (T)	Approx. weight **
1/2	.840	1.375	2	1/32	.710	.065	.13	.674	.083	.14
3/4	1.050	1.688	2	1/32	.920	.065	.14	.884	.083	.18
1	1.315	2.000	2	1/32	1.185	.065	.19	1.097	.109	.31
1-1/4	1.660	2.500	2	1/32	1.530	.065	.21	1.442	.109	.42
1-1/2	1.900	2.875	2	1/32	1.770	.065	.29	1.682	.109	.44
2	2.375	3.625	2-1/2	1/32	2.245	.065	.44	2.157	.109	.81
2-1/2	2.875	4.125	2-1/2	1/32	2.709	.083	.75	2.635	.120	1.00
3	3.500	5.000	2-1/2	1/32	3.334	.083	.94	3.260	.120	1.25
4	4.500	6.188	3	1/32	4.334	.083	1.38	4.260	.120	1.88
5	5.563	7.313	3	1/16	5.345	.109	2.06	5.295	.134	2.63
6	6.625	8.500	3-1/2	1/16	6.407	.109	2.75	6.357	.134	3.56
8	8.625	10.625	4	1/16	8.407	.109	3.88	8.329	.148	6.19
10	10.750	12.750	5	1/16	10.482	.134	7.48	10.420	.165	9.46
12	12.750	15.000	6	1/16	12.438	.156	15.00	12.390	.180	16.07
14	14.000	16.250	6	1/16	13.688	.156	19.20	13.624	.188	23.10
16	16.000	18.500	6	1/16	15.670	.165	23.90	15.624	.188	27.20
18	18.000	21.000	6	1/16	17.670	.165	28.50	17.624	.188	32.40
20	20.000	23.000	6	1/16	19.624	.188	36.30	19.564	.218	47.70
24	24.000	27.250	6	1/16	23.564	.218	56.00	23.500	.250	58.27



BOTH - WELL

HIGH PRESSURE FITTINGS

**FORGED
CARBON ALLOY
STAINLESS STEEL
THREADED SOCKETWELD**

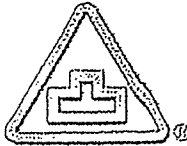


BOTH-WELL STEEL FITTINGS CO., LTD.

NO.303 Ren-sin Road, Ren-wu District, Kaohsiung City,
Taiwan, R.O.C. (814020)

TEL : 886-7-371-1536 • 371-0497 • 372-0260

FAX : 886-7-371-3864 • 371-3882



INTRODUCTION

Both WELLS and WELLS have been in existence for more than 40 years, serving both consumers and manufacturers both in India and abroad. We have been involved in providing a wide range of products and services to our customers since 1985. With the introduction of advanced technology and staying on the cutting edge of product development, we continue to provide the most up-to-date product facilities and services to our customers. Our products are manufactured on the basis of skilled manpower and a simulated experience. Both WELLS and WELLS have been recognized as the best of their kind worldwide for the excellence of their products and services. We have been able to establish a well-developed reputation in our business.

QUALITY ASSURANCE

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PRODUCTION RANGE AND SPECIFICATION :

TYPE : A. ELBOW, TEE, COUPLING, HALF COUPLING, CAP, PLUG, BUSHING, UNION, OUTLET, SWAGE NIPPLE, BULL PLUG, REDUCER INSERT AND HEX. NIPPLE, STREET ELBOWS, BOSS,...ETC.
B. SOCKET-WELD, THREADED (NPT, and PT, and BSP (ISO7-1, ISO228-1)), BUTT-WELDING.

SIZE : NPS 1/8" ~ 4".
DN 6 ~ 100

RATING : PRESSURE : THREADED END - 2000 / 3000 / 6000 LBS.
SOCKET-WELD END - 3000 / 6000 / 9000 LBS.
BUTT WELD END - SCH40 / SCH80 / SCH160 / XXS.

SPECIFICATIONS : A. DIM. SPEC. : ASME B16.11
MSS SP - 79, 83, 95, 97 and BS3799.
B. MATERIAL SPEC : ASME/ASTM SA/A105, SA/A350 LF2, SA/A106, SA/A312, SA/A234, SA/A403.
ASME/ASTM SA/A182 (F304, F304L, F316, F316L, F304H, F316H, F317L, F321, F5, F9, F11, F22, F44, F51/60, F53, F91).
C. SIZE of RAW MATERIAL : DIA. 19 ~ 120mm ROUND BAR.

MARKING : A. CARBON and ALLOY STEEL : MARKED BY STAMPING or LASER MARKING
B. STAINLESS STEEL : MARKED BY JET PRINTING or STAMPING or LASER MARKING
C. 3/8" UNDER : BRAND ONLY.
D. 1/2" to 4" : MARKED WITH BRAND, MATERIAL, HEAT CODE, B16 (FOR ASME B16.11 PRODUCT), RATING and SIZE

FINISHING : CARBON STEEL - GALVANIZED, PHOSPHATE, or ANTI-RUST OIL COATING
LOW ALLOY STEEL - PHOSPHATE, or ANTI-RUST OIL COATING
STAINLESS STEEL - PICKLED.

PACKING : CARTON / WOODEN CASE.
PLYWOODEN CASE.





PIPE PROGRAM



Stainless Steel Pipe Sizes and Weights

	SCH 5S	SCH 10S	SCH 40S	SCH 80S	SCH 10	SCH 20	SCH 30	SCH 40	SCH 60	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	Up to
Nominal Pipe Size In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.	Wall Thk. In.
1/2	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055
1	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
1 1/2	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
2	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
2 1/2	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
3	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
3 1/2	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
4	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
4 1/2	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
5	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
5 1/2	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
6	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
6 1/2	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
8	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
10	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
12	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
14	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
16	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
18	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
20	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
22	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
24	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
26	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
28	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
30	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
32	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065

Items shown in grey are not part of our standard manufacturing capabilities. For most 300 series stainless steels computed weights based on wft = 10.76 (100-wall) Wall

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Items shown are produced regularly for quick delivery from stock or within competitive industry lead-times. Please call a PRIMUS PIPE & TUBE representative for availability.
Our Midwood facility is ISO 9001 approved.

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- Radiographic Testing - Film and Real Time Radiography
- Penetrant Testing
- Positive Material Identification - X-ray fluorescence, and optical emission (Caution)
- Nondestructive Evaluation - Ultrasonic, Magnetic, and Visual
- Mechanical Testing - Tensile, Impact, Hardness, etc.
- Corrosion Testing
- Brazing, end caps, girth welding, special line making
- Specialty Specifying
- Fast track program for one week lead time on small orders
- Up to 60' total lengths

Grades

Authentic

304/4301, 304L/4307, 321/4541, 347/4550, 316/4404, 253 MA, 316S/4845, 304H/4948, 321H/4878, 347H/4550, 153 MA, 316H, 309S/4833, 309H, 904L, 254 SMO, 317, 317L, 317LM, 317LMN, DX 2205, Code Plus Two*, LDX 2101, Zeron 100, SOX 2507

Duplex

Nickel alloys

Aluminum

ASTM

Additional grades available upon request.

		SCH 10 through 36.00" OD				SCH 20 through 36.00" OD				SCH 40 for 36.00" OD																																																																																																																																																																																																																																																																																																																																																																		
Nominal Pipe Size	Outside Wall Dia. in.	Wall Thk. in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.	WUFt in.

BRISMET

BRISTOL METALS, LLC

Specifications

STAINLESS STEELS					
ALLOY	UNS#	SPECIFICATION(S)	ALLOY	UNS#	SPECIFICATION(S)
AL 611	S30601	A999	309H	S30909	A312, A358
304	S30400	A312, A358, A409	309S	S30908	A312, A358
304H	S30409	A312, A358	310H	S31009	A312, A358
304L	S30403	A312, A778, A358, A409	310S	S31008	A312, A358
316	S31600	A312, A358	321	S32100	A312, A778, A358
316H	S31609	A312, A358	321H	S32109	A312, A358
316L	S31603	A312, A778, A358	347	S34700	A312, A778, A358
317	S31700	A312, A358	347H	S34709	A312, A358
317L	S31703	A312, A778, A358	348	S34800	A312, A358
317LMN	S31726	A312, A358	348H	S34809	A312, A358
DUPLEX STAINLESS					
2205	S31803	A790, A928	2102*	S82011	A790
2205	S32205	A790, A928	2304**	S32304	A790, A928
2507	S32750	A790, A928	ZERON®100	S32760	A790, A928
F255	S32550	A790, A928			
6 MOLY GRADES					
AL-6XN ®	N08367	A312, A358, B675, B804	25-6MO	N08926	A312, A358, B673, B804
254 SMO ®	S31254	A312, A358	1925hMo	N08926	A312, A358, B673, B804
NICKEL ALLOY GRADES					
200	N02200	B725, B474	825	N08825	B705, B474
201	N02201	B725, B474	ALLOY 20	N08020	B464, B474, A358
400	N04400	B725, B474	ALLOY 59	N06059	B619
600	N06600	B517, B474	B-2	N10665	B619, B474
601	N06601	B474	C-22 ^v	N06022	B619, B474
625	N06625	B705, B474	C276	N10276	B619, B474
686	N06686	B619	G-3	N06985	B619, B474
800	N08800	B514, A358, A312	G-30	N06030	B619, B474
800H	N08810	B514, A358, A312	904L	N08904	A312, A358
800HT	N08811	A312, A358, B515 (Tubing)			
TITANIUM					
TiGr7	R52400	B862	TiGr2	R50400	B862
REGISTERED TRADEMARKS					
AL-6XN & 2102.....			Allegheny Ludlum Corp.		
Ferralium			Langley Alloys Ltd.		
RA Grades & Zeron®100.....			Rolled Alloys, Inc.		
Cold Working of the weld bead is now offered on 1/2" - 36" NPS pipe & all tubing					

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PIPE SCHEDULES & WEIGHTS
THICKNESSES PRODUCED BY BRISTOL METALS, LLC ARE HIGHLIGHTED

SCHEDULE	SS	105	405	805	10	20	30	40	60	80	100	120	140	160	STD	X5	XX5
Size	WALL/In																
O.D.	Lbs./Ft																
1/2"	0.065	0.083	0.109	0.147			0.095	0.109		0.147				0.188	0.109	0.147	0.194
0.840	0.54	0.68	0.86	1.10			0.76	0.86		1.10				1.32	0.86	1.10	1.73
3/4"	0.065	0.083	0.113	0.154			0.095	0.113		0.154				0.219	0.113	0.154	0.308
1.050	0.69	0.87	1.14	1.49			0.98	1.14		1.49				1.96	1.14	1.49	2.46
1"	0.065	0.109	0.133	0.179			0.114	0.133		0.179				0.250	0.133	0.179	0.358
1.315	0.88	1.12	1.39	2.19			1.48	1.69		2.19				2.87	1.69	2.19	3.69
1 1/4"	0.065	0.109	0.140	0.191			0.117	0.140		0.191				0.250	0.140	0.191	0.382
1.660	1.12	1.82	2.29	3.02			1.55	2.29		3.02				3.80	2.29	3.02	5.26
1 1/2"	0.065	0.109	0.145	0.200			0.125	0.145		0.200				0.281	0.145	0.200	0.400
1.900	1.29	2.10	2.74	3.67			2.39	2.74		3.67				4.90	2.74	3.67	6.47
2"	0.065	0.109	0.154	0.218			0.125	0.154		0.218				0.344	0.154	0.218	0.436
2.375	1.62	2.66	3.69	5.07			3.03	3.69		5.07				7.53	3.69	5.07	9.11
2 1/2"	0.083	0.120	0.203	0.276			0.188	0.203		0.276				0.375	0.203	0.276	0.552
2.075	2.50	3.56	5.85	7.73			5.45	5.85		7.73				10.11	5.85	7.73	13.82
3"	0.083	0.120	0.216	0.300			0.188	0.216		0.300				0.438	0.216	0.300	0.600
3.500	3.06	4.37	7.65	10.35			6.71	7.65		10.35				14.46	7.65	10.35	18.76
3 1/2"	0.083	0.120	0.226	0.318			0.188	0.226		0.318					0.226	0.318	
4.000	3.50	5.02	9.19	12.62			7.73	9.19		12.62					5.19	12.62	
4"	0.083	0.120	0.237	0.337			0.188	0.237		0.337				0.531	0.237	0.337	0.674
4.500	3.95	5.67	10.89	15.12			8.74	10.89		15.12				22.72	10.89	15.12	27.80
5"	0.109	0.134	0.258	0.375				0.258		0.375				0.625	0.258	0.375	0.750
5.563	6.41	7.84	14.75	20.97				14.75		20.97				33.27	14.75	20.97	38.91
6"	0.109	0.134	0.280	0.432				0.280		0.432				0.719	0.280	0.432	0.864
6.625	7.66	9.38	19.15	28.84				19.15		28.84				45.70	19.15	28.84	53.66
8"	0.109	0.148	0.322	0.500		0.250	0.277	0.322	0.406	0.500	0.594	0.719	0.812	0.906	0.322	0.500	0.875
8.625	10.01	13.52	28.82	43.79		22.57	24.93	28.82	35.97	43.79	51.43	61.28	68.39	75.59	28.82	43.79	79.10
10"	0.134	0.165	0.365	0.500		0.250	0.307	0.365	0.500	0.594	0.719	0.844	1.000	1.125	0.365	0.500	1.000
10.750	15.34	18.83	40.86	55.25		28.30	34.56	40.86	55.25	65.03	77.75	90.13	105.11	110.73	40.86	55.25	105.11
12"	0.156	0.180	0.375	0.500		0.250	0.330	0.406	0.562	0.688	0.844	1.000	1.125	1.312	0.375	0.500	1.000
12.750	21.16	24.39	50.03	66.03		33.69	44.18	54.03	73.84	89.46	108.32	126.67	140.90	161.77	50.03	66.03	126.67
14"	0.156	0.188			0.250	0.312	0.375	0.438	0.594	0.750	0.938	1.094	1.250	1.406	0.375	0.500	
14.000	23.28	27.99			37.06	46.04	55.08	64.03	83.84	107.13	131.08	151.00	171.81	190.88	55.08		
16"	0.165	0.188			0.250	0.312	0.375	0.500	0.656	0.844	1.031	1.219	1.438	1.594	0.375	0.500	
16.000	28.17	31.05			42.45	52.76	63.16	78.55	108.51	137.80	166.37	194.23	225.73	247.54	63.16		
18"	0.165	0.188			0.25	0.312	0.438	0.562	0.75	0.938	1.156	1.375	1.562	1.781	0.375	0.5	
18.000	31.72	36.10			47.84	59.49	82.92	105.65	139.47	172.52	209.3	246.42	276.79	311.39	71.25	94.33	
20"	0.188	0.218			0.250	0.375	0.500	0.594	0.812	1.031	1.281	1.500	1.750	1.969	0.375	0.500	
20.000	40.15	46.49			53.23	79.33	105.11	124.26	167.96	210.82	258.49	299.15	344.29	382.72	79.33	105.11	
24"	0.218	0.250			0.250	0.375	0.562	0.688	0.969	1.219	1.531	1.812	2.062	2.344	0.375	0.500	
24.000	55.89	64.01			64.01	95.50	142.00	172.90	240.58	299.36	370.83	433.41	487.65	547.21	95.50	142.00	
30"	0.250	0.312			0.312	0.500	0.625								0.375	0.500	
30.000	80.18	95.85			99.45	159.02	197.91								119.76	159.02	
36"					0.312	0.500	0.625	0.750							0.375	0.500	
36.000					120.03	191.35	238.34	285.00							144.01	191.35	

60' LENGTHS

40' LENGTHS

20' LENGTHS

10' LENGTHS

* SEE STD WALL

** SEE X5 WALL

20' LENGTHS HEAVY WALL OPS

10' LENGTHS HEAVY WALL OPS

OTHER PIPE SIZES AND WALLS PRODUCED

THICKNESSES PRODUCED BY BRISTOL METALS, LLC ARE HIGHLIGHTED

Wall Thickness (Inches)	OD	0.188	0.250	0.312	0.375	0.500	0.688	0.750	0.812	1.000	1.125	1.250	1.375	1.500	1.750	2.000
26"	0.188	0.250	0.312	0.375	0.500	0.688	0.750	0.812	1.000	1.125	1.250	1.375	1.500	1.750	2.000	
28"	0.188	0.250	0.312	0.375	0.500	0.688	0.750	0.812	1.000	1.125	1.250	1.375	1.500	1.750	2.000	
30"	0.188	0.250	0.312	0.375	0.500	0.688	0.750	0.812	1.000	1.125	1.250	1.375	1.500	1.750	2.000	
32"	0.188	0.250	0.312	0.375	0.500	0.688	0.750	0.812	1.000	1.125	1.250	1.375	1.500	1.750	2.000	
36"	0.188	0.250	0.312	0.375	0.500	0.688	0.750	0.812	1.000	1.125	1.250	1.375	1.500	1.750	2.000	
38" - 44"	0.188	0.250	0.312	0.375	0.500	0.688	0.750	0.812	1.000	1.125	1.250	1.375	1.500	1.750	2.000	
48" - 96"	0.188	0.250	0.312	0.375	0.500	0.688	0.750	0.812	1.000	1.125	1.250	1.375	1.500	1.750	2.000	

