

5TH EDITION

INTRODUCING USA INDUSTRIES' **BEST-IN-CLASS**
PIPING ISOLATION & TESTING PLUG

GRIPSAFEST

see Section 1 - Page 12



PRODUCT CATALOG

Piping Isolation & Testing Products • Tube Plugs • Orifice Plates
Heat Exchanger Tools & Tooling • Custom Machining



LINE BLANKS & SPACERS, BLIND FLANGES, STORAGE • ISOLATION & TESTING PIPE PLUGS • BLEEDER CLEANERS, BLEED RINGS • ENGINEERED, METAL TAPERED & NON-METAL TYPE TUBE PLUGS
HEADER/SHOULDER PLUGS & GASKETS • UNIVERSAL, PADDLE & RTJ TYPE ORIFICE PLATES, RESTRICTION ORIFICE UNIONS • HEAT EXCHANGER TOOLS & TOOLING • MUCH MORE!

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THE SAFER, FASTER & SMARTER CHOICE!

Heat Exchanger
Tube Plugs



Snap It®

tube plugging system

Meets ASME PCC-2 2018 standards
For use in heat exchanger, boiler and condenser tubes.





TABLE OF CONTENTS

	SECTION PAGE
About USA Industries	4
SECTION 1 - PIPING PRODUCTS	PI (24 pages)
Line Blinds/Blanks, Spacers, Blind Flanges & Paddle Blind Storage	6 - 11
INTRODUCING GripSafe® ST Isolation and Testing Pipe Plugs	12
GripSafe ST Model Application Sheets	
• GripSafe ST Double Block and Bleed (DBB)	13
• GripSafe ST Outboard Retraction Blocking (ORB)	14
• GripSafe ST Inboard Insertion Blocking (IIB)	15
Conventional Pipe Plug Products	16 - 19
Bleed Rings / Drip Rings / Vent Rings	20
Bleeder Cleaners / Rod Out Tools	21
Beveling Machines	22
PIPE SCHEDULE CHART	23
SECTION 2 - ORIFICE PLATES	OP (6 pages)
Introduction	25
Bore Types	26
Plate Types (Universal/Series 500, Series 520 Paddle Plates, Series 560 & 590 Plate Holders, Restriction Orifice Unions)	27 - 28
Flanges & Holding Blocks	29
Restriction Orifice Unions	30
SECTION 3 - HEAT EXCHANGER, CONDENSER, BOILER TOOLS	HE (52 pages)
Heat Exchanger & Condenser Tube Expanders	36 - 44
Boiler Tube Expanders	45 - 49
Special Tube Expanders / Bevelers	50
Tube Expander Adapters	52 - 53
Pneumatic & Electric Roll Motors, Accessories & Tube Installation Tools	54 - 61
Tube Leak Testing Equipment	62 - 65
Tube Removal / Puller Systems	66 - 73
Tube Cutters	73 - 74
Collapsing / Knockout Tools	75
Pneumatic or Electric Tube Beveling Machines	76
Tube Cleaning Equipment & Accessories	77 - 82
SECTION 4 - TUBE PLUGS	TP (16 pages)
Introduction	83
Snap It® Jr. and Sr. Engineered Plugs & System Plugging Accessories	84 - 89
Metal Tapered Plugs	90
Two-Piece Metal Tapered Plugs	91
Non-Metal Phenolic / Micarta / Wood Tapered Plugs	92
Cork Plugs	92
Rubber Tapered Plugs	93
Shoulder / Header Plugs	94
EZ Torque® Sure Seal Header Gaskets	95
Low & High Pressure Single & Double Seal Neoprene Plugs	96
Threaded Metal Tapered Plugs	97
Zinc Anode Plugs / Pencil Zincs	97
TUBE GAUGE CHART	98

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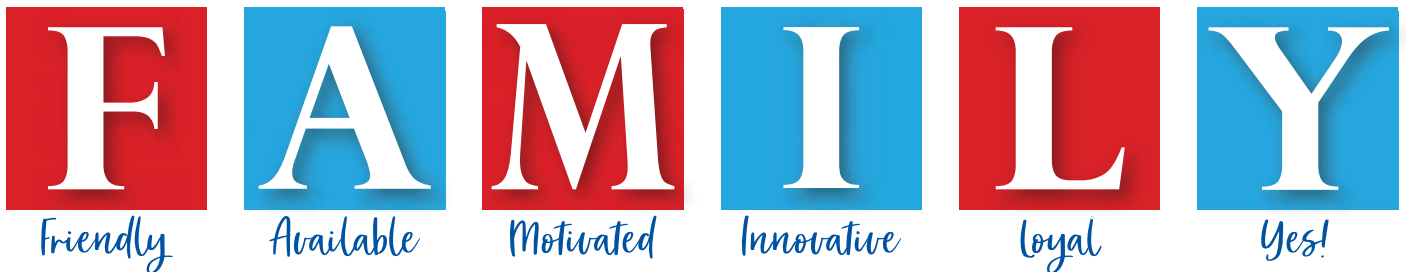
ABOUT US

We started out in 1959 manufacturing tools used to repair and maintain heat exchangers, boilers and condensers. We introduced piping isolation products to serve the local Petrochemical Industry shortly after incorporating in 1982. Today, USA Industries offers a broad range of products and maintains large inventories of **Isolation & Hydrotest Thickness Paddle Blinds, Blind Storage Racks, Blind Flanges, Isolation and Testing Pipe Plugs, Bleed Rings, Bleeder Cleaners, Orifice Plates, Tube Plugs, Heat Exchanger Tools, and Custom Machining.**

OUR CULTURE

You can count on us to always work ethically, safely and with integrity. Our continued growth and success is built around our customers, employees and the community maintaining trust and confidence in us to provide the highest quality products and services at the right price, delivered on-time, and from a single source.

OUR COMPANY CORE VALUES



OUR CUSTOMERS

Our goal is to build effective relationships in order to better understand each customers' own requirements. This shared relationship allows us to innovate our products and services to the exact needs of the market. You can count on us to take pride in our work and in the products and services we provide.

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When it comes to isolating or testing piping, Think of ***USA Industries*** first!

For rental or sale, our stocked inventory is one of the largest available - consisting of Blind Flanges and Isolation and Hydro Test Thickness Paddle Blinds in line sizes 1/2" to 96" with flange ratings of 150# to 2500#.

Our pipe plug products include our three, **ALL NEW** and patented GripSafe® ST models for high pressure applications, plus our standard Double Block & Bleed, Flange Weld Test, Industrial Isolation, Grip Type, Plumbers-type Inflatable Balloons and Wing Nuts. We also manufacture Bleed Rings, Rodout Tools, and our innovative EZ Lock Blind Rack® storage solution, plus offer tube, pipe and plate Beveling Machines and more.



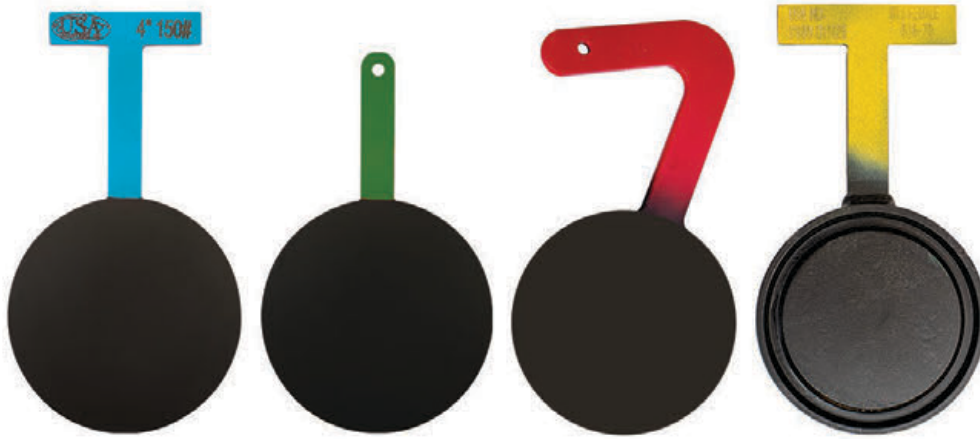
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PADDLE BLINDS - ISOLATION & HYDROTEST THICKNESSES

See chart on page **PI-7** for our standard thicknesses or specify your own.



SALES & RENTALS AVAILABLE!

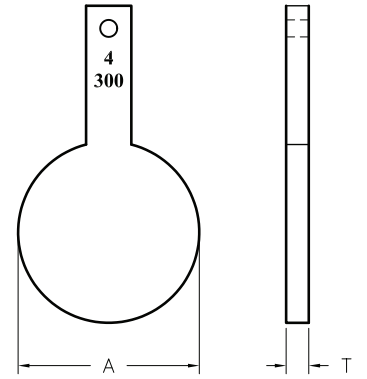
When Ordering Specify:

- Flange Rating
- Line Size
- Mill or Serrated Face
- Thickness (Isolation, Hydro or custom)
- Handle Type
- Material
- Quantity
- Delivery Date

HANDLE COLORS					
150#	RED	300#	BLUE	600#	YELLOW
900#	GREEN	1500#	WHITE	2500#	ORANGE

Inventory consists of 516 - Gr70 Spec Carbon Steel material made to ASME B16.47 & B16.48/ANSI B16.5 & B16.2 standards Available in Raised Face, Mill or Serrated Finish - Ring Type Joint, Oval or Octagonal, Male or Female configurations.

- Line sizes 1/2" — 96"
- Flange ratings 150# — 2500#
- 125-250 RMS Serrated Finishes or Mill Finish available
- Stamped with Size & Rating
- Ground to provide smooth edges
- Ring Type Joint — Male or Female — Oval or Octagonal (Hydro thickness only)
- Q/A & Q/C: manufactured under our strict ISO 9001: 2015 Quality Assurance Program



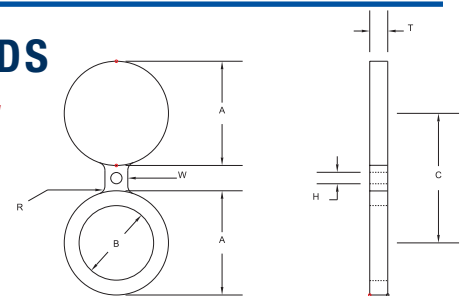
SPECTACLE / FIGURE-8 BLINDS

See Thickness Chart on page **PI-7**



- Inventory consists of 516 - Gr70 carbon steel, 304 and 316 stainless steel.
- Line sizes 1/2" — 96"
- Flange ratings 150# — 2500#
- 125-250 RMS Serrated Finishes or Mill Finish available
- Ring Type Joint — Male or Female — Oval or Octagonal
- Stamped with Size & Rating
- Ground to provide smooth edges
- Can be made to your customized specifications
- Q/A & Q/C: Manufactured under our strict ISO 9001: 2015 Quality Assurance Program

SALES & RENTALS AVAILABLE!



When Ordering Specify:

- Flange Rating
- Line Size
- Mill or Serrated Face
- Thickness (Isolation, Hydro or custom)
- Material
- Quantity
- Delivery Date

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PADDLE BLIND & SPACER DIMENSIONS + THICKNESS CHART

LINE SIZE (in.)	ISO.	150#			300#			600#			900#			1500#			2500#		
		THK	O.D.	I.D.	THK	O.D.	I.D.	THK	O.D.	I.D.	THK	O.D.	I.D.	THK	O.D.	I.D.	THK	O.D.	I.D.
1/2	5/16	1-3/4	5/8	5/16	2	5/8	5/16	2	5/8	5/16	2-3/8	5/8	5/16	2-3/8	5/8	5/16	2-5/8	5/8	3/8
3/4	5/16	2-1/8	7/8	5/16	2-1/2	7/8	5/16	2-1/2	7/8	5/16	2-5/8	7/8	5/16	2-5/8	7/8	3/8	2-7/8	7/8	3/8
1	5/16	2-1/2	1-1/8	5/16	2-3/4	1-1/8	5/16	2-3/4	1	5/16	3	1	5/16	3	1	3/8	3-1/4	1	3/8
1-1/4	5/16	2-7/8	1-5/8	5/16	3-1/8	1-5/8	5/16	3-1/8	1-3/8	3/8	3-3/8	1-3/8	3/8	3-3/8	1-3/8	3/8	4	1-3/8	1/2
1-1/2	5/16	3-1/4	1-7/8	5/16	3-5/8	1-7/8	5/16	3-5/8	1-5/8	3/8	3-3/4	1-5/8	3/8	3-3/4	1-5/8	1/2	4-1/2	1-5/8	5/8
2	5/16	4	2-3/8	5/16	4-1/4	2-3/8	3/8	4-1/4	2-1/8	3/8	5-1/2	2-1/8	1/2	5-1/2	2	1/2	5-5/8	2	5/8
2-1/2	5/16	4-3/4	2-7/8	5/16	5	2-7/8	3/8	5	2-5/8	1/2	6-3/8	2-5/8	1/2	6-3/8	2-1/2	5/8	6-1/2	2-3/8	3/4
3	5/16	5-1/4	3-1/2	5/16	5-3/4	3-1/2	3/8	5-3/4	3-1/4	1/2	6-1/2	3-1/4	5/8	6-3/4	3	3/4	7-5/8	3	7/8
3-1/2	5/16	6-1/4	4	3/8	6-3/8	4	3/8	6-1/4	3-3/4	5/8									
4	5/16	6-3/4	4-1/2	3/8	7	4-1/2	1/2	7-1/2	4-1/4	5/8	8	4-1/4	3/4	8-1/8	4	7/8	9-1/8	4	1-1/8
5	5/16	7-5/8	5-1/2	3/8	8-3/8	5-1/2	5/8	9-3/8	5-3/8	3/4	9-5/8	5-1/4	7/8	9-7/8	5	1-1/8	10-7/8	5	1-3/8
6	5/16	8-5/8	6-5/8	1/2	9-3/4	6-5/8	5/8	10-3/8	6-3/8	7/8	11-1/4	6-3/8	1	11	6	1-3/8	12-3/8	6	1-5/8
8	5/16	10-7/8	8-5/8	1/2	12	8-5/8	7/8	12-1/2	8-3/8	1-1/8	14	8-3/8	1-3/8	13-3/4	8	1-5/8	15-1/8	7-7/8	2-1/8
10	5/16	13-1/4	10-3/4	5/8	14-1/8	10-3/4	1	15-5/8	10-3/8	1-3/8	17	10-3/8	1-5/8	17	10	2	18-5/8	9-3/4	2-5/8
12	5/16	16	12-3/4	3/4	16-1/2	12-3/4	1-1/8	17-7/8	12-3/8	1-5/8	19-1/2	12-3/8	1-7/8	20-3/8	12	2-3/8	21-1/2	11-3/8	3-1/8
14	5/16	17-5/8	14	3/4	19	14	1-1/4	19-1/4	13-5/8	1-3/4	20-3/8	13-5/8	2-1/8	22-5/8	13-1/8	2-5/8			
16	5/16	20-1/8	16	7/8	21-1/8	16	1-1/2	22-1/8	15-5/8	2	22-1/2	15-5/8	2-3/8	25-1/8	15	3			
18	5/16	21-1/2	18	1	23-3/8	18	1-5/8	24	17-5/8	2-1/8	25	17-5/8	2-5/8	27-5/8	16-7/8	3-3/8			
20	5/16	23-3/4	20	1-1/8	25-5/8	20	1-3/4	26-3/4	19-1/2	2-1/2	27-3/8	19-1/2	2-7/8	29-5/8	18-7/8	3-3/4			
22	5/16	25-7/8	22	1-1/4	27-5/8	22	1-7/8	28-3/4	21-1/2	2-3/4									
24	5/16	28-1/8	24	1-1/4	30-3/8	24	2	31	23-1/2	2-7/8	32-7/8	23-1/2	3-1/2	35-3/8	22-5/8	4-3/8			
MSS SP-44 SERIES "A" SPECS													METHODOLOGY						
26	5/16	30-3/8	26	1-5/8	32-3/4	26	2-1/2	34	26	3-1/2	34-5/8	26	4-3/8	Line sizes up to 96" are available. Standard Isolation thickness is 5/16" (+/-1/16). Any thickness rating or alloy is available upon request.					
28	5/16	32-5/8	28	1-3/4	35-1/4	28	2-3/4	35-7/8	28	3-3/4	37-1/8	28	4-5/8	Sizes and thicknesses meet the following specifications ASME 16.48, ASME 16.5, ASME B16.47					
30	5/16	34-5/8	30	1-7/8	37-3/8	30	2-7/8	38-1/8	30	4-1/8	39-5/8	30	5	Blank thicknesses over 24 NPS were calculated using the equation for blanks in ASME B31.3 as follows:					
32	5/16	36-7/8	32	2	39-1/2	32	3-1/8	40-1/8	32	4-3/8	42-1/8	32	5-3/8	$T = d / ((3P) / (16SE))$					
34	5/16	38-7/8	34	2-1/8	41-1/2	34	3-1/4	42-1/8	34	4-5/8	44-5/8	34	5-5/8	d = I.D. of ring gasket (in.)					
36	5/16	41-1/8	36	2-1/4	43-7/8	36	3-1/2	44-3/8	36	4-7/8	47-1/8	36	6	T = Blank Thickness (in.)					
38	5/16	43-5/8	38	2-3/8	41-3/8	38	3-5/8	43-3/8	38	5-1/8	47-1/8	38	6-1/4	S = 23,300psi					
40	5/16	45-5/8	40	2-1/2	43-3/4	40	3-7/8	45-3/8	40	5-3/8	49-1/8	40	6-5/8	E = 1.00					
42	5/16	47-7/8	42	2-5/8	45-3/4	42	4	47-7/8	42	5-5/8	51-1/8	42	7	P = Design Gauge Pressure psi.					
44	5/16	50-1/8	44	2-3/4	47-7/8	44	4-1/4	49-7/8	44	6	53-3/4	44	7-1/4	S (Basic Allowable Stress) and E (Quality Factor) values were determined from tables A1 and A1-A from B31.3 for 516-Gr 70 material with the temperature range of -20 to 100° Fahrenheit. This calculation does not take into consideration any required corrosion allowance if needed.					
46	5/16	52-1/8	46	2-7/8	50	46	4-1/2	52-1/8	46	6-1/4	56-3/8	46	7-5/8						
48	5/16	54-3/8	48	3	52	48	4-5/8	54-5/8	48	6-1/2	58-3/8	48	8						
50	5/16	56-3/8	50	3-1/8	54-1/8	50	4-7/8	56-7/8	50	6-3/4									
52	5/16	58-5/8	52	3-1/4	56-1/8	52	5	58-7/8	52	7									
54	5/16	60-7/8	54	3-1/4	58-5/8	54	5-1/4	61-1/8	54	7-1/4									
56	5/16	63-1/8	56	3-3/8	60-5/8	56	5-3/8	63-3/8	56	7-1/2									
58	5/16	65-3/8	58	3-1/2	62-5/8	58	5-5/8	65-3/8	58	7-7/8									
60	5/16	67-3/8	60	3-5/8	64-5/8	60	5-3/4	68-1/8	60	8-1/8									
API-605 SERIES "B" SPECS																			
26	5/16	28-7/16	26	1-5/8	30-1/4	26	2-1/2	30	26	3-1/2	32-7/8	26	4-3/8						
28	5/16	30-7/16	28	1-3/4	32-3/8	28	2-3/4	32-1/8	28	3-3/4	35-3/8	28	4-5/8						
30	5/16	32-7/16	30	1-7/8	34-3/4	30	2-7/8	34-1/2	30	4-1/8	37-5/8	30	5						
32	5/16	34-9/16	32	2	36-7/8	32	3-1/8	36-5/8	32	4-3/8	39-7/8	32	5-3/8						
34	5/16	36-11/16	34	2-1/8	39	34	3-1/4	39-1/8	34	4-5/8	42-1/8	34	5-5/8						
36	5/16	38-3/4	36	2-1/4	41-1/8	36	3-1/2	41-1/8	36	4-7/8	44-1/8	36	6						
38	5/16	41	38	2-3/8	43-1/8	38	3-5/8												
40	5/16	43	40	2-1/2	45-1/8	40	3-7/8												
42	5/16	45	42	2-5/8	47-1/8	42	4												
44	5/16	47	44	2-3/4	49-1/8	44	4-1/4												
46	5/16	49-5/16	46	2-7/8	51-3/4	46	4-1/2												
48	5/16	51-5/16	48	3	53-3/4	48	4-5/8												
50	5/16	53-5/16	50	3-1/8	55-3/4	50	4-7/8												
52	5/16	55-5/16	52	3-1/4	57-3/4	52	5												
54	5/16	57-1/2	54	3-1/4	60-1/8	54	5-1/4												
56	5/16	59-1/2	56	3-3/8	62-5/8	56	5-3/8												
58	5/16	62-1/16	58	3-1/2	65-1/16	58	5-5/8												
60	5/16	64-1/16	60	3-5/8	67-1/16	60	5-3/4												



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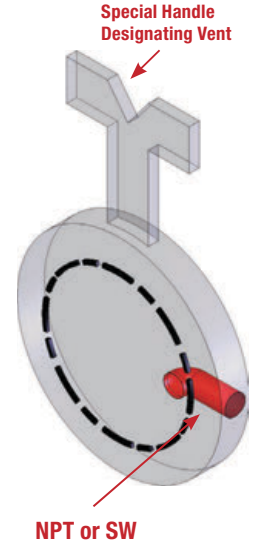


EZ VENT® SLIP BLINDS



- Multiple ports added at any position, venting one or both sides
- EZ Vent is used to block one side of your flange while allowing access to vent the other side
- Excellent for use when there is not a valve on your piping at that location
- Vent is commonly used to verify there is zero energy in the line; vent off any pressure that has leaked by upstream valve; as an entry point for hydrotesting
- Available in Ring Type Joint
- NPT or SW ports
- Color coded handle*

NPT \ SW Size (in.)	Recommended Min. Blind Thickness (in.)
1/8	1/2
1/4	3/4
3/8	7/8
1/2	1
3/4	1-1/4
1	1-1/2



Machine Finish may require increased thickness.



