APPLICATION FOR REGISTRATION OF FITTING DESIGNS

NEW BRUNSWICK NOVA SCOTIA PRINCE EDWARD ISLAND NEWFOUNDLAND AND LABRADOR
NUNAVUT YUKON NORTHWEST TERRITORIES

MANUFACTURERS NAME:	The Phoenix Forge Group
MANUFACTURERS ADDRESS:	800 Front St., Catasauqua, PA 18032
PLANT LOCATIONS:	see attached ISO 9001:2015 certificate

CATEGORY OF FITTINGS TO BE REGISTERED. CIRCLE ONE CATEGORY ONLY

A Pipe fittings, including couplings, tees, elbows, Ys, plugs, unions, pipe caps, or reducers
B Flanges: all flanges
C Valves: all line valves
D Expansion joints, flexible connections, and hose assemblies: all types
E Strainers, filters, separators, and steam traps
F Measuring devices, including pressure gauges, level gauges, sight glasses, levels, or pressure transmitters
G Certified capacity-rated pressure relief devices acceptable as primary over pressure protection on boilers, pressure vessels, piping and fusible plugs
(H) Pressure retaining components that do not fall into one of the above categories
N Nuclear components: Class 1 ☐ Class 2 ☐ Class 3 ☐, (Meeting CNSC or ASME requirements)

TITLE OF THE STANDARD OF CONSTRUCTION

Tank fittings are a proprietary design in accordance with UL&ASME Boiler and Pressure Code Sec 2,4,8. Pressed steel fittings (UL58,UL80,UL142 per UL file#MH15498) Proprietary Design supported by Section VIII, Div 1 calculations.

SHOW MANUFACTURERS NAME, TRADEMARK, OR LOGO AS IT WILL APPEAR ON THE PRODUCT

see attached sheet for trademarks and logos.

TYPE OF CONSTRUCTION

FORGED ☒ WELDED ☐ WROUGHT ☐
CAST ☐ OTHER ☒
DESCRIBE OTHER: Pressed flanges are formed from plate stock.

LIST OF SUPPORTING DOCUMENTATION AND IDENTIFICATION OF THE ACTUAL ITEMS TO BE REGISTERED:

Tank and Cylinder Fittings Catalog (also available on www.phoenixforge.com) pg 1-14
ISO 9001:2015 certificate
Trademark and logo sheet
Design registration application
Previous CRN registration approvals.

DECLARATION:

I Kevin Miller (see note 3) employed by The Phoenix Forge Group and being the person having full authority and responsibility for the quality of the end product do solemnly declare that the information contained in this form is true and to the best of my knowledge represents the product for which registration is sought. The dimensions, materials of construction, pressure temperature ratings, and identification markings are in accordance with the herein named standards. I further declare that the manufacture of these fittings is regulated by a Quality Control Program which extends to each plant where fabrication occurs in whole or in part and has been verified by DNV- GL Business Assurance as being suitable for that purpose and I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath.

Signature of Declarer: K [signature]

Declared before me at Catasauqua

This 19 day of June AD 2019

Commissioner of Oaths or Notary Public: (sign) Melissa A Reimer

Commonwealth of Pennsylvania - Notary Seal
Melissa A. Reimer, Notary Public
Lehigh County
My commission expires April 11, 2022
Commission number 1282898
Member, Pennsylvania Association of Notaries

This space for Regulatory Authority use

This registration must be revalidated after ten (10) years from the date of acceptance.

CRN: 0H0693.9 REV2

FID#: 167

Pgs. 1-10 of catalogue - D.G.

$65.00

Notes:
1. All fittings shall be registered in the name of the Manufacturer.
2. Each category shall be supported with two Statutory Declaration forms and one copy of supporting documentation.
3. The declaration shall be made by the person having full authority and responsibility for the quality of the end product.
4. Quality control programs shall be resubmitted for validation at a maximum interval of five (5) years.

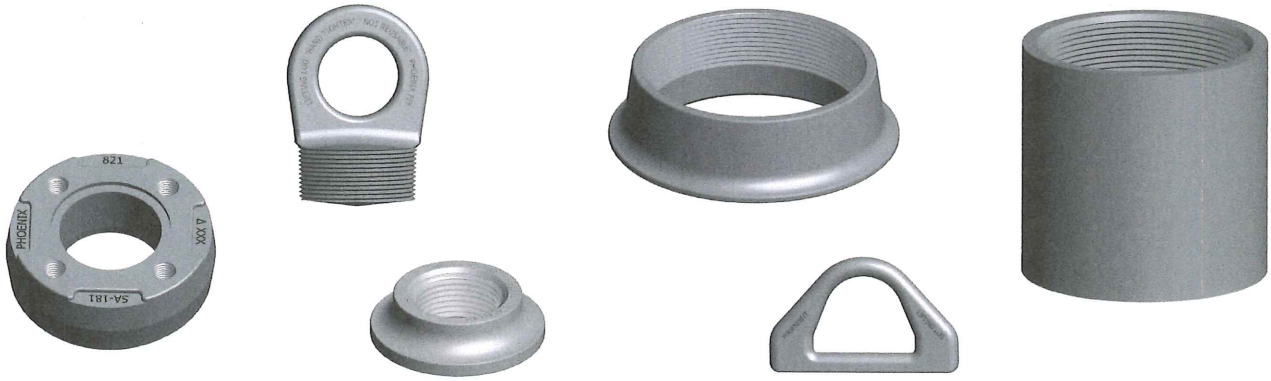
Northwest Territories
REGISTERED
UNDER THE AUTHORITY OF
THE BOILER AND PRESSURE
VESSEL ACT.
C.R.N 0H0693.9T Rev 2
SIGNED [signature]
DATE Sept 16/2019