Nominal Pipe Weight (Lb/ft) = (OD-wall) X wall X 10.76

OTHER SIZES AVAILABLE ON REQUEST

BRISMET
BRISTOL METALS, LLC

www.brismet.com

1 (423) 989-4700

email: sales@brismet.com

PO Box 1589 Bristol, Tennessee 37621 USA

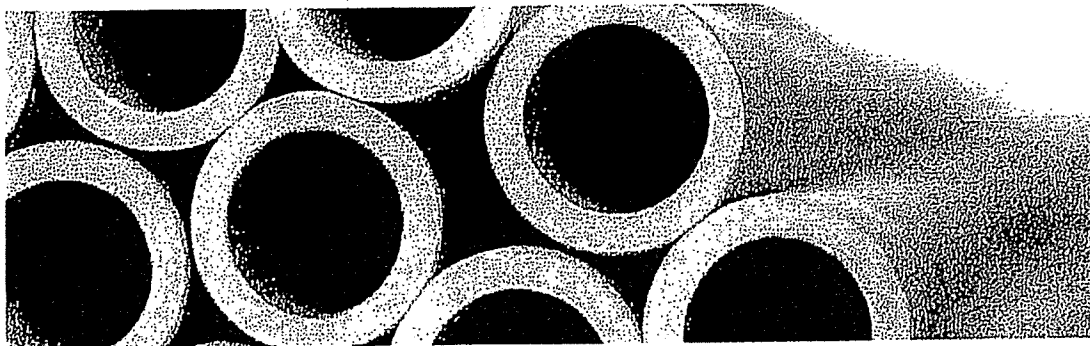
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STAINLESS STEEL WELDED / SEAMLESS PIPE

DIMENSION AND WEIGHT



DIMENSIONS

unit : inch / lb

SCHEDULE	5S	10S	40S	80S	10	20	30	40	60	80	100	120	140	160	STD	XS	XXS
SIZE O.D.	Wall/In Wgt/Lb																
1/4"			0.088	0.119				0.088		0.119					0.088	0.119	
0.540			0.43	0.54				0.43		0.54					0.43	0.54	
3/8"			0.091	0.126				0.091		0.126					0.091	0.126	
0.675			0.57	0.76				0.57		0.76					0.57	0.76	
1/2"	0.065	0.083	0.109	0.147			0.095	0.109		0.147				0.188	0.109	0.147	0.294
0.840	0.54	0.88	0.86	1.10			0.76	0.86		1.10				1.32	0.86	1.10	1.73
3/4"	0.065	0.083	0.113	0.154			0.095	0.113		0.154				0.219	0.113	0.154	0.308
1.050	0.69	0.87	1.14	1.49			0.98	1.14		1.49				1.96	1.14	1.49	2.46
1"	0.065	0.109	0.133	0.179			0.114	0.133		0.179				0.250	0.133	0.179	0.358
1.315	0.88	1.42	1.69	2.19			1.48	1.69		2.19				2.87	1.69	2.19	3.69
1 1/4"	0.065	0.109	0.140	0.181			0.117	0.140		0.191				0.250	0.140	0.191	0.382
1.660	1.12	1.82	2.29	3.02			1.95	2.29		3.02				3.80	2.29	3.02	5.26
1 1/2"	0.065	0.109	0.145	0.200			0.125	0.145		0.200				0.281	0.145	0.200	0.400
1.900	1.20	2.10	2.74	3.67			2.39	2.74		3.67				4.90	2.74	3.67	6.47
2"	0.065	0.109	0.164	0.218			0.125	0.154		0.218				0.344	0.154	0.218	0.436
2.375	1.62	2.66	3.69	5.07			3.03	3.69		5.07				7.53	3.69	5.07	9.11
2 1/2"	0.083	0.120	0.203	0.276			0.188	0.203		0.276				0.375	0.203	0.276	0.552
2.875	2.50	3.56	5.85	7.73			5.45	5.85		7.73				10.11	5.85	7.73	13.82
3"	0.083	0.120	0.216	0.300			0.188	0.216		0.300				0.438	0.216	0.300	0.600
3.500	3.06	4.37	7.65	10.35			6.71	7.65		10.35				14.46	7.65	10.35	18.76
3 1/2"	0.083	0.120	0.226	0.318			0.188	0.226		0.318					0.228	0.318	
4.000	3.50	5.02	9.19	12.62			7.73	9.19		12.62					9.19	12.62	
4"	0.083	0.120	0.237	0.337			0.188	0.237		0.337		0.438		0.531	0.237	0.337	0.674
4.500	3.95	5.67	10.89	15.12			8.74	10.89		15.12		19.18		22.72	10.89	15.12	27.8
5"	0.109	0.134	0.258	0.375				0.258		0.375		0.500		0.625	0.258	0.375	0.750
5.563	6.41	7.84	14.75	20.97				14.75		20.97		27.29		33.27	14.75	20.97	38.91
6"	0.109	0.134	0.280	0.432				0.280		0.432		0.562		0.719	0.280	0.432	0.864
6.625	7.66	9.38	19.15	28.84				19.15		28.84		36.73		45.78	19.15	28.84	53.66
8"	0.109	0.148	0.322	0.500		0.250	0.277	0.322	0.405	0.500	0.594	0.719	0.812	0.906	0.322	0.500	0.875
8.625	10.01	13.52	28.82	43.79		22.57	24.93	28.82	35.97	43.79	51.43	61.28	68.39	75.39	28.82	43.79	73.1
10"	0.134	0.165	0.365	0.500		0.250	0.307	0.365	0.500	0.594	0.719	0.844	1.000	1.125	0.365	0.500	1.000
10.750	15.34	18.83	40.86	55.25		28.3	34.56	40.86	55.25	65.03	77.75	90.13	105.11	116.73	40.86	55.25	105.11
12"	0.156	0.180	0.375	0.500		0.250	0.330	0.406	0.562	0.688	0.844	1.000	1.125	1.312	0.375	0.500	1.000
12.750	21.18	24.39	50.03	66.03		33.69	44.18	54.03	73.84	89.46	108.32	128.67	140.98	161.77	50.03	66.03	126.67
14"	0.156	0.188			0.250	0.312	0.375	0.438	0.594	0.750	0.938	1.094	1.250	1.406	0.375	0.500	
14.000	23.28	27.99			37.06	46.04	55.08	64.03	85.84	107.13	132.08	152.2	171.81	190.88	55.08	72.77	
16"	0.165	0.188			0.250	0.312	0.375	0.500	0.656	0.844	1.031	1.219	1.438	1.594	0.375	0.500	
16.000	28.17	32.05			42.45	52.76	63.16	83.55	108.51	137.89	166.37	194.23	225.73	247.54	63.16	83.55	
18"	0.165	0.188			0.250	0.312	0.438	0.562	0.750	0.938	1.166	1.376	1.562	1.781	0.375	0.500	
18.000	31.72	36.10			47.84	59.49	82.92	105.85	139.47	172.52	209.9	246.42	276.79	311.39	71.25	94.33	
20"	0.188	0.218			0.250	0.375	0.500	0.594	0.812	1.031	1.281	1.500	1.750	1.969	0.375	0.500	
20.000	40.15	46.49			53.23	79.33	105.11	124.26	167.96	210.82	258.49	299.15	344.29	382.72	79.33	105.11	
24"	0.218	0.250			0.250	0.375	0.562	0.688	0.969	1.219	1.531	1.812	2.062	2.344	0.375	0.500	
24.000	55.89	64.01			64.01	95.50	142.00	172.9	240.58	299.36	370.83	433.41	487.65	547.21	95.50	126.67	
30"	0.250	0.312			0.312	0.500	0.625								0.375	0.500	
30.000	80.18	99.65			98.85	159.01	197.91								119.76	159.01	
36"					0.312	0.500	0.625	0.750							0.375	0.500	
36.000					120.03	191.35	238.34	285.00							144.01	191.35	

Highlighted Produced by Ta Chen Stainless Pipe Co., Ltd.

*SEE STD WALL **SEE XS WALL



STAINLESS STEEL WELDED PIPE

TYPE 304L SCHEDULES 5S, 10S ALLOWABLE WORKING PRESSURE

ALLOWABLE WORKING PRESSURES
FOR A-312 WELDED PIPE

TYPE 304L
Schedules 5S, 10S

TEMPERATURE °F.			- 425 to 300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
MAX. STRESS			16700	15800	14800	14000	13700	13500	13300	13000	12800	11900	9900	7800	6300	5100	4000	3200	2600	2100	1700	1100	1000	900
NOM. PIPE SIZE	SCH. NO.	NOM. WALL.	ALLOWABLE WORKING PRESSURES PSIG																					
1/4	5S	.065	1809	1712	1603	1517	1484	1463	1441	1408	1387	1289	1073	845	683	553	433	347	282	226	184	119	108	98
	10S	.083	2310	2186	2047	1937	1695	1868	1840	1798	1771	1646	1370	1079	872	706	553	443	360	291	235	152	138	125
3/8	5S	.065	1447	1389	1283	1213	1187	1170	1153	1127	1109	1031	858	676	546	442	347	277	225	182	147	95	87	78
	10S	.083	1848	1749	1636	1549	1516	1494	1472	1439	1417	1317	1096	863	697	564	443	354	288	232	188	122	111	100
1	5S	.065	1156	1093	1024	969	948	934	920	900	886	823	635	540	436	353	277	221	180	145	118	76	69	62
	10S	.109	1938	1834	1717	1625	1590	1567	1543	1509	1485	1381	1149	905	731	592	464	371	302	244	197	128	116	104
1 1/4	5S	.065	915	888	811	767	751	740	729	713	702	652	543	426	345	280	219	175	143	115	93	60	55	49
	10S	.109	1535	1452	1361	1287	1259	1241	1223	1195	1177	1094	910	717	579	469	368	294	239	193	156	101	92	83
1 1/2	5S	.065	800	757	709	671	656	647	637	623	613	570	474	374	302	244	192	153	125	101	81	53	48	43
	10S	.109	1341	1269	1189	1124	1100	1084	1068	1044	1028	956	795	626	506	410	321	257	209	169	137	88	60	72
2	5S	.065	640	605	567	538	525	517	510	498	490	456	379	299	241	195	153	123	100	80	65	42	38	34
	10S	.109	1073	1015	951	900	880	867	855	835	822	765	638	501	405	328	257	206	167	135	109	71	64	58
2 1/2	5S	.083	675	639	598	566	554	546	538	525	517	481	400	315	255	206	162	129	105	85	69	44	40	36
	10S	.120	976	923	865	818	801	789	777	760	748	695	579	456	368	298	234	187	152	123	99	64	58	53
3	5S	.083	554	525	491	465	455	448	442	432	425	395	329	259	209	169	133	106	86	70	56	37	33	30
	10S	.120	802	758	710	672	658	648	638	624	614	571	475	374	302	245	192	154	125	101	82	53	48	43
3 1/2	5S	.083	485	459	430	407	398	392	386	378	372	346	288	227	183	148	116	93	76	61	49	32	29	26
	10S	.120	701	664	622	588	575	567	559	546	538	500	416	328	265	214	168	134	109	88	71	46	42	38
4	5S	.083	431	408	382	362	354	349	343	336	331	307	256	201	163	132	103	83	67	54	44	28	26	23
	10S	.120	623	590	553	523	511	504	497	485	478	444	370	291	235	190	149	119	97	78	63	41	37	34
5	5S	.109	458	433	406	384	376	370	365	357	351	326	272	214	173	140	110	88	71	58	47	30	27	25
	10S	.134	583	533	499	472	462	455	449	438	432	401	334	263	212	172	135	108	88	71	57	37	34	30
6	5S	.109	385	364	341	322	316	311	306	299	295	274	228	180	145	117	92	74	60	48	39	25	23	21
	10S	.134	473	447	419	396	388	382	377	368	362	337	260	221	178	144	113	91	74	59	48	31	28	25
8	5S	.109	295	280	262	248	242	239	235	230	226	211	175	138	111	90	71	57	46	37	30	19	18	16
	10S	.148	401	380	356	336	329	324	320	312	307	286	238	187	151	123	98	77	62	50	41	26	24	22
10	5S	.134	291	278	258	244	239	236	232	227	223	208	173	138	110	89	70	58	45	37	30	19	17	16
	10S	.165	359	340	318	301	294	290	286	279	275	256	213	168	135	110	86	69	56	45	37	24	21	19
12	5S	.156	286	271	254	240	235	231	228	223	219	204	170	134	108	87	69	55	45	36	29	19	17	15
	10S	.180	330	312	293	277	271	267	263	257	253	235	196	154	125	101	79	63	51	42	34	22	20	18
14	5S	.156	261	246	231	218	214	211	207	203	200	186	154	122	98	80	62	50	41	33	27	17	16	14
	10S	.188	314	297	276	263	258	254	250	244	241	224	186	147	118	96	75	60	49	39	32	21	19	17
16	5S	.165	241	228	214	202	198	195	192	188	185	172	143	113	91	74	58	46	38	30	25	16	14	13
	10S	.188	275	260	243	230	225	222	219	214	211	196	163	128	104	84	66	53	43	35	28	18	16	15
18	5S	.165	214	203	190	180	176	173	171	167	164	153	127	100	81	65	51	41	33	27	22	14	13	12
	10S	.188	244	231	216	205	200	197	194	190	187	174	145	114	92	75	58	47	38	31	25	16	15	13
20	5S	.188	220	208	195	184	180	178	175	171	168	157	130	106	83	67	53	42	34	28	22	14	13	12
	10S	.218	255	241	226	214	209	206	203	198	195	182	151	119	96	78	61	49	40	32	26	17	15	14
24	5S	.218	212	201	188	178	174	172	169	165	163	151	126	99	80	65	51	41	33	27	22	14	13	11
	10S	.250	244	230	216	204	200	197	194	190	187	174	144	114	92	74	58	47	38	31	25	16	15	13

The Allowable Stress Values used are as shown in Appendix "A" of ANSI B31.3-1993 for welded pipe to ASTM A-312 having a weld joint factor of .80.
Allowable Working Pressures shown for each size reflect the minus 12 1/2% manufacturers wall tolerance.