When Ordering Specify:

- Flange Rating
- Line Size
- Thickness (Isolation, Hydro or custom)
- Mill or Serrated Finish
- # of Ports
- Location of NPT or SW ports
- Material
- Quantity
- Delivery Date

EZ PURGE® SLIP BLINDS



For line purging applications, past practice has been to use a slip blind and a number of spacers sandwiched between the blind and the gapped flange. While this procedure can be effective to create a purging area, several problems exist that can lead to unsafe practices and/or damage to equipment.

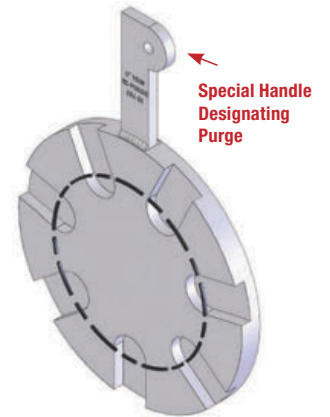
USA Industries EZ Purge blinds can help eliminate those problems. Our purge blinds are easily identifiable and can be made to any specification requested. The current standard we use is a 1/2" thick isolation slip blind with a 1/4" deep channel. Custom thicknesses available upon request.



- Any flange size & rating
- Unique handle identifies it as a purge blind
- Painted flat black
- Stamped with Size & Rating
- Q/A & Q/C — manufactured under our ISO 9001: 2015 Quality Assurance Program
- Available in Ring Type Joint
- Color coded handle*

The ratio of gasket area versus purge area is approximately 50% to allow for proper sealing force distribution.

Custom configurations available to suit your specific purge flow requirements.



When Ordering Specify:

- Flange Rating
- Line Size
- Mill or Serrated Face
- Material
- Quantity
- Delivery Date

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EZ VENT-PURGE BLIND®

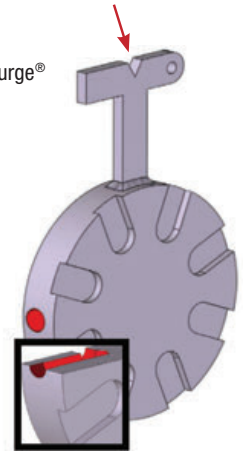


SALES & RENTALS AVAILABLE!

Our EZ Vent-Purge Blind combines the benefits of BOTH the EZ Purge® and EZ Vent® slip blinds as noted on page **PI-8**.

- Any flange size & rating
- Unique handle identifies it as a Vent-Purge blind
- Painted flat black
- Color coded handle*
- Stamped with Size & Rating
- Available in Ring Type Joint
- Q/A & Q/C — Manufactured under our ISO 9001:2015 Quality Assurance Program

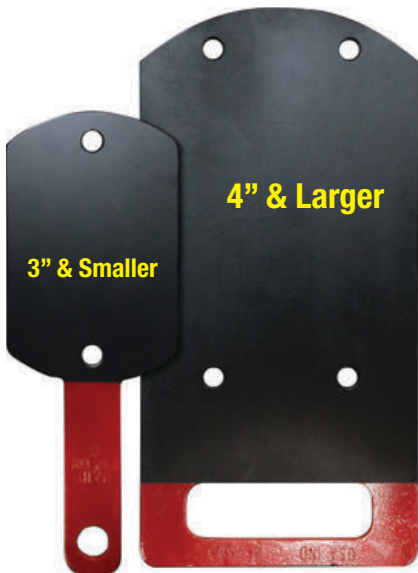
Special Handle Designating Vent-Purge



When Ordering Specify:

- Flange Rating
- Line Size
- Thickness (Isolation, Hydro or custom)
- Mill or Serrated Face
- # of Ports
- NPT or SW Port(s) Location(s)
- Material
- Quantity
- Delivery Date

EZ GUILLOTINE™ SLIP BLINDS



SALES & RENTALS AVAILABLE!

Guillotine Blinds are used to provide an isolation source on the flare header side of a PSV prior to removal of the PSV for repair.

A blind flange is then placed over and bolted using remaining bolt holes to ensure pressure holding capabilities.

Available in Carbon Steel and Stainless Steel or other alloys to meet your specifications

When Ordering Specify:

- Flange Rating
- Line Size
- Thickness
- Color coded handle*
- Material
- Quantity
- Delivery Date

HANDLE COLORS *

150#	RED	300#	BLUE	600#	YELLOW
900#	GREEN	1500#	WHITE	2500#	ORANGE

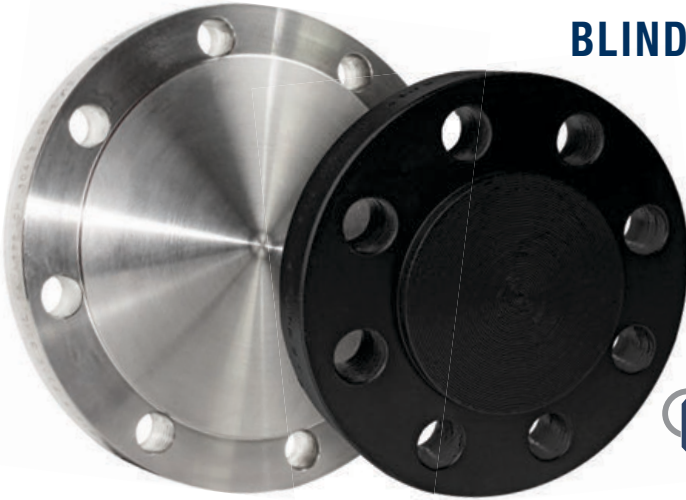
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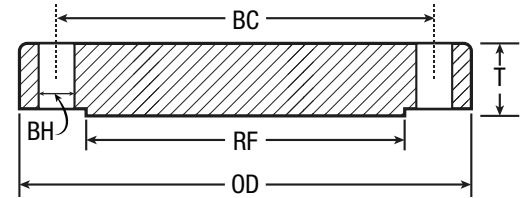


BLIND FLANGES

Blind Flanges meet SA105 (carbon steel) specifications.

- Line sizes 1/2" — 96"
- Flange ratings 150# — 2500#
- Raised Face or Ring Type Joint Gasket surfaces
- Provided for either Series A (MSS SP44) or Series B (API 605) meeting ASME B16.47 & B16.48 / ANSI B16.5 and B16.2 specifications
- Other blind specifications A182, A350, B160, etc. can be provided upon request for purchase

SALES & RENTALS AVAILABLE!



NPS	CLASS 150 ASME B16.5						300 ASME B16.5						600 ASME B16.5						900 ASME B16.5					
	OD OF FLANGE (OD)	DIA. OF BOLT CIRCLE (BC)	DIA. OF RAISED FACE (RF)	NO. OF BOLT HOLES	DIA. OF BOLT HOLE (BH)	BLIND THICKNESS (T)	OD OF FLANGE (OD)	DIA. OF BOLT CIRCLE (BC)	DIA. OF RAISED FACE (RF)	NO. OF BOLT HOLES	DIA. OF BOLT HOLE (BH)	BLIND THICKNESS (T)	OD OF FLANGE (OD)	DIA. OF BOLT CIRCLE (BC)	DIA. OF RAISED FACE (RF)	NO. OF BOLT HOLES	DIA. OF BOLT HOLE (BH)	BLIND THICKNESS (T)	OD OF FLANGE (OD)	DIA. OF BOLT CIRCLE (BC)	DIA. OF RAISED FACE (RF)	NO. OF BOLT HOLES	DIA. OF BOLT HOLE (BH)	BLIND THICKNESS (T)
1/2	3.50	2.38	1.38	4	0.63	0.44	3.75	2.63	1.38	4	0.63	0.56	3.75	2.62	1.38	4	0.62	0.56	4.75	3.25	1.38	4	0.88	0.88
3/4	3.88	2.75	1.69	4	0.63	0.50	4.62	3.25	1.69	4	0.75	0.63	4.62	3.25	1.69	4	0.75	0.63	5.12	3.50	1.69	4	0.88	1.00
1	4.25	3.12	2.00	4	0.63	0.56	4.88	3.50	2.00	4	0.75	0.69	4.88	3.50	2.00	4	0.75	0.69	5.88	4.00	2.00	4	1.00	1.13
1-1/4	4.62	3.50	2.50	4	0.63	0.63	5.25	3.88	2.50	4	0.75	0.75	5.25	3.88	2.50	4	0.75	0.81	6.25	4.38	2.50	4	1.00	1.13
1-1/2	5.00	3.88	2.88	4	0.63	0.69	6.12	4.50	2.88	4	0.88	0.81	6.12	4.50	2.88	4	0.88	0.88	7.00	4.88	2.88	4	1.13	1.25
2	6.00	4.75	3.63	4	0.75	0.75	6.50	5.00	3.63	8	0.75	0.88	6.50	5.00	3.63	8	0.75	1.00	8.50	6.50	3.63	8	1.00	1.50
2-1/2	7.00	5.50	4.13	4	0.75	0.88	7.50	5.88	4.13	8	0.88	1.00	7.50	5.88	4.13	8	0.88	1.13	9.62	7.50	4.13	8	1.13	1.63
3	7.50	6.00	5.00	4	0.75	0.94	8.25	6.63	5.00	8	0.88	1.13	8.25	6.62	5.00	8	0.88	1.25	9.50	7.50	5.00	8	1.00	1.50
3-1/2	8.50	7.00	5.50	8	0.75	0.94	9.00	7.25	5.50	8	0.88	1.19	9.00	7.25	5.50	8	1.00	1.38	-	-	-	-	-	-
4	9.00	7.50	6.19	8	0.75	0.94	10.00	7.88	6.19	8	0.88	1.25	10.75	8.50	6.19	8	1.00	1.50	11.50	9.25	6.19	8	1.25	1.75
5	10.00	8.50	7.31	8	0.88	0.94	11.00	9.25	7.31	8	0.88	1.38	13.00	10.50	7.31	8	1.12	1.75	13.75	11.00	7.31	8	1.38	2.00
6	11.00	9.50	8.50	8	0.88	1.00	12.50	10.63	8.50	12	0.88	1.44	14.00	11.50	8.50	12	1.12	1.88	15.00	12.50	8.50	12	1.25	2.19
8	13.50	11.75	10.63	8	0.88	1.13	15.00	13.00	10.63	12	1.00	1.63	16.50	13.75	10.63	12	1.25	2.19	18.50	15.50	10.63	12	1.50	2.50
10	16.00	14.25	12.75	12	1.00	1.19	17.50	15.25	12.75	16	1.13	1.88	20.00	17.00	12.75	16	1.38	2.50	21.50	18.50	12.75	16	1.50	2.75
12	19.00	17.00	15.00	12	1.00	1.25	20.50	17.75	15.00	16	1.25	2.00	22.00	19.25	15.00	20	1.38	2.63	24.00	21.00	15.00	20	1.50	3.13
14	21.00	18.75	16.25	12	1.13	1.38	23.00	20.25	16.25	20	1.25	2.13	23.75	20.75	16.25	20	1.50	2.75	25.25	22.00	16.25	20	1.63	3.38
16	23.50	21.25	18.50	16	1.13	1.44	25.50	22.50	18.50	20	1.38	2.25	27.00	23.75	18.50	20	1.63	3.00	27.75	24.25	18.50	20	1.75	3.50
18	25.00	22.75	21.00	16	1.25	1.56	28.00	24.75	21.00	24	1.38	2.38	29.25	25.75	21.00	20	1.75	3.25	31.00	27.00	21.00	20	2.00	4.00
20	27.50	25.00	23.00	20	1.25	1.69	30.50	27.00	23.00	24	1.38	2.50	32.00	28.50	23.00	24	1.75	3.50	33.75	29.50	23.00	20	2.13	4.25
22	29.50	27.25	25.25	20	1.38	1.81	33.00	29.25	25.25	24	1.63	2.63	34.25	30.63	25.25	24	1.88	3.75	-	-	-	-	-	-
24	32.00	29.50	27.25	20	1.38	1.88	36.00	32.00	27.25	24	1.63	2.75	37.00	33.00	27.25	24	2.00	4.00	41.00	35.50	27.25	20	2.63	5.50

SERIES A - ASME 16.47

26	34.25	31.75	29.50	24	1.38	2.63	38.25	34.50	29.50	28	1.75	3.25	40.00	36.00	29.50	28	2.00	4.94	42.75	37.50	29.50	20	2.88	6.31
28	36.50	34.00	31.50	28	1.38	2.75	40.75	37.00	31.50	28	1.75	3.50	42.25	38.00	31.50	28	2.12	5.19	46.00	40.25	31.50	20	3.12	6.75
30	38.75	36.00	33.75	28	1.38	2.88	43.00	39.25	33.75	28	1.88	3.69	44.50	40.25	33.75	28	2.12	5.50	48.50	42.75	33.75	20	3.12	7.18
32	41.75	38.50	36.00	28	1.62	3.13	45.25	41.50	36.00	28	2.00	3.88	47.00	42.50	36.00	28	2.38	5.81	51.75	45.50	36.00	20	3.38	7.62
34	43.75	40.50	38.00	32	1.62	3.19	47.50	43.50	38.00	28	2.00	4.07	49.00	44.50	38.00	28	2.38	6.06	55.00	48.25	38.00	20	3.62	8.06
36	46.00	42.75	40.25	32	1.62	3.50	50.00	46.00	40.25	32	2.12	4.32	51.75	47.00	40.25	28	2.62	6.38	57.50	50.75	40.25	20	3.62	8.44
38	48.75	45.25	42.25	32	1.62	3.38	46.00	43.00	40.50	32	1.62	4.19	50.00	45.75	41.50	28	2.38	6.12	57.50	50.75	43.25	20	3.62	8.50
40	50.75	47.25	44.25	36	1.62	3.50	48.75	45.50	42.75	32	1.75	4.44	52.00	47.75	43.75	32	2.38	6.38	59.50	52.75	45.75	24	3.62	8.81
42	53.00	49.50	47.00	36	1.62	3.75	50.75	47.50	44.75	32	1.75	4.63	55.25	50.50	46.00	28	2.62	6.75	61.50	54.75	47.75	24	3.62	9.12
44	55.25	51.75	49.00	40	1.62	3.94	53.25	49.75	47.00	32	1.88	4.82	57.25	52.50	48.25	32	2.62	7.00	64.88	57.62	50.00	24	3.88	9.56
46	57.25	53.75	51.00	40	1.62	4.00	55.75	52.00	49.00	28	2.00	5.00	59.50	54.75	50.25	32	2.62	7.31	68.25	60.50	52.50	24	4.12	10.06
48	59.50	56.00	53.50	44	1.62	4.19	57.75	54.00	51.25	32	2.00	5.19	62.75	57.50	52.50	32	2.62	7.69	70.25	62.50	54.50	24	4.12	10.38
50	61.75	58.25	55.50	44	1.88	4.32	60.25	56.25	53.50	32	2.12	5.44	65.75	60.00	54.50	28	3.12	8.00	-	-	-	-	-	-
52	64.00	60.50	57.50	44	1.88	4.50	62.25	58.25	-	32	2.12	5.63	67.75	62.00	-	32	3.12	8.25	-	-	-	-	-	-
54	66.25	62.75	59.50	44	1.88	4.69	65.25	61.00	-	28	2.38	5.94	70.00	64.25	-	32	3.12	8.56	-	-	-	-	-	-
56	68.75	65.00	62.00	48	1.88	4.82	67.25	63.00	-	28	2.38	6.00	73.00	66.75	-	32	3.38	8.88	-	-	-	-	-	-
58	71.00	67.25	64.00	48	1.88	5.00	69.25	65.00	-	32	2.38	6.19	75.00	68.75	-	32	3.38	9.12	-	-	-	-	-	-
60	73.00	69.25	66.00	52	1.88	5.13	71.25	67.00	-	32	2.38	6.38	78.50	71.75	-	28	3.62	9.56	-	-	-	-	-	-

SERIES B - ASME 16.47

26	30.94	29.31	28.00	36	0.88	1.75	34.12	31.62	29.00	32	1.38	3.50	35.00	31.75	28.62	28	1.75	4.38	40.25	35.50	30.00	20	2.62	6.06
28	32.94	31.31	30.00	40	0.88	1.88	36.25	33.75	31.00	36	1.38	3.50	37.50	34.00	30.88	28	1.88	4.56	43.50	38.25	32.25	20	2.88	6.56
30	34.94	33.31	32.00	44	0.88	2.00	39.00	36.25	33.25	36	1.50	3.69	40.25	36.50	33.12	28	2.00	5	46.50	40.75	34.50	20	3.12	6.93
32	37.06	35.44	34.00	48	0.88	2.12	41.50	38.50	35.50	32	1.62	4.06	42.75	38.75	35.25	28	2.12	5.31	48.75	43.00	36.50	20	3.12	7.31
34	39.56	37.69	36.25	40	1.00	2.25	43.62	40.62	37.50	36	1.62	4.06	45.75	41.50	37.50	24	2.38	5.68	51.75	45.50	39.00	20	3.38	7.68
36	41.62	39.75	38.25	44	1.00	2.31	46.12	42.88	39.75	32	1.75	4.06	47.75	43.50	39.75	28	2.38	5.94	53.00	47.25	40.50	24	3.12	7.94
38	44.25	42.12	40.25	40	1.12	2.50	48.12	44.88	41.75	36	1.75	4.38	-	-	-	-	-	-	-	-	-	-	-	-
40	46.25	44.12	42.50	44	1.12	2.62	50.12	46.88	43.88	40	1.75	4.56	-	-	-	-	-	-	-	-	-	-	-	-
42	48.25	46.12	44.50	48	1.12	2.69	52.50	49.00	46.00	36	1.88	4.69	-	-	-	-	-	-	-	-	-	-	-	-
44	50.25	48.12	46.50	52	1.12	2.81	54.50	51.00	48.00	40	1.88	5.00	-	-	-	-	-	-	-	-	-	-	-	-
46	52.81	50.56	48.62	40	1.25	2.94	57.50	53.75	50.00	36	2.00	5.12	-	-	-	-	-	-	-	-	-	-	-	-
48	54.81	52.56	50.75	44	1.25	3.06	59.50	55.75	52.25	40	2.00	5.31	-	-	-	-	-	-	-	-	-	-	-	-
50	56.81	54.56	52.75	4																				

EZ LOCK BLIND RACK®

Patented EZ Lock Blind Rack^[1] for Storage of Paddle / Hydrotest Blinds

SALES & RENTALS AVAILABLE!



(Patent No. 9,546,889)

January 17, 2017

- Weight accommodation: 12,000 lbs.
- Storage capacity: up to 884 blinds*
- Accommodates "7" or "T" handles
- Holds blinds up to 24-1/4" OD
- Lockable lid security to reduce theft and blind loss
- Patented Indexing Retainers for safety and blind security
- Easily accessed from both sides of the unit
- Overhead heavy lift crane lugs
- Bottom accessible forklift cavities
- Order fully stocked and receive discount

* = 884 blinds is dependent on blind sizes & thicknesses

Blinds are secured by our patented, and innovative Indexing Retainers.

[1] Tracy Sue and Casey Sue, "Lock rack for hydro, isolation or test blinds..."



**IN-STOCK ITEMS
SHIP SAME DAY**

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www.USAINdustries.com

VISA



INTRODUCING

GRIPSAFE[®] ST

RENTALS AVAILABLE!

After more than half a century of various industries using the same basic isolation and testing plug technology, with known incidents of ejections and plug movement, USA Industries introduces its GripSafe ST line of plugs incorporating significant technological advancements over competitive gripping plugs. All GripSafe ST plugs feature a newly patented independent wedge gripping system that delivers maximum holding capabilities while lowering risks to personnel and operator equipment. This fundamental rethinking of traditional plug designs makes this line of plugs the safest, most reliable and technologically advanced plugs in the world.



**SUPERIOR
TECHNOLOGY**

GRIPSAFE[®] ST INNOVATION

Manufactured Exclusively by USA Industries an ISO 9001:2015 Certified Company

For the latest patent and trademark information, go to:
<https://www.USAIindustries.com/gripsafe-patents-trademarks>
 or scan QR code to the right with your mobile phone



WARNING:

A SPECIAL WORD OF CAUTION: Pressure testing can be an extremely hazardous operation and safety precautions should be strictly adhered to.