Sect. 1.0 - Fittings Rev. 1 06/2003

Founded 1882

PHOENIX®

Tank and Cylinder Fittings



FORGED WITH PRIDE IN THE USA

PFC511 R1

THE PHOENIX FORGE GROUP

Commanding a Higher Standard SM

THE PHOENIX FORGE GROUP

Commanding a Higher Standard SM

CAPITOL MANUFACTURING COMPANY*
Crowley, LA

CAPPRODUCTS Ltd.*
Vanastra, ON

CONDUIT PIPE PRODUCTS CO.*
W. Jefferson, OH

*ISO 9001:2008

PHOENIX FORGING COMPANY*
Catasauqua, PA

PHOENIX HOTFORM COMPANY*
Allentown, PA

BARCO INDUSTRIES, INC.
Reading, PA

OUR PROMISE TO YOU

We promise to provide you with quality forged products, delivered on time and at a fair price. We can make this promise because only Phoenix offers you experience dating back to the 19th Century, state-of-the-art 20th Century manufacturing technologies, and 21st Century innovation.

When your production plans call for Forged Steel Fittings, Trans-O-Con transition pipe connections, Tank and Cylinder Fittings or custom forged products—contact The Phoenix Forge Group.

THE PHOENIX LEADERSHIP ADVANTAGE

Phoenix Forging is the nation's largest producer and distributor of Tank & Cylinder Fittings. It pays to deal with the industry leader.

- **FULL LINE SUPPLIER—** Forged Steel Fittings—All Standard Styles & Sizes: Unions, Lifting Lugs, LPG Gage Adapters, Couplings, Thread Protectors, Pressed Steel Fittings and Custom Products.
- **LARGE INVENTORY—** Multi-Million Dollar Inventory and Next Day Shipment
- **CUSTOM DESIGN—** Our technical engineers, assisted by CAD/CAM capability, are available to assist you.
- **TECHNICAL SUPPORT—** Statistical calculations regarding application criteria available upon request.
- **COMPUTER SERVICES—** Computer assisted order entry, inventory control, database management system.
- **QUALITY ASSURANCE PROGRAM—** Material qualification, equipment maintenance and upgrading, statistical process control and gauge control are all included in a concentrated program to ensure production of superior quality products. **- ISO 9001 CERTIFICATION -**
- **EXPERIENCE—** Phoenix has over 100 years experience in manufacturing a wide variety of products.
- **COMMUNICATIONS—** State of the Art order placement & communications systems, including EDI, XML & e-commerce.
- **ELECTRONIC MTR's—** Immediate access to MTR's at www.phoenixforge.com.
- **BAR CODING—** All product has a standard Phoenix barcode. Custom barcoding available on request.
- **UL RECOGNIZED PARTS**
- **CANADIAN REGISTRATION NUMBERS—** View and download CRN's at www.phoenixforge.com.

CONTENTS

SPECIFICATIONS

Our flanges are manufactured in accordance with Underwriter's Laboratories and ASME Boiler and Pressure Code Section II and applicable portions of Section IV and VIII.

Material Specifications comply with ASTM A105/ASME SA105, ASTM A181-70A, SME SA 181-70 or applicable DOT specifications.

Our standard threaded product complies with ANSI/ASME B1.20.1-1983.

NPTF (Dry Seal) threads as well as other special threads are available.

Certifications are provided on the web at www.phoenixforge.com.

Canadian Provincial Registration numbers are available on the web at www.phoenixforge.com.

IDENTIFICATION AND MARKING

During the forging process, all Phoenix products are marked with the size, heat of steel, part number and Phoenix identification. These figures remain visible after installation.

Dimensional Tolerances—Hot Forged Welding Flanges

THICKNESS

Pipe Size: 1/8" to 1 1/2"	± 1/32"
Pipe Size: 2" to 4"	+ 3/64" -1/32"
Pipe Size: 5" to 8"	+ 1/16" -1/32"

OUTSIDE DIAMETER

Pipe Size: 1/8" to 1 1/4"	± 1/64"
Pipe Size: 1 1/2" to 3"	+ 1/32" -1/64"
Pipe Size: 3 1/2" to 6"	± 1/32"
Pipe Size: 8"	+ 3/64" -1/32"