STAINLESS STEEL WELDED PIPE

TYPE 304 SCHEDULE 10S ALLOWABLE WORKING PRESSURE

ALLOWABLE WORKING PRESSURES FOR A-312 WELDED PIPE

TYPE 304 Schedule 10S

TEMPERATURE °F.			-425 to 300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
MAX. STRESS			20000	18700	17500	16400	16200	16000	15600	15200	14900	14600	14400	13800	12200	9700	7700	6000	4700	3700	2900	2300	1800	1400
NOM. PIPE SIZE	SCH. NO.	NOM. WALL.	ALLOWABLE WORKING PRESSURES PSIG																					
1/4	10S	.083	2767	2587	2421	2269	2241	2213	2158	2103	2061	2020	1992	1909	1688	1342	1065	830	650	512	401	318	249	194
1/4	10S	.083	2213	2069	1937	1815	1793	1771	1726	1682	1649	1616	1594	1527	1350	1073	852	664	520	409	321	255	199	155
1	10S	.109	2321	2170	2031	1903	1880	1857	1810	1764	1729	1694	1671	1601	1416	1126	894	696	545	429	337	267	209	162
1 1/4	10S	.109	1839	1719	1609	1508	1489	1471	1434	1397	1370	1342	1324	1269	1122	892	708	552	432	340	267	211	165	129
1 1/4	10S	.109	1606	1502	1406	1317	1301	1285	1253	1221	1197	1173	1157	1108	980	779	618	482	377	297	233	185	145	112
2	10S	.109	1265	1202	1124	1054	1041	1028	102	977	957	938	925	887	784	623	495	386	302	238	186	148	116	90
2 1/4	10S	.120	1169	1093	1023	958	947	935	912	888	871	853	841	806	713	567	450	351	275	216	169	134	105	82
3	10S	.120	960	898	840	787	778	768	749	730	715	701	691	662	586	466	370	288	226	178	139	110	86	67
3 1/4	10S	.120	840	785	735	689	680	672	655	638	626	613	605	580	512	407	323	252	197	155	122	97	76	59
4	10S	.120	747	698	653	612	605	597	582	567	556	545	538	515	455	362	287	224	175	138	106	86	67	52
5	10S	.134	674	631	590	553	548	540	526	513	502	492	486	465	411	327	260	202	158	125	98	78	61	47
6	10S	.134	566	530	496	464	459	453	442	430	422	413	406	391	345	275	218	170	133	105	82	65	51	40
8	10S	.148	480	449	420	394	389	384	375	365	358	351	346	332	293	233	185	144	113	89	70	55	43	34
10	10S	.165	430	402	376	352	348	344	335	327	320	314	309	297	262	208	165	129	101	80	62	49	39	30
12	10S	.180	395	370	346	324	320	316	308	300	294	289	285	273	241	192	152	119	93	73	57	45	36	28
14	10S	.188	376	352	329	308	305	301	293	288	280	274	271	259	229	182	145	113	88	70	55	43	34	26
16	10S	.188	329	308	288	270	266	263	257	250	245	240	237	227	201	160	127	99	77	61	48	38	30	23
18	10S	.188	292	273	256	240	237	234	228	222	218	213	211	202	178	142	113	88	69	54	42	34	26	20
20	10S	.218	305	285	267	250	247	244	238	232	227	223	220	211	186	148	118	92	72	56	44	35	27	21
24	10S	.250	292	273	255	239	236	233	228	222	217	213	210	201	178	141	112	88	69	54	42	34	26	20

The Allowable Stress Values used are as shown in Appendix "A" of ANSI B31.3-1993 for welded pipe to ASTM A-312 having a weld joint factor of .80.
The Stress Values at all temperatures above 1000°F apply only when the carbon is 0.04% or higher.



STAINLESS STEEL WELDED PIPE

TYPE 304L SCHEDULES 40S, 80S ALLOWABLE WORKING PRESSURE

ALLOWABLE WORKING PRESSURES FOR A-312 WELDED PIPE

TYPE 304L Schedules 40S, 80S

FOR A-312 WELDED PIPE																								
TEMPERATURE °F.			- 425 to 300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
MAX. STRESS			16700	15800	14800	14000	13700	13500	13300	13000	12800	11900	9900	7800	6300	5100	4000	3200	2600	2100	1700	1100	1000	900
NOM. PIPE SIZE	SCH. NO.	NOM. WALL.	ALLOWABLE WORKING PRESSURES PSIG																					
1/8	40S	.109	3034	2870	2689	2543	2489	2453	2146	2362	2325	2162	1799	1417	1145	927	727	581	472	382	309	200	182	164
	80S	.147	4092	3871	3626	3430	3357	3308	3259	3185	3136	2916	2426	1911	1544	1260	980	784	637	515	417	270	245	221
1/4	40S	.113	2516	2381	2230	2109	2084	2034	2004	1959	1929	1793	1492	1175	949	768	603	482	392	316	256	166	151	136
	80S	.154	3429	3244	3039	2875	2813	2772	2731	2669	2628	2443	2033	1602	1294	1047	821	657	534	431	349	226	205	185
1	40S	.133	2365	2237	2096	1962	1940	1912	1863	1841	1812	1685	1402	1104	892	722	566	453	368	297	241	156	142	127
	80S	.179	3183	3011	2820	2668	2611	2573	2535	2477	2439	2268	1887	1486	1201	972	762	610	495	400	324	210	191	172
1 1/4	40S	.140	1972	1866	1747	1653	1618	1594	1570	1535	1511	1405	1169	921	744	602	472	376	307	248	201	130	118	106
	80S	.191	2690	2545	2384	2255	2207	2175	2142	2094	2062	1917	1595	1256	1015	822	644	515	419	338	274	177	161	145
1 1/2	40S	.145	1784	1688	1561	1496	1464	1442	1421	1389	1368	1271	1058	833	673	545	427	342	278	224	182	118	107	96
	80S	.200	2461	2328	2181	2063	2019	1989	1960	1916	1886	1754	1459	1149	928	752	589	472	383	309	251	162	147	133
2	40S	.154	1516	1434	1344	1271	1244	1226	1207	1180	1162	1080	899	708	572	463	363	290	236	191	154	100	91	82
	80S	.218	2146	2030	1902	1799	1761	1735	1709	1671	1645	1529	1272	1002	810	655	514	411	334	270	218	141	129	116
2 1/2	40S	.203	1651	1562	1463	1384	1354	1335	1315	1285	1265	1176	979	771	623	504	395	316	257	208	168	109	99	89
	80S	.276	2244	2124	1989	1882	1841	1814	1788	1747	1720	1599	1331	1048	847	685	538	430	349	282	228	148	134	121
3	40S	.216	1443	1365	1279	1210	1184	1166	1149	1123	1106	1028	855	674	544	441	348	276	225	181	147	95	86	78
	80S	.300	2004	1896	1776	1680	1644	1620	1596	1560	1536	1428	1188	938	756	612	480	384	312	252	204	132	120	108
3 1/2	40S	.226	1321	1250	1171	1107	1084	1068	1052	1028	1012	941	783	617	498	403	316	253	206	166	134	87	79	71
	80S	.318	1859	1759	1647	1558	1525	1503	1460	1447	1425	1324	1102	868	701	568	445	356	289	234	169	122	111	100
4	40S	.237	1231	1165	1091	1032	1010	995	981	959	944	877	730	575	465	376	295	236	192	155	125	81	74	66
	80S	.337	1751	1657	1552	1468	1436	1415	1394	1363	1342	1248	1038	818	661	535	419	336	273	220	178	115	105	94
5	40S	.258	1084	1026	961	909	890	877	864	844	831	773	643	506	409	331	260	208	169	136	110	71	65	58
	80S	.375	1576	1491	1397	1321	1293	1274	1255	1227	1208	1123	934	738	595	481	377	302	245	198	160	104	94	85
6	40S	.280	988	935	876	828	811	799	787	769	757	704	586	462	373	302	237	189	154	124	101	65	59	53
	80S	.432	1525	1442	1351	1278	1251	1232	1214	1187	1169	1086	904	712	575	466	365	292	237	192	155	100	91	82
8	40S	.322	873	826	774	732	716	706	695	679	669	622	517	408	329	267	209	167	136	110	89	57	52	47
	80S	.500	1355	1262	1201	1136	1112	1096	1079	1055	1039	966	803	633	511	414	325	260	211	170	138	89	81	73
10	40S	.385	794	751	704	665	651	642	632	618	608	586	471	371	299	242	190	152	124	100	81	52	48	43
	80S	.500	1087	1029	984	912	892	879	866	847	833	775	645	508	410	332	260	208	169	137	111	72	65	59
12	40S	.375	688	651	609	576	564	556	548	535	527	490	408	321	259	210	165	132	107	86	70	45	41	37
	80S	.500	917	867	813	769	752	741	730	714	703	653	544	428	346	280	220	176	143	115	93	60	55	49
14	40S	.375	626	593	555	525	514	506	499	488	480	446	371	293	235	191	150	120	98	79	64	41	38	34
	80S	.500	835	790	740	700	685	675	665	650	640	595	495	390	315	255	200	160	130	105	85	55	50	45
16	40S	.375	548	518	486	459	450	443	438	427	420	390	325	256	207	167	131	105	85	69	56	36	33	30
	80S	.500	731	691	648	613	599	591	582	569	560	521	433	341	276	223	175	140	114	92	74	48	44	39
18	40S	.375	487	461	432	408	400	394	386	379	373	347	289	228	184	149	117	93	76	61	50	32	29	26
	80S	.500	649	614	576	544	533	525	517	506	498	463	385	303	245	198	156	124	101	82	66	43	39	35
20	40S	.375	438	415	389	368	360	354	349	341	336	312	260	205	165	134	105	84	68	55	45	29	26	24
	80S	.500	585	553	518	490	480	473	466	455	448	417	347	273	221	179	140	112	91	74	60	39	35	32
24	40S	.375	365	346	324	306	300	295	291	284	280	260	217	171	138	112	88	70	57	46	37	24	22	20
	80S	.500	487	461	432	408	400	394	386	379	373	347	289	228	184	149	117	93	76	61	50	32	29	26

The Allowable Stress Values used are as shown in Appendix "A" of ANSI B31.3-1993 for welded pipe to ASTM A-312 having a weld joint factor of .80.
Allowable Working Pressures shown for each size reflect the minus 12 1/2% manufacturers wall tolerance.



STAINLESS STEEL WELDED PIPE

TYPE 304 SCHEDULES 40S, 80S ALLOWABLE WORKING PRESSURE

ALLOWABLE WORKING PRESSURES FOR A-312 WELDED PIPE

TYPE 304 Schedules 40S, 80S

TEMPERATURE °F.			425 to 300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
MAX. STRESS			20000	18700	17500	16400	16200	16000	15600	15200	14900	14600	14400	13800	12200	9700	7700	6000	4700	3700	2900	2300	1800	1400
NOM. PIPE SIZE	SCH. NO.	NOM. WALL.	ALLOWABLE WORKING PRESSURES PSIG																					
1/2	40S	.109	3633	3397	3179	2979	2943	2907	2834	2761	2707	2652	2618	2507	2216	1762	1399	1090	854	672	527	418	327	254
	80S	.147	4900	4582	4288	4018	3969	3920	3822	3724	3651	3577	3528	3381	2989	2377	1887	1470	1152	907	711	564	441	343
3/4	40S	.113	3013	2617	2637	2471	2441	2411	2350	2290	2245	2200	2170	2079	1838	1461	1160	904	708	557	437	347	271	211
	80S	.154	4107	3840	3593	3387	3326	3285	3203	3121	3059	2998	2957	2834	2505	1992	1581	1232	965	760	595	472	370	287
1	40S	.133	2832	2648	2478	2322	2294	2266	2209	2152	2110	2067	2039	1954	1727	1373	1090	850	666	524	411	326	255	198
	80S	.179	3811	3584	3335	3125	3087	3049	2973	2897	2839	2782	2744	2630	2325	1849	1467	1143	898	705	553	438	343	267
1 1/4	40S	.140	2361	2208	2066	1936	1913	1889	1842	1795	1759	1724	1700	1629	1440	1145	909	708	555	437	342	272	213	165
	80S	.191	3222	3012	2819	2642	2610	2577	2513	2448	2400	2352	2320	2223	1985	1563	1240	967	757	596	467	370	290	226
1 1/2	40S	.145	2137	1996	1870	1752	1731	1709	1667	1624	1592	1560	1539	1474	1303	1036	823	641	502	395	310	246	192	150
	80S	.200	2947	2758	2579	2417	2387	2358	2299	2240	2196	2152	2122	2034	1798	1429	1135	884	693	545	427	339	265	206
2	40S	.154	1816	1693	1589	1489	1471	1452	1416	1380	1353	1325	1307	1253	1108	881	699	545	427	336	263	209	163	127
	80S	.218	2570	2403	2249	2107	2082	2058	2005	1953	1915	1876	1850	1773	1588	1247	989	771	604	475	373	296	231	180
2 1/2	40S	.203	1977	1849	1730	1621	1601	1582	1542	1503	1473	1443	1423	1384	1206	959	761	593	465	368	287	227	178	138
	80S	.276	2888	2513	2352	2204	2177	2150	2097	2043	2003	1962	1935	1855	1640	1304	1035	806	632	497	390	309	242	188
3	40S	.216	1728	1616	1512	1417	1400	1362	1348	1313	1287	1261	1244	1192	1054	838	665	518	408	320	251	199	158	121
	80S	.300	2400	2244	2100	1988	1944	1920	1872	1824	1788	1752	1728	1658	1464	1164	924	720	564	444	348	276	218	168
3 1/2	40S	.226	1562	1479	1364	1297	1261	1266	1234	1202	1179	1155	1139	1092	965	767	609	475	372	293	229	182	142	111
	80S	.318	2226	2081	1948	1825	1803	1781	1738	1692	1658	1625	1603	1538	1358	1080	857	668	523	412	323	256	200	156
4	40S	.237	1475	1379	1290	1209	1194	1180	1150	1121	1099	1077	1062	1018	900	715	588	442	347	273	214	170	133	103
	80S	.337	2097	1961	1835	1719	1698	1678	1636	1594	1562	1531	1510	1447	1279	1017	807	629	493	388	304	241	169	147
5	40S	.258	1299	1214	1136	1065	1052	1039	1013	987	967	948	935	896	792	630	500	390	305	240	188	149	117	91
	80S	.375	1667	1765	1652	1548	1529	1510	1472	1434	1408	1378	1359	1302	1151	915	727	566	444	349	274	217	170	132
6	40S	.280	1183	1106	1035	970	959	947	923	899	882	864	852	817	722	574	455	355	278	219	172	136	107	83
	80S	.432	1628	1707	1596	1497	1479	1461	1424	1368	1360	1333	1315	1260	1114	886	703	546	429	338	265	210	164	128
8	40S	.322	1045	977	915	857	847	836	815	794	779	763	753	721	638	507	402	314	246	193	152	120	94	73
	80S	.500	1623	1518	1420	1331	1315	1299	1266	1234	1209	1185	1169	1120	990	787	625	487	381	300	235	187	146	114
10	40S	.385	951	889	832	780	770	761	742	723	708	694	685	658	580	461	386	285	223	176	138	109	86	67
	80S	.500	1302	1218	1140	1068	1055	1042	1016	990	970	951	938	899	794	632	501	391	306	241	189	150	117	91
12	40S	.375	824	770	721	675	667	659	642	626	61	601	593	568	502	399	317	247	194	152	119	95	74	58
	80S	.500	1098	1027	961	900	869	876	856	835	818	802	791	756	670	533	423	329	258	203	159	126	99	77
14	40S	.375	750	701	656	615	608	600	585	570	559	548	540	518	458	364	289	225	178	139	109	86	68	53
	80S	.500	1000	935	875	820	810	800	780	760	745	730	720	690	610	485	385	300	235	185	145	115	90	70
16	40S	.375	656	614	574	538	532	525	512	499	489	479	473	453	400	318	253	197	154	121	95	75	59	46
	80S	.500	875	818	766	718	709	700	683	665	652	639	630	604	534	424	337	263	206	162	127	101	79	61
18	40S	.375	583	545	510	478	473	467	455	443	435	426	420	403	358	263	225	175	137	106	85	67	53	41
	80S	.500	778	727	681	638	630	622	607	591	579	568	560	537	474	377	299	233	183	144	113	89	70	54
20	40S	.375	525	491	459	431	425	420	410	399	391	383	378	362	320	255	202	158	123	97	76	60	47	37
	80S	.500	700	655	613	574	587	560	548	532	522	511	504	483	427	340	270	210	165	130	102	81	63	49
24	40S	.375	438	409	383	359	354	350	341	333	328	319	315	302	267	212	168	131	103	81	63	50	39	31
	80S	.500	583	545	510	478	473	467	455	443	435	426	420	403	358	283	225	175	137	108	85	67	53	41

The Allowable Stress Values used are as shown in Appendix "A" of ANSI B31.3-1993 for welded pipe to ASTM A-312 having a weld joint factor of .80.
The Stress Values at all temperatures above 1000F apply only when the carbon is 0.04% or higher.