All connections, valves, flanges and other fittings should be checked for suitability to test pressure. Verify the line ID & Plug Range match. Most importantly — Never stand or pass in front of any test plug or other enclosure while test is in progress. If plug discharges during a test, serious injury or death could occur.

IN-STOCK ITEMS
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DOUBLE BLOCK AND BLEED (DBB) 3/4" TO 36"*

RENTALS
AVAILABLE!

SAFETY & RELIABILITY

Instantly Secure. With its unprecedented patented design, GripSafe ST's independent self-gripping technology virtually eliminates the risk of plug ejection from the moment it's inserted into the pipe, without tightening a single nut.

Superior Self Gripping. The innovative system distributes equal loading across the gripping wedges ensuring maximum surface contact and holding capabilities. As pressure increases behind the plug, the wedges grip tighter. Even in pipe diameters that are asymmetrical, each wedge independently adapts to variances within the pipe. Coupled with its automatic gripping feature upon installation, GripSafe ST takes "self-gripping" to a new level.

Less Weight. GripSafe ST plugs weigh less on average than competitive products. Significant weight differences exist as plug sizes increase, reaching upwards of 50% weight reductions in larger sizes without sacrificing holding capabilities.

No Pipe Damage. Unlike competitive products which rely on serrated jaws to bite into the pipe for holding purposes, GripSafe ST uses a specially designed wedge system that grips the pipe without scarring the surface. Within rated pipe pressures, GripSafe ST leaves no damage, no need for clean up, no stress risers or crevices for corrosive leak paths to form.

Non-Contaminating. GripSafe ST plugs utilize a proprietary texture on the gripping wedges that can be used on any metal type with no carbon contamination. Therefore, in contrast with other plugs, GripSafe ST requires no alternate parts for use in stainless and other alloy pipes where cross contamination is a concern.

APPLICATIONS

Flange Weld Testing. Pressure can be placed between the two seals to test weld-neck flanges by means of hydrostatic pressure, checking for hoop stress failure, weld leaks and/or pinhole leak paths while providing protection from any unexpected pressure discharge.

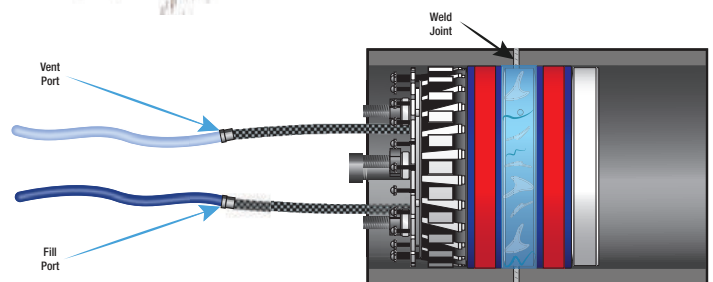
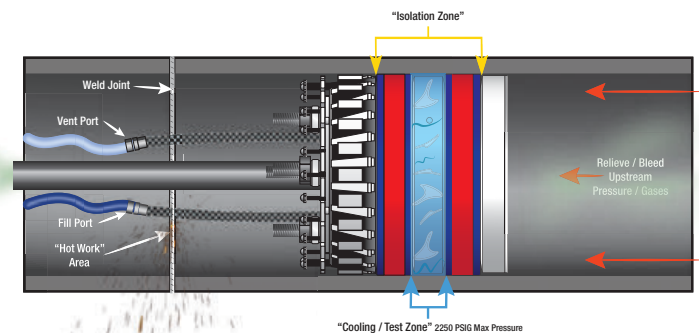
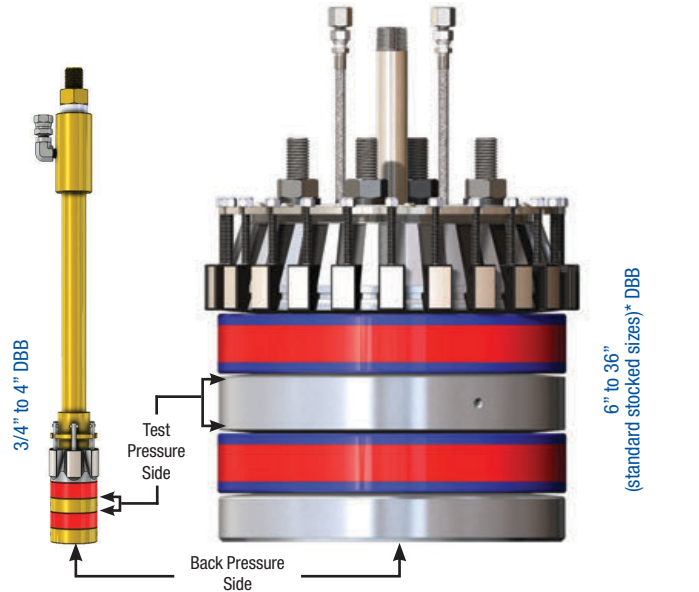
Pre/Post Weld Operations. Dual port design provides enhanced cooling by circulating water between the seals during pre/post weld processes (on 6"+ models).

Isolation. Increase safety by preventing exposure to hydrocarbon or other process leaks. Eliminate risk of injury to personnel in the event of inadvertent valve openings, valve leaks, or other pressure equipment failures upstream.

Positive Isolation Monitoring. Pressure between the two seals verifies seal integrity and ensures the plug's seals are effectively isolating the pipe.

Line Purging. Feed inert gases through the vent pipe, into a vessel, for back-purging welds or to remove oxygen for other processes.

GRIPSAFE[®] ST



WARNING:
(See page PI-12)

* Larger sizes and custom configurations available upon request

When Ordering Specify:

- GripSafe ST Plug Model Required
- Line Size
- Pipe Schedule
- Quantity
- Delivery Date

Scan QR code to go to GripSafe ST's webpage



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www.USAIndustries.com



OUTBOARD RETRACTION BLOCKING (ORB) 3/4" TO 36"*

RENTALS
AVAILABLE!

SAFETY & RELIABILITY

Instantly Secure. With its unprecedented patented design, GripSafe ST's independent self-gripping technology virtually eliminates the risk of plug ejection from the moment it's inserted into the pipe, without tightening a single nut.

Superior Self Gripping. The innovative system distributes equal loading across the gripping wedges ensuring maximum surface contact and holding capabilities. As pressure increases behind the plug, the wedges grip tighter. Even in pipe diameters that are asymmetrical, each wedge independently adapts to variances within the pipe. Coupled with its automatic gripping feature upon installation, GripSafe ST takes "self-gripping" to a new level.

Less Weight. GripSafe ST plugs weigh less on average than competitive products. Significant weight differences exist as plug sizes increase, reaching upwards of 50% weight reductions in larger sizes without sacrificing holding capabilities.

No Pipe Damage. Unlike competitive products which rely on serrated jaws to bite into the pipe for holding purposes, GripSafe ST uses a specially designed wedge system that grips the pipe without scarring the surface. Within rated pipe pressures, GripSafe ST leaves no damage, no need for clean up, no stress risers or crevices for corrosive leak paths to form.

Non-Contaminating. GripSafe ST plugs utilize a proprietary texture on the gripping wedges that can be used on any metal type with no carbon contamination. Therefore, in contrast with other plugs, GripSafe ST requires no alternate parts for use in stainless and other alloy pipes where cross contamination is a concern.

APPLICATIONS

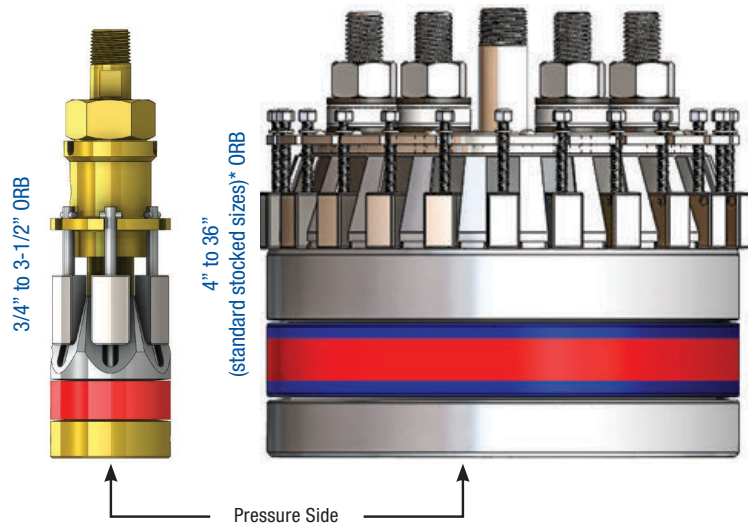
Pipe Testing. Test pipe sections without the need for flanges.

Pipe Spool Testing. Perform hydrostatic testing of pipe spools, eliminating the need for end caps and welding.

Isolation. Increase safety by preventing exposure to hydrocarbon or other process leaks. Eliminate risk of injury to personnel in the event of inadvertent valve openings, valve leaks, or other pressure equipment failures upstream.

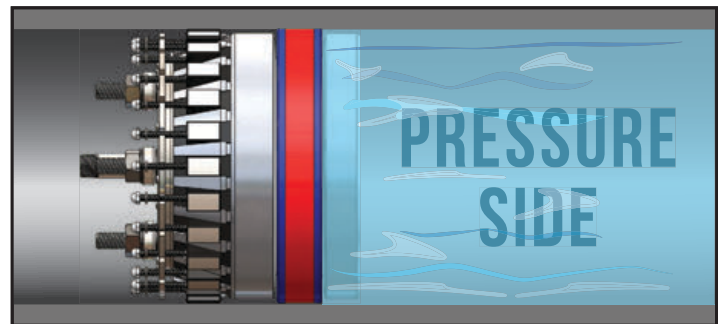
Line Purging. Feed inert gases through the vent pipe, into a vessel, for back-purging welds or to remove oxygen for other processes.

GRIPSAFE[®] ST



Note: For 4" NPS, Pipe Schedules 120, 160, and XX require the smaller plug configuration.

* Larger sizes and custom configurations available upon request



WARNING:
(See page PI-12)

When Ordering Specify:

- GripSafe ST Plug Model Required
- Line Size
- Pipe Schedule
- Quantity
- Delivery Date

Scan QR code to go to GripSafe ST's webpage



IN-STOCK ITEMS
SHIP SAME DAY

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www.USAIindustries.com



INBOARD INSERTION BLOCKING (IIB) REVERSE PRESSURE 3/4" TO 24"*

RENTALS
AVAILABLE!

SAFETY & RELIABILITY

Security. With its unprecedented patented design, GripSafe ST's independent self-gripping technology virtually eliminates the risk of plug movement downstream upon installation.

Superior Self Gripping. The innovative system distributes equal loading across the gripping wedges ensuring maximum surface contact and holding capabilities. As pressure increases in front of the plug, the wedges grip tighter. Even in pipe diameters that are asymmetrical, each wedge independently adapts to variances within the pipe. GripSafe ST takes "self-gripping" to a new level.

No Pipe Damage. Unlike competitive products which rely on serrated jaws to bite into the pipe for holding purposes, GripSafe ST uses a specially designed wedge system that grips the pipe without scarring the surface. Within rated pipe pressures, GripSafe ST leaves no damage, no need for clean up, no stress risers or crevices for corrosive leak paths to form.

Non-Contaminating. GripSafe ST plugs utilize a proprietary texture on the gripping wedges that can be used on any metal type with no carbon contamination. Therefore, in contrast with other plugs, GripSafe ST requires no alternate parts for use in stainless and other alloy pipes where cross contamination is a concern.

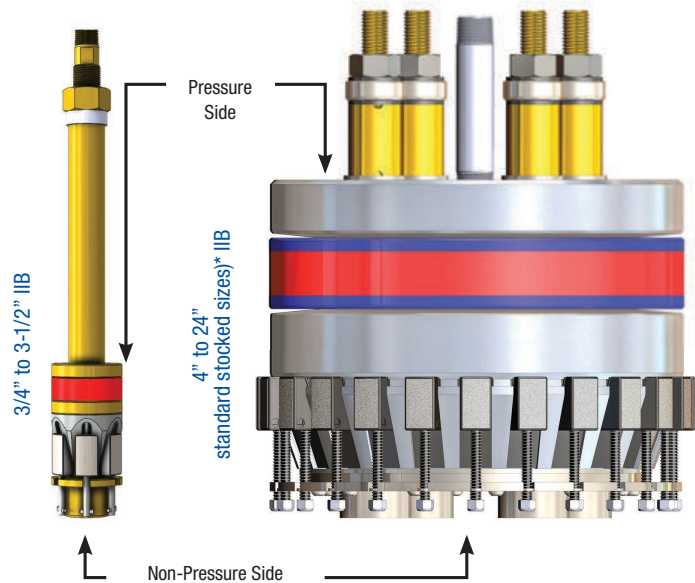
Less Weight. GripSafe ST plugs weigh less on average than competitive products. Significant weight differences exist as plug sizes increase, reaching upwards of 50% weight reductions in larger sizes without sacrificing holding capabilities.

APPLICATIONS

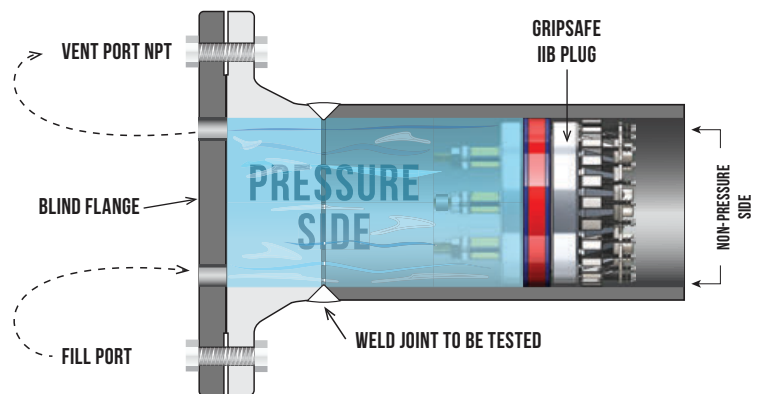
Flange Weld Testing. Used in conjunction with a ported blind flange, GripSafe ST IIB plugs stress the weld joint in longitudinal (axial), circumferential (hoop) and radial pressures identical to the stresses that would be induced when hydro-testing the entire piping system, making them superior to traditional flange test plugs (FTP) which apply hoop and radial stresses only.

Pressure Vessels. Block outlet piping in vessels to pressurize for cleaning or testing purposes.

GRIPSAFEST



* Larger sizes and custom configurations available upon request



WARNING:
(See page PI-12)

When Ordering Specify:

- GripSafe ST Plug Model Required
- Line Size
- Pipe Schedule
- Quantity
- Delivery Date

Scan QR code to go to GripSafe ST's webpage



IN-STOCK ITEMS
SHIP SAME DAY

(713) 941-3797 • Toll Free: (800) 456-8721
www.USAIndustries.com

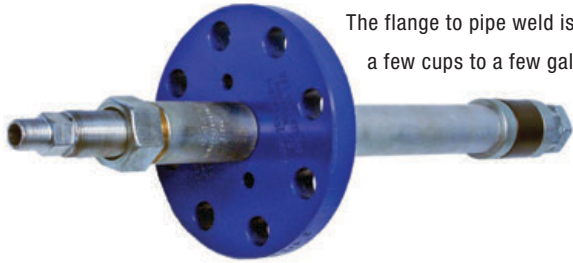


FLANGE WELD TEST PLUGS

Clear, Purge, Weld and Test With Our Superior Flange Weld Test Plugs

LARGEST RENTAL FLEET AVAILABLE

Insert the plug into the pipe to be welded, bolt the flanges together and tighten the large compression nut(s) to expand the seal — ***It's that Simple!***



The flange to pipe weld is ready to be tested. A complete test requires a minimum amount of water — from a few cups to a few gallons, depending on the line size — ***virtually eliminating your hazardous waste disposal costs.***



When Ordering Specify:

- Flange Rating
- Line Size
- Pipe Schedule
- Gasket Type
- Quantity
- Rental or Purchase
- Delivery Date

Waste disposal is reduced to just a few gallons of water at most.



- Fast, safe and easy installation and testing
- Reduces testing, downtime, and waste disposal costs
- Stocked Line Sizes from 3/4" to 24"
- Flange ratings: 150# - 2500#
- Available in Raised-Face or Ring Type Joint Flanges
- Seals — ***NEW CHEMISTRY*** — easier to seal against Pitted Pipes — color coded for line schedule
- Seal and compression ring sets are easily changed to accommodate different pipe schedules - segmented compression tube allows adjustment of seal installation depth
- Testing pressures meeting ANSI B16.5 requirements
- Rugged, heavy duty construction
- Q/A & Q/C — manufactured under our strict ISO 9001:2015 Quality Assurance Program

WARNING:

A SPECIAL WORD OF CAUTION: Pressure testing can be an extremely hazardous operation and safety precautions should be strictly adhered to.

All connections, valves, flanges and other fittings should be checked for suitability to test pressure. Verify the line ID & Plug Range match. Most importantly — Never stand or pass in front of any test plug or other enclosure while test is in progress. If plug discharges during a test, serious injury or death could occur.

**IN-STOCK ITEMS
SHIP SAME DAY**

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www.USAIndustries.com

VISA



DOUBLE BLOCK AND BLEED

SALES &
RENTALS
AVAILABLE!

**ONE PLUG,
TWO FUNCTIONS!**



Line Sizes 6" & Larger

Line Sizes 4" & Smaller



USA Industries' Double Block & Bleed plug has two separate sealing areas which enable positive isolation of your internal piping, allowing you to safely perform work. The Double Block & Bleed plugs also have a Vent between the seals which enables you to verify the seals' integrity AND can allow you to pressure test welds by positioning the weld between the two seals.

Plugs can be customized to extend further (deeper) into the pipe to meet your needs.

When Ordering Specify:

- Line Size
- Pipe Schedule
- Quantity
- Rental or Purchase
- Delivery Date

WARNING:

A SPECIAL WORD OF CAUTION: Pressure testing can be an extremely hazardous operation and safety precautions should be strictly adhered to.

All connections, valves, flanges and other fittings should be checked for suitability to test pressure. Verify the line ID & Plug Range match. Most importantly — Never stand or pass in front of any test plug or other enclosure while test is in progress. If plug discharges during a test, serious injury or death could occur.

IN-STOCK ITEMS
SHIP SAME DAY

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VISA



HEAVY DUTY INDUSTRIAL ISOLATION PLUGS

Provides Rugged, Simple and Safe Isolation

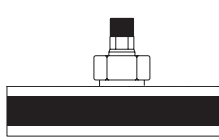
SALES & RENTALS AVAILABLE!

Our unique seals are capable of expansions exceeding 1" with minimal torque. To use, simply install into the open end of the pipe or tube and tighten the compression nut(s) to expand the seal element.

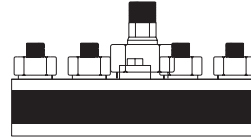
- Available in Standard, Extended Insertion, or Double Block configurations
- Heavy-Duty Construction — corrosion resistant finish — stainless steel parts available
- Maintenance free



Extended Reach



8" & Smaller



10" & Larger



Standard Isolation

When Ordering Specify:

- Line Size
- Pipe Schedule
- Quantity
- Rental or Purchase
- Delivery Date

- Manufactured under our strict ISO 9001:2015 Quality Assurance Program
- Urethane seals — **New Chemistry** — easier to seal against pitted pipes — color coded for line schedule
- Can be provided for any pipe size
- Large stock

WARNING:
(See page PI-17)

GRIP TYPE HIGH PRESSURE PLUGS

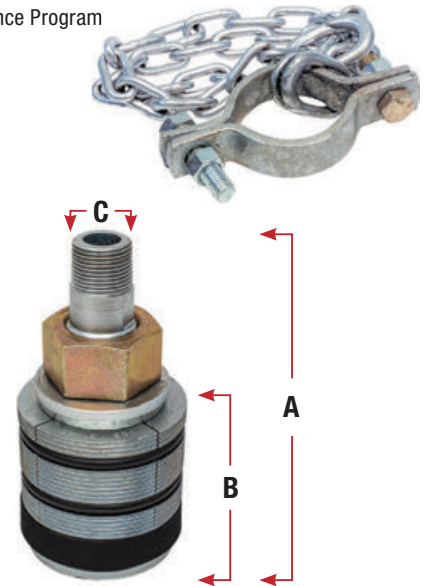
SALES & RENTALS AVAILABLE!

The test plugs are held in place by the steel grips while the neoprene seals - all by tightening one compression nut!

Provided to isolate & test sections of piping without the need for flanges! The standard plugs can be used for test pressures up to 3,000 psig, in line sizes from 1/2" to 24" and Schedules 40 or 80 pipe. Other sizes and test pressures available.