DIAMETER OF PILOT

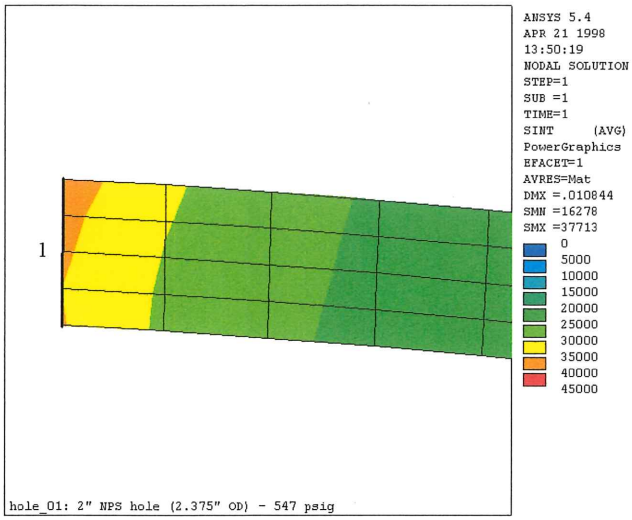
Pipe Size: 1/8" to 1"	± 1/32"
Pipe Size: 1 1/4" to 4"	+ 3/64" -1/32"

THREADING

All sizes ± One Thread

Phoenix Forged Welding Flanges and other related products are also available.

1. Special Threaded Parts
2. Stainless Steel
3. Custom Designed Parts
4. Full Coupling Line
5. Machined "O" - Ring Products
6. Evacuation Dip Tubes
7. Dielectric Nylon Fittings
8. Screw Machine Parts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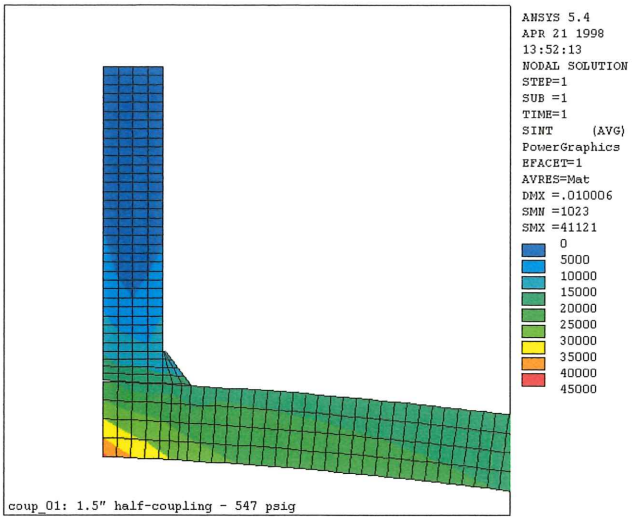
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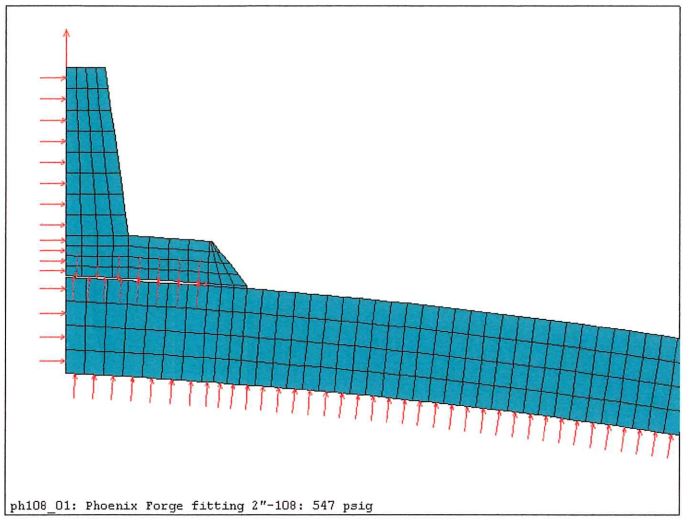
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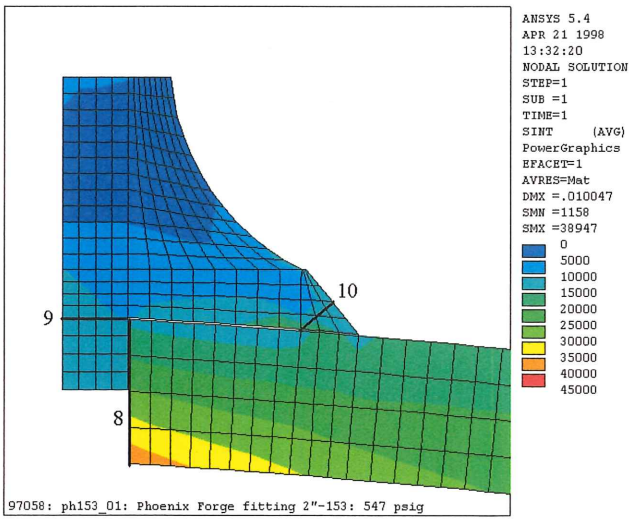
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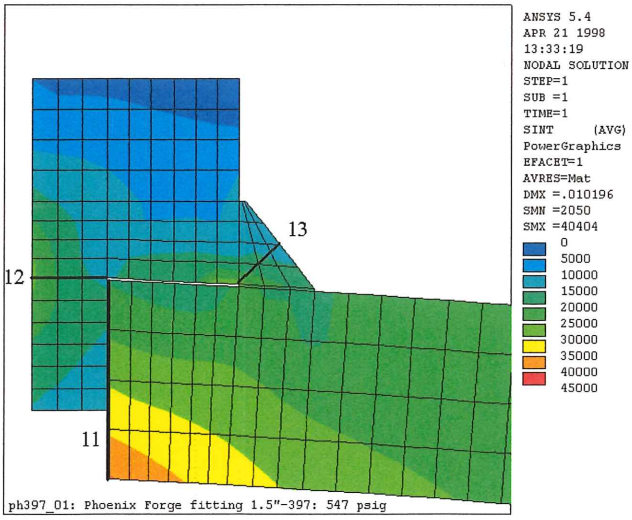
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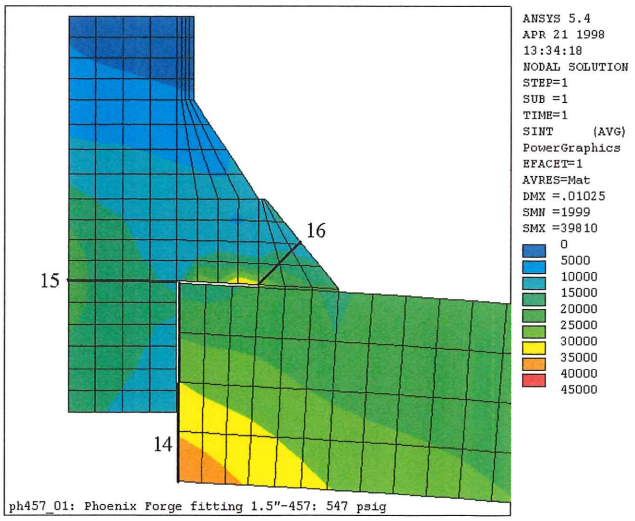
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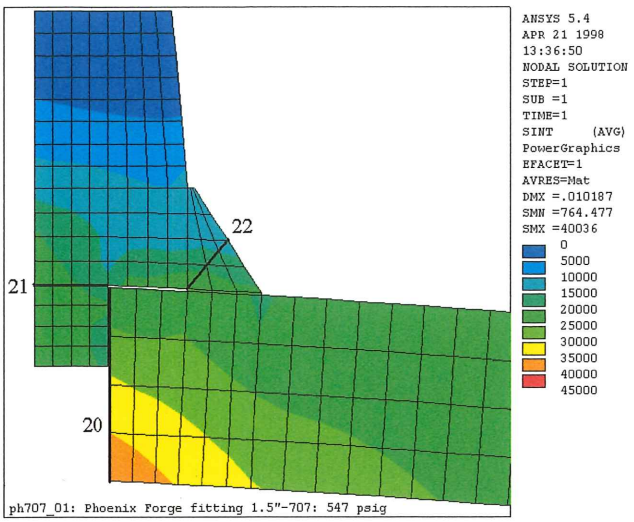
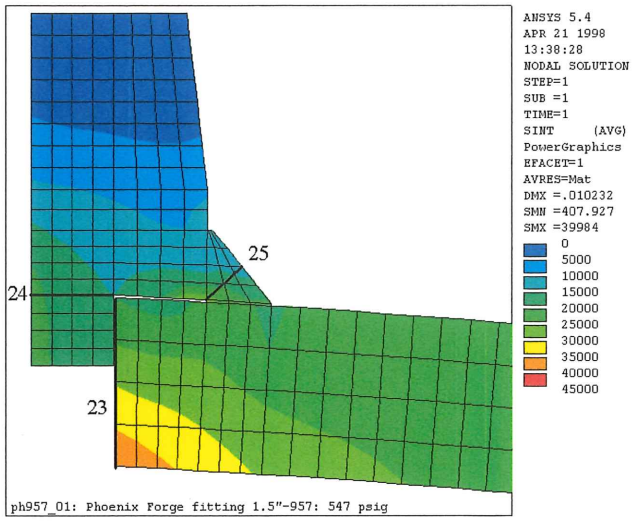