STAINLESS STEEL WELDED PIPE

TYPE 316L SCHEDULES 5S, 10S ALLOWABLE WORKING PRESSURE

ALLOWABLE WORKING PRESSURES FOR A-312 WELDED PIPE

TYPE 316L Schedules 5S, 10S

TEMPERATURE °F.			- 425 to 300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
MAX. STRESS			16700	15500	14400	13500	13200	12900	12600	12400	12100	11800	11500	11200	10800	10200	8800	6400	4700	3500	2500	1800	1300	1000
NOM. PIPE SIZE	SCH. NO.	NOM. WALL.	ALLOWABLE WORKING PRESSURES PSIG																					
1/8	5S	.065	1809	1679	1560	1463	1430	1398	1365	1343	1311	1278	1246	1213	1170	1105	953	693	509	379	271	195	141	108
	10S	.083	2310	2144	1992	1888	1826	1785	1743	1715	1674	1632	1591	1549	1494	1411	1217	885	650	484	346	249	180	138
1/4	5S	.065	1447	1343	1248	1170	1144	1118	1092	1075	1049	1023	997	971	936	884	763	555	407	303	217	158	113	87
	10S	.083	1848	1715	1594	1494	1461	1428	1394	1372	1339	1306	1273	1239	1195	1129	974	708	520	387	277	199	144	111
1/2	5S	.065	1156	1073	997	934	913	893	872	858	837	817	796	775	747	706	609	443	325	242	173	125	90	69
	10S	.109	1938	1799	1671	1587	1532	1497	1462	1439	1404	1389	1335	1300	1253	1184	1021	743	545	406	290	209	151	116
3/4	5S	.065	915	850	789	740	724	707	691	680	663	647	630	614	592	559	482	351	258	192	137	55	71	55
	10S	.109	1535	1425	1324	1241	1213	1186	1158	1140	1112	1085	1057	1030	993	938	809	588	432	322	230	165	120	92
1 1/4	5S	.065	800	742	690	647	632	618	603	594	580	565	551	538	517	489	421	307	225	168	120	86	62	48
	10S	.109	1341	1245	1157	1084	1060	1038	1012	998	972	948	924	900	887	819	707	514	377	281	201	145	104	80
2	5S	.065	640	594	552	517	506	494	483	475	464	452	441	429	414	391	337	245	180	134	96	69	50	38
	10S	.109	1073	996	925	867	848	829	810	797	777	758	739	720	694	655	565	411	302	225	161	116	84	64
2 1/2	5S	.083	675	626	582	546	534	521	509	501	489	477	465	453	437	412	356	259	190	141	101	73	53	40
	10S	.120	976	906	841	789	771	754	736	725	707	690	672	654	631	596	514	374	275	205	146	105	76	58
3	5S	.083	554	515	478	448	438	428	418	412	402	392	382	372	359	339	292	212	156	116	83	60	43	33
	10S	.120	802	744	691	648	634	619	605	595	581	566	552	538	518	490	422	307	226	168	120	86	62	48
3 1/2	5S	.083	485	450	418	392	383	375	366	360	352	343	334	325	314	296	256	186	137	102	73	52	38	29
	10S	.120	701	651	605	567	554	542	529	521	506	496	483	470	454	428	370	269	197	147	105	76	55	42
4	5S	.083	431	400	372	349	341	333	325	320	312	305	297	289	279	263	227	165	121	90	65	46	34	26
	10S	.120	623	579	538	504	493	482	470	463	452	441	429	418	403	381	329	239	175	131	93	67	49	37
5	5S	.109	458	425	395	370	362	354	346	340	332	324	315	307	296	280	241	176	129	96	69	49	36	27
	10S	.134	563	523	486	455	445	435	425	418	408	398	388	378	364	344	297	216	158	118	84	61	44	34
6	5S	.109	385	357	332	311	304	297	290	286	279	272	265	258	249	235	203	147	108	81	58	41	30	23
	10S	.134	473	439	408	362	374	365	357	351	343	334	326	317	306	289	249	181	133	99	71	51	37	28
8	5S	.109	295	274	255	239	234	228	223	219	214	209	203	198	191	180	158	113	83	62	44	32	23	18
	10S	.148	401	372	346	324	317	310	303	298	291	283	276	269	259	245	211	154	113	84	60	43	31	24
10	5S	.134	291	270	251	236	230	225	220	216	211	206	201	195	188	178	154	112	82	61	44	31	23	17
	10S	.165	359	333	309	290	284	277	271	266	260	254	247	241	232	219	189	138	101	75	54	39	28	21
12	5S	.156	266	266	247	231	226	221	216	212	207	202	197	192	185	175	151	110	81	60	43	31	22	17
	10S	.180	330	308	285	267	261	255	249	245	239	233	227	221	213	202	174	126	93	69	49	36	26	20
14	5S	.156	261	242	225	211	206	201	197	193	189	184	179	175	168	159	137	100	73	55	39	28	20	16
	10S	.188	314	291	271	254	248	243	237	233	227	222	216	211	203	192	165	120	88	66	47	34	24	19
16	5S	.165	241	224	208	195	191	186	182	179	175	170	168	162	156	147	127	92	68	51	36	26	19	14
	10S	.188	275	255	237	222	217	212	207	204	199	194	189	184	178	168	145	105	77	58	41	30	21	16
18	5S	.165	214	199	185	173	169	166	162	159	155	151	148	144	139	131	113	85	60	45	32	23	17	13
	10S	.188	244	227	211	197	193	189	184	181	177	173	168	164	158	149	129	94	69	51	37	26	19	15
20	5S	.188	220	204	190	178	174	170	166	163	159	155	151	147	142	134	116	84	62	46	33	24	17	13
	10S	.218	255	237	220	206	201	197	192	189	185	180	175	171	165	156	134	96	72	53	38	27	20	15
24	5S	.218	212	197	183	172	168	164	160	158	154	150	146	142	137	130	112	81	60	45	32	23	17	13
	10S	.250	244	226	210	197	193	188	184	181	176	172	168	163	158	149	128	93	69	51	36	26	19	15

The Allowable Stress Values used are as shown in Appendix "A" of ANSI B31.3-1993 for welded pipe to ASTM A-312 having a weld joint factor of .80.
Allowable Working Pressures shown for each size reflect the minus 12 1/4% manufacturers wall tolerance.



STAINLESS STEEL WELDED PIPE

TYPE 316 SCHEDULE 10S ALLOWABLE WORKING PRESSURE

ALLOWABLE WORKING PRESSURES FOR A-312 WELDED PIPE

TYPE 316 Schedule 10S

TEMPERATURE °F.			- 425 to 300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
MAX. STRESS			20000	19300	17900	17000	16700	16300	16100	15900	15700	15500	15400	15300	14500	12400	9600	7400	5500	4100	3100	2300	1700	1300
NOM. PIPE SIZE	SCH. NO.	NOM. WALL	ALLOWABLE WORKING PRESSURES PSIG																					
1/8	10S	.083	2767	2670	2476	2352	2310	2255	2227	2200	2172	2144	2130	2117	2006	1715	1356	1024	761	587	429	318	235	180
1/4	10S	.083	2213	2136	1981	1881	1848	1804	1782	1760	1737	1715	1704	1693	1605	1372	1085	819	609	454	343	255	188	144
1	10S	.109	2321	2240	2077	1973	1938	1892	1888	1845	1822	1799	1787	1775	1683	1439	1137	859	638	476	360	267	197	151
1 1/4	10S	.109	1839	1774	1646	1563	1535	1496	1480	1462	1443	1425	1416	1406	1333	1140	901	680	506	377	285	211	156	120
1 1/2	10S	.109	1608	1550	1438	1365	1341	1309	1293	1277	1261	1245	1237	1229	1165	996	787	594	442	329	249	185	137	104
2	10S	.109	1285	1240	1150	1092	1073	1047	1034	1022	1009	996	989	983	932	797	630	475	353	263	199	148	109	84
2 1/2	10S	.120	1169	1128	1046	993	976	952	941	929	917	906	900	894	847	725	573	432	321	240	181	134	99	76
3	10S	.120	960	926	859	816	802	782	773	763	754	744	739	734	696	595	470	355	264	197	149	110	82	62
3 1/2	10S	.120	840	811	752	714	701	685	676	668	659	651	647	643	609	521	412	311	231	172	130	97	71	55
4	10S	.120	747	721	668	635	623	609	601	594	586	579	575	571	541	463	366	276	205	153	116	86	63	49
5	10S	.134	674	651	604	573	563	550	543	538	529	523	519	516	489	418	330	250	185	138	105	78	57	44
6	10S	.134	566	547	507	481	473	462	456	450	445	439	438	433	411	351	278	210	156	116	88	65	48	37
8	10S	.148	480	464	430	408	401	392	387	382	377	372	370	368	348	298	235	178	132	96	74	55	41	31
10	10S	.165	430	415	385	365	359	350	346	342	337	333	331	329	312	266	211	159	118	88	67	49	37	28
12	10S	.180	395	381	354	336	330	322	318	314	310	306	304	302	287	245	194	148	109	81	61	45	34	26
14	10S	.188	376	363	337	320	314	306	303	299	295	291	290	288	273	233	184	139	103	77	58	43	32	24
16	10S	.188	329	317	294	260	275	268	265	262	258	255	253	252	239	204	161	122	90	67	51	38	28	21
18	10S	.188	292	282	262	249	244	238	235	232	230	227	225	224	212	181	143	108	80	60	45	34	25	19
20	10S	.218	305	295	273	259	255	249	246	243	240	237	235	233	221	189	150	113	84	63	47	35	26	20
24	10S	.250	292	281	261	248	244	238	235	232	229	226	225	223	211	181	143	108	80	60	45	34	25	19

The Allowable Stress Values used are as shown in Appendix "A" of ANSI B31.3-1993 for welded pipe to ASTM A-312 having a weld joint factor of .80.
The Stress Values at all temperatures above 1000F apply only when the carbon is 0.04% or higher.



STAINLESS STEEL WELDED PIPE

TYPE 316L SCHEDULES 40S, 80S ALLOWABLE WORKING PRESSURE

ALLOWABLE WORKING PRESSURES FOR A-312 WELDED PIPE

TYPE 316L
Schedules 40S, 80S

TEMPERATURE *F.			~ 425 to 300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
MAX. STRESS			16700	15500	14400	13500	13200	12900	12600	12400	12100	11800	11500	11200	10800	10200	8800	6400	4700	3500	2500	1800	1300	1000
NOM. PIPE SIZE	SCH. NO.	NOM. WALL.	ALLOWABLE WORKING PRESSURES PSIG																					
1/8	40S	.109	3034	2816	2616	2453	2398	2344	2289	2253	2198	2144	2089	2035	1962	1853	1599	1163	854	636	454	327	236	182
	80S	.147	4092	3796	3528	3306	3234	3161	3067	3038	2965	2891	2816	2744	2646	2499	2158	1568	1152	858	613	441	319	245
1/4	40S	.113	2516	2335	2170	2034	1989	1944	1898	1888	1823	1778	1733	1687	1627	1537	1326	964	706	527	377	271	196	151
	80S	.154	3429	3183	2957	2772	2710	2649	2587	2546	2485	2423	2361	2300	2218	2094	1807	1314	965	719	513	370	267	205
1	40S	.133	2365	2195	2039	1912	1869	1827	1784	1756	1713	1671	1628	1586	1529	1444	1246	906	666	496	354	255	184	142
	80S	.179	3183	2954	2744	2573	2516	2458	2401	2363	2306	2249	2192	2134	2058	1944	1677	1220	896	667	476	343	248	191
1 1/4	40S	.140	1972	1830	1700	1594	1559	1523	1488	1464	1429	1393	1358	1322	1275	1204	1039	756	555	413	295	213	153	118
	80S	.191	2690	2497	2320	2175	2126	2078	2030	1997	1949	1901	1852	1804	1740	1643	1418	1031	757	564	403	290	209	161
1 1/2	40S	.145	1784	1656	1539	1442	1410	1378	1346	1325	1293	1261	1229	1197	1154	1090	940	684	502	374	267	192	139	107
	80S	.200	2461	2284	2122	1989	1945	1901	1857	1827	1763	1739	1695	1651	1592	1503	1297	943	693	516	368	265	192	147
2	40S	.154	1516	1407	1307	1226	1198	1171	1144	1126	1098	1071	1044	1017	980	926	799	581	427	318	227	163	118	91
	80S	.218	2146	1992	1850	1735	1696	1658	1619	1593	1555	1516	1478	1439	1388	1311	1131	822	604	450	321	231	167	129
2 1/2	40S	.203	1651	1532	1423	1335	1305	1275	1246	1226	1196	1166	1137	1107	1068	1008	870	633	465	346	247	178	129	99
	80S	.276	2244	2083	1935	1814	1774	1734	1693	1667	1626	1586	1548	1505	1452	1371	1183	860	632	470	336	242	175	134
3	40S	.216	1443	1339	1244	1166	1140	1115	1069	1071	1045	1020	994	968	933	881	760	553	406	302	216	156	112	86
	80S	.300	2004	1860	1728	1620	1584	1548	1512	1488	1452	1416	1380	1344	1296	1224	1056	766	564	420	300	216	156	120
3 1/2	40S	.226	1321	1226	1139	1068	1044	1020	997	961	957	933	910	886	854	807	696	506	372	277	198	142	103	79
	80S	.318	1859	1725	1603	1503	1469	1438	1402	1380	1347	1313	1280	1247	1202	1135	979	712	523	390	278	200	145	111
4	40S	.237	1231	1143	1062	995	973	951	929	914	892	870	848	826	796	752	649	472	347	258	184	133	96	74
	80S	.337	1751	1625	1510	1415	1384	1352	1321	1300	1269	1237	1206	1174	1132	1069	923	671	493	367	262	189	138	105
5	40S	.258	1084	1006	935	877	857	838	818	805	786	766	747	727	701	662	571	416	305	227	162	117	84	65
	80S	.376	1576	1463	1359	1274	1248	1217	1189	1170	1142	1114	1085	1057	1019	963	830	604	444	330	236	170	123	94
6	40S	.280	988	917	852	799	781	763	746	734	716	698	680	663	639	604	521	379	278	207	148	107	77	59
	80S	.432	1525	1415	1315	1232	1205	1178	1150	1132	1105	1077	1050	1022	986	931	803	584	429	320	228	164	119	91
8	40S	.322	873	810	753	706	690	674	659	648	632	617	601	585	564	533	460	335	246	183	131	94	68	52
	80S	.500	1365	1258	1169	1096	1071	1047	1023	1006	982	958	933	909	877	826	714	519	381	284	203	146	106	81
10	40S	.385	794	737	685	642	627	613	599	589	575	561	547	532	513	485	418	304	223	166	119	86	62	48
	80S	.500	1087	1009	938	879	860	840	820	807	788	768	749	729	703	664	573	417	306	228	163	117	85	65
12	40S	.375	688	638	593	556	544	531	519	511	498	486	474	461	445	420	362	264	194	144	103	74	54	41
	80S	.500	917	851	791	741	725	708	692	681	664	648	631	615	593	560	483	351	258	192	137	99	71	55
14	40S	.375	626	581	540	508	495	484	473	465	454	443	431	420	405	383	330	240	176	131	94	68	49	38
	80S	.500	835	775	720	675	660	645	630	620	605	590	575	560	540	510	440	320	235	175	125	90	65	50
16	40S	.375	548	509	473	443	433	423	413	407	397	387	377	368	354	335	289	210	154	115	82	59	43	33
	80S	.500	731	678	630	591	576	564	551	543	529	516	503	490	473	446	385	260	206	153	109	79	57	44
18	40S	.375	487	452	420	394	385	376	368	362	353	344	335	327	315	298	257	187	137	102	73	53	38	29
	80S	.500	649	603	560	525	513	502	490	482	471	459	447	436	420	397	342	249	183	136	97	70	51	39
20	40S	.375	438	407	378	354	347	339	331	326	318	310	302	294	284	268	231	168	123	92	66	47	34	26
	80S	.500	585	543	504	473	462	452	441	434	424	413	403	392	378	357	306	224	165	123	88	63	46	35
24	40S	.375	365	339	315	295	289	282	276	271	265	258	252	245	236	223	193	140	103	77	55	39	28	22
	80S	.500	487	452	420	394	385	376	368	362	353	344	335	327	315	298	257	187	137	102	73	53	38	29

The Allowable Stress Values used are as shown in Appendix "A" of ANSI B31.3-1993 for welded pipe to ASTM A-312 having a weld joint factor of .80.
Allowable Working Pressures shown for each size reflect the minus 12 1/2% manufacturers wall tolerance.