- Flangeless hydro testing of pipe
- Test pressures to 3,000 psig - 5,000 psig available for special orders
- Hardened and plated parts - inhibits corrosion
- Manufactured under our strict Quality Assurance Program

Type	Size Sch. 40&80	"A" DIM	"B" DIM	NPT MALE THREAD "C" DIM	WEIGHT	STEM HOLE SIZE	NUT SIZE
"C"	.466 to .680	3-3/4"	1-1/4"	1/8"*	5 oz.	3/16"	5/8"-18
	.700 to 1"	3-3/4"	1-1/4"	1/4"	5 oz.	1/4"	5/8"-18
"D"	1"	4"	1-1/2"	1/4"	8 oz.	1/4"	5/8"-18
	1-1/4"	4"	1-1/2"	1/4"	12 oz.	3/8"	5/8"-18
	1-1/2"	4-1/2"	1-3/4"	3/8"	1 lb.	3/8"	7/8"-14
	2"	5"	2"	1/2"	2 lb.	3/8"	1"-14
	2-1/2"	5-1/4"	2"	3/4"	4 lb.	5/8"	1-1/4"-12
	3"	5-3/4"	3"	3/4"	6 lb.	5/8"	1-1/4"-12
	4"	5-3/4"	3"	3/4"	10 lb.	3/5"	1-1/4"-12
	5"	6"	3-1/4"	3/4"	14 lb.	8/9"	1-1/4"-12
	6"	6-1/2"	3-1/2"	1"	21 lb.	8/9"	1-1/2"-12
	8"	7"	3-3/4"	1"	40 lb.	1"	1-1/2"-12
	10"	7-1/2"	3-3/4"	1"	70 lb.	1"	1-1/2"-12
	12"	8"	4"	1-1/4"	100 lb.	1"	2"-12
	14"	8"	4"	1-1/4"	132 lb.	1"	
	16"	8-1/2"	4-23/32"	1-1/4"	171 lb.	1"	
	18"	8-1/2"	4-1/2"	1-1/4"	210 lb.	1"	
	20"	9"	5"	1-1/4"	270 lb.	1"	
24"	9"	5"	1-1/4"	450 lb.	1"		



WARNING:
(See page PI-17)

CANVAS BALLOON PLUGS

When Ordering Specify:

- Line Size
- Quantity
- Rental or Purchase
- Delivery Date

Balloon Plugs are for isolating piping in line sizes from 1.5" through 66." Special plugs can be provided with flow-through vents so upstream back pressure can be vented.

Includes 2 ft hose and pressure gauge.

Custom length hose provided upon request.



WARNING:

(See note at bottom of page)

WING NUT ISOLATION PLUGS

When Ordering Specify:

- Line Size
- Pipe Schedule
- Quantity
- Rental or Purchase
- Delivery Date

Plumber's Type Plugs — These plugs use Neoprene seals with die cast bodies and are available in line up to 24". Available with or without upstream venting capabilities.



WARNING:

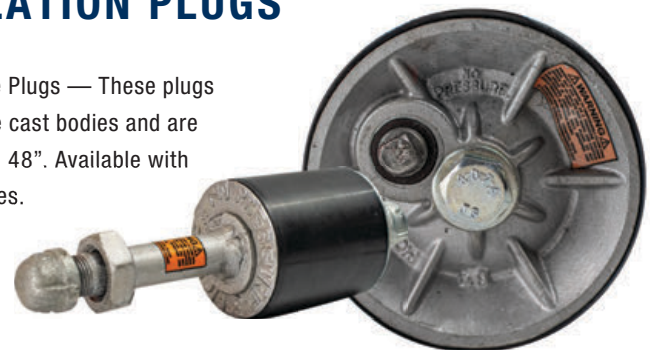
(See note at bottom of page)

"FOREMAN" ISOLATION PLUGS

When Ordering Specify:

- Line Size
- Pipe Schedule
- Quantity
- Rental or Purchase
- Delivery Date

Single bolt low pressure Isolation Type Plugs — These plugs use Neoprene seals with aluminum die cast bodies and are available in line sizes from 4" through 48". Available with or without upstream venting capabilities.



WARNING:

A SPECIAL WORD OF CAUTION: Pressure testing can be an extremely hazardous operation and safety precautions should be strictly adhered to. All connections, valves, flanges and other fittings should be checked for suitability to test pressure. Verify the line ID & Plug Range match. Most importantly — Never stand or pass in front of any test plug or other enclosure while test is in progress. If plug discharges during a test, serious injury or death could occur.

IN-STOCK ITEMS
SHIP SAME DAY

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VISA



BLEED RINGS | DRIP RINGS | VENT RINGS

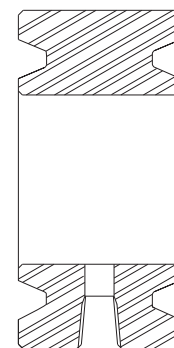
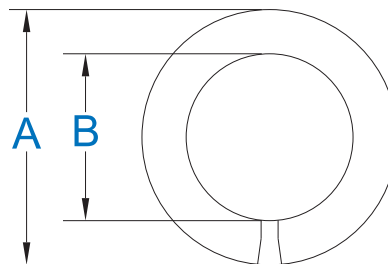


Stocked materials include 516-Gr70, A105/LF-2, 304 & 316 Stainless Steel. Available with Threaded or Socket-Weld connections and either Raised-Face (125 — 250 RMS) or Ring Type Joint — Male or Female, Oval or Octagonal - gasket types. Any other material available upon request.

Raised Face and Ring Type Joint dimensions and tolerances are manufactured meeting ASME/ANSI B16.5 and B16.20 specifications. For Ring Joints, Female oval ring grooves are standard, Male joints available. USA Industries provides one 1/2" or 3/4", threaded or socket-weld tap. Multiple taps can be provided, but must be oriented by customer. Thickness of ring may be affected if larger taps are requested.

One coat of Black Lacquer is applied to all carbon steel plate products unless specified differently.

RTJ Bleed Rings Available



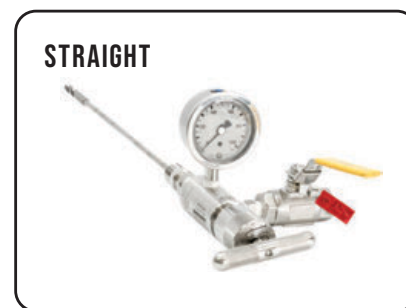
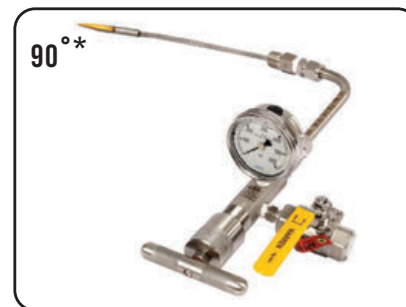
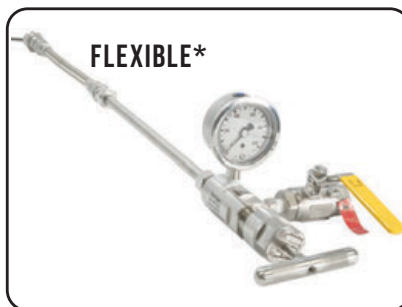
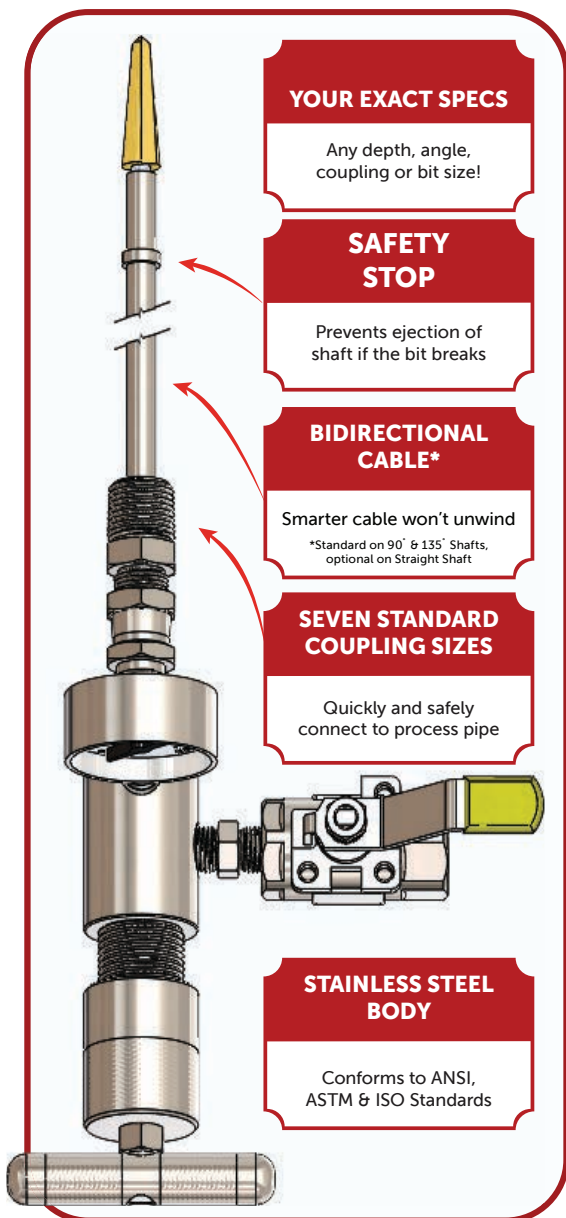
When Ordering Specify:

- Flange Rating
- Line Size
- Material
- Gasket Surface Type
- Number, Size, & Type of Bleed Holes - Threaded or Socket-Weld
- Quantity
- Delivery Date

LINE SIZE	"A" CHART DIMENSIONS FOR RAISED FACE RINGS - ALL MEASUREMENTS IN INCHES						"B"	STD THICKNESS
	150#	300#	600#	900#	1500#	2500#		
1/2	1-3/4	2	2	2-3/8	2-3/8	2-5/8	5/8	1-1/2
3/4	2-1/8	2-1/2	2-1/2	2-5/8	2-5/8	2-7/8	7/8	
1	2-1/2	2-3/4	2-3/4	3	3	3-1/4	1-1/8	
1-1/4	2-7/8	3-1/8	3-1/8	3-3/8	3-3/8	4	1-3/8	
1-1/2	3-1/4	3-5/8	3-5/8	3-3/4	3-3/4	4-1/2	1-5/8	
2	4	4-1/4	4-1/4	5-1/2	5-1/2	5-5/8	2-1/8	
2-1/2	4-3/4	5	5	6-3/8	6-3/8	6-1/2	2-5/8	
3	5-1/4	5-3/4	5-3/4	6-1/2	6-1/2	7-5/8	3-1/8	
3-1/2	6-1/4	6-3/8	6-1/4	-	-	-	3-5/8	
4	6-3/4	7	7-1/2	8	8-1/8	9-1/8	4-1/8	
6	8-5/8	9-3/4	10-3/8	11-1/4	11	12-3/8	6-1/8	
8	10-7/8	12	12-1/2	14	13-3/4	15-1/8	8-1/8	
10	13-1/4	14-1/8	15-5/8	17	17	18-3/4	10-1/8	
12	16	16-1/2	17-7/8	19-1/2	20-3/8	21-5/8	12-1/8	
14	17-5/8	19	19-1/8	20-1/4	22-1/2	-	14	

BLEEDER CLEANER

AVAILABLE IN FOUR SHAFT TYPES:



** USA Industries' Bleeder Cleaners are the only ones on the market with a bi-directional cable that will not unwind if turned counter-clockwise.*

Bleeder Cleaners (aka rod-out device, orifice tap cleaner or tap reamer) allow clogged bleed, drain, vent and instrument tap valves to be cleaned during normal operations **SAFELY** and **EFFICIENTLY** while completely containing the product. Properly using our tool eliminates the possibility of dangerous product releases which can result in your personnel and others being exposed to unsafe and hazardous conditions. Our Bleeder Cleaners are rated up to 1,000° F and 1,000 PSIG and are available in four model types. If required, can be made to hold higher pressure.

Simple to use: 1. Screw the end connector onto the item needing cleaning. 2. Close the bleed valve. 3. Open the process valve. 4. Insert the shaft while rotating the handle. 5. After the line has been fully cleared, back out the shaft. 6. Close the process valve. 7. Open the bleed valve and disconnect the tool... **SAFELY CLEANED LINE!**

When Ordering Specify:

- Length of Shaft (standard length is 14")
- Shaft Type (Straight, 90, 135 or Flexible shaft)
- Drill Bit Size
- Coupling Size
- Quantity
- Delivery Date

Available Bit Types

Everlast Drill Bit



Twist Drill Bit



All components supplied conform to ANSI, ASME, ASTM Standards for Dimensions. Manufactured under our ISO 9001:2015 Quality Assurance Program.

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BEVELING MACHINES

SALES &
RENTALS
AVAILABLE!

USA MINI

The USA MINI machine is a lightweight yet powerful pipe beveller. A favorite in areas such as power station and Petrochemical plant shut-down work, due to its ease of set-up and speed of operation. This unit is available with the unique “auto-lock” function, to set the jaws, just flip the switch — it’s that simple!

Range: .78” — 1.65” ID Standard (reduced shaft option from .49’ to .82” ID)

Functions: Weld Removal, Beveling, Facing, Counter-boring, Tube or Pipe Prep

Materials: Any kind of steel

Power: Pneumatic or Electric

Available Bits for Internal and External Beveling (37¹/₂°) or Flat Facing.

Others available upon request.



USA BOILER 1” - 4”

A very popular versatile machine that is robust and extremely powerful. Used in many industries, but commonly found in tough Petrochemical plant environments. Electric version available or a conversion kit easily changes pneumatic to electric.

Range: 0.9” - 4.25” ID

Functions: Weld Removal, Beveling, Facing, Counter-boring, Tube or Pipe Prep

Materials: Any kind of steel

Power: Pneumatic or Electric

Available Bits for Internal and External Beveling (37¹/₂°) or Flat Facing.

Others available upon request.



USA SUPERBOILER T5

A powerful machine able to produce fast accurate weld preps on any schedule and material of pipe effortlessly. Optional extras include, flange facing attachment.

Range: 2” - 8” ID

Functions: Weld Removal, Beveling, Facing, Counter-boring, Pipe Prep

Materials: Any kind of steel

Power: Pneumatic or Electric

Available Bits for Internal and External Beveling (37¹/₂°) or Flat Facing.

Others available upon request.



All units are supplied with all gripping segments to cover the full range of the machine as well as service tools, drawings, instruction manual and warranty certificate. Each machine is supplied with a protective metal carrying case.



USA Industries PIPE SCHEDULE CHART

Pipe Size	OD	ID	Schedules	Wall	Est Wt LBS per Ft	Pipe Size	OD	ID	Schedules	Wall	Est Wt LBS per Ft	Pipe Size	OD	ID	Schedules	Wall	Est Wt LBS per Ft				
1/8"	.405	.307	10, 10S	.049	.1863	4 1/2"	5.000	4.506	STD, 40S	.247	12.54	16"	16.000	15.624	10S	.188	31.75				
		.269	40, STD, 40S	.068	.2447			4.290	XS, 80S	.355	17.61			15.500	10	.250	42.05				
		.215	80, XS, 80S	.095	.3145			5.295	10, 10S	.134	7.770			15.375	20	.312	52.27				
1/4"	.540	.410	10, 10S	.065	.3297	5"	5.563	5.047	40, STD, 40S	.258	14.62			15.250	30, STD, 40S	.375	.6258	15.000	40, XS, 80S	.500	82.77
		.364	40, STD, 40S	.088	.4248			4.813	80, XS, 80S	.375	20.78			14.688	60	.656	107.5				
		.302	80, XS, 80S	.119	.5351			4.563	120	.500	27.04			14.314	80	.844	136.6				
3/8"	.675	.545	10, 10S	.065	.4235	6"	6.625	4.313	160	.625	32.96			13.938	100	1.031	164.8	13.564	120	1.22	192.4
		.493	40, STD, 40S	.091	.5676			4.063	XX	.750	38.55			13.124	140	1.438	223.6				
		.423	80, XS, 80S	.126	.7388			6.357	10, 10S	.134	9.290			12.814	160	1.594	245.3				
1/2"	.840	.674	10, 10S	.083	.6710	8"	8.625	6.065	40, STD, 40S	.280	18.97			17.624	10S	.188	35.76	17.500	10	.250	47.99
		.622	40, STD, 40S	.109	.8510			5.761	80, XS, 80S	.432	28.57			17.375	20	.312	58.94				
		.546	80, XS, 80S	.147	1.088			5.501	120	.562	35.39			17.250	STD, 40S	.375	70.59				
3/4"	1.050	.466	160	.187	1.304	10"	10.750	4.897	XX	.864	53.16	17.124	30	.438	82.15	17.000	XS, 80S	.500	93.45		
		.252	XX	.294	1.714			8.329	10, 10S	.148	13.40	16.876	40	.562	104.7						
		.884	10, 10S	.083	.8572			8.125	20	.250	22.36	16.500	60	.750	138.2						
1"	1.315	.824	40, STD, 40S	.113	1.131	12"	12.750	8.071	30	.277	24.70	16.126	80	.938	170.9	16.064	160	1.969	379.20		
		.742	80, XS, 80S	.154	1.474			7.981	40, STD, 40S	.322	28.55	15.688	100	1.156	208.00						
		.614	160	.218	1.937			7.813	60	.406	35.64	15.250	120	1.38	244.10						
1 1/4"	1.660	.434	XX	.308	2.441	14"	14.000	7.625	80, XS, 80S	.500	43.39	14.876	140	1.562	274.20	14.725	STD, 40S	.375	78.6		
		1.097	10, 10S	.109	1.404			7.439	100	.594	50.95	14.624	10S	.218	48.05						
		1.049	40, STD, 40S	.133	1.679			7.189	120	.719	61.71	19.500	10	.250	52.73						
1 1/2"	1.900	.957	80, XS, 80S	.179	2.172	16"	16.000	10.250	20	.250	28.04	19.250	20, STD, 40S	.375	78.6	19.000	30, XS, 80S	.500	104.10		
		.815	160	.250	2.844			10.136	30	.307	34.24	18.812	40	.594	123.10						
		.599	XX	.358	3.659			10.020	40, STD, 40S	.365	40.48	18.376	60	.812	155.40						
2"	2.375	1.442	10, 10S	.109	1.806	18"	18.000	9.750	60, XS, 80S	.500	54.74	18.126	80	1.031	208.90	17.938	80	1.031	208.90		
		1.380	40, STD, 40S	.140	2.273			9.564	80	.594	64.43	17.438	100	1.281	256.10						
		1.278	80, XS, 80S	.191	2.997			9.314	100	.719	77.03	17.000	120	1.500	296.40						
2 1/2"	2.875	1.160	160	.250	3.765	20"	20.000	8.750	140, XX	1.000	104.1	16.500	140	1.750	341.10	16.064	160	1.969	379.20		
		.896	XX	.382	5.214			8.500	160	1.125	115.6	16.064	160	1.969	379.20						
		1.682	10, 10S	.109	2.085			12.390	10, 10S	.180	24.16	23.500	10, 10S	.250	63.41						
3"	3.500	2.067	40, STD, 40S	.154	3.853	24"	24.000	12.250	20	.250	33.38	23.250	20, STD, 40S	.375	96.42	23.000	XS, 80S	.500	125.50		
		1.939	80, XS, 80S	.218	5.022			12.090	30	.330	43.77	22.876	30	.562	140.70						
		1.689	160	.344	7.462			12.000	STD, 40S	.375	49.56	22.626	40	.688	171.30						
3 1/2"	4.000	1.503	XX	.436	9.029	30"	30.000	11.938	40	.406	53.52	22.064	60	.969	238.40	21.564	80	1.219	296.80		
		2.635	10, 10S	.120	3.531			11.750	XS, 80S	.500	65.42	22.064	60	.969	238.40						
		2.469	40, STD, 40S	.203	5.793			11.626	60	.562	73.15	20.938	100	1.531	357.40						
4"	4.500	2.323	80, XS, 80S	.276	7.651	36"	36.000	11.376	80	.688	88.63	20.376	120	1.812	429.40	20.376	120	1.812	429.40		
		2.125	160	.375	10.01			11.064	100	.844	107.9	19.876	140	2.062	483.10						
		1.771	XX	.552	13.70			10.750	120, XX	1.000	125.5	19.314	160	2.344	542.10						
4 1/2"	5.000	3.260	10, 10S	.120	4.332	48"	48.000	10.500	140	1.125	136.7	29.376	10, 10S	.312	98.93	29.250	STD, 40S	.375	118.65		
		3.068	40, STD, 40S	.216	7.576			10.126	160	1.312	150.3	29.000	20, XS, 80S	.500	157.53						
		2.900	80, XS, 80S	.300	10.25			13.624	10S	.188	27.73	28.750	30	.625	196.06						
5"	5.563	2.624	160	.438	14.32	5"	5.563	13.500	10	.250	36.71	35.376	10	.312	118.92	35.250	STD, 40S	.375	142.68		
		2.300	XX	.600	18.58			13.375	20	.312	45.61	35.000	XS, 80S	.500	157.57						
		3.760	10, 10S	.120	4.937			13.250	30, STD, 40S	.375	54.57	34.750	30	.625	235.13						
6"	6.625	3.548	40, STD, 40S	.226	9.109	6"	6.625	13.124	40	.438	63.44	47.250	STD, 40S	.375	190.74	47.000	XS, 80S	.500	253.65		
		3.364	80, XS, 80S	.318	12.51			13.000	XS, 80S	.500	72.09										
		2.728	XX	.636	22.85			12.814	60	.594	85.05										
7"	7.315	4.260	10, 10S	.120	5.613	7"	7.315	12.500	80	.750	106.1										
		4.026	40, STD, 40S	.237	10.790			12.124	100	.938	130.9										
		3.826	80, XS, 80S	.337	14.98			11.814	120	1.09	150.8										
8"	8.625	3.624	120	.438	19	8"	8.625	11.500	140	1.250	170.2										
		3.438	160	.531	22.51			11.188	160	1.406	189.1										
		3.152	XX	.674	27.54																

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days of the year availability!