Phoenix Pressure Vessel Fittings - Pressure Temperature Ratings Basis

The finite element analysis summarized in the above figures were performed to confirm the strength-equivalence between a standard Phoenix Forge Group ASME B16.11, Class 3000 threaded coupling and threaded fittings, when welded to a pressure vessel in accordance with Section VIII, Division I of the ASME Boiler and Pressure Vessel Code. The design temperature and other service conditions for all welding fittings are limited by various construction codes. Within these limits, The Phoenix Forge Group certifies its welding fittings identified as such, as Manufacturer's Standard per ASME Section VIII, Division I, paragraph UG-11 (a) (1).

When identified with a 3000 or a 3M the maximum allowable pressure for a fitting is that computed for Schedule 160 straight seamless pipe of equivalent material, as done in ASME B36.11. The wall thickness used in such computation shall be that tabulated in ASME B36.10M for the fitting nominal pipe size and schedule 160, reduced by applicable manufacturing tolerances and other allowances (e.g., threaded allowances). Any corrosion allowance and any variation in allowable stress due to temperature shall be applied to the pipe and fitting alike.

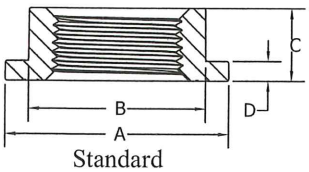
Note that the pressure-temperature ratings obtained in this manner are for the fitting, because the fitting to pipe or vessel attachment welds are governed by design codes such as ASME Section VIII, Divisional I, paragraph UW-16, which may impose more restrictive pressure -temperature limits.