STAINLESS STEEL WELDED PIPE

TYPE 316 SCHEDULES 40S, 80S ALLOWABLE WORKING PRESSURE

ALLOWABLE WORKING PRESSURES FOR A-312 WELDED PIPE

TYPE 316 Schedules 40S, 80S

TEMPERATURE °F.			-425 to 300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
MAX. STRESS			20000	19300	17900	17000	16700	16300	16100	15900	15700	15500	15400	15300	14500	12400	9800	7400	5500	4100	3100	2300	1700	1300
NOM. PIPE SIZE	SCH. NO.	NOM. WALL.	ALLOWABLE WORKING PRESSURES PSIG																					
1/8	40S	.109	3633	3506	3252	3088	3034	2961	2925	2889	2652	2816	2798	2780	2634	2253	1780	1344	999	745	563	418	309	238
	80S	.147	4900	4729	4386	4165	4092	3994	3945	3896	3847	3798	3773	3749	3553	3038	2401	1813	1348	1005	760	564	417	319
1/4	40S	.113	3013	2908	2697	2561	2516	2456	2426	2396	2365	2335	2320	2305	2185	1868	1477	1115	829	618	467	347	256	196
	80S	.154	4107	3953	3675	3491	3429	3347	3308	3265	3224	3183	3162	3142	2977	2546	2012	1519	1129	842	637	472	349	267
1/2	40S	.133	2832	2733	2535	2407	2365	2308	2280	2251	2223	2195	2161	2166	2053	1756	1368	1048	779	581	439	326	241	184
	80S	.179	3811	3678	3411	3240	3183	3106	3068	3030	2992	2954	2935	2916	2763	2383	1888	1410	1048	781	591	438	324	248
3/4	40S	.140	2361	2279	2113	2007	1972	1925	1901	1877	1854	1830	1818	1807	1712	1464	1157	874	649	484	366	272	201	153
	80S	.191	3222	3109	2883	2738	2690	2628	2593	2561	2529	2497	2481	2465	2336	1997	1579	1192	886	660	499	370	274	209
1 1/4	40S	.145	2137	2062	1912	1816	1784	1742	1720	1699	1677	1656	1645	1635	1549	1325	1047	791	588	438	331	246	182	139
	80S	.200	2947	2844	2638	2505	2461	2402	2373	2343	2314	2284	2269	2255	2137	1827	1444	1091	811	604	457	339	251	192
2	40S	.154	1816	1752	1625	1543	1516	1480	1462	1443	1425	1407	1398	1389	1316	1126	890	672	499	372	281	209	154	118
	80S	.216	2570	2480	2300	2185	2146	2095	2069	2043	2018	1992	1979	1966	1863	1593	1259	951	707	527	398	296	218	167
2 1/2	40S	.203	1977	1908	1769	1680	1651	1611	1592	1572	1552	1532	1522	1512	1433	1226	969	732	544	405	306	227	168	129
	80S	.276	2688	2594	2406	2265	2244	2191	2164	2137	2110	2083	2070	2056	1949	1667	1317	995	739	551	417	309	228	175
3	40S	.216	1728	1688	1547	1469	1443	1408	1391	1374	1356	1339	1331	1322	1253	1071	847	639	475	354	266	199	147	112
	80S	.300	2400	2316	2148	2040	2004	1956	1932	1908	1884	1860	1848	1838	1740	1488	1176	888	660	492	372	276	204	158
3 1/2	40S	.226	1582	1527	1416	1345	1321	1289	1274	1258	1242	1226	1218	1210	1147	981	775	585	435	324	245	182	134	103
	80S	.318	2226	2146	1992	1892	1859	1814	1792	1770	1747	1725	1714	1703	1614	1360	1091	824	612	456	345	256	189	145
4	40S	.237	1475	1423	1320	1253	1231	1202	1187	1172	1158	1143	1135	1128	1069	914	723	546	406	302	229	170	125	96
	80S	.337	2097	2023	1877	1782	1751	1709	1688	1667	1646	1625	1615	1604	1520	1300	1027	776	577	430	325	241	178	136
5	40S	.258	1299	1253	1162	1104	1084	1058	1045	1032	1019	1006	1000	993	941	805	636	480	357	266	201	149	110	84
	80S	.375	1887	1821	1689	1604	1576	1538	1519	1501	1482	1463	1453	1444	1368	1170	925	698	519	387	293	217	160	123
6	40S	.280	1183	1142	1059	1006	988	964	953	941	929	917	911	905	858	734	580	438	325	243	183	138	101	77
	80S	.432	1826	1762	1634	1552	1525	1488	1470	1452	1433	1415	1406	1397	1324	1132	895	676	502	374	283	210	155	119
8	40S	.322	1045	1009	936	889	873	852	841	831	821	810	805	800	758	648	512	387	287	214	162	120	89	68
	80S	.500	1623	1566	1453	1380	1355	1323	1307	1290	1274	1258	1250	1242	1177	1006	795	601	446	333	252	187	138	106
10	40S	.365	951	917	851	808	794	775	765	756	746	737	732	727	689	589	466	352	261	195	147	109	81	62
	80S	.500	1302	1257	1166	1107	1087	1061	1048	1035	1022	1009	1003	996	944	807	638	482	358	287	202	150	111	85
12	40S	.375	824	795	737	700	688	671	663	655	646	638	634	630	597	511	404	305	226	169	128	95	70	54
	80S	.500	1098	1060	983	933	917	895	884	873	862	851	845	840	796	681	538	406	302	225	170	126	93	71
14	40S	.375	750	724	671	638	626	611	604	596	589	581	578	574	544	465	366	278	206	154	116	86	64	49
	80S	.500	1000	965	895	850	835	815	805	795	785	775	770	765	725	620	490	370	275	205	155	115	85	65
16	40S	.375	656	633	587	558	548	535	528	522	515	509	505	502	476	403	322	243	180	135	102	75	56	43
	80S	.500	875	844	783	744	731	713	704	696	687	678	674	669	634	543	429	324	241	179	136	101	74	57
18	40S	.375	583	563	522	496	487	475	470	464	458	452	449	446	423	362	266	216	160	120	90	67	50	38
	80S	.500	778	751	696	661	649	634	626	618	611	603	599	595	584	482	381	288	214	159	121	89	68	51
20	40S	.375	525	507	470	446	438	428	423	417	412	407	404	402	381	326	257	194	144	108	81	60	45	34
	80S	.500	700	676	627	595	585	571	564	557	550	543	539	536	508	434	343	259	193	144	109	81	60	46
24	40S	.375	438	422	392	372	365	357	352	348	343	339	337	335	317	271	214	162	120	90	68	50	37	28
	80S	.500	583	563	522	496	487	475	470	464	458	452	449	446	423	362	286	216	160	120	90	67	50	38

The Allowable Stress Values used are as shown in Appendix "A" of ANSI B31.3-1993 for welded pipe to ASTM A-312 having a weld joint factor of .80.
The Stress Values at all temperatures above 1000°F apply only when the carbon is 0.04% or higher.



INCONEL alloy C-276 (UNS N10276/W.Nr. 2.4819) is known for its corrosion resistance in a wide range of aggressive media. The high molybdenum content imparts resistance to localized corrosion such as pitting. The low carbon minimizes carbide precipitation during welding to maintain resistance to intergranular attack in heat-affected zones of welded joints. It is used in chemical processing, pollution control, pulp and paper production, industrial and municipal waste treatment and the recovery of "sour" natural gas. Applications in air pollution control include stack liners, ducts, dampers, scrubbers, stack-gas re-heaters, fans and fan housings. In chemical processing, the alloy is used for components including heat exchangers, reaction vessels, evaporators and transfer piping.

Physical Properties

Table 2 - Physical Properties

Temp	Thermal Conductivity	Coeff. of Expansion ^a	Electrical Resistivity	Young's Modulus
°F	Btu•in./ft ² •h•°F	10 ⁻⁶ in/in•°F	ohm•cmil/ft	10 ³ ksi
-270	50	-	-	-
-100	60	-	0	-
0	65	-	-	-
77	-	-	739.2	29.8
100	71	-	-	-
200	77	6.8	743.8	29.5
400	90	7.0	749.3	28.6
600	104	7.2	757.7	27.8
800	117	7.4	760.3	26.7
1000	132	7.5	772.5	25.7
1200	145	7.7	781.5	24.8
1400	159	8.1	773.9	23.5
1600	173	8.5	768.3	22.0
1800	185	-	766.2	20.6
2000	195	-	757.7	19.1
°C	W/m•°C	µm/m•°C	µΩ•cm	GPa
-168	7.2	-	-	-
-73	8.7	-	-	-
20	9.8	-	-	-
25	-	-	122.9	205
100	11.2	12.2	123.7	203
200	12.8	12.4	124.5	198
300	14.7	12.9	125.7	192
400	16.4	13.2	126.0	186
500	18.2	13.5	127.7	180
600	20.0	13.6	129.9	178
700	21.9	14.1	129.7	167
800	23.7	14.8	128.2	159
900	25.4	-	127.4	150
1000	27.0	-	127.1	141
1100	28.3	-	-	-

^aMean coefficient of linear expansion between 77°F (25°C) and temperature shown.

Table 1 - Limiting Chemical Composition, %

Nickel.....	Balance
Molybdenum	15.0-17.0
Chromium.....	14.5-16.5
Iron	4.0-7.0
Tungsten.....	3.0-4.5
Cobalt	2.5 max.
Manganese	1.0 max.
Carbon	0.01 max.
Vanadium	0.35 max.
Phosphorus	0.04 max.
Sulfur	0.03 max.
Silicon	0.08 max.

Table 4 - Elevated Temperature Dynamic Modulus Properties

Temperature	Young's Modulus	Shear Modulus	Poisson's Ratio
°F	10 ³ ksi	10 ³ ksi	
70	31.30	11.81	0.33
100	31.18	11.75	0.33
200	30.77	11.57	0.33
300	30.35	11.40	0.33
400	29.92	11.23	0.33
500	29.42	11.05	0.33

Table 3 - Physical Constants

Density, lb/in ³	0.321
g/cm ³	8.89
Melting Range, °F	2415-2500
°C	1325-1370
Thermal Conductivity, Btu•in./ft ² •h•°F	67.9
W/m•°C	9.8
Specific Heat, Btu•lb•°F	0.102
J/kg•°C	427
Young's Modulus, 10 ³ ksi	29.8
GPa	205
Shear Modulus, 10 ³ ksi	11.4
GPa	79
Permeability at 200 oersted (15.9 kA/m)	1.0002
Poisson's Ratio	0.307

INCONEL[®] alloy C-276



INCONEL® alloy C-276

Mechanical Properties

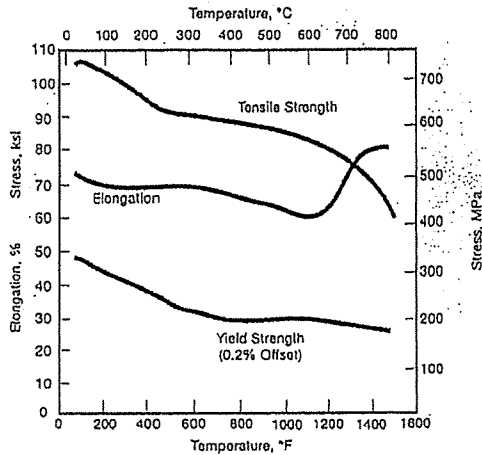


Figure 1. Tensile properties of annealed plate.

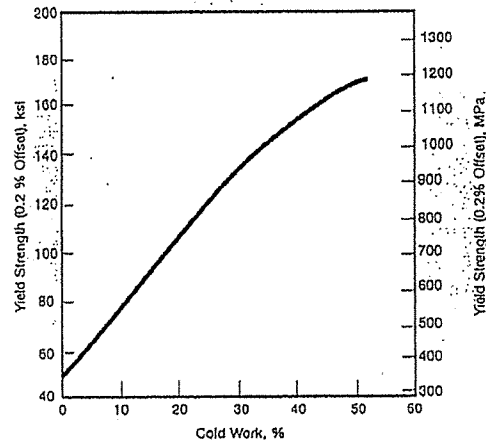


Figure 2. Effect of cold work on the yield strength of annealed plate.

Table 4 - Typical Room-Temperature Tensile Properties of Annealed Material

Product Form	Tensile Strength		Yield Strength (0.2% Offset)		Elongation	Hardness
	ksi	MPa	ksi	MPa	%	Rb
Tubing	105.4	727	45.4	313	70	92
Plate	107.4	741	50.3	347	67	89
Bar	110.0	758	52.6	363	62	88
Sheet	115.5	796	54.6	376	60	86

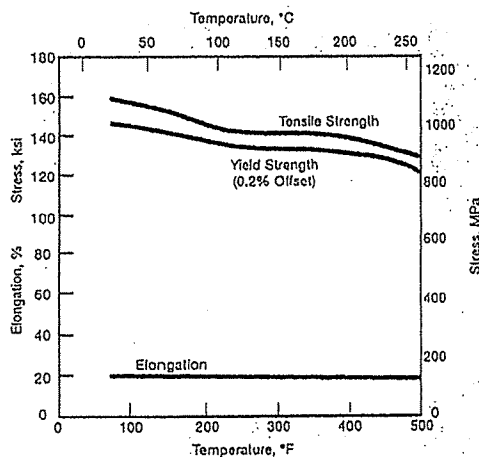


Figure 3. Tensile properties of 33.5% cold-worked tubing.

Corrosion Resistance

INCONEL alloy C-276 is resistant to general corrosion, stress-corrosion cracking, pitting and crevice corrosion in a broad range of severe environments. Its resistance to carbide precipitation during welding maintains corrosion resistance in the heat-affected zones of welded joints.

It has exceptional resistance to sulfuric acid and hydrochloric acid. It resists many of the most severe media encountered in chemical processing, including reducing and oxidizing acids, highly oxidizing, neutral, and acid chlorides, solvents, formic and acetic acids, acetic anhydride, wet chlorine gas, hypochlorites, and chlorine solutions. It has excellent resistance to phosphoric acid. At all temperatures below the boiling point and at concentrations lower than 65 wt %, tests have shown corrosion rates of less than 5 mpy (0.13 mm/y).

INCONEL alloy C-276 exhibits excellent resistance to corrosion by seawater especially under crevice conditions which induce attack in other commonly used materials such as 316 stainless steel, MONEL® alloy 400, and INCONEL alloy 625.

See Special Metals publication SMC-026, "Resistance to Aqueous Corrosion" on the website www.specialmetals.com, for more corrosion data.

INCONEL® alloy C-276

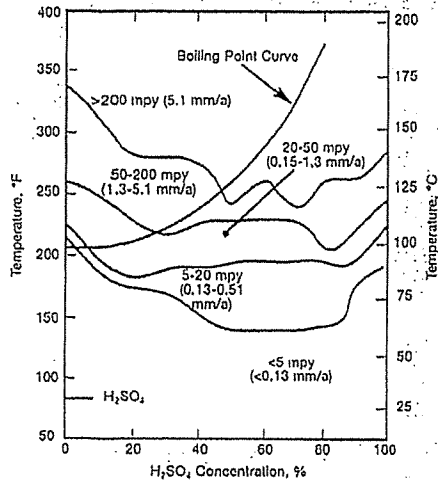


Figure 4. Corrosion rates in sulfuric acid.

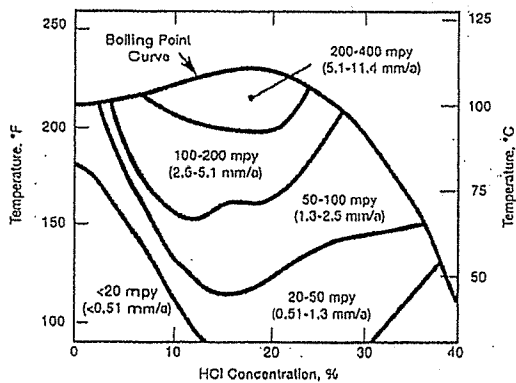


Figure 5. Corrosion rates in oxygen-saturated hydrochloric acid.

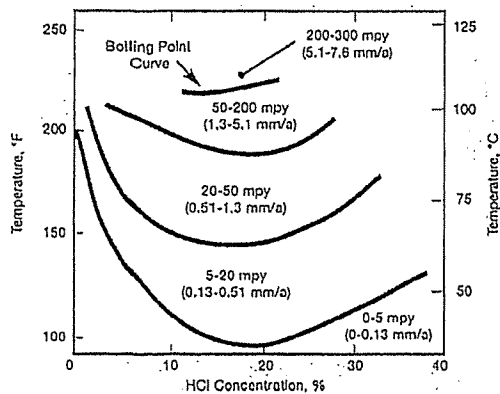


Figure 6. Corrosion rates in hydrochloric acid.

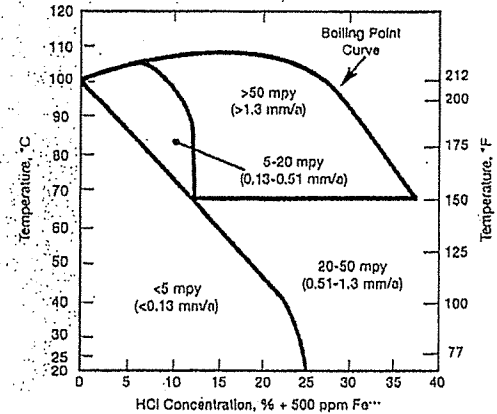


Figure 7. Corrosion rates in hydrochloric acid + 500 ppm Fe⁺⁺⁺

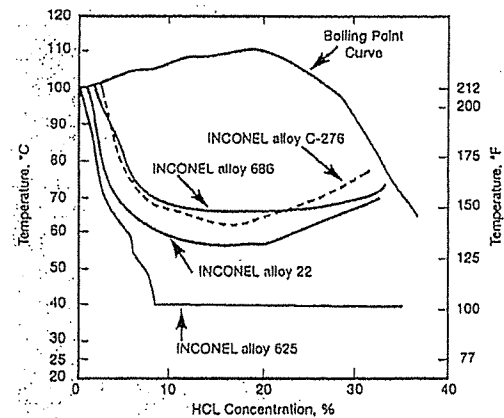


Figure 8. Corrosion resistance in hydrochloric acid. The isocorrosion curves show temperatures and concentrations above which the corrosion rate exceeds 0.5 mm/a (20 mpy).