ORIFICE PLATES

We specialize in Orifice Plates

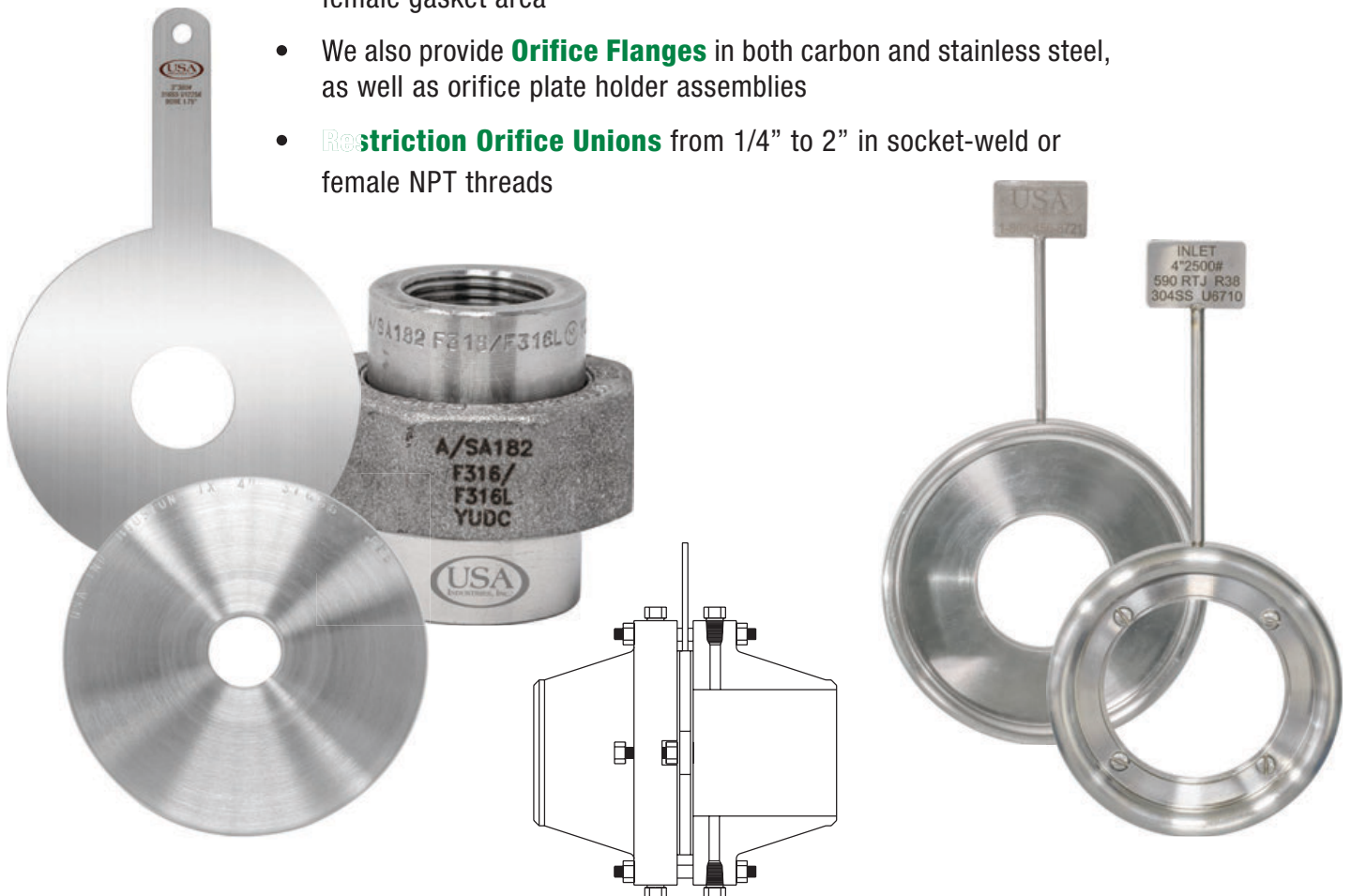
ANY SIZE - ANY MATERIAL - ANY THICKNESS

USA Industries manufactures each plate to meet or exceed *A.G.A., I.S.A., A.N.S.I., A.S.M.E.* and *A.P.I.* standards and recommendations.

Stocked plates include 304 & 316 stainless steel in 1/8" and 1/4" thicknesses. Other materials and / or thicknesses are available upon request.

We typically bore plates to the customer's supplied sizing calculation, however, for an additional fee we can provide sizing calculation services to you.

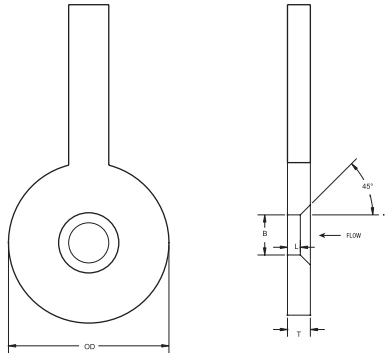
- **Series 500 Universal Plates** - for orifice fittings
- **Series 520 Paddle Plates** - for raised face flanges
- **Series 560 & 590 Plates** - Ring Type Joint Plates with male or female gasket area
- We also provide **Orifice Flanges** in both carbon and stainless steel, as well as orifice plate holder assemblies
- **Restriction Orifice Unions** from 1/4" to 2" in socket-weld or female NPT threads



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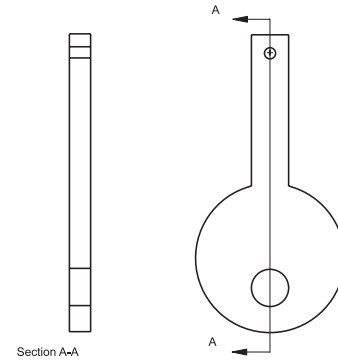
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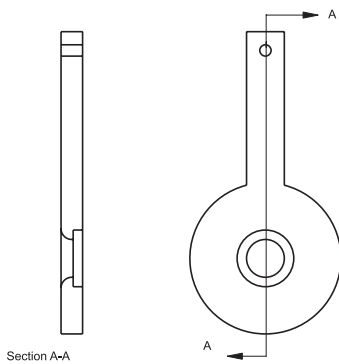
*Concentric Bore

Used primarily for clean liquids, gases, or vapors that are relatively non-viscous. When necessary, a bevel is machined at a 45 degree angle to attain the proper edge thickness. Accuracy range at +.6% for beta ratio between 0.2 to 0.75.



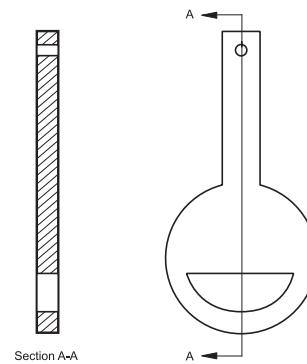
Eccentric Bore

Primarily used for measurement of entrained solids or slurries of vapors and gases where condensation is present. The eccentric bore is offset so where the bore edge is inscribed in a circle that is 98% of line I.D. Accuracy range at +1.5% to +2% for beta ratio between 0.3 to 0.75.



Quadrant Bore

This type of orifice bore is used primarily in the measurement of high viscosity flow, such as heavy crude, syrups, and slurries. The radius on the inlet side is equal to the plate thickness. The quadrant is always recommended where the Reynolds number factor is less than 100,000. Accuracy range is +2% for beta ratio between 0.24 to 0.6.



Segmental Bore

The segmental bore is located in the same way that the eccentric bore is. These bores are used primarily for slurries or extremely dirty gases where the flow may contain impurities heavier than fluid. Accuracy range at +2% for beta ratio between 0.35 to 0.75.

**Plate Bevel determined per Instrument Engineers Handbook, Edition 3: Bela Lipták. All plates thicker than 1/8" should be beveled 45 degrees on the downstream side to a 1/8" edge thickness. Any orifice bore less than 1" to be beveled to 1/16" if plate thickness is 1/8".*

Orifice Plate Installation

1. Install orifice plate and new gaskets between flanges.
2. Release the flanges by turning the two jack bolts counterclockwise.
3. Replace studs and tighten to spec.

Orifice Plate Removal

1. Loosen all studs and remove the top half of the studs.
2. Spread flanges apart by turning the jack bolts clockwise.
3. Remove orifice plate for inspection or replacement.

When Installing Orifice Plates

1. Orifice Bore must be centered within 3% of inside pipe diameter.

Note: Writing on the Orifice Plate

ALWAYS faces upstream

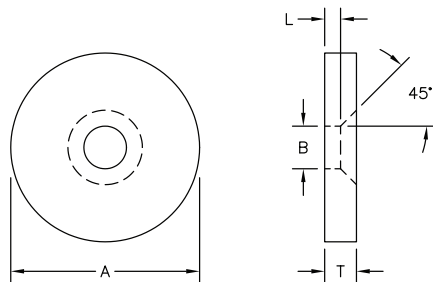
2. Inside diameter of gaskets must not protrude beyond inside surface of pipe.*
3. Tighten flange bolts evenly to prevent plate buckling.

*Gaskets should be replaced at each orifice plate inspection.

SERIES 500 UNIVERSAL ORIFICE PLATES

Universal Orifice Plates are Manufactured for use in ALL standard orifice fitting assemblies or Ring Type Joint plate holders. Each plate is carefully manufactured to meet or exceed standards set by *A.G.A., I.S.A., A.N.S.I, A.S.M.E. & A.P.I.* recommendations. Stocked in 304 & 316 stainless steel and available in any material requested, such as monel, hastelloy, copper-nickel, etc. Coatings can also be provided.

Nominal Pipe Size (in.)	"A" (in.)	"L" (in.)	"T" (in.)
1	1.312	0.02	0.125
1.5	2	0.03	0.125
2	2.437	0.03	0.125
2.5	2.812	0.03	0.125
3	3.437	0.03	0.125
4	4.406	0.06	0.125
5	6	0.06	0.125
6	6.437	0.06	0.125
8	8.437	0.125	0.25
10	10.687	0.125	0.25
12	12.593	0.25	0.25
14	14	0.25	0.25
16	16	0.25	0.375
18	18	0.25	0.375
20	20	0.375	0.375
24	24	0.375	0.375



Notes:
Dimension "A" does not include seal ring.
L = Thickness for Restriction Applications



We offer Hycar® and Teflon® seal rings / o-rings that fit our universal orifice plates. Request with your next order to have them shipped together.

- When Ordering Specify:**
- Line Size
 - Seal Type (Hycar® or Teflon®)
 - Plate Thickness
 - Bore Size
 - Bevel / No Bevel
 - Material
 - Quantity
 - Delivery Date

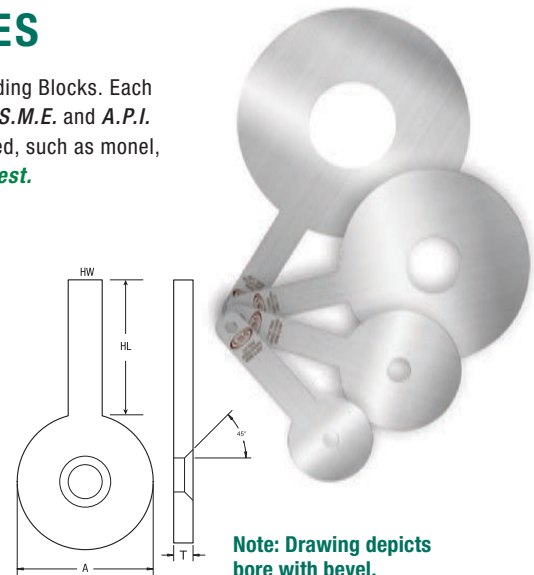
Hycar® is a registered Trademark of Lubrizol Advanced Materials. Teflon® is a registered Trademark of DuPont.

SERIES 520 PADDLE-TYPE PLATES

Paddle-Type orifice plates are manufactured for use with Raised Face Orifice Flanges and Holding Blocks. Each plate is carefully manufactured to meet or exceed standards set by *A.G.A., I.S.A., A.N.S.I, A.S.M.E. and A.P.I.* recommendations. Stocked in 304 & 316 stainless steel and available in any material requested, such as monel, hastelloy, copper-nickel, etc. Coatings can also be provided. **Vent or drain available on request.**

Line Size (in.)	Flange Rating A							HL (in.)	HW (in.)	T (in.)
	150#	300#	400#	600#	900#	1500#	2500#			
0.5	1.875	2.125	2.125	2.125	2.5	2.5	2.75	4	1	.125
0.75	2.25	2.625	2.625	2.625	2.75	2.75	3			
1	2.625	2.875	2.875	2.875	3.125	3.125	3.375			
1.25	3	3.25	3.25	3.25	3.5	3.5	4.125			
1.5	3.375	3.75	3.75	3.75	3.875	3.875	4.625			
2	4.125	4.375	4.375	4.375	5.625	5.625	5.75			
2.5	4.875	5.125	5.125	5.125	6.5	6.5	6.625			
3	5.375	5.875	5.875	5.875	6.625	6.875	7.75			
4	6.875	7.125	7	7.625	8.125	8.25	9.25			
5	7.75	8.5	8.375	9.5	9.75	10	11			
6	8.75	9.875	9.75	10.5	11.375	11.125	12.125			
8	11	12.125	12	12.625	14.125	13.875	15.25			
10	13.375	14.125	14.125	15.75	17.125	17.125	18.75			
12	16.125	16.625	16.5	18	19.625	20.5	21.625			
14	17.75	19.125	19	19.375	20.5	22.75	-			
16	20.25	21.25	21.125	22.25	22.625	25.25	-			
18	21.5	23.375	23.25	24	25	27.625	-			
20	23.75	25.625	25.375	26.75	27.375	29.625	-			
22	26	27.75	27.5	28.875	-	-	-			
24	28.125	30.735	30.125	31	32.875	35.5	-			
30	34.625	37.375	37.25	38.125	-	-	-			
36	41.125	43.875	43.875	44.375	-	-	-			

All dimensions are in inches. Additional sizes Available.



Note: Drawing depicts bore with bevel.

- When Ordering Specify:**
- Line Size
 - Plate Thickness
 - Bore Size
 - Bevel / No Bevel
 - Material
 - Quantity
 - Delivery Date

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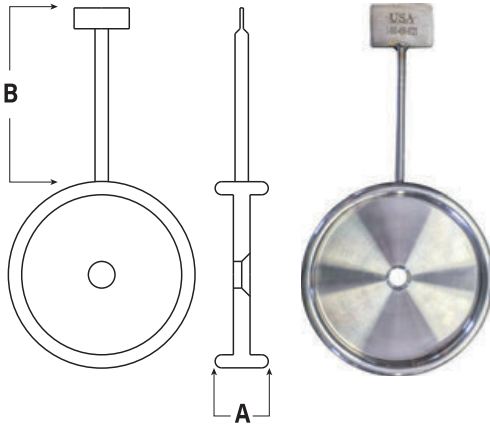
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RING TYPE JOINT PLATES

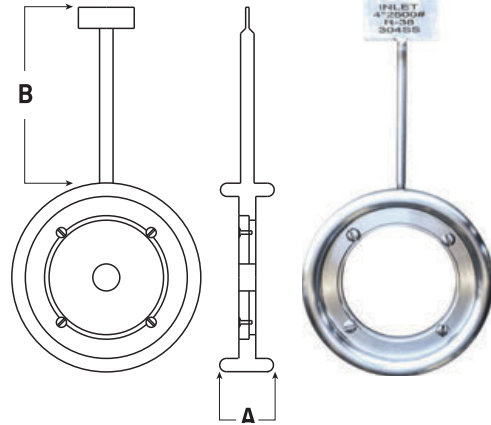
Choose from Either Style of Plate to Suit your Particular Needs.

SERIES 560



Series 560 plates are of a one-piece construction. Manufactured in any material requested such as 304 or 316 SS, monel, hastelloy, copper-nickel, etc.

SERIES 590



Series 590 plates are manufactured with hold-down screws and use Universal plates for the orifice bore. The 590 Series should be used where frequent replacement or sizing changes are expected. Manufactured in any material requested such as 304 or 316 SS, monel, hastelloy, copper-nickel, etc.

When Ordering Specify:

- Line Size
- Plate Thickness
- Flange Rating
- Material
- Quantity
- Delivery Date

When Ordering Specify:

- Line Size
- Flange Rating
- API Rating
- Material
- Quantity
- Delivery Date

If Needed:

- Series 500 plate thickness
- Bore Size
- Quantity

Note: 560 Plate Holders 2" - 8" have a standard plate thickness of 1/4"

Line Size (in.)	FLANGE RATING													
	300# - 600#			900#			1500#			2500#				
	RING SIZE	A	B	RING SIZE	A	B	RING SIZE	A	B	RING SIZE	A	B		
1/2	R-11	29/32	4-1/4	R-12	1	4-1/4	R-12	1	6-1/2	R-13	1	6-1/2		
3/4	R-13	1		R-14			R-14			R-16			R-16	R-18
1	R-16			R-20			R-20			R-23			R-23	R-26
1-1/2	R-20			R-24			R-24			R-26			R-26	R-28
2	R-23	1-1/16	5-1/4	R-27	1-1/16	5-1/4	R-27	1-1/16	6-1/2	R-28	1-1/16	6-1/2		
2-1/2	R-26			R-31			R-31			R-32			R-32	
3	R-31			-			-			R-38			R-38	
3-1/2	R-34			R-37			R-37			R-42			R-42	
4	R-37	1-1/16	6-1/4	R-41	1-1/16	6-1/4	R-44	1-3/16	6-1/2	R-47	1-7/16	7-1/2		
5	R-41			R-45			R-45			R-51			R-51	
6	R-45			R-49			R-49			R-55			R-55	
8	R-49			R-53			R-53			R-60			R-60	
10	R-53	1-3/16	7-1/2	R-57	1-3/16	7-1/2	R-54	1-7/16	7-1/2	R-55	2	8-1/2		
12	R-57			R-58			R-58			R-60			R-60	
14	R-61			R-62			R-62			-			-	
16	R-65			R-66			R-66			-			-	
18	R-69	1-1/4	7-1/2	R-70	1-9/16	7-1/2	R-67	2	9-1/2	-	-	-		
20	R-73			R-74			R-74			-			-	
24	R-77			R-78			R-78			-			-	

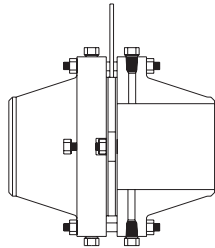
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FLANGES & HOLDING BLOCKS

ORIFICE FLANGES

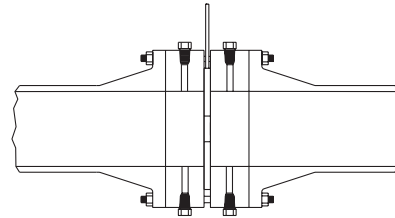


Available in carbon or stainless steel and manufactured to meet *A.G.A.*, *A.P.I.*, *A.S.M.E.*, *I.S.A.* standards. In addition, available for all flange ratings and line sizes.

When Ordering Specify:

- Line Size
- Pipe Schedule
- Gasket Type
- Flange Rating
- Material
- Quantity
- Delivery Date

ORIFICE HOLDING BLOCKS



Meets *A.G.A./A.S.M.E./I.S.A.* flange tap location requirements. Available in 150# *A.N.S.I.* rating in all line sizes, ideal for "lined piping" in caustic service. More economical than using orifice flanges in particular applications. Available in carbon, stainless steel, monel, brass, nickel as well as many other alloys. Coated with Teflon® or Kynar®.