NOTICE

It should be noted that this study is supportive only of the Phoenix Forge Group Pressure Vessel Fittings' proven designs. No consent is given to use Phoenix Pressure Vessel Fittings' proof of test or mathematical calculation to support other manufacturer's products which may be similar to Phoenix designs. Furthermore, it is cautioned that the use of these tests or calculations to support other manufacturer's products may be invalid because of differences in materials, fabrication processes or dimensions.

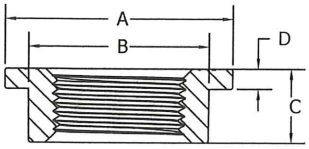
Tank and Cylinder Fittings

ASTM A 105/ASME SA 105
ASTM A 181-70/ASME SA 181-70



Standard
Tapped from hub side

SERIES 100

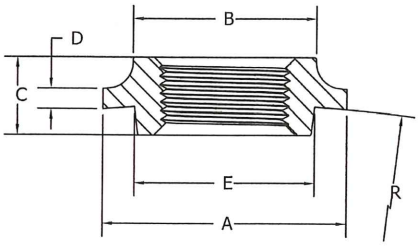


Inverted
Tapped from flange side

SERIES 125

FLAT TYPE

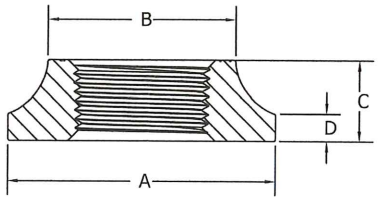
Pipe Size	Series Standard	Series Inverted	Approx Weight	A	B	C	D
1/8	100	125	0.04	1.188	.625	.281	.125
1/4	101	126	0.06	1.250	.750	.375	.156
3/8	102	127	0.08	1.375	.938	.375	.156
1/2	103	128	0.12	1.500	1.125	.579	.157
3/4	104	129	0.18	1.750	1.375	.625	.188
1	105	130	0.28	2.125	1.688	.688	.188
1-1/4	106	131	0.32	2.500	2.000	.688	.188
1-1/2	107	132	0.52	3.000	2.375	.812	.188
2	108	133	0.68	3.375	2.875	.812	.203
2-1/2	109	134	1.20	4.250	3.500	1.000	.188
3	110	135	1.44	5.000	4.125	1.000	.219
4	112	137	2.12	6.000	5.188	1.125	.250



SERIES 150

STANDARD HEAVY CURVED TYPE WITH PILOT

Pipe Size	Series	Approx Weight	A	B	C	D	E	R
3/4	150A	0.26	2.062	1.437	.625	.196	1.344	7.000
1	150	0.36	2.375	1.781	.750	.196	1.750	15.000
1-1/4	151	0.46	2.750	2.156	.750	.196	1.875	10.000
1-1/2	152	0.58	3.125	2.406	.750	.196	2.344	15.000
2	153	0.66	3.375	2.875	.812	.196	2.719	15.000
2-1/2	154	1.12	4.250	3.438	1.000	.125	3.062	22.000
3	155	1.36	4.875	4.094	1.000	.219	3.688	22.000
4	157	1.86	5.812	5.125	1.250	.218	4.750	26.000
5	158	3.50	7.125	6.250	1.375	.250	5.812	42.000
6	159	4.88	8.250	7.375	1.437	.250	6.875	28.000
8	160	8.14	10.500	9.500	1.562	.250	9.000	48.000

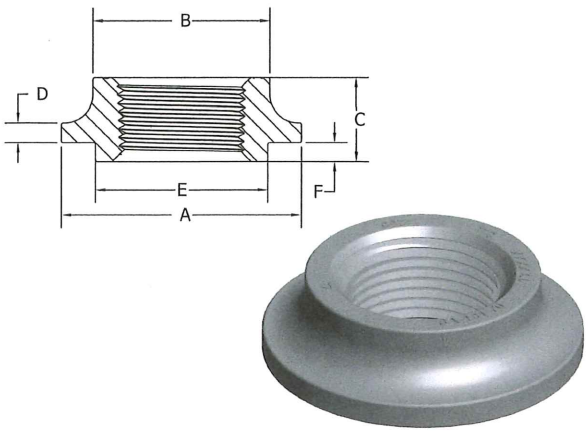


SERIES 175

EXTRA HEAVY FLAT TYPE SERIES

Pipe Size	Series	Approx Weight	A	B	C	D
1/4	175A	0.26	2.000	1.250	.750	.191
3/8	175B	0.24	2.000	1.250	.750	.191
1/2	175	0.30	2.000	1.250	.750	.188
3/4	176	0.44	2.250	1.500	.728	.250
1	177	0.56	2.500	1.750	.750	.250
1-1/4	178	0.64	2.875	2.062	.750	.250
1-1/2	179	0.84	3.250	2.375	.750	.250
2	180	1.00	3.750	2.875	.750	.250
2-1/2	181	1.68	4.250	3.500	1.000	.250
3	182	2.92	5.500	4.250	1.000	.250
4	184	4.10	6.500	5.375	1.125	.250
5	185	7.82	8.062	6.688	1.406	.313
6	186	8.38	8.500	7.625	1.500	.406