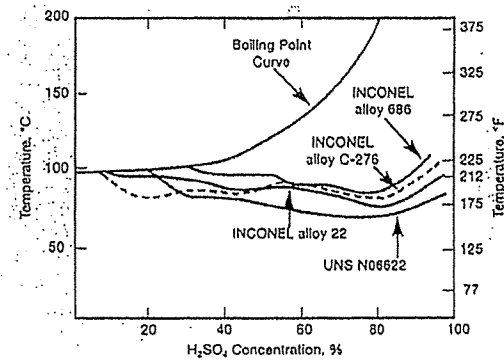


Figure 9. Comparative behavior of several nickel base alloys in sulfuric acid. The isocorrosion curves show temperatures and concentrations above which the corrosion rate exceeds 0.5 mm/a (20 mpy).

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Table 5 - Corrosion Rates in Acid Solutions^a

Solution	Temperature		Corrosion Rate, mpy (mm/a)			
	°F	°C	INCONEL alloy C-276	INCONEL alloy 22	INCONEL alloy 625	INCONEL alloy 686
10% H ₂ SO ₄	Boiling	Boiling	20 (0.51)	22 (0.56)	17 (0.43)	3 (0.08)
20% H ₂ SO ₄	176	80	3 (0.08)	1 (0.03)	1 (0.03)	-
40% H ₂ SO ₄	176	80	5 (0.13)	10 (0.25)	5 (0.13)	-
80% H ₂ SO ₄	176	80	4 (0.10)	9 (0.23)	6 (0.15)	4 (0.10)
95% H ₂ SO ₄	122	50	0.1 (0.003)	-	48 (1.2)	-
5% H ₂ SO ₄ + 0.1% HCl	Boiling	Boiling	22 (0.56)	24 (0.61)	-	-
10% H ₂ SO ₄ + 1% HCl	Boiling	Boiling	70 (1.78)	201 (5.11)	465 (11.68)	-
10% H ₂ SO ₄ + 2% HCl	Boiling	Boiling	138 (3.51)	281 (7.14)	-	132 (3.35)
10% H ₂ SO ₄ + 2% HCl	122	50	0.2 (0.005)	0.1 (0.003)	0.1 (0.003)	0 (0)
10% H ₂ SO ₄ + 5% HCl	Boiling	Boiling	256 (6.50)	456 (11.58)	-	-
40% H ₂ SO ₄ + 10% HCl	176	80	26 (0.66)	32 (0.81)	-	-
2% HCl	Boiling	Boiling	43 (1.09)	52 (1.32)	-	6 (0.15)
5% HCl	140	60	10 (0.25)	-	46 (1.17)	1.2 (0.30)
20% HCl	212	100	154 (3.91)	269 (6.83)	385 (9.78)	-
5% HCl + 2% HF	158	70	18 (0.46)	40 (1.02)	102 (2.59)	-
85% H ₃ PO ₄	Boiling	Boiling	10 (0.25)	13 (0.33)	>180 (>4.57)	16 (0.41)
10% HNO ₃ + 3% HF	Boiling	Boiling	95 (2.41)	23 (0.61)	28 (0.71)	-

^a168 h tests.

Table 6 - Corrosion Rates in Hydrochloric, Phosphoric and Acetic Acids^a

Solution	Temperature		Corrosion Rate, mpy (mm/a)				
	°F	°C	INCONEL alloy C-276	INCOLOY® alloy 25-6MO	INCOLOY alloy 27-7MO	INCONEL alloy 22	INCONEL alloy 686
0.2% HCl	Boiling	Boiling	0.60 (0.02)	<0.1 (<0.003)	1.3 (0.03)	<0.1 (<0.003)	0.20 (0.005)
1% HCl	Boiling	Boiling	6.5 (0.17)	119 (3.02)	<0.1 (<0.003)	2.7 (0.07)	2.0 (0.05)
	194	90	3.5 (0.09)	37.0 (0.94)	<0.1 (<0.003)	-	-
	158	70	0.74 (0.02)	0.02 (<0.001)	<0.1 (<0.003)	-	-
5% HCl	158	70	13.2 (0.34)	142 (3.61)	150 (3.8)	18.8 (0.48)	9.8 (0.25)
	122	50	0.5 (0.01)	43.4 (1.10)	5 (0.13)	1 (0.03)	0 (0)
85% H ₃ PO ₄	Boiling	Boiling	10.4 (0.26)	114 (2.90)	27 (0.69)	13.0 (0.33)	16.2 (0.41)
	194	90	0.20 (0.005)	10.6 (0.27)	<0.1 (<0.003)	0.21 (0.005)	0.18 (0.005)
80% CH ₃ COOH	Boiling	Boiling	0.15 (0.004)	<0.1 (<0.003)	<1 (<0.03)	<0.1 (<0.003)	<0.1 (<0.003)

^a192 h tests.

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Table 7 - Corrosion Rates in Various Media^a

Solution	Temperature		Corrosion Rate	
	°F	°C	mpy	mm/a
10% HNO ₃	Boiling	Boiling	15 ^b	0.38 ^b
10% HNO ₃ + 2% HCl	180	82	6.5	0.17
15% HNO ₃ + 3% HF	140	60	179	4.55
20% HNO ₃ + 2% HF	140	60	215	5.46
3% HF	176	80	53	1.35
10% HF	75	24	2	0.05
10% HF	176	80	28	0.71
Concentrated HF	75	24	1	0.03
Concentrated HF	176	80	34	0.86
20% H ₃ PO ₄	Boiling	Boiling	<1	<0.03
60% H ₃ PO ₄	Boiling	Boiling	1	0.03
85% H ₃ PO ₄	212	100	<1	<0.03
85% H ₃ PO ₄	Boiling	Boiling	10	0.25
99.9% CH ₃ COOH + 0.1% NaCl	Boiling	Boiling	<1	<0.03
50% NaOH	Boiling	Boiling	1	0.03
10% HBr	176	80	<1	<0.03
10% HBr	Boiling	Boiling	<1	<0.03
10% NH ₃ Br	176	80	0	0.00
10% NH ₃ Br	Boiling	Boiling	0	0.00

^aTest duration of 168 h except as noted.

^bTest duration of 24 h.

Table 9 - Critical Crevice and Critical Pitting Temperatures in an Acidified 6% Ferric Chloride Solution (ASTM G 48, Methods C & D)

Alloy	Critical Crevice Temperature		Critical Pitting Temperature	
	°C	°F	°C	°F
INCONEL alloy 686	>85	>185	>85	>185
INCONEL alloy 22	75	167	>85	>185
INCONEL alloy C-276	50	122	>85	>185
INCOLOY alloy 27-7MO	45	122	>85	>185
INCONEL alloy 625	35	95	>85	>185
INCOLOY alloy 25-6MO	35	86	70	158
INCOLOY alloy 825	5	41	30	86
AISI Stainless Steel	<0	<32	20	68

Table 10 - Corrosion Rates^a in Simulated FGD Mixed-Gas Condensate Solutions

Solution	Temperature		Corrosion Rate, mpy (mm/a)		
	°F	°C	INCONEL alloy C-276	INCONEL alloy 22	INCONEL alloy 625
Solution 1 ^b	185	85	82 (2.08)	20 (0.51)	14 (0.36)
Solution 2 ^c	176	80	42 (1.07)	50 (1.27)	126 (3.20)

^a168 h test.

^b60% H₂SO₄ + 0.5% HCl + 0.1% HF + 0.1% HNO₃.

^c60% H₂SO₄ + 2.5% HCl + 0.2% HF + 0.5% fly ash.

The performance of INCONEL alloy C-276 in a severe test for susceptibility to intergranular attack (ASTM G 28) is shown below in Table 8. The base corrosion rates listed are representative of typical production material. Rates significantly higher than these indicate susceptibility to intergranular attack. This test is designed to verify mill production only and not to compare alloys for use in applications such as flue gas desulfurization.

Table 8 - ASTM G28 Tests for Intergranular Attack

Alloy	Method A ^a Corrosion Rate		Method B ^b Corrosion Rate	
	mpy	mm/a	mpy	mm/a
INCONEL alloy C-276	175	4.45	30	0.76

^aBoiling ferric sulfate/50% sulfuric acid.

^bBoiling 23% H₂SO₄ + 1.2% HCl + 1% FeCl₃ + 1% CuCl₂.

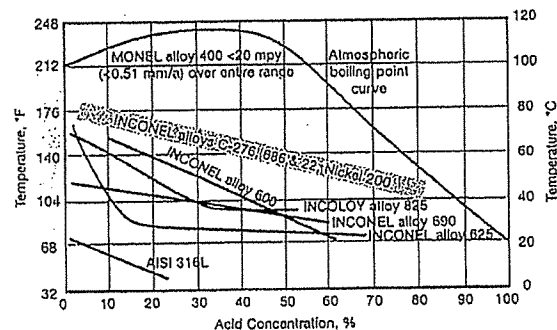


Figure 10. A summary iso-corrosion chart for 20 mpy (0.51 mm/a) data in hydrofluoric acid.

Corrosion Resistance - Flue Gas Desulfurization

INCONEL alloy C-276 is useful for flue gas desulfurization (FGD) systems to control air pollution from electric power plants. The alloy is used for various applications including scrubbers, ducting and stack liners.

Scrubber liquors and gas condensates generally contain chlorides and the chloride level often determines the corrosion behavior of the materials. INCONEL alloy C-276 has been shown to withstand higher chloride content than other alloys before the onset of localized corrosion in a simulated scrubber environment.

INCONEL® alloy C-276

Table 11 - Maximum Pitting or Crevice Attack, mils (mm), in FGD Scrubber Slurry^a

Alloy	Quencher	Absorber	Absorber Outlet	Outlet Duct	Bypass Duct
AISI 316L	22 (0.56)	21 (0.53)	35 (0.89) ^b	35 (0.89) ^b	12 (0.30)
AISI 317LM	20 (0.51)	22 (0.56)	29 (0.74)	33 (0.84)	29 (0.74)
INCOLOY alloy 825	15 (0.38)	33 (0.84)	39 (0.99)	50 (1.27) ^b	10 (0.25)
INCONEL alloy 625	<2 (<0.05)	10 (0.25)	11 (0.28)	7 (0.18)	nil
INCONEL alloy C-276	nil	nil	<2 (<0.05)	nil	nil

^a6-month exposure at 126°F (52°C), pH 5.5, 5000 ppm chlorides.

^bPerforated.

Table 12 - Maximum Pitting or Crevice Attack, mils (mm), in Scrubber Slurry^a

Alloy	Scrubber Bottom	Under Spray Nozzles	Scrubber Outlet	Hold Tank
AISI 316	5 (0.13)	7 (0.18)	49 (1.24) ^b	2 (0.05)
INCOLOY alloy 825	<2 (<0.05)	1.2 (0.03)	49 (1.24) ^b	nil
INCONEL alloy 625	nil	nil	26 (0.66)	nil
INCONEL alloy C-276	nil	nil	nil	nil

^a3-month exposure at 120°F (49°C), pH 5.8-6.1, 10,000 ppm chlorides.

^bPerforated.

Corrosion Resistance - Oilfield Applications

INCONEL alloy C-276 is one of the premier materials for recovery and handling of "sour" natural gas, which contains hydrogen sulfide and usually carbon dioxide and chlorides. The gas can be extremely corrosive to carbon and alloy steels, and may cause brittle failure of many alloys by sulfide stress cracking (hydrogen embrittlement) or stress-corrosion cracking. The high levels of nickel, chromium, and molybdenum in INCONEL alloy C-276 make the alloy resistant to sour environments even at high temperatures in deep wells. The alloy is used for tubing and a variety of other downhole and surface components.

Table 13 - C-Ring Tests in NACE Solution^a

Material Condition	Simulated Well Age	Yield Strength (0.2% Offset)		Hardness, Rockwell C	Duration, Days	Sulfide Stress Cracking
		ksi	MPa			
Cold Worked	600°F (315°C)/1000 h	126.6	873	32	43	No
Cold Worked	600°F (315°C)/1000 h	155.1	1069	38	43	No
Cold Worked	600°F (315°C)/1000 h	166.8	1150	35	43	No
Cold Worked	600°F (315°C)/1000 h	188.7	1301	43	43	No

^aRoom-temperature tests at 100% of yield strength in 5% NaCl plus 0.5% acetic acid saturated with H₂S. All specimens were coupled to carbon steel.

Heat Treatments

Hot forming should be between 1600 and 2250°F (870 and 1230°C), with all heavy forming above 2000°F (1090°C). INCONEL alloy C-276 is normally annealed at 2100-2150°F (1150-1175°C) and rapidly cooled such as by water quenching.

INCONEL® alloy C-276

Joining

INCONEL alloy C-276 has good weldability and can be used as-welded for most applications. INCO-WELD® filler metal and welding electrode 686CPT* can be used to "overmatch" INCONEL alloy C-276 where enhanced corrosion resistance is required.

Information on joining is available in the Special Metals publication "Joining" on the website, www.specialmetals.com.

Table 14 - Recommended Welding Products

Shielded Metal Arc Welding	Gas Tungsten Arc Welding, Gas Metal Arc Welding
INCONEL welding electrode C-276	INCONEL filler metal C-276
INCO-WELD welding electrode 686CPT	INCO-WELD filler metal 686CPT

Table 15 - Corrosion Resistance of Weldments in INCONEL alloy C-276

Environment	Base Metal Alloy (5-6 mm thickness)	Weld Filler Metal	Maximum Pitting Depth of Attack, mm Average Results for Duplicate Specimens			
			GTAW Process		GMAW Pulsed Process	
			Base Metal	Weld Metal	Base Metal	Weld Metal
Green Death*	INCONEL alloy C-276	INCONEL filler metal C-276	0	6.2	0	3.4
	INCONEL alloy C-276	INCO-WELD filler metal 686CPT	0	0	0	0
ASTM G48C	INCONEL alloy C-276	INCONEL filler metal C-276	0	0	0	0
	INCONEL alloy C-276	INCO-WELD filler metal 686CPT	0	0	0	0

*11.9% H₂SO₄ + 1.3% HCl + 1% FeCl₃ + 1% CuCl₂ boiling at 103°C for 72 h.

Machining

Information on machining is available in the Special Metals publication "Machining" on the website, www.specialmetals.com.

Fabricating

Information on fabricating is available in the Special Metals publication "Fabricating" on the website, www.specialmetals.com.

Available Products and Specifications

INCONEL alloy C-276 is designated as UNS N10276 and Werkstoff Nr. 2.4819. It is listed in NACE MR0175 for oil and gas service. Alloy C-276 is available as pipe, tube, sheet, strip, plate, round bar, flat bar, forging stock, hexagon and wire.

INCONEL alloy C-276 is approved as a material of construction by the ASME Boiler and Pressure Vessel Code. Allowable stresses for Section III construction up to 800°F, Section VIII, Division 1 construction up to 1250°F, and Section VIII, Division 2 construction up to 800°F are contained in Tables 1B and 2B of ASME Code Case Section II, Part D.