	NOMINAL PIPE SIZE	DIAMETER OF FLANGE	MIN FLANGE THICKNESS	DIAMETER OF RAISED FACE	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	DIAMETER BOLT CIRCLE	# OF HOLES	SIZE OF HOLES	SIZE & LENGTH OF STUDS	SIZE & LENGTH OF JACK SCREW	APPROX WT PER UNION (LBS)
	SIZE	0	T	R	L	P	BC	#□	□	S	J	W
CLASS 300, DIMENSIONAL DATA (in.)	*0.5	3.75	1.5	1.38	3	0.12	2.62	4	0.56	0.5 X 4.75	0.5 X 3	10
	*0.75	4.62	1.5	1.69	3.12	0.12	3.25	4	0.69	0.625 X 5	0.5 X 3	11
	1	4.88	1.5	2	3.25	0.25	3.5	4	0.69	0.625 X 5	0.625 X 3	18
	*1.25	5.25	1.5	2.5	3.31	0.25	3.88	4	0.69	0.625 X 5	0.625 X 3	21
	1.5	6.12	1.5	2.88	3.38	0.25	4.5	4	0.81	0.75 X 5.25	0.625 X 3	28
	2	6.5	1.5	3.62	3.38	0.25	5	8	0.69	0.625 X 5	0.625 X 3	33
	2.5	7.5	1.5	4.12	3.5	0.25	5.88	8	0.81	0.75 X 5.25	0.625 X 3	43
	3	8.25	1.5	5	3.5	0.375	6.62	8	0.81	0.75 X 5.25	0.75 X 3	48
	4	10	1.5	6.19	3.62	0.5	7.88	8	0.81	0.75 X 5.25	0.75 X 3	68
	6	12.5	1.5	8.5	3.94	0.5	10.62	12	0.88	0.75 X 5.25	0.75 X 3	100
	8	15	1.62	10.62	4.38	0.5	13	12	1	0.875 X 5.75	0.75 X 3	155
	10	17.5	1.88	12.75	4.62	0.5	15.25	16	1.12	1 X 6.5	1 X 4.5	220
	12	20.5	2	15	5.12	0.5	17.75	16	1.25	1.125 X 7	1 X 4.5	330
	14	23	2.12	16.25	5.62	0.5	20.25	20	1.25	1.125 X 7.25	1 X 4.5	425
	16	25.5	2.25	18.5	5.75	0.5	22.25	20	1.38	1.25 X 7.75	1 X 4.5	590
	18	28	2.38	21	6.25	0.5	24.75	24	1.38	1.25 X 8	1 X 4.5	750
	20	30.5	2.5	23	6.38	0.5	27	24	1.38	1.25 X 8.5	1 X 4.5	910
	22	33	2.69	25.25	6.5	0.5	29.25	24	1.62	1.5 X 9.25	1 X 5.5	1125
24	36	2.75	27.25	6.62	0.5	32	24	1.62	1.5 X 9.5	1 X 5.5	1350	
36	50	4.18	40.25	9.5	0.5	46	32	2.12	2 X 13.25	1 X 6.5	3200	
CLASS 600, DIMENSIONAL DATA (in.)	1	4.88	1.5	2	3.25	0.25	3.5	4	0.75	0.625 X 5	0.625 X 3	19
	1.5	6.12	1.5	2.88	3.375	0.25	4.5	4	0.875	0.75 X 5.25	0.625 X 3	23
	2	6.5	1.5	3.625	3.375	0.25	5	8	0.75	0.625 X 5	0.625 X 3	25
	2.5	7.5	1.5	4.125	3.5	0.25	5.875	8	0.875	0.75 X 5.25	0.625 X 3	33
	3	8.25	1.5	5	3.5	0.375	6.625	8	0.875	0.75 X 5.25	0.75 X 3	45
	4	10.75	1.5	6.19	4	0.5	8.5	8	1	0.875 X 6	0.75 X 4	97
	6	14	1.88	8.5	4.62	0.5	11.5	12	1.12	1 X 7	0.75 X 4	195
	8	16.5	2.19	10.62	5.25	0.5	13.75	12	1.25	1.125 X 7.75	0.75 X 4.5	285
	10	20	2.5	12.75	6	0.5	17	16	1.38	1.25 X 8.75	1 X 5.5	450
	12	22	2.62	15	6.12	0.5	19.25	20	1.38	1.25 X 9	1 X 5.5	540
	14	23.75	2.75	16.25	6.5	0.5	20.75	20	1.5	1.375 X 9.5	1 X 4.5	820
	16	27	3	18.5	7	0.5	23.75	20	1.625	1.5 X 10.25	1 X 5.5	1110
	18	29.25	3.25	21	7.25	0.5	25.75	20	1.75	1.625 X 11	1 X 5.5	1305
	20	32	3.5	23	7.5	0.5	28.5	24	1.75	1.625 X 11.75	1 X 5.5	1624
24	37	4	27.25	8	0.5	33	24	2	1.875 X 13.25	1 X 6.5	2322	

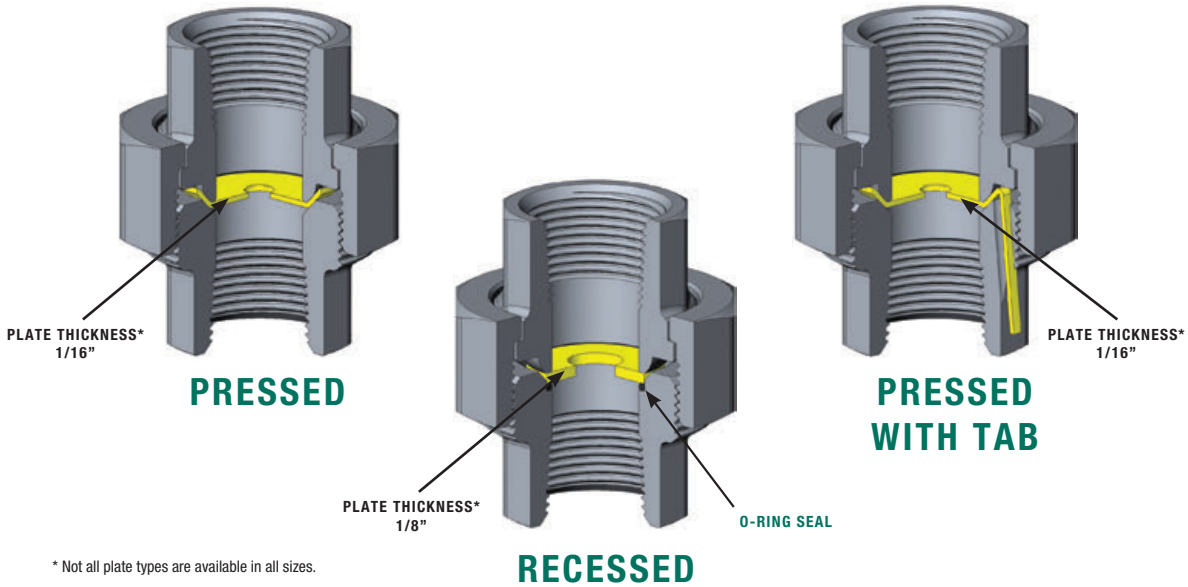
If requested, each orifice flange assembly comes complete with (2) Jackscrews & (2) 1/2" Plugs

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RESTRICTION ORIFICE UNIONS



* Not all plate types are available in all sizes.

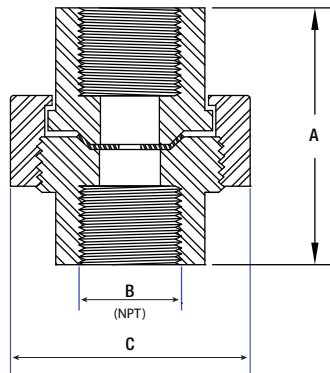


Carbon & stainless steel bodies stocked in pressure ratings of 3,000 psig. Available in line sizes from 1/4" through 2" in both female NPT and Socket-Weld connections. Other sizes and materials available.

Orifices bored to your specifications. All plates are stainless steel and can be ordered separately.

- Available with or without tabbed plate
- Female NPT or Socket-weld Connections
- From 1/4" through 2"
- All recessed plates sealed with a Rubber O-Ring
- Pressed plates are metal to metal sealing

Line Size (in.)	A OAL (in.)	B NPT or SW (in.)	C Hex Size (in.)
1/4	1-3/4	1/4	1-3/8
3/8	1-7/8	3/8	1-5/8
1/2	2	1/2	1-3/4
3/4	2-1/4	3/4	2-3/16
1	2-9/16	1	2-9/16
1-1/4	2-7/8	1-1/4	3-1/6
1-1/2	3-1/8	1-1/2	3-7/16
2	3-1/2	2	4



When Ordering Specify:

- Line Size
- NPT Thread Size OR Socket Weld Connection
- Plate Type - Recessed (1), Pressed (2), or Pressed with Tab (3)
- Material
- Orifice Bore
- Quantity
- Delivery Date



USA Industries has been manufacturing Heat Exchanger Tools & Tooling in Houston, TX, since 1982. **We are the largest manufacturer of heat exchanger tools & tooling in the Southern United States** with a huge inventory of stocked items.

Our products are used to **“build, repair, replace, test, clean or plug”** heat exchangers, condensers, boilers and air-cooled exchangers.

We take pride in both the quality of our products and our customer service. Since most of our clientele operate 24/7, we do also, and can typically ship within 2 hours of a phone call on stocked items.

In addition to the items we sell, we can assist you in keeping your overhead costs down with our large rental fleet. Please see our **RENTAL AVAILABLE** symbol throughout the catalog or call USA Industries’ Rental Department for more information.

This section includes:

EXPANDERS



Pages HE-35 — HE-50

INSTALLATION TOOLS



Pages HE-52 — HE-61

TESTING EQUIPMENT



Pages HE-62 — HE-65

REMOVAL TOOLS



Pages HE-66 — HE-76

CLEANING EQUIPMENT



Pages HE77 — HE-82

TUBE & HEADER PLUGS



Tube Plug Section 4

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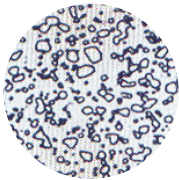


HEAT EXCHANGER, CONDENSER AND BOILER TOOLS

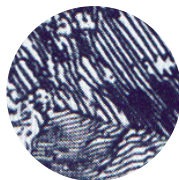
Whether rolling 1/4" copper tube or 5" boiler tubes, we have a complete line to suit your every need.

Improvements in the design and manufacture of our tube expanders have been implemented recently.

The expanders we offer provide the greatest value with exceptional tool life at competitive pricing. Quality tool steel is used to manufacture the Mandrels and Roll Sets, heat treated, then cryogenically processed to impart a superior and unmatched durability to enhance the expander's life.



Before



After

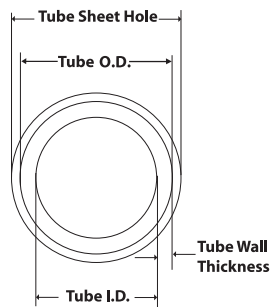
State of the art cryogenic and heat treatment processes, unmatched by any other manufacturer, make our Mandrels and Roll Sets the strongest available.

CRYOGENIC process - the best treatment ever for tool steels. This is a deep chilling treatment for a prolonged period of time, which makes the alloy carbides in steel precipitate, leaving a very tough matrix of martensite. Increased toughness guarantees resilience to abnormal shocks, while fine precipitates of carbide reduce wear. Research shows up to a 2X increase in life of the tool.

HEAT EXCHANGER, CONDENSER AND BOILER EXPANDERS

TUBE EXPANDERS - *Tube Expanding Basics*

Tube Expanding is the art of reducing a tube wall by compressing the O.D. of the tube against a tube sheet or boiler drums. To assure a proper seal, the tube wall must be reduced by a predetermined percentage. For correct Tube Wall Reduction, see the following chart.



TUBE WALL REDUCTION SET-UP GUIDE

Step A	Measure Tube Sheet Hole	
Step B	Measure Tube OD	
Step C	Calculate Clearance (A-B)	
Step D	Measure Tube ID	
Step E	Calculate Total Tube Wall Thickness (B-D)	
Step F	Calculate 7% Wall Reduction (.07 X E)	
Step G	Calculate Finished Rolled Tube ID (C+D+F)	

Note: Example is for a 7% tube reduction

Some important factors to consider when rolling certain alloys: When rolling 3003 or 4004 Aluminum you should not reduce the walls over 5%. When rolling 6061-T Aluminum, you can reduce the wall 10% to 12%.

Admiralty Brass - Tube Wall Reduction is approximately 7-8% and should be well lubricated. Reduction in excess of 15% may cause leaking, splits or flaked tubes.

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Carbon Steel

Tube wall reduction should be approximately 4% to 5%, use a lot of lubrication. It is possible to roll tubes up to 150 Brinell (90 - 120 optimal hardness) with flaking and cracking more likely to occur as the tube hardness increases.

Copper and Cupro Nickel

Approximately 8% - 10% wall reduction. Copper is easily rolled; however, use plenty of lubrication as it has an abrasive action on tube expanders.

Stainless Steel and Titanium

Approximately 7% to 8% wall reduction in a serrated hole using 4 or 5 Roll Expanders. When rolling these alloys, the entire wall reduction should be done quickly as materials have a greater tendency to work harden.

Major Causes of Tube Leaks

Tube joint leakage is usually caused by under-rolling, over-rolling or improper preparation of tube sheets. It is very important to have a clean tube sheet.

Under-Rolling

Not enough wall reduction (the tube is not expanded to fill the tube sheet hole). However, it is better to under-roll than to over-roll.

Over-Rolling

Too much wall reduction. Over-rolling can do considerable damage to a vessel and causes distortion of tube sheet ligaments and decreases the strength of adjacent tubes, creating premature leaks.

Improper Preparation of Tube Holes

The smoother the tube sheet, the easier it is to roll an optimum tube joint. The ligaments and light tube walls make it more important that the finish of the tube hole be in the low micro finish range. Reaming and sizing or burnishing is recommended to get the micro finish desired for tube holes.

Preparation of Tube Holes

Preparation of tube holes in heat exchangers and condensers is as follows:

1. Drill and ream tube sheet holes to .006" to .010" over the outside diameter of the tube to be used:
5/8" = .006
3/4" = .008
1" = .010
2. Be certain the ligaments are sufficient to guarantee a safe and permanent tube joint.
3. When conditions permit, utilize a sizing or burnishing tool to further assure a high quality finish in the tube hole. This will also increase the tensile strength of the ligament.
4. The serrations (grooves) to be used will determine the holding power of the tube.
5. It is extremely important when re-tubing that the grooves be clean.

Quality, Care, Maintenance and Storage of Tube Expanders

Quality

USA Industries' tube expanders are made of special alloy tool steels carefully heat treated to withstand severe operating forces. These tools are produced by a highly skilled workforce using the latest machinery and state-of-the-art manufacturing technology.

Care

Tube expanders are precision made tools. After rolling several tubes, submerge tools in solvent to clean and cool, then dip in lightweight oil to lubricate. For best results in rolling tubes, it is suggested to use two or more tube expanders alternately. Replace chipped or worn mandrels and rolls immediately. For Storage, clean tools thoroughly in solvent, replace worn parts, then coat with rust preventive or keep submerged in lightweight oil.

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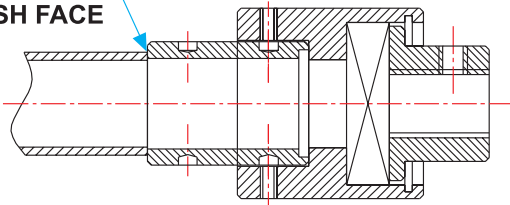
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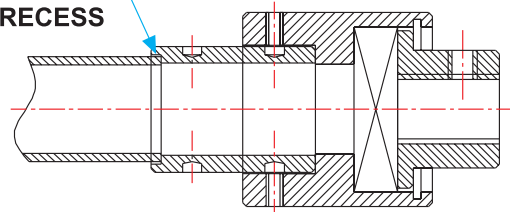
HEAT EXCHANGER, CONDENSER AND BOILER EXPANDERS

Reversible Thrust Collar Assembly Provided Standard and in All Tube Expanders

COLLAR WITH FLUSH FACE



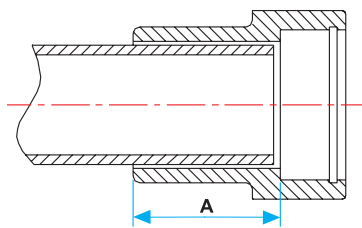
COLLAR WITH FIX RECESS



Nose portion can be 'reversed' to expand tubes flush with tube sheet and also tubes that are projecting 1/8" from tube sheet. This collar is supplied standard on all tube expanders.

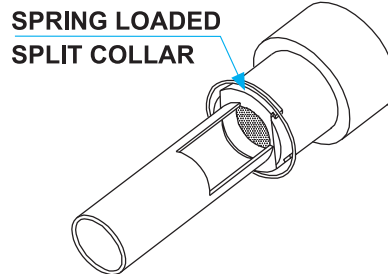
Thin Wall Thrust Collars

FULL RECESS THRUST COLLAR



Used when tubes project varying distances from the tube sheet.

SPRING LOADED SPLIT COLLAR



Has an expandable front nose that expands along with the rolls and eliminates the tube from being sucked into the collar.

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TUBE EXCHANGER INDEX

Condenser and Heat Exchanger Expanders



900 Series
HE-36



1300 Series
HE-36



AN Series
HE-37



800-3 Series
HE-38 - 39



800-5 Series
HE-40 - 41



1200-3 Series
HE-42 - 43



1200-5 Series
HE-44

Boiler Expanders



114 Series
HE-45



8012 Series
HE-46 - 47



A Series
HE-48 - 49



AF3 Series
HE-48 - 49



AB Series
HE-48 - 49



ABF3 Series
HE-48 - 49



COMBO BEADING
HE-50

Special Miscellaneous Expanders



AL Series
HE-50

Adapters



HE-52 - 53

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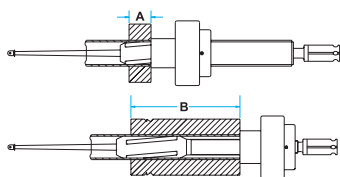


“900” SERIES TUBE EXPANDER

Features

Used to Expand small diameter tubes in oil coolers, radiators, etc. For tube sizes 1/4” 20 gauge to 3/8” 24 gauge, Roll Sets 1/4” or 1 1/4” and Roll Depth adjustable from 1/4” to 1 1/4”.

Note: All 900 Series expanders come with 1/4” square mandrel drives. Round mandrel drives are optional.



Roller Length	Roll Depth	
	min “A”	max “B”
3/4” (19.05mm)	1/4” (6.35mm)	3/4” (19.05mm)
1-1/4” (31.75mm)	3/4” (19.05mm)	1-1/4” (31.75mm)

Tube I.D. Sizes	
.152” - .331” (3.8mm - 8.4mm)	

Tube O.D. (in) (mm)	BWG	Tube I.D.		Expander with 3/4” (19.05mm) Long Rollers			Expander with 1-1/4” (31.75mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
1/4” 6.35mm	20	.180	4.5	923	M-40	R-923	-	-	-	.175	4.4	.200	5.1
	21	.186	4.7	924	M-40	R-924	-	-	-	.180	4.5	.207	5.2
	22	.194	4.9	925	M-41	R-925	-	-	-	.190	4.8	.216	5.5
	23	.200	5.0	926	M-41	R-923	-	-	-	.195	4.9	.222	5.6
	24	.206	5.2	927	M-41	R-924	-	-	-	.201	5.1	.230	5.8
	28	.222	5.6	928	928	R-903	-	-	-	.222	5.6	.238	6.0
	29	.224	5.7	928	928	R-903	-	-	-	.222	5.6	.238	6.0
3/8” 9.53mm	30	.226	5.7	928	928	R-903	-	-	-	.222	5.6	.238	6.0
	14	.209	5.3	927	M-41	R-924	-	-	-	.201	5.1	.232	5.8
	15	.231	5.8	915	M-42	R-903	-	-	-	.230	5.8	.265	6.7
	16	.245	6.2	916	M-36	R-916	916 L	M-36 L	R-916-L	.240	6.1	.275	6.9
	17	.259	6.5	918	M-38	R-903	920	M-38	R-904	.255	6.4	.289	7.3
	18	.277	7.0	901	M-30	R-903	902	M-30	R-904	.272	6.9	.307	7.8
	19	.291	7.3	903	M-31	R-903	904	M-31	R-904	.286	7.2	.320	9.1
	20	.305	7.7	905	M-32	R-907	906	M-32	R-908	.300	7.6	.334	8.4
	21	.311	7.9	907	M-33	R-907	908	M-33	R-908	.306	7.7	.340	8.6
	22	.319	8.1	909	M-34	R-909	910	M-34	R-910	.314	7.9	.349	8.8
	23	.325	8.2	911	M-34	R-911	912	M-34	R-912	.320	8.1	.357	9.0
	24	.331	8.4	911	M-34	R-911	912	M-34	R-912	.320	8.1	.357	9.0

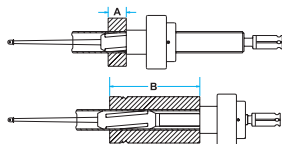
“1300” SERIES TUBE EXPANDER

Features

Used to expand small diameter tubes in oil coolers, radiators and other apparatus with small diameter tubes and thick tube sheets.

For tube sizes 3/8” 15 Gauge to 3/8” 24 Gauge, Roll Sets 3/4” or 1 1/4” and Roll Depths adjustable from 3/4” to 3 1/2”.

Note: All 1300 series expanders come with 1/4” square mandrel drives. Round mandrel drives are optional.