STANDARD FLAT TYPE WITH PILOT

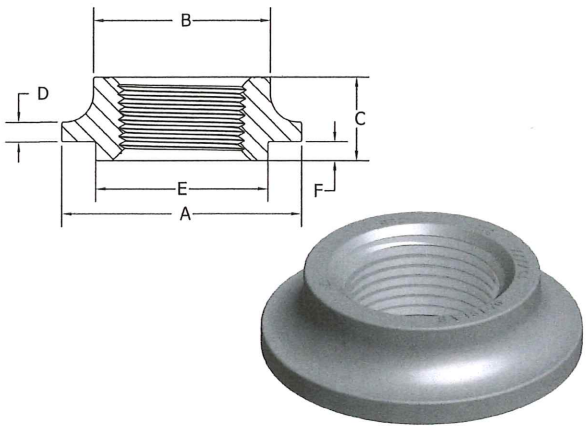


SERIES 250

Pipe Size	Series	Approx Weight	A	B	C	D	E	F
1/8	250	0.10	1.375	.875	.469	.094	.843	.082
1/4	251	0.12	1.500	1.000	.500	.140	.968	.125
3/8	252	0.14	1.625	1.062	.500	.140	.937	.125
1/2	253	0.18	1.812	1.118	.625	.156	1.156	.156
3/4	254	0.26	2.062	1.438	.750	.156	1.343	.156
1	255	0.40	2.375	1.750	.830	.195	1.703	.188
1-1/4	256	0.46	2.500	2.125	.875	.196	1.938	.188
1-1/2	257	0.62	3.031	2.375	.875	.204	2.312	.187
2	258	0.64	3.375	2.875	.812	.188	2.688	.188
2-1/2	259	0.96	4.063	3.312	1.000	.093	3.187	.188
3	260	1.10	4.625	3.938	1.000	.219	3.688	.188
3-1/2	261	1.45	5.125	4.438	1.000	.219	4.188	.188
4	262	2.10	5.812	4.938	1.250	.219	4.750	.188

ASTM A304L/316L - Manufactured to A-182 Spec

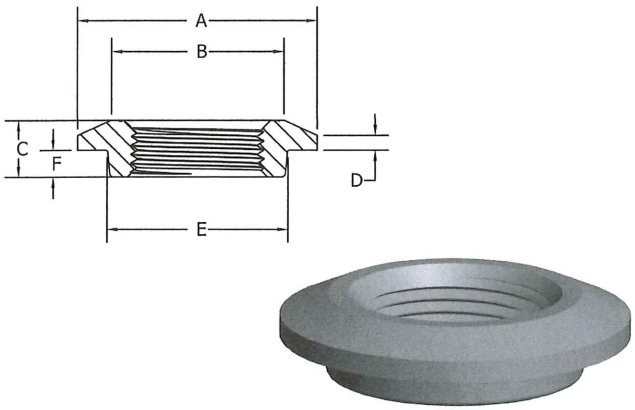
STAINLESS STEEL FLAT TYPE WITH PILOT



SERIES 250
STAINLESS

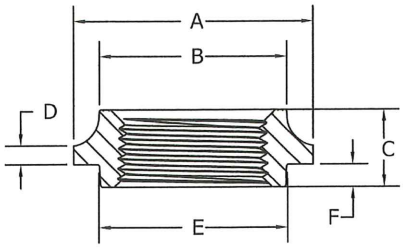
Pipe Size	Series	Approx Weight	A	B	C	D	E	F
1/4	251	0.12	1.500	1.000	.500	.140	.968	.125
3/8	252	0.14	1.625	1.062	.500	.140	.937	.125
1/2	253	0.18	1.812	1.118	.625	.156	1.156	.156
3/4	254	0.26	2.062	1.438	.750	.156	1.343	.156
1	255	0.40	2.375	1.750	.830	.195	1.703	.188
1-1/4	256	0.46	2.500	2.125	.875	.196	1.938	.188
1-1/2	257	0.62	3.031	2.375	.875	.204	2.312	.187
2	258	0.64	3.375	2.875	.812	.188	2.688	.188
3	260	1.10	4.625	3.938	1.000	.219	3.688	.188

BOILER FLANGE WITH PILOT



SERIES 300

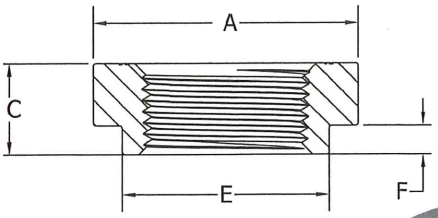
Pipe Size	Series	Approx Weight	A	B	C	D	E	F
1/8	300	0.08	1.312	.812	.406	.094	.875	.125
1/4	301	0.08	1.312	.812	.406	.094	.875	.125
3/8	302	0.12	1.438	1.062	.469	.094	1.188	.188
1/2	303	0.14	1.625	1.188	.468	.140	1.125	.188
3/4	304	0.20	2.000	1.375	.468	.140	1.312	.188
1	305	0.26	2.250	1.625	.531	.140	1.687	.250
1-1/4	306	0.30	2.562	1.938	.562	.140	1.938	.250
1-1/2	307	0.42	2.937	2.312	.578	.156	2.250	.250
2	308	0.46	3.375	2.750	.593	.156	2.625	.250