Rod, Bar, Wire and Forging Stock - ASTM B 462 (Rod, Bar and Forging Stock), ASTM B 564 & ASME SB 564 (Forgings), ASTM B 574 & ASME SB 574 (Rod, Bar and Wire), ISO 9723 (Rod and Bar), ISO 9724 (Wire), ISO 9725 (Forgings), DIN 17752, DIN 17753, DIN 17754, VdTÜV 400/12.98

Plate, Sheet and Strip - ASTM B 575/B 906 & ASME SB 575/SB 906, ISO 6208, DIN 17750, VdTÜV 400/12.98

Pipe and Tube - ASTM B 622/B 829 & ASME SB 622/SB 829 (Seamless Tube), ASTM B 626/B 751 & ASME SB 626/SB 751 (Welded Tube), ASTM B 619/B 775 & ASME SB 619/SB 775 (Welded Pipe), ISO 6207 (Seamless Tube), DIN 17751, VdTÜV 400/12.98

Welding Products - INCONEL Filler Metal C-276 - AWS A5.14 / ERNiCrMo-4, INCONEL Welding Electrode C-276 - AWS A5.11 / ENiCrMo-4

Others - ASTM B 366 & ASME SB 366 (Fittings), DIN 17744 (chemical composition)

Publication Number SMC-019

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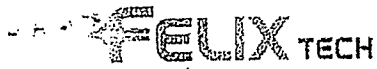
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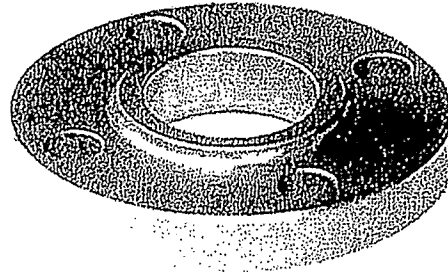
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On the basis of excellent quality and service, industrial forging business of Felix Technology Co., Ltd. has been successfully supplying forged products including flanges for domestic and overseas Oil & Gas, Ship-building, Petrochemical & Power Plants fields.

SO

SLIP-ON FLANGE

The slip-on flange has a low hub because the pipe slips into the flange prior to welding. It is welded both inside and outside to provide sufficient strength and prevent leakage. Slip-on flanges are all bored slightly larger than the OD of the matching pipe.



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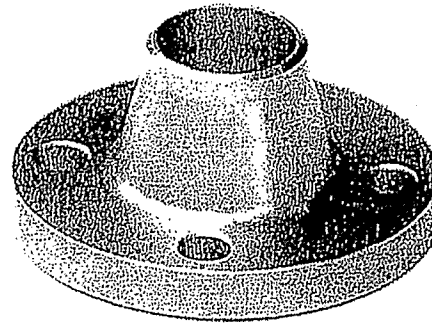
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WELDING NECK FLANGE

The welding neck flange is normally referred to as the "high hub" flange. It is designed to transfer stresses to the pipe, thereby reducing high stress concentrations at the base of the flange.



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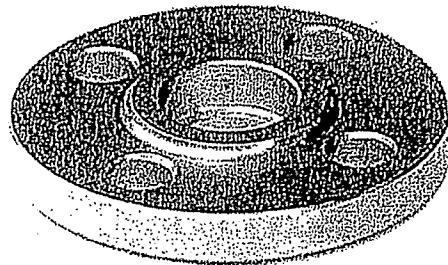
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SOCKET WELDING FLANGE

The socket welding flange is similar to a slip-on flange except it has a bore and a counterbore dimension. The counterbore is slightly larger than the OD of the matching pipe. The diameter of the smaller bore is the same as the ID of the matching pipe.



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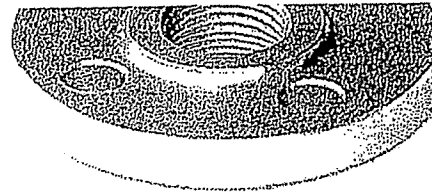
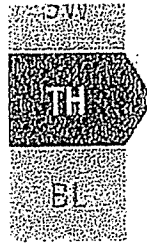
THREADED(SCREWED) FLANGE

The threaded flange is similar to the slip-on flange, but the bore is threaded. It can be assembled without welding.



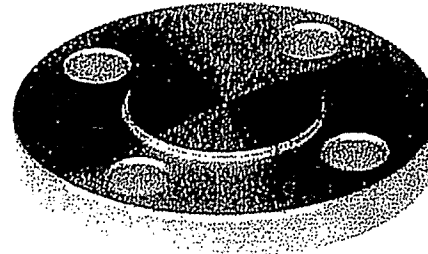
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BLIND FLANGE

The blind flange is a flange without a bore, it is used to close off the ends of a piping system and/or a pressure vessel opening.



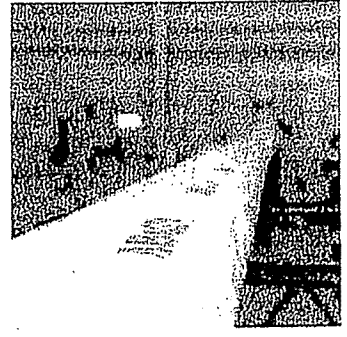
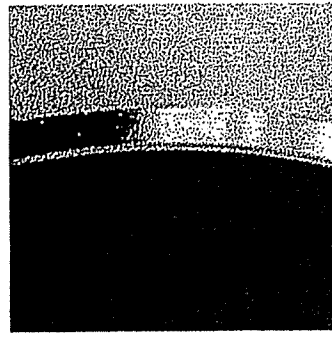
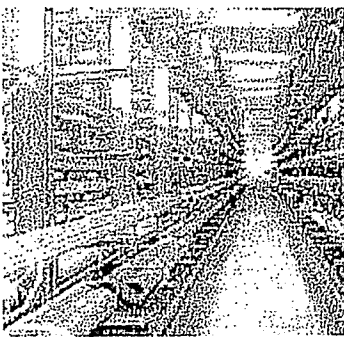
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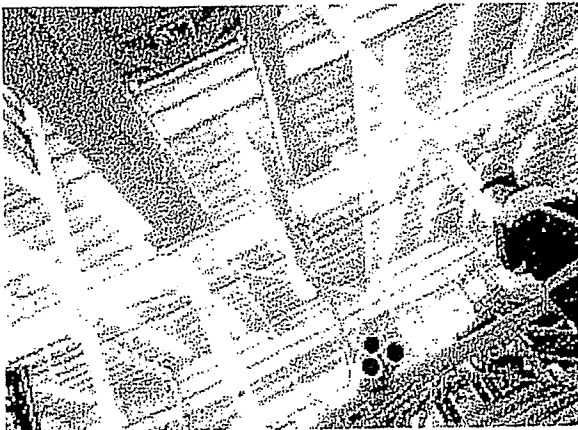
2.3 STAINLESS STEEL:

FAMILIES AND

GRADES

The categorization of stainless steels is unusual amongst metals in that it is based upon the nature of their metallurgical structure - the terms used denote the arrangement of the atoms which make up the grains in the steel, and which can be observed when a polished section through a piece of the material is viewed at high magnification through a microscope. Depending upon the exact chemical composition of the steel the microstructure may be made up of the stable phases austenite or ferrite, a "duplex" mix of these two, the martensite phase created when some steels are rapidly quenched from a high temperature, or a structure hardened by precipitated micro-constituents.

Austenitic	Additional elements can be added for critical applications Suitable for cryogenic applications Avoids brittleness at low temperatures	304, 310, 314, 316, 316L, 317, 317L, 321, 347
Ferritics	Additional elements can be added for critical applications Suitable for cryogenic applications Avoids brittleness at low temperatures	405, 409, 430, 434, 446
Martensitics	Possibility of hardening by heat treatment to very high tensile strength Adequate for mildly corrosive environments	403, 410, 416, 420, 422, 431, 440
Precipitation hardening	Moderate corrosion resistance to aggressive environments	
Duplex	Resistant to stress corrosion cracking Toughness superior than ferritics, but inferior than austenitic To be used between -50°C - 300°C	UNS S31803, UNS S32760, UNS S32750
High Ni Alloys	To be used in extremely corrosive conditions High temperature resistance: • Alloy 20: resistance to sulfuric acid and chloride stress corrosion • Alloy 28: phosphoric and sulfuric acid resistance + intergranular corrosion • Alloy 800: good resistance in oxidizing, nitriding and carburizing conditions • Alloy 825: resistant to chloride stress corrosion and to intergranular attack.	Alloy 20, Alloy 28, Alloy 800, Alloy 825



2.3.1 AUSTENITICS

This group contains at least 16% chromium and 6% nickel (the basic grade 304 is referred to as 18/8) and range through to the high alloy or "super austenitics" such as 904L and 6% molybdenum grades. Additional elements can be added such as molybdenum, titanium or copper, to modify or improve their properties, making them suitable for many critical applications involving high temperature as well as corrosion resistance. This group of steels is also suitable for cryogenic applications because the effect of the nickel content in making the steel austenitic avoids the problems of brittleness at low temperatures, which is a characteristic of other types of steel.

Ni-Cr-Fe Alloys

Add Ni for corrosion resistance in high temperature applications

309, 310, 314, 330 S30815

Add Cr and Ni for strength and oxidation resistance

304
18Cr-8Ni

Add Mo for pitting resistance

316

Add more Mo for more pitting resistance

317

Add S or Se for machinability

303, 303Se

Add Nb + Ta to reduce sensitization

347

Add Ti to reduce sensitization

321

Lower C to reduce sensitization

304L

316L

317L

Add Ni, Mo, N for corrosion resistance

Super austenitic stainless steel

904L, S31254

Figure 4. The relationship between the various 300 series austenitic grades (Courtesy Kappa Associates International [2]).

2.3.2 FERRITICS

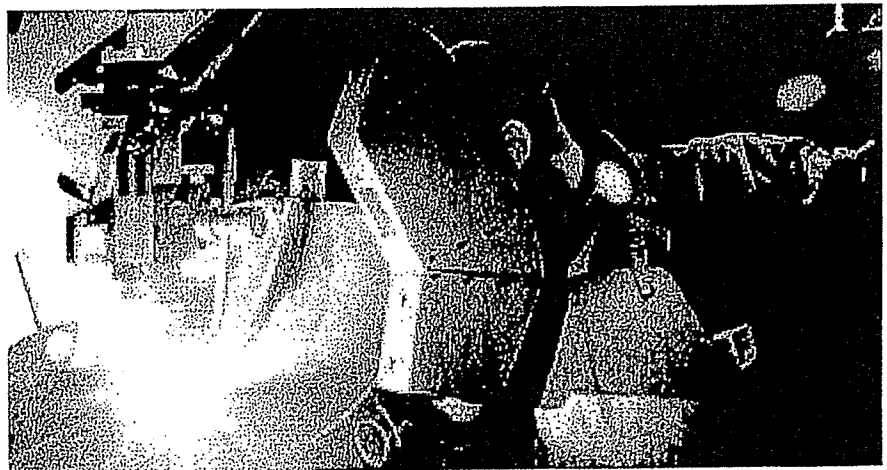
Ferritic stainless steels are plain chromium stainless steels (10.5 to 18%). They have good ductility, are magnetic and have good resistance to high temperature oxidation and moderately corrosive environments.

2.3.3 MARTENSITICS

Martensitic stainless steels are also plain chromium stainless steels but, because of a high carbon (C) content, they can be hardened by heat treatment to very high tensile strength and hardness, although ductility and toughness diminish with increasing strength. The martensitic stainless steels are magnetic and have adequate corrosion resistance in mildly corrosive environments.

2.3.4 PRECIPITATION HARDENING STAINLESS STEELS

Precipitation - hardening stainless steels are chromium/nickel stainless steels containing other elements such as aluminum (Al) or copper (Cu). Hardening is achieved by a solution treating the steel, quenching (rapid cooling) and then aging. The precipitation-hardening grades have moderate corrosion resistance to aggressive environments.



GENERAL CONDITIONS

- a. The Contractor enters into this agreement with the full knowledge of the conditions and requirements of the specifications. The specifications, proposal, instruction to bidders, etc. will prevail in all cases over any conflict between the same and the General Conditions listed hereto.
- b. The Contractor agrees that during the entire term of the contract it will pursue the work faithfully and diligently and will, at all times, have the necessary sources of supply, labor, material and machinery necessary to complete the contract in accordance with the terms of the specifications.
- c. All work done under this contract shall be done to the satisfaction of the Engineer of P.V.S.C., or a P.V.S.C. Representative who shall in all cases determine the amount, quality, acceptability and fitness of the material and work which are to be paid for hereunder and shall decide any questions which may arise as to the fulfillment of this decision thereon shall be final and conclusive. The word "Engineer" shall mean the person holding the position of Manager of Plant Engineering of the Passaic Valley Sewerage Commission, or the authorized representative.
- d. If the Contractor should be adjudged a bankrupt, or if it should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of its insolvency, or if it should persistently or repeatedly refuse or should fail to supply enough skilled workmen or proper materials, or if it should fail to make prompt payment to subcontractors for material, labor, or equipment rental, or persistently disregard laws, ordinances, or other instructions of the Engineer, or the PVSC representative, or this contract, then P.V.S.C., upon the certificate of the Engineer or the PVSC representative that sufficient cause exists to justify such action, may without prejudice to any other right or remedy and after giving the Contractor thirty (30) days written notice, terminate the employment of the Contractor. The termination of the employment of the Contractor under the provisions of this paragraph shall not relieve the surety of its responsibility.
- e. All notices, demands, requests, instructions, approvals and claims shall be in writing. Any notice to or demand upon the Contractor shall be sufficiently given if delivered at the office of the Contractor specified in the bid (or at such other offices as the Contractor may from time to time designate to the Engineer or the PVSC representative in writing) or if deposited in the United States mail in a sealed, postage prepaid envelope, or delivered by telephone electronic/facsimile (FAX) transmission system. All papers required to be delivered to P.V.S.C. shall, unless otherwise specified to the Contractor in writing, be delivered to the office of P.V.S.C. at 600 Wilson Avenue, Newark, New Jersey and any notice to or demand upon P.V.S.C. shall be sufficiently given if delivered to the said office, or if deposited in the United States mail in a sealed, postage-prepaid envelope, certified mail, return receipt requested.
- f. No final or semi-final payment shall be made until the representative has certified to P.V.S.C. that the work has been completed by the Contractor in accordance with the requirements of the plans, specifications and contract. Pursuant to N.J.S.A. 2A:30A-2(f), disputes regarding whether a party has failed to make payments required pursuant to N.J.S.A. 2A:30A-2 may be submitted to a process of alternative dispute resolution. Alternative dispute resolution permitted by this section shall not apply to disputes concerning the bid solicitation or award process, or to the formation of contracts or subcontracts. In any civil action brought to collect payments pursuant to this section, the action shall be conducted inside of this State and the prevailing party shall be awarded reasonable costs and attorney fees.

- g. The Contractor shall not assign the contract or sublet it in whole or in part without the prior written consent of P.V.S.C., nor shall the Contractor assign any monies due or becoming due to it without the prior written consent of P.V.S.C..
- h. This contract, and all incorporations by reference together with the plans, specifications and bid documents, constitutes the entire agreement and understanding between the parties. This contract may not be modified, altered, abridged, amended or supplemented, except by written agreement executed by the parties.
- i. Neither the inspection by the Engineer or any agent or employee of P.V.S.C., nor any order by P.V.S.C. for the payment of money, nor any payment for, or acceptance of, the whole or any part of the work, by the PVSC representative or the Engineer, nor any possession taken by P.V.S.C. or their employees, shall operate as a waiver of any provisions of this contract, or of any right to damage herein provided, nor shall any waiver of any breach of the contract be held to be a waiver of any or subsequent breach. Any remedy provided in this Contract shall be taken and construed as cumulative, that is, in addition to each and every other remedy herein provided, and P.V.S.C. shall also be entitled as of right to a writ of injunction against any breach of any of the provisions of this contract.
- j. The Contractor covenants and agrees that anything in this contract or in the contract documents to the contrary notwithstanding, or regardless of any matter, thing, contingency or condition unforeseen or otherwise, present or future, the Contractor shall not be entitled to receive any additional or further sums of money than the amounts in said contract documents provided, except pursuant to a written change order duly authorized by a resolution of P.V.S.C.; and the failure of P.V.S.C. to insist upon strict performance of any of the terms, covenants, agreements, provisions or conditions in this contract or in the contract documents or any one or more instances, shall not be construed as a waiver of relinquishment for the future of any such terms covenants, agreements, provisions and conditions, but the same shall be and remain in full force and effect with power and authority on the part of P.V.S.C. to enforce the same or cause the same to be enforced at any time, without prejudice to any other rights which P.V.S.C. may have against the Contractor under this contract or the contract documents.
- k. Plans, specifications and the within contract shall be construed in accordance with the laws of the State of New Jersey.
- l. The Contractor shall not employ any subcontractor that P.V.S.C. may object to as incompetent or unfit; nor shall the Contractor subcontract to any person that has submitted a bid proposal for the award of the contract. Additionally, the Contractor shall not enter into any joint venture of any kind whatsoever relating to the within construction. P.V.S.C. may waive the provisions of this paragraph in its sole and absolute discretion, upon submission of a written request by the Contractor for a waiver supported by a disclosure of all of the facts and circumstances accompanied by a copy of the joint venture contract agreement or understanding.
- m. The Contractor agrees that it is as fully responsible to P.V.S.C. for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.
- n. The Contractor will be required to comply with the requirements of all New Jersey Statutes affecting public contracts; more particularly, but not limited to, the provisions of the Statutes hereinafter recited. All statutes not referred to herein but required by law to be applicable to public contracts are incorporated herein as though fully set forth.
- o. Any spillage caused by the Contractor, his subcontractor, his suppliers or his equipment while on P.V.S.C. property, shall be the Contractor's responsibility to properly clean up at the Contractor's expense. The clean up shall meet all Federal and State requirements and regulations, including supplying all documentation. A copy of the vendor's/contractor's spill response plan shall be submitted to the P.V.S.C. upon award of this contract.