Roller Length	Roll Depth	
	min “A”	max “B”
3/4” (19.05mm)	3/4” (19.05mm)	3” (76.2mm)
1-1/4” (31.75mm)	1-1/4” (31.75mm)	3-1/2” (88.9mm)

Tube I.D. Sizes	
.231” - .331” (5.8mm - 8.4mm)	

Tube O.D. (in) (mm)	BWG	Tube I.D.		Expander with 3/4” (19.05mm) Long Rollers			Expander with 1-1/4” (31.75mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
3/8” 9.53mm	15	.231	5.8	1315	M-86	R-1315	1316	M-86	R-1316	.230	5.8	.265	6.7
	16	.245	6.2	1319	M-876	R-916	1319 L	M-86	R-916-L	.240	6.1	.275	6.9
	17	.259	6.5	1317	M-88	R-903	1318	M-88	R-904	.255	6.4	.289	7.3
	18	.277	7.0	1301	M-80	R-903	1302	M-80	R-904	.272	6.9	.307	7.8
	19	.291	7.3	1303	M-81	R-903	1304	M-81	R-904	.286	7.2	.320	9.1
	20	.305	7.7	1305	M-82	R-907	1306	M-82	R-908	.300	7.6	.334	8.4
	21	.311	7.9	1307	M-83	R-907	1308	M-83	R-908	.306	7.7	.340	8.6
	22	.319	8.1	1309	M-84	R-909	1310	M-84	R-910	.314	7.9	.349	8.8
	23	.325	8.2	1311	M-84	R-911	1312	M-84	R-912	.320	8.1	.357	9.0
	24	.331	8.4	1311	M-84	R-911	1312	M-84	R-912	.320	8.1	.357	9.0

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“AN” SERIES TUBE EXPANDER

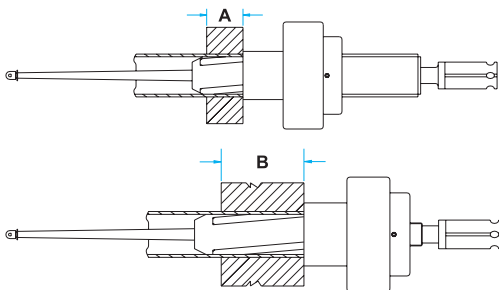


Features

Rapid Operation, Ideal for High Production Environments. Used to expand small diameter tubes in oil coolers, radiators and other apparatus with small diameter tubes. The Captive Mandrel - eliminates potential scratching of tube ID.

For Tube Sizes 1/4" 18 Gauge to 3/8" 24 Gauge with Roll Depth Adjustable from 1/4" to 1".

Note: All AN series expanders come with 1/4" square mandrel drives. Round mandrel drives are optional.



Tube I.D. Sizes
.152" - .331" (3.8mm - 8.4mm)

Roller Length	Roll Depth	
	min "A"	max "B"
1" (25.4mm)	1/4" (6.35mm)	1" (25.4mm)

Tube O.D.	BWG	Tube I.D.		Expander with 1" (25.4mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
1/4" 6.35mm	18	.152	3.8	A-25018	M-21819	R-20018	.148	3.7	.167	4.2
	19	.166	4.2	A-25019	M-21819	R-21920	.160	4.0	.180	4.5
	20	.180	4.5	A-25020	M-22021	R-21920	.175	4.4	.196	4.9
	21	.186	4.7	A-25021	M-22021	R-22124	.180	4.5	.202	5.1
	22	.194	4.9	A-25022	M-20022	R-22124	.190	4.8	.213	5.4
	23	.200	5.0	A-25023	M-22324	R-21920	.195	4.9	.216	5.5
	24	.206	5.2	A-25024	M-22324	R-22124	.201	5.1	.224	5.7
	28	.222	5.6	A-25028	M-22830	R-22830	.217	5.4	.243	6.1
	29	.224	5.7	A-25028	M-22830	R-22830	.217	5.4	.243	6.1
	30	.226	5.7	A-25028	M-22830	R-22830	.217	5.4	.243	6.1
3/8" 9.53mm	14	.209	5.3	A-37514	M-22830B	R-21920	.204	5.1	.230	5.8
	15	.231	5.8	A-37515	M-22830B	R-31516	.225	5.6	.265	6.6
	16	.245	6.2	A-37516	M-31617	R-31516	.238	6.0	.278	7.0
	17	.259	6.5	A-37517	M-31617	R-31720	.253	6.4	.293	7.4
	18	.277	7.0	A-37518	M-30018	R-31720	.270	6.8	.310	7.8
	19	.291	7.3	A-37519	M-30019	R-31720	.285	7.1	.325	8.1
	20	.305	7.7	A-37520	M-32021	R-31720	.295	7.4	.335	8.4
	21	.311	7.9	A-37521	M-32021	R-32122	.305	7.5	.345	8.6
	22	.319	8.1	A-37522	M-32224	R-32122	.312	7.9	.353	8.9
	23	.325	8.2	A-37523	M-32224	R-32324	.318	8.1	.363	9.2
24	.331	8.4	A-37523	M-32224	R-32324	.318	8.1	.363	9.2	

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"800" SERIES 3-ROLL TUBE EXPANDER



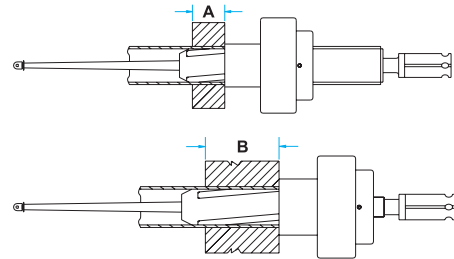
Features

The most economical Tool for Heat Exchangers and Condensers. The 800 series 3-roll expanders are the most popular worldwide. For tube sizes 1/2" 14 Gauge to 1 1/2" 20 Gauge, Roll Sets 1 1/2" or 2 1/4" and Roll Depths adjustable from 1/2" to 1 1/2" or 1 1/4" to 2 1/4".

Note: Model 797-856 expanders come with 3/8" square mandrel drives and Model 857-900 expanders come with 1/2" square mandrel drives.

Tube I.D. Sizes	
.334" - 1.43" (8.4mm - 36.3mm)	

Roller Length	Roll Depth	
	min "A"	max "B"
1-1/2" (38.1mm)	1/2" (12.7mm)	1-1/2" (38.1mm)
2-1/4" (57.1mm)	1/4" (31.7mm)	2-1/4" (57.1mm)



Tube O.D. (in) (mm)	BWG	Tube I.D.		Expander with 1-1/2" (38.1mm) Long Rollers			Expander with 2-1/4" (57.1mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
1/2" 12.70mm	14	.334	8.4	797	M-797	R-797	-	-	-	.324	8.2	.374	9.5
	15	.356	9.0	799	M-799	R-1	-	-	-	.348	8.8	.398	10.1
	16	.370	9.4	801	M-1	R-1	-	-	-	.360	9.1	.410	10.4
	17	.384	9.7	803	M-1	R-2	-	-	-	.374	9.5	.424	10.7
	18	.402	10.2	805	M-2	R-3	-	-	-	.392	9.9	.447	11.3
5/8" 15.88mm	20	.430	10.9	805 S	M-3	R-3	-	-	-	.406	10.3	.461	11.7
	12	.407	10.3	805	M-2	R-3	-	-	-	.392	9.9	.447	11.3
	13	.435	11.0	807	M-3	R-4	-	-	-	.425	10.8	.480	12.1
	14	.459	11.6	809	M-4	R-4	810	M-4	R-4-A	.449	11.4	.509	12.9
	15	.481	12.2	811	M-5	R-5	812	M-5	R-5-A	.471	11.9	.536	13.6
	16	.495	12.5	813	M-5	R-6	814	M-5	R-6-A	.485	12.3	.550	13.9
	17	.509	12.9	815	M-6	R-6	816	M-6	R-6-A	.499	12.6	.564	14.3
	18	.527	13.3	817	M-7	R-7	818	M-7	R-7-A	.517	13.1	.572	14.5
	19	.541	13.7	819	M-6	R-7	820	M-6	R-7-A	.522	13.2	.582	14.7
	20	.555	14.1	819 S	M-8	R-7	820 S	M-8	R-7-A	.536	13.6	.596	15.1
3/4" 19.05mm	21	.561	14.2	819 S	M-8	R-7	820 S	M-8	R-7-A	.536	13.6	.596	15.1
	22	.569	14.4	819 S	M-8	R-7	820 S	M-8	R-7-A	.536	13.6	.596	15.1
	10	.482	12.2	811	M-5	R-5	812	M-5	R-5-A	.471	11.9	.536	13.6
	11	.510	12.9	815	M-6	R-6	816	M-6	R-6-A	.499	12.6	.564	14.3
	12	.532	13.5	819	M-6	R-7	820	M-6	R-7-A	.522	13.2	.582	14.7
	13	.560	14.2	821	M-8	R-8	822	M-8	R-8-A	.550	13.9	.615	15.6
	14	.584	14.8	823	M-8	R-9	824	M-8	R-9-A	.574	14.5	.639	16.2
	15	.606	15.3	825	M-8	R-10	826	M-8	R-10-A	.596	15.1	.661	16.7
	16	.620	15.7	827	M-9	R-10	828	M-9	R-10-A	.605	15.3	.685	17.4
	17	.634	16.1	829	M-9	R-11	830	M-9	R-11-A	.619	15.7	.699	17.7
	18	.652	16.5	829	M-9	R-11	830	M-9	R-11-A	.619	15.7	.699	17.7
	19	.666	16.9	831	M-9	R-12	832	M-9	R-12-A	.642	16.3	.722	18.3
	20	.680	17.2	831	M-9	R-12	832	M-9	R-12-A	.642	16.3	.722	18.3
7/8" 22.22mm	21	.686	17.4	831	M-9	R-12	832	M-9	R-12-A	.642	16.3	.722	18.3
	22	.694	17.6	831	M-9	R-12	832	M-9	R-12-A	.642	16.3	.722	18.3
	10	.607	15.4	825	M-8	R-10	826	M-8	R-10-A	.596	15.1	.661	16.7
	11	.635	16.1	829	M-9	R-11	830	M-9	R-11-A	.619	15.7	.699	17.7
	12	.657	16.6	831	M-9	R-12	832	M-9	R-12-A	.642	16.3	.722	18.3
	13	.685	17.4	833	M-10	R-13	834	M-10	R-13-A	.670	17.0	.750	19.0
	14	.709	18.0	835	M-11	R-14	836	M-11	R-14-A	.685	17.4	.774	19.6
	15	.731	18.5	837	M-11	R-15	838	M-11	R-15-1	.712	18.0	.801	20.3
	16	.745	18.9	839	M-12	R-15	840	M-12	R-15-A	.726	18.4	.815	20.7
17	.759	19.2	843	M-12	R-16	844	M-12	R-16-A	.740	18.8	.829	21.0	
18	.777	19.7	843	M-12	R-16	844	M-12	R-16-A	.740	18.8	.829	21.0	

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"800" SERIES 3-ROLL TUBE EXPANDER

Tube O.D. (in) (mm)	BWG	Tube I.D.		Expander with 1-1/2" (38.1mm) Long Rollers			Expander with 2-1/4" (57.1mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
1" 25.40mm	8	.670	17.0	841	M-9	R-13	842	M-9	R-13-A	.655	16.6	.735	18.6
	9	.704	17.8	835	M-11	R-14	836	M-11	R-14-A	.685	17.4	.774	19.6
	10	.732	18.5	837	M-11	R-15	838	M-11	R-15-A	.712	18.0	.801	20.3
	11	.760	19.3	843	M-12	R-16	844	M-12	R-16-A	.740	18.8	.829	21.1
	12	.782	19.8	845	M-12	R-17	846	M-12	R-17-A	.763	19.3	.852	21.6
	13	.810	20.5	847	M-12	R-18	848	M-12	R-18-A	.791	20.0	.880	22.3
	14	.834	21.1	849	M-13	R-18	850	M-13	R-18-A	.810	20.5	.909	23.1
	15	.856	21.7	851	M-13	R-19	852	M-13	R-19-A	.837	21.2	.936	23.7
	16	.870	22.1	851	M-13	R-19	852	M-13	R-19-A	.837	21.2	.936	23.7
	17	.884	22.4	855	M-13	R-21	856	M-13	R-21-A	.865	21.9	.964	24.4
	18	.902	22.9	855	M-13	R-21	856	M-13	R-21-A	.865	21.9	.964	24.4
	19	.916	23.2	855	M-13	R-21	856	M-13	R-21-A	.865	21.9	.964	24.4
20	.930	23.6	855	M-13	R-21	856	M-13	R-21-A	.865	21.9	.964	24.4	
1-1/8" 28.58mm	8	.795	20.1	853	M-13	R-20	854	M-13	R-20-A	.776	19.7	.875	22.2
	9	.829	21.0	849	M-13	R-18	850	M-13	R-18-A	.810	20.5	.909	23.1
	10	.857	21.7	851	M-13	R-19	852	M-13	R-19-A	.837	21.2	.936	23.7
	11	.885	22.4	855	M-13	R-21	856	M-13	R-21-A	.865	21.9	.964	24.4
	12	.907	23.0	857	M-14	R-21	858	M-14	R-21-A	.883	22.4	.982	24.9
	13	.935	23.7	859	M-14	R-22	860	M-14	R-22-A	.916	23.2	1.015	25.7
	14	.959	24.3	861	M-15	R-23	862	M-15	R-23-A	.935	23.7	1.044	26.5
	15	.981	24.9	863	M-15	R-24	864	M-15	R-24-A	.962	24.4	1.071	27.2
	16	.995	25.2	863	M-15	R-24	864	M-15	R-24-A	.962	24.4	1.071	27.2
	17	1.010	25.6	867	M-16	R-26	868	M-16	R-26-A	.990	25.1	1.009	27.9
18	1.027	26.0	867	M-16	R-26	868	M-16	R-26-A	.990	25.1	1.009	27.9	
1-1/4" 31.75mm	8	.920	23.3	865	M-15	R-25	866	M-15	R-25-A	.901	22.8	1.010	25.6
	9	.954	24.2	861	M-15	R-23	862	M-15	R-23-A	.935	23.7	1.044	26.5
	10	.982	24.9	863	M-15	R-24	864	M-15	R-24-A	.962	24.4	1.071	27.2
	11	1.010	25.6	867	M-16	R-26	868	M-16	R-26-A	.990	25.1	1.099	27.9
	12	1.032	26.2	869	M-16	R-27	870	M-16	R-27-A	1.013	25.7	1.122	28.5
	13	1.060	26.9	871	M-17	R-28	872	M-17	R-28-A	1.039	26.4	1.150	29.2
	14	1.084	27.5	873	M-17	R-29	874	M-17	R-29-A	1.060	26.9	1.169	29.6
	15	1.106	28.0	875	M-17	R-30	876	M-17	R-30-A	1.087	27.6	1.196	30.3
	16	1.120	28.4	875	M-17	R-30	876	M-17	R-30-A	1.087	27.6	1.196	30.3
	17	1.134	28.8	879	M-18	R-30	880	M-18	R-30-A	1.115	28.3	1.224	31.0
18	1.152	29.2	879	M-18	R-30	880	M-18	R-30-A	1.115	28.3	1.224	31.0	
1-3/8" 34.92mm	8	1.045	26.5	877	M-17	R-31	878	M-17	R-31-A	1.026	26.0	1.135	28.8
	9	1.079	27.4	873	M-17	R-29	874	M-17	R-29-A	1.060	26.9	1.169	29.6
	10	1.107	28.1	875	M-17	R-30	876	M-17	R-30-A	1.087	27.6	1.196	30.3
	11	1.135	28.8	879	M-18	R-30	880	M-18	R-30-A	1.115	28.3	1.224	31.0
	12	1.157	29.3	881	M-18	R-32	882	M-18	R-32-A	1.133	28.7	1.242	31.5
	13	1.185	30.1	883	M-19	R-33	884	M-19	R-33-A	1.160	29.4	1.275	32.3
	14	1.209	30.7	885	M-20	R-34	886	M-20	R-34-A	1.179	29.9	1.294	32.8
	15	1.231	31.2	887	M-20	R-35	888	M-20	R-35-A	1.206	30.6	1.321	33.5
1-1/2" 38.1mm	8	1.245	31.6	887	M-20	R-25	888	M-20	R-25-A	1.206	30.6	1.321	33.5
	8	1.170	29.7	889	M-19	R-34	890	M-19	R-34-A	1.145	29.0	1.260	32.0
	9	1.204	30.5	885	M-20	R-34	886	M-20	R-34-A	1.177	29.9	1.294	32.8
	10	1.232	31.2	887	M-20	R-35	888	M-20	R-35-A	1.206	30.6	1.321	33.5
	11	1.260	32.0	891	M-20	R-36	892	M-20	R-36-A	1.235	31.3	1.350	34.2
	12	1.282	32.5	893	M-20	R-37	894	M-20	R-37-A	1.257	31.9	1.372	34.8
	13	1.310	33.2	895	M-21	R-37	896	M-21	R-37-A	1.285	32.6	1.400	35.5
	14	1.334	33.8	895	M-21	R-37	896	M-21	R-37-A	1.285	32.6	1.400	35.5
	15	1.356	34.4	897	M-21	R-38	898	M-21	R-38-A	1.331	33.8	1.446	36.7
	16	1.370	34.8	897	M-21	R-38	898	M-21	R-38-A	1.331	33.8	1.446	36.7
	17	1.384	35.1	899	M-22	R-38	900	M-22	R-38-A	1.331	33.8	1.472	37.3
	18	1.402	35.6	899	M-22	R-38	900	M-22	R-38-A	1.331	33.8	1.472	37.3
19	1.416	35.9	899	M-22	R-38	900	M-22	R-38-A	1.331	33.8	1.472	37.3	
20	1.430	36.3	899	M-22	R-38	900	M-22	R-38-A	1.331	33.8	1.472	37.3	

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“800” SERIES 5-ROLL TUBE EXPANDER



Features

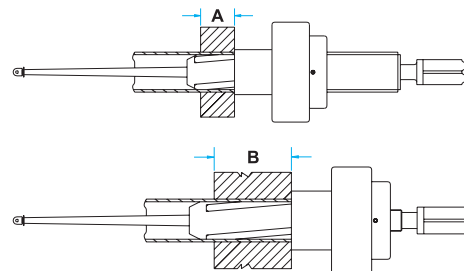
800 series 5-roll expanders are ideally suited to expand thin wall tubes (19 through 24 gauge walls) of Titanium, Stainless Steel, Incoloy and other exotic metals.

For tube sizes $\frac{5}{8}$ " 17 Gauge to $1\frac{1}{2}$ " 24 Gauge, with Roll Depths adjustable from $\frac{1}{2}$ " to $1\frac{1}{2}$ " for $1\frac{1}{2}$ " Rollers and $\frac{1}{4}$ " to $2\frac{1}{4}$ " for $2\frac{1}{4}$ " Rollers.

Note: Model 815-5 to 858-5 come with $\frac{3}{8}$ " square mandrel drives and Model 859-5 to 900-5 come with $\frac{1}{2}$ " square mandrel drives.