SERIES 380

LIGHTWEIGHT FLAT TYPE WITH PILOT

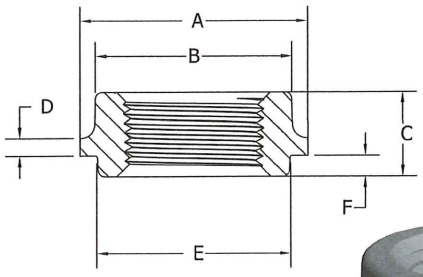
Pipe Size	Series	Approx Weight	A	B	C	D	E	F
1/8	380	0.06	1.188	.750	.406	.094	.750	.125
1/4	381	0.06	1.188	.875	.438	.094	.750	.156
3/8	382	0.06	1.312	.938	.438	.094	.938	.156
1/2	383	0.08	1.438	1.063	.469	.094	1.063	.188
3/4	384	0.10	1.625	1.250	.468	.156	1.375	.156
1	385	0.20	2.000	1.562	.641	.156	1.562	.188
1-1/4	386	0.26	2.375	1.937	.641	.156	1.937	.188
1-1/2	387	0.32	2.688	2.188	.641	.156	2.188	.188
2	388	0.36	3.125	2.625	.734	.156	2.625	.250



SERIES 390

MODIFIED LIGHTWEIGHT FLAT TYPE WITH PILOT

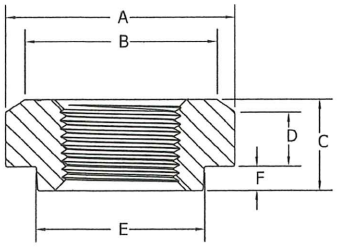
Pipe Size	Series	Approx Weight	A	C	E	F
1/4	391	0.12	1.438	.406	.938	.125
3/8	392	0.12	1.438	.438	.938	.156
1/2	393	0.12	1.438	.469	1.062	.188
3/4	394	0.14	1.625	.531	1.375	.250
1	395	0.28	2.000	.688	1.316	.219
1-1/4	396	0.36	2.375	.688	1.938	.250
1-1/2	397	0.50	2.688	.750	2.188	.250
2	398	0.60	3.125	.781	2.625	.250



SERIES 450

TRIMMED FLAT TYPE WITH PILOT

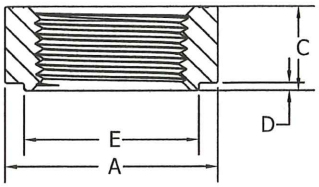
Pipe Size	Series	Approx Weight	A	B	C	D	E	F
3/8	452	0.10	1.312	1.063	.500	.156	.968	.125
3/4	454	0.18	1.750	1.438	.656	.156	1.344	.156
1	455	0.32	2.031	1.750	.750	.156	1.718	.187
1-1/2	457	0.46	2.687	2.375	.750	.188	2.313	.188
2	458	0.62	3.125	2.875	.906	.250	2.688	.250

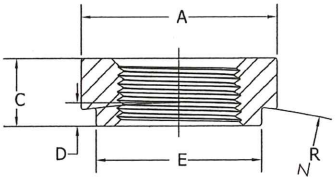


SERIES 500

L.P.G. FLANGE WITH PILOT

Pipe Size	Series	Approx Weight	A	B	C	D	E	F
3/4	504	0.40	1.875	1.438	.875	.500	1.500	.250
1	505	0.48	2.125	1.656	.906	.500	1.750	.250
1-1/4	506	0.54	2.375	2.000	.937	.560	2.000	.250

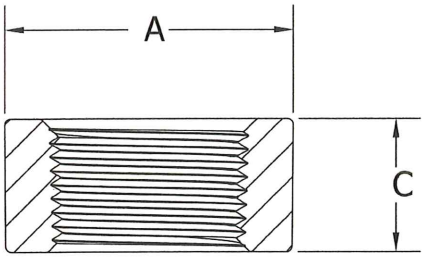




SERIES 700

COUPLING TYPE FLANGE WITH PILOT

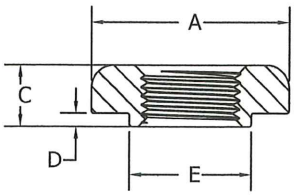
Pipe Size	Series	Approx Weight	A	C	D	E	R
1/4	701	0.14	1.188	.562	.062	.921	NA
3/8	702	0.12	1.188	.562	.062	.921	NA
1/2	703	0.10	1.250	.562	.062	.921	NA
3/4	704	0.14	1.500	.563	.063	1.172	NA
1	705	0.20	1.750	.688	.063	1.437	NA
1	705-7R	0.30	2.000	.688	.238	1.688	7.000
1-1/4	706-7R	0.38	2.375	.688	.250	1.938	7.000
1-1/4	706	0.28	2.125	.688	.125	1.812	12.000
1-1/2	707	0.40	2.500	.750	.218	2.188	12.000
2	708	0.56	3.000	.781	.218	2.562	12.000
2-1/2	709	1.24	3.750	1.000	.188	3.125	18.000
3	710	1.36	4.250	1.063	.188	3.812	18.000