- p. Representatives of P.V.S.C. may have access to the work when it is in progress. Any inspection costs incurred by P.V.S.C. by reason of any breach or derelictions by the Contractor shall be chargeable to the Contractor.
- q. Contractor shall indemnify and save harmless P.V.S.C. against any and all damages to property or injuries to or death of any person or persons, including property and employees or agents of P.V.S.C., and/or the Contractor, and shall defend, indemnify and save harmless P.V.S.C. from any and all claims, demands, suits, actions, or proceedings of any kind or nature including workmen's compensation claims, of or by anyone whomsoever, in any way resulting from or arising out of the operations in connection herewith, including operations of subcontractors and acts or omissions of employees or agents of Contractor or its subcontractors. Insurance coverage specified herein constitutes the minimum requirements and said requirements shall in no way lessen or limit the liability of Contractor under the terms of the contract. Contractor shall procure and maintain, at its own cost and expense, any additional kinds and amounts of insurance, which, in its own judgment, may be necessary for its proper protection in the prosecution of the work. Any and all policies of insurance maintained by the Contractor shall be primary without contribution from any insurance carried by PVSC.
- r. Before final acceptance and final or semi-final payment by P.V.S.C., the Contractor shall deliver to the P.V.S.C. Representative a complete release of all liens arising out of the contract. Contractor agrees that at no time shall any municipal liens, mechanical liens, notices of intention, or secured instruments be filed against the work and should P.V.S.C. be compelled to remove or discharge a municipal lien, mechanic's lien, notice of intention or secured instrument, the Contractor shall reimburse P.V.S.C. for all costs.
- s. P.V.S.C. shall pay and the Contractor shall receive as full compensation for everything furnished and done under this contract, for all loss or damage arising out of the nature of the work, or from the action of the elements, or from any unforeseen obstruction or difficulty encountered in the prosecution of work, and for all risks of every description connected with the work, and for all expenses and losses incurred by or in consequence of the suspension or discontinuance of the work, all in accordance with the terms and conditions of this contract.
- t. The Commission may order, and the Contractor shall perform, extra work under this contract that is limited to the subject matter of this contract.

On any work done by the contractor, as ordered by the Commission in writing, which is not covered in the contract as defined in the contract herein the contractor shall be paid as extra work. Extra Work costs shall be arrived at as follows:

- (a) By such applicable unit prices, if any, as are set forth in the contract; or
- (b) If no such unit prices are set forth, and if the parties cannot agree upon prices or lump sum, then for work performed the Contractor shall receive as compensation the actual cost to him, which cost shall include only:
1. Labor, including foreman, but not supervisors;
 2. Materials entering permanently into the work;
 3. The ownership or rental cost of construction plant and equipment during the time of use on the extra or changed order;
 4. Power and consumable supplies for the operation of power equipment during the above time;
 5. Insurance;
 6. Social Security and old age and unemployment contributions;
 7. Plus a fixed fee equal to 15% of the summation of items #1 through #6 above, which fee shall be compensation to cover the cost of supervision, overhead, bond, profit, and any other general expenses. The prime contractor will not be permitted to include both his 15% and any subcontractor's 15% for the items enumerated herein.

u. Default - In the event that the vendor, unless prevented by strike or strikers, which prevents delivery of parts or services, and shall fail to furnish the materials, or services listed in this contract as per the specifications, and according to all the terms of this contract, the Commission reserve the right to hold the Contractor in default of the contract and purchase the materials, or services through the open market, and the vendor agrees to pay the excess costs, if any, between the amount paid for same and the amount calculated at the contract price. The vendor shall also forfeit his bid or performance security to the P.V.S.C. and will not be considered a responsible bidder for any future P.V.S.C. bids.

Failure to comply with the N. J. Worker and Community Right to Know Act shall be reason for the Commission to hold the vendor in default of the contract, and apply the default conditions as described herein.

v. Affirmative Action - During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affection-al or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, up-grading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union of the contractor's commitments under this chapter and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

The contractor or subcontractor agrees to make good faith efforts to meet targeted county employment goals established in accordance with N.J.A.C. 17:27-5.2.

The contractor or subcontractor agrees to inform in writing its appropriate recruitment agencies including, but not limited to, employment agencies, placement bureaus, colleges, universities, and labor unions, that it does not discriminate on the basis of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex, and that it will discontinue the use of any recruitment agency which engages in direct or indirect discriminatory practices.

The contractor or subcontractor agrees to revise any of its testing procedures, if necessary, to assure that all personnel testing conforms with the principles of job related testing, as established by the statutes and court decisions of the State of New Jersey and as established by applicable Federal law and applicable Federal court decisions.

In conforming with the targeted employment goals, the contractor or subcontractor agrees to review all procedures relating to transfer, upgrading, downgrading and layoff to ensure that all such actions are taken without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex, consistent with the statutes and court decisions of the State of New Jersey, and applicable Federal law and applicable Federal court decisions.

The contractor shall submit to the public agency, after notification of award but prior to execution of a goods and services contract, one of the following three documents:

Letter of Federal Affirmative Action Plan Approval;

Certificate of Employee Information Report; or

Employee Information Report Form AA-302 (electronically provided by the Division and distributed to the public agency through the Division's website at:

http://www.state.nj.us/treasury/contract_compliance.

The contractor and its subcontractors shall furnish such reports or other documents to the Division of Purchase & Property, CCAU, EEO Monitoring Program as may be request-ed by the office from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Purchase & Property, CCAU, EEO Monitoring Program for conducting a compliance investigation pursuant to N.J.A.C. 17:27-1.1 et seq.

SUPPLEMENTAL CONDITIONS**A. N.J.R.S. 10:2-1**

Every contract for or on behalf of the State or any county or municipality or other political subdivision of the State, or any agency of or authority created by any of the foregoing, for the construction, alteration or repair of any public building or public work or for the acquisition of materials, equipment, supplies or services shall contain provisions by which the contractor agrees that:

- a. In the hiring of persons for the performance of work under this contract or any subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under this contract, no contractor, nor any person acting on behalf of such contractor or subcontractor, shall, by reason of race, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation discriminate against any person who is qualified and available to perform the work to which the employment relates;
- b. No contractor, subcontractor, nor any person on his behalf shall in any manner, discriminate against or intimidate any employee engaged in the performance of work under this contract or any subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under such contract, on account of race, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation;
- c. There may be deducted from the amount payable to the contractor by the contracting public agency, under this contract, a penalty of \$50.00 for each person for each calendar day during which such person is discriminated against or intimidate in violation of the provisions of the contract; and
- d. This contract may be cancelled or terminated by the contracting public agency, and all money due or to become due hereunder may be forfeited, for any violation of this section of the contract occurring after notice to the contractor from the contracting public agency of any prior violation of this section of the contract.

B. N.J.R.S. 14A:13-3

1. No foreign corporation shall have the right to transact business in this State until it shall have procured a certificate of authority so to do from the Secretary of State. A foreign corporation may be authorized to do in this State any business which may be done lawfully in this State by a domestic corporation, to the extent that it is authorized to do such business if the jurisdiction of its incorporation, but no other business.
2. Without excluding other activities which may not constitute transacting business in this State, a foreign corporation shall not be considered to be transacting business in this State, for the purposes of this act, by reason of carrying on in this State any one or more of the following activities;
 - a. maintaining, defining or otherwise participating in any action or proceeding, whether judicial, administrative, arbitative or otherwise, or effecting the settlement thereof or the settlement of claims or disputes;
 - b. holding meetings of its directors or shareholders;
 - c. maintaining bank accounts or borrowing money, with or without security, even if such borrowings are repeated and continuous transactions and even if such security has a situs in this State;
 - d. maintaining offices or agencies for the transfer, exchange and registration of its securities, or appointing and maintaining trustees or depositaries with relation to its securities.

3. The specification in subsection 14A:13-3(2) does not establish a standard for activities which may subject a foreign corporation to service of process or taxation in this State.

C. N.J.R.S. 34:11-56.27

In accordance with the New Jersey Prevailing Wage Act for workman engaged in any public work, prevailing wage rates can be paid (as shall be designated by the Commission) to the workers employed in the performance of the contract and that such workers shall be paid not less than such prevailing wage rate. In the event it is found that any workers, employed by the contractor or any subcontractor covered by said contract, has been paid a rate of wages less than the prevailing wage required to be paid by such contract the public body or lessor may terminate the contractor's or subcontractor's right to proceed with the work, or such part of the work as to which there has been a failure to pay required wages and to prosecute the work to completion or otherwise. The contractor and his sureties shall be liable to the public body or lessor for any excess costs occasioned thereby.

Pursuant to N.J.S.A. 34:11-56.25 et seq., successful bidders on projects for public work shall adhere to all requirements of the New Jersey Prevailing Wage Act. The contractor shall be required to submit a certified payroll record to the OWNER within ten (10) days of the payment of the wages. The contractor is also responsible for obtaining and submitting all subcontractors' certified payroll records within the aforementioned time period. The contractor shall submit said certified payrolls in the form set forth in N.J.A.C. 12:60-6.1(c). It will be the contractor's responsibility to obtain any additional copies of the certified payroll form to be submitted by contacting the Office of Administrative Law, CN 049, Trenton, New Jersey 08625 or the New Jersey Department of Labor, Division of Workplace Standards.

NOTE: Prevailing wage rates will not apply or be applicable to any contract if an appendix from the New Jersey Department of Labor which includes the "Prevailing Wage Rate Determination", listing the prevailing wage levels is not attached to the contract.

D. N.J. S.A. 52:24-24.2

No corporation or partnership shall be awarded any contract nor shall any agreement be entered into for the performance of any work or the furnishing of any materials or supplies, the cost of which is to be paid with or out of any public funds, by the State, or any county, municipality or school district, or any subsidiary or agency of the State, or of any county, municipality or school district, or by any authority, board, or commission which exercises governmental functions, unless prior to the receipt of the bid or accompanying the bid, of said corporation or said partnership, there is submitted a statement setting forth the names and addresses of all stockholders in the corporation or partnership who own 10% or more of its stock, of any class or of all individual partners in the partnership who own a 10% or greater interest therein, as the case may be. If one or more such stockholder or partner is itself a corporation or partnership, the stockholders holding 10% or more of that corporation's stock, or the individual partners owning 10% or greater interest in that partnership, as the case may be, shall also be listed. The disclosure shall be continued until all names and addresses of every noncorporate stockholder, and individual partner, exceeding the 10% ownership criteria established in this act, has been listed.

E. N.J.S.A. 52:33-1 AND 3

52:33-2. Notwithstanding any inconsistent provision of any law, and unless the head of the department, or other public officer charged with the duty by law, shall determine it to be inconsistent with the public interest, or the cost to be unreasonable, only domestic materials shall be acquired or used for any public work.

This section shall not apply with respect to domestic materials to be used for any public work, if domestic materials of the class or kind to be used are not mined, produced or manufactured, as the case may be, in the United States in commercial quantities and of a satisfactory quality.

52:33-3 Every contract for the construction, alteration, or repair of any public work in this state shall contain a provision that in the performance of the work the contractor and all subcontractors shall use only domestic material in the performance of the work; but if the head of the department or other public officer authorized by law to make the contract shall find that in respect to some particular domestic materials it is impracticable to make such requirement or that it would unreasonably increase the cost, an exception shall be noted in the specifications as to that particular material, and a public record made of the findings which justified the exception.

The Contractor will be required to comply fully with the requirements set forth in NJAC 7:31-3.17 as stated below. Since the work is adjacent to but does not involve direct handling of chlorine equipment, the Contractor's major efforts should be directed in the area of emergency response.

7:31-3.17 Contractors and Contractor Employees

(a) The PVSC included in its risk management program written procedures to insure that work done by persons not directly employed by PVSC meets the applicable requirements of the risk management program. The procedures apply to specific activities involving the handling of chlorine by a contractor and/or its employees. Temporary employees, either directly hired by the PVSC or furnished by a non-employer agency, are subject to the same requirements of this chapter that are applicable to permanent PVSC employees.

(b) The procedure shall not apply to contractors providing incidental services which do not influence safety, such as janitorial work, food and drink services or other supply services;

(c) The procedures shall apply to the following activities performed by the contractor and/or its employees:

1. Maintenance or repair, turnaround, major renovation or specialty work on, or adjacent to, a facility handling chlorine;
2. Assistance as chlorine operators in facilities handling chlorine; and
3. Assistance during an emergency response accident involving chlorine, including mitigating the release.

(d) The procedure shall require the contractor to inform, train and evaluate its employees, as applicable to individual assignments, concerning:

1. The requirements of the site's preventive maintenance program;
2. The applicable provisions of the facility standard operating procedure on chlorine; and
3. The applicable provision of the site's emergency response plan (plant evacuation).

(e) The procedures shall require that:

1. The PVSC, when selecting a contractor, will obtain information regarding contractor's safety performance and programs;
2. The PVSC shall inform the contractors of the known potential fire, explosion or toxic release hazards related to the contractor's work and the facility handling chlorine;
3. The PVSC shall explain to the contractors the applicable provisions of the site's emergency response plan;
4. The PVSC shall develop and implement safe work practice to control the entrance, presence and exit of the contractor and/or its employees.
5. The PVSC will periodically evaluate the performance of the contractors in fulfilling their obligations as required below:

- i. The PVSC will request that the contractor assure that it and/or each its employees is trained in work practices necessary to safely perform his/her job;
- ii. The PVSC will request that the contractor assure that it and/or each of its employees is instructed in the known potential fire, explosion or toxic release hazards related to his/her job and the facility handling chlorine and the applicable provisions of the emergency response plan;
- iii. The PVSC will request that the contractor document that it and/or each of its employees has received and understand the training requested by the registrant. The PVSC shall request that the contractor prepare a record which contains the identity of its employee, the date of training and the means used to verify that the employee understood the training;
- iv. The PVSC will request that the contractor assure that it and/or each of its employees follows the safety rules of the PVSC including safe works practices;
- v. The PVSC will request that the contractor advise the registrant of any unique hazards presented by the contractor's work or of any hazards found by the contractor during its work.

G: N.J.S.A. 59:49-19 and N.J.S.A. 59:49-20

NOTICE TO ALL STATE VENDORS: SET -OFF FOR STATE TAX

Please be advised that, pursuant to L. 1995, c. 159, effective January 1, 1996 and codified at N.J.S.A. 59:49-19 and N.J.S.A. 59:49-20, and notwithstanding any provision of the law to the contrary, whenever any taxpayer, partnership or S corporation under contract to provide goods or services or construction projects to the State of New Jersey or its agencies or instrumentalities, including the legislative and judicial branches of State government, is entitled to payment for those goods and services or construction projects, at the same time a taxpayer, partner or shareholder of that entity is indebted for any State tax, the Director of the Division of Taxation shall seek to set off that taxpayer's, partner's or shareholder's share of the payment of that indebtedness. The amount set off shall not allow for the deduction of any expenses or other deductions which might be attributable to the taxpayer, partner or shareholder subject to set-off.

The Division of Taxation may initiate procedures to set off the tax debt of a specific vendor upon the expiration of ninety (90) days after either the issuance by the Division of a notice and demand for payment of any state tax owed by the taxpayer or the issuance by the Division of a final determination on any protest filed by the taxpayer against an assessment or final audit determination. A set-off reduces the contract payment due to a vendor by the amount of that vendor's state tax indebtedness or, in the case of a vendor-partnership or vendor-S corporation, by the amount of state tax indebtedness of any member-partner or shareholder of the partnership or S corporation, respectively. N.J.A.C. 18:2-8.3.

The Director of the Division of Taxation shall give notice of the set-off to the taxpayer, partner or shareholder and shall provide an opportunity for a hearing within thirty (30) days of such notice under the procedures for protests established under N.J.S.A. 54:49-18. No requests for conference, protest or subsequent appeal to the Tax Court from any protest permitted under N.J.S.A. 59:49-19 shall stay the collection of the indebtedness. Interest that may be payable by the State to the taxpayer, pursuant to L. 1987, c. 184 (N.J.S.A. 52:32-35) shall be stayed.