SERIES 750

COUPLING TYPE FLANGE

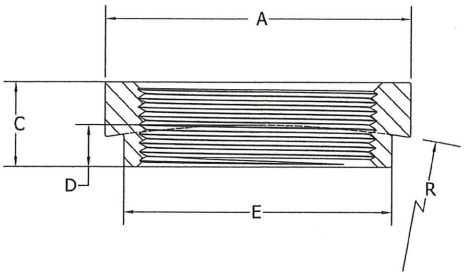
Pipe Size	Series	Approx Weight	A	C
1/4	751	*	1.000	0.688
3/8	752	*	1.188	0.688
1/2	753	.16	1.250	0.688
3/4	754	*	1.500	0.688
1	755	*	1.750	0.781
1-1/4	756	*	2.250	0.813
1-1/2	757	.57	2.500	0.813
2	758	.81	3.000	0.875
2-1/2	759	*	3.620	1.312
3	760	2.35	4.250	1.375
4	762	4.37	5.500	1.500



SERIES 950

COMPOSITE FLAT FLANGE WITH PILOT

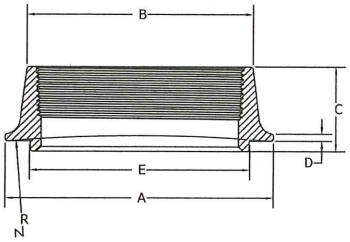
Pipe Size	Series	Approx Weight	A	C	D	E
1/4	951	0.20	1.625	.500	.109	1.000
1/2	953	0.18	1.625	.500	.109	1.000



SERIES 958 R

COMPOSITE CURVED FLANGE WITH PILOT

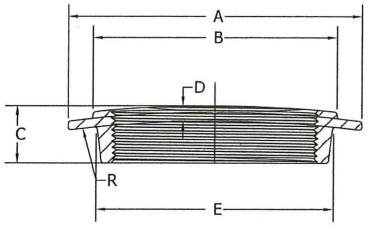
Pipe Size	Series	Approx Weight	A	C	D	E	R
1-1/2	957	0.56	2.688	.781	.266	2.266	7.500
2	958	0.50	3.000	.828	.406	2.625	10.000



HI-FIVE

Pipe Size	Series	Approx Weight	A	B	C	D	E	R
5	158-A	5.00	7.125	6.000	2.250	.188	5.812	42.000

NOTE: Standard Tolerances do not apply.

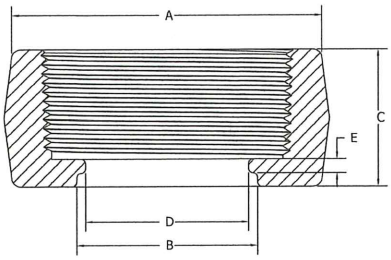


LOW PROFILE

Pipe Size	Series	A	C	D	E	R
4	875	6.312	1.225	.328	5.250	26.000
5	878	7.312	1.375	.375	6.375	42.000

Tank and Cylinder Fittings

ASTM A 105/ASME SA 105
ASTM A 181-70/ASME SA 181-70



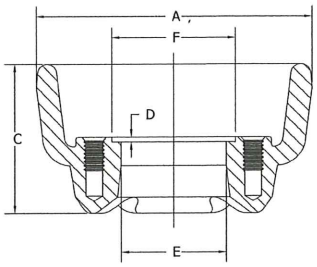
MONITORING FLANGE

Pipe Size	Series	Approx Weight	A	B	C	D	E
3	837	3.68	4.250	2.500	1.875	2.250	.187

3" NPT inside top.
Bottom bore to suit 2" Schedule 40 pipe.
NOTE: Standard Tolerances do not apply.

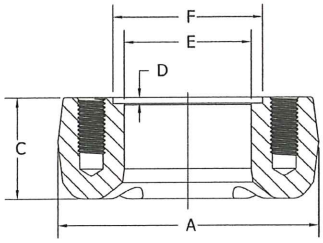
Forged Float Gage Adapters

Specify Phoenix Float Gage Adapters:
* Meets ASME SA-181-70 * Markings on top surface * Permanent Traceability



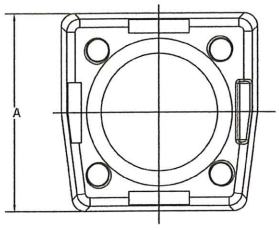
JUNIOR RECESSED

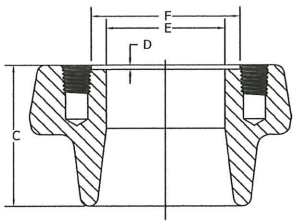
Series	Approx Weight	A	C	D	E	F
820	1.88	3.531	1.906	.062	1.340	1.578



JUNIOR DONUT

Series	Approx Weight	A	C	D	E	F
821	1.12	2.750	1.062	.062	1.340	1.578





SENIOR

Series	Approx Weight	A	C	D	E	F
826	2.04	2.812	1.968	.062	1.670	2.094