Tube I.D. Sizes	
.509" - 1.44" (12.9mm - 37.0mm)	

Roller Length	Roll Depth	
	min "A"	max "B"
1-1/2" (38.1mm)	1/2" (12.7mm)	1-1/2" (38.1mm)
2-1/4" (57.1mm)	1/4" (31.7mm)	2-1/4" (57.1mm)



Tube O.D.	BWG	Tube I.D.		Expander with 1-1/2" (38.10mm) Long Rollers			Expander with 2-1/4" (57.15mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
5/8" 15.88mm	17	.509	12.9	815-5	M-816-5	R-4-5	816-5	M-816-5	R-4-A-5	.499	12.6	.564	14.3
	18	.527	13.3	817-5	M9	R-4-5	-	-	-	.517	13.1	.576	14.6
	19	.541	13.7	819-5	M-820-5	R-4-5	820-5	M-820-5	R-4-A-5	.522	13.2	.582	14.8
	20	.555	14.1	819-5 S	M-820-5 S	R-4-5	820-5 S	M-820-5 S	R-4-A-5	.536	13.6	.596	15.1
	21	.561	14.2	819-5 S	M-820-5 S	R-4-5	820-5 S	M-820-5 S	R-4-A-5	.536	13.6	.596	15.1
	22	.569	14.4	819-5 S	M-820-5 S	R-4-5	820-5 S	M-820-5 S	R-4-A-5	.536	13.6	.596	15.1
3/4" 19.65mm	13	.560	14.2	821-5	M-822-5	R-5-5	822-5	M-822-5	R-5-A-5	.550	13.9	.615	15.6
	14	.584	14.8	823-5	M-824-5	R-6-5	824-5	M-824-5	R-6-A-5	.574	14.5	.629	15.9
	15	.606	15.3	825-5	M-826-5	R-7-5	826-5	M-826-5	R-7-A-5	.590	14.9	.661	16.8
	16	.620	15.7	827-5	M-13	R-7-5	828-5	M-13	R-7-A-5	.605	15.3	.680	17.2
	17	.634	16.1	829-5	M-830-5	R-7-5	830-5	M-830-5	R-7-A-5	.619	15.7	.699	17.8
	18	.652	16.5	829-5	M-830-5	R-7-5	830-5	M-830-5	R-7-A-5	.619	15.7	.699	17.8
	19	.666	16.9	831-5	M-13	R-9-5	832-5	M-13	R-9-A-5	.642	16.3	.729	18.5
	20	.680	17.2	831-5	M-13	R-9-5	832-5	M-13	R-9-A-5	.642	16.3	.729	18.5
	21	.686	17.4	831-5	M-13	R-9-5	832-5	M-13	R-9-A-5	.642	16.3	.729	18.5
	22	.694	17.6	831-5	M-13	R-9-5	832-5	M-13	R-9-A-5	.642	16.3	.729	18.5
	23	.700	17.8	833-5	M-14-3/8	R-9-5	834-5	M-14-3/8	R-9-A-5	.670	17.0	.747	18.9
7/8" 22.22mm	13	.685	17.4	833-5	M-14-3/8	R-9-5	834-5	M-14-3/8	R-9-A-5	.670	17.0	.747	18.9
	14	.709	18.0	835-5	M-15-3/8	R-10-5	836-5	M-15-3/8	R-10-A-5	.685	17.4	.750	19.0
	16	.745	18.9	839-5	M-840-5	R-11-5	840-5	M-840-5	R-11-A-5	.726	18.4	.800	20.3
	17	.759	19.2	843-5	M-17-3/8	R-11-5	844-5	M-17-3/8	R-11-A-5	.740	18.8	.824	20.9
	18	.777	19.7	843-5	M-17-3/8	R-11-5	844-5	M-17-3/8	R-11-A-5	.740	18.8	.824	20.9
	19	.791	20.1	845-5	M-18-3/8	R-11-5	846-5	M-18-3/8	R-11-A-5	.763	19.4	.851	21.6
	20	.805	20.4	845-5	M-18-3/8	R-11-5	846-5	M-18-3/8	R-11-A-5	.763	19.4	.851	21.6
	21	.811	20.6	845-5	M-18-3/8	R-11-5	846-5	M-18-3/8	R-11-A-5	.763	19.4	.851	21.6
	22	.819	20.8	845-5	M-18-3/8	R-11-5	846-5	M-18-3/8	R-11-A-5	.763	19.4	.851	21.6
	23	.825	20.9	847-5	M-18-3/8	R-13-5	848-5	M-18-3/8	R-13-A-5	.791	20.1	.880	22.4
	24	.831	21.1	847-5	M-18-3/8	R-13-5	848-5	M-18-3/8	R-13-A-5	.791	20.1	.880	22.4

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"800" SERIES 5-ROLL TUBE EXPANDER

Tube O.D. (in) (mm)	BWG	Tube I.D.		Expander with 1-1/2" (38.10mm) Long Rollers			Expander with 2-1/4" (57.15mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
1" 25.40mm	12	.782	19.8	845-5	M-18-3/8	R-11-5	846-5	M-18-3/8	R-11-A-5	.763	19.3	.852	21.6
	13	.810	20.5	847-5	M-18-3/8	R-13-5	848-5	M-18-3/8	R-13-A-5	.791	20.0	.880	22.4
	14	.834	21.2	849-5	M-850-5	R-12-5	850-5	M-18-3/8	R-12-A-5	.810	20.5	.909	23.2
	15	.856	21.7	851-5	M-852-5	R-13-5	852-5	M-852-5	R-13-A-5	.837	21.2	.936	23.8
	16	.870	22.1	851-5	M-852-5	R-13-5	852-5	M-852-5	R-13-A-5	.837	21.2	.936	23.8
	17	.884	22.4	855-5	M-856-5	R-13-5	856-5	M-856-5	R-13-A-5	.865	21.9	.965	24.5
	18	.902	22.9	855-5	M-856-5	R-13-5	856-5	M-856-5	R-13-A-5	.865	21.9	.965	24.5
	19	.916	23.2	855-5	M-856-5	R-13-5	856-5	M-856-5	R-13-A-5	.865	21.9	.965	24.5
	20	.930	23.6	855-5	M-856-5	R-13-5	856-5	M-856-5	R-13-A-5	.865	21.9	.965	24.5
	21	.936	23.8	857-5	M-21-3/8	R-15-5	858-5	M-21-3/8	R-15-A-5	.883	22.4	.997	25.3
	22	.944	24.0	857-5	M-21-3/8	R-15-5	858-5	M-21-3/8	R-15-A-5	.883	22.4	.997	25.3
	23	.950	24.1	857-5	M-21-3/8	R-15-5	858-5	M-21-3/8	R-15-A-5	.883	22.4	.997	25.3
1-1/8" 28.58mm	24	.956	24.3	857-5	M-21-3/8	R-15-5	858-5	M-21-3/8	R-15-A-5	.883	22.4	.997	25.3
	25	.960	24.4	857-5	M-21-3/8	R-15-5	858-5	M-21-3/8	R-15-A-5	.883	22.4	.997	25.3
	12	.907	23.0	857-5	M-21-3/8	R-15-5	858-5	M-21-3/8	R-15-A-5	.883	22.4	.997	25.3
	13	.935	23.7	859-5	M-860-5	R-16-5	860-5	M-860-5	R-16-A-5	.916	23.2	1.000	25.4
1-1/4" 31.75mm	14	.959	24.3	861-5	M-862-5	R-17-5	862-5	M-862-5	R-17-A-5	.935	23.7	1.039	26.4
	22	1.069	27.2	871-5	M-872-5	R-19-5	872-5	M-872-5	R-19-A-5	1.039	26.4	1.157	29.4
	24	1.081	27.5	871-5	M-872-5	R-19-5	872-5	M-872-5	R-19-A-5	1.039	26.4	1.157	29.4
	15	1.106	28.1	875-5	M-876-5	R-21-5	876-5	M-876-5	R-21-A-5	1.087	27.6	1.196	30.4
	16	1.120	28.4	875-5	M-876-5	R-21-5	876-5	M-876-5	R-21-A-5	1.087	27.6	1.196	30.4
	17	1.134	28.8	879-5	M-880-5	R-21-5	880-5	M-880-5	R-21-A-5	1.115	28.3	1.231	31.3
	18	1.152	29.3	879-5	M-880-5	R-21-5	880-5	M-880-5	R-21-A-5	1.115	28.3	1.231	31.3
	19	1.166	29.6	879-5	M-880-5	R-21-5	880-5	M-880-5	R-21-A-5	1.115	28.3	1.231	31.3
1-3/8" 34.92mm	20	1.180	30.0	879-5	M-880-5	R-21-5	880-5	M-880-5	R-21-A-5	1.115	28.3	1.231	31.3
	21	1.186	30.1	879-5	M-880-5	R-21-5	880-5	M-880-5	R-21-A-5	1.115	28.3	1.231	31.3
	22	1.194	30.3	879-5	M-880-5	R-21-5	880-5	M-880-5	R-21-A-5	1.115	28.3	1.231	31.3
	23	1.200	30.5	881-5	M-882-5	R-21-5	882-5	M-882-5	R-21-A-5	1.133	28.8	1.242	31.5
	24	1.206	30.6	881-5	M-882-5	R-21-5	882-5	M-882-5	R-21-A-5	1.133	28.8	1.242	31.5
	12	1.154	29.3	881-5	M-882-5	R-21-5	880-5	M-880-5	R-21-A-5	1.133	28.8	1.242	31.5
1-1/2" 38.10mm	14	1.209	30.7	885-5	M-882-5	R-23-5	886-5	M-882-5	R-23-A-5	1.179	29.9	1.296	32.9
	20	1.305	33.2	893-5	M-894-5	R-26-5	894-5	M-894-5	R-26-A-5	1.257	31.9	1.385	35.2
	22	1.319	33.5	895-5	M-896-5	R-26-5	896-5	M-896-5	R-26-A-5	1.285	32.6	1.417	36.0
	24	1.331	33.8	895-5	M-896-5	R-26-5	896-5	M-896-5	R-26-A-5	1.285	32.6	1.417	36.0
1-1/2" 38.10mm	17	1.384	35.1	899-5	M-900-5	R-29-5	900-5	M-900-5	R-29-A-5	1.331	33.8	1.489	37.8
	18	1.402	35.6	899-5	M-900-5	R-29-5	900-5	M-900-5	R-29-A-5	1.331	33.8	1.489	37.8
	19	1.416	36.0	899-5	M-900-5	R-29-5	900-5	M-900-5	R-29-A-5	1.331	33.8	1.489	37.8
	20	1.430	36.3	899-5	M-900-5	R-29-5	900-5	M-900-5	R-29-A-5	1.331	33.8	1.489	37.8
	21	1.436	36.5	899-5	M-900-5	R-29-5	900-5	M-900-5	R-29-A-5	1.331	33.8	1.489	37.8
	22	1.444	36.7	899-5	M-900-5	R-29-5	900-5	M-900-5	R-29-A-5	1.331	33.8	1.489	37.8
	23	1.450	36.8	899-5	M-900-5	R-29-5	900-5	M-900-5	R-29-A-5	1.331	33.8	1.489	37.8
24	1.456	37.0	899-5	M-900-5	R-29-5	900-5	M-900-5	R-29-A-5	1.331	33.8	1.489	37.8	

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"1200" SERIES 3-ROLL TUBE EXPANDER

Features

1200 series 3-roll expanders are the most versatile for thick tubesheets, available in 4 different lengths to best suit your needs and can be provided in Lengths up to 60" (& longer) upon special request.

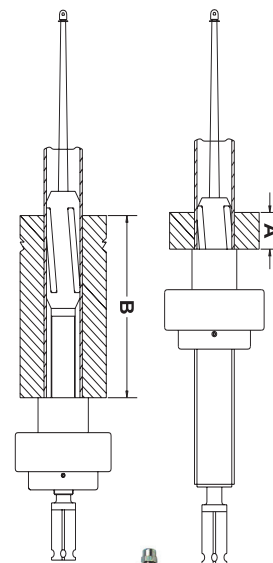
For tube sizes 1/2" 14 Gauge to 1 1/2" 20 Gauge, Roll Sets 1 1/2" or 2 1/4" and Roll Depths adjustable from: STD Reach 1 1/2" to 6" - A Reach from 1 1/2" to 8" - B Reach from 1 1/2" to 10" - C Reach from 1 1/2" to 12" for 1 1/2" Roller Lengths; STD Reach from 2 1/4" to 6 3/4" - A Reach from 2 1/4" to 8 3/4" - B Reach from 2 1/4" to 10 3/4" - C Reach from 2 1/4" to 12 3/4" for 2 1/4" Roller Lengths.

Note: Model 1197-1256 expanders come with 3/8" mandrel drives and Model 1257-1300 expanders come with 1/2" square mandrel drives.

Tube I.D. Sizes	
.334" - 1.43" (8.4mm - 36.3mm)	

Roller Length		Roll Depth	
		min "A"	max "B"
1-1/2" (38.1mm)	STD Reach	1-1/2" (38.1mm)	6" (152.4mm)
	A Reach	1-1/2" (38.1mm)	8" (203.2mm)
	B Reach	1-1/2" (38.1mm)	10" (253.8mm)
	C Reach	1-1/2" (38.1mm)	12" (304.6mm)
2-1/4" (57.1mm)	STD Reach	2-1/4" (57.1mm)	6-3/4" (171.4mm)
	A Reach	2-1/4" (57.1mm)	8-3/4" (221.1mm)
	B Reach	2-1/4" (57.1mm)	10-3/4" (272.8mm)
	C Reach	2-1/4" (57.1mm)	12-3/4" (323.6mm)

Tube O.D. (in) (mm)	BWG	Tube I.D.		Expander with 1-1/2" (38.1mm) Long Rollers			Expander with 2-1/4" (57.1mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
1/2" 12.70mm	14	.334	8.4	1197	M-1197	R-797	-	-	-	.324	8.2	.374	9.5
	15	.356	9.0	1199	M-1199	R-1	-	-	-	.348	8.8	.398	10.1
	16	.370	9.4	1201	M-51	R-1	-	-	-	.360	9.1	.410	10.4
	17	.384	9.7	1203	M-51	R-2	-	-	-	.374	9.5	.424	10.7
	18	.402	10.2	1205	M-52	R-3	-	-	-	.392	9.9	.447	11.3
	20	.430	10.9	1205 S	M-53	R-3	-	-	-	.406	10.3	.461	11.7
5/8" 15.88mm	12	.407	10.3	1205	M-52	R-3	-	-	-	.392	9.9	.447	11.3
	13	.435	11.0	1207	M-53	R-4	-	-	-	.425	10.8	.480	12.1
	14	.459	11.6	1209	M-54	R-4	1210	M-54	R-4-A	.449	11.4	.509	12.9
	15	.481	12.2	1211	M-55	R-5	1212	M-55	R-5-A	.471	11.9	.536	13.6
	16	.495	12.5	1213	M-55	R-6	1214	M-55	R-6-A	.485	12.3	.550	13.9
	17	.509	12.9	1215	M-56	R-6	1216	M-56	R-6-A	.499	12.6	.564	14.3
	18	.527	13.3	1217	M-57	R-7	1218	M-57	R-7-A	.517	13.1	.572	14.5
	19	.541	13.7	1219	M-56	R-7	1220	M-56	R-7-A	.522	13.2	.582	14.7
	20	.555	14.1	1219 S	M-58	R-7	1220 S	M-58	R-7-A	.536	13.6	.596	15.1
	21	.561	14.2	1219 S	M-58	R-7	1220 S	M-58	R-7-A	.536	13.6	.596	15.1
3/4" 19.05mm	10	.482	12.2	1211	M-55	R-5	1212	M-55	R-5-A	.471	11.9	.536	13.6
	11	.510	12.9	1215	M-56	R-6	1216	M-56	R-6-A	.499	12.6	.564	14.3
	12	.532	13.5	1219	M-56	R-7	1220	M-56	R-7-A	.522	13.2	.582	14.7
	13	.560	14.2	1221	M-58	R-8	1222	M-58	R-8-A	.550	13.9	.615	15.6
	14	.584	14.8	1223	M-58	R-9	1224	M-58	R-9-A	.574	14.5	.639	16.2
	15	.606	15.3	1225	M-58	R-10	1226	M-58	R-10-A	.596	15.1	.661	16.7
	16	.620	15.7	1227	M-59	R-10	1228	M-59	R-10-A	.605	15.3	.685	17.4
	17	.634	16.1	1229	M-59	R-11	1230	M-59	R-11-A	.619	15.7	.699	17.7
	18	.652	16.5	1229	M-59	R-11	1230	M-59	R-11-A	.619	15.7	.699	17.7
	19	.666	16.9	1231	M-59	R-12	1232	M-59	R-12-A	.642	16.3	.722	18.3
7/8" 22.22mm	10	.607	15.4	1225	M-58	R-10	1226	M-58	R-10-A	.596	15.1	.661	16.7
	11	.635	16.1	1229	M-59	R-11	1230	M-59	R-11-A	.619	15.7	.699	17.7
	12	.657	16.6	1231	M-59	R-12	1232	M-59	R-12-A	.642	16.3	.722	18.3
	13	.685	17.4	1233	M-60	R-13	1234	M-60	R-13-A	.670	17.0	.750	19.0
	14	.709	18.0	1235	M-61	R-14	1236	M-61	R-14-A	.685	17.4	.774	19.6
	15	.731	18.5	1237	M-61	R-15	1238	M-61	R-15-1	.712	18.0	.801	20.3
	16	.745	18.9	1239	M-62	R-15	1240	M-62	R-15-A	.726	18.4	.815	20.7
	17	.759	19.2	1243	M-62	R-16	1244	M-62	R-16-A	.740	18.8	.829	21.0
	18	.777	19.7	1243	M-62	R-16	1244	M-62	R-16-A	.740	18.8	.829	21.0



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"1200" SERIES 3-ROLL TUBE EXPANDER

Tube O.D.	BWG	Tube I.D.		Expander with 1-1/2" (38.1mm) Long Rollers			Expander with 2-1/4" (57.1mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
1" 25.40mm	8	.670	17.0	1241	M-59	R-13	1242	M-59	R-13-A	.655	16.6	.735	18.6
	9	.704	17.8	1235	M-61	R-14	1236	M-61	R-14-A	.685	17.4	.774	19.6
	10	.732	18.5	1237	M-61	R-15	1238	M-61	R-15-A	.712	18.0	.801	20.3
	11	.760	19.3	1243	M-62	R-16	1244	M-62	R-16-A	.740	18.8	.829	21.1
	12	.782	19.8	1245	M-62	R-17	1246	M-62	R-17-A	.763	19.3	.852	21.6
	13	.810	20.5	1247	M-62	R-18	1248	M-62	R-18-A	.791	20.0	.880	22.3
	14	.834	21.1	1249	M-63	R-18	1250	M-63	R-18-A	.810	20.5	.909	23.1
	15	.856	21.7	1251	M-63	R-19	1252	M-63	R-19-A	.837	21.2	.936	23.7
	16	.870	22.1	1251	M-63	R-19	1252	M-63	R-19-A	.837	21.2	.936	23.7
	17	.884	22.4	1255	M-63	R-21	1256	M-63	R-21-A	.865	21.9	.964	24.4
	18	.902	22.9	1255	M-63	R-21	1256	M-63	R-21-A	.865	21.9	.964	24.4
19	.916	23.2	1255	M-63	R-21	1256	M-63	R-21-A	.865	21.9	.964	24.4	
20	.930	23.6	1255	M-63	R-21	1256	M-63	R-21-A	.865	21.9	.964	24.4	
1-1/8" 28.58mm	8	.795	20.1	1253	M-63	R-20	1254	M-63	R-20-A	.776	19.7	.875	22.2
	9	.829	21.0	1249	M-63	R-18	1250	M-63	R-18-A	.810	20.5	.909	23.1
	10	.857	21.7	1251	M-63	R-19	1252	M-63	R-19-A	.837	21.2	.936	23.7
	11	.885	22.4	1255	M-63	R-21	1256	M-63	R-21-A	.865	21.9	.964	24.4
	12	.907	23.0	1257	M-64	R-21	1258	M-64	R-21-A	.883	22.4	.982	24.9
	13	.935	23.7	1259	M-64	R-22	1260	M-64	R-22-A	.916	23.2	1.015	25.7
	14	.959	24.3	1261	M-65	R-23	1262	M-65	R-23-A	.935	23.7	1.044	26.5
	15	.981	24.9	1263	M-65	R-24	1264	M-65	R-24-A	.962	24.4	1.071	27.2
	16	.995	25.2	1263	M-65	R-24	1264	M-65	R-24-A	.962	24.4	1.071	27.2
	17	1.010	25.6	1267	M-66	R-26	1268	M-66	R-26-A	.990	25.1	1.009	27.9
	18	1.027	26.0	1267	M-66	R-26	1268	M-66	R-26-A	.990	25.1	1.009	27.9
1-1/4" 31.75mm	8	.920	23.3	1265	M-65	R-25	1266	M-65	R-25-A	.901	22.8	1.010	25.6
	9	.954	24.2	1261	M-65	R-23	1262	M-65	R-23-A	.935	23.7	1.044	26.5
	10	.982	24.9	1263	M-65	R-24	1264	M-65	R-24-A	.962	24.4	1.071	27.2
	11	1.010	25.6	1267	M-66	R-26	1268	M-66	R-26-A	.990	25.1	1.099	27.9
	12	1.032	26.2	1269	M-66	R-27	1270	M-66	R-27-A	1.013	25.7	1.122	28.5
	13	1.060	26.9	1271	M-67	R-28	1272	M-67	R-28-A	1.039	26.4	1.150	29.2
	14	1.084	27.5	1273	M-67	R-29	1274	M-67	R-29-A	1.060	26.9	1.169	29.6
	15	1.106	28.0	1275	M-67	R-30	1276	M-67	R-30-A	1.087	27.6	1.196	30.3
	16	1.120	28.4	1275	M-67	R-30	1276	M-67	R-30-A	1.087	27.6	1.196	30.3
	17	1.134	28.8	1279	M-68	R-30	1280	M-68	R-30-A	1.115	28.3	1.224	31.0
	18	1.152	29.2	1279	M-68	R-30	1280	M-68	R-30-A	1.115	28.3	1.224	31.0
1-3/8" 34.92mm	8	1.045	26.5	1277	M-67	R-31	1278	M-67	R-31-A	1.026	26.0	1.135	28.8
	9	1.079	27.4	1273	M-67	R-29	1274	M-67	R-29-A	1.060	26.9	1.169	29.6
	10	1.107	28.1	1275	M-67	R-30	1276	M-67	R-30-A	1.087	27.6	1.196	30.3
	11	1.135	28.8	1279	M-68	R-30	1280	M-68	R-30-A	1.115	28.3	1.224	31.0
	12	1.157	29.3	1281	M-68	R-32	1282	M-68	R-32-A	1.133	28.7	1.242	31.5
	13	1.185	30.1	1283	M-69	R-33	1284	M-69	R-33-A	1.160	29.4	1.275	32.3
	14	1.209	30.7	1285	M-70	R-34	1286	M-70	R-34-A	1.179	29.9	1.294	32.8
	15	1.231	31.2	1287	M-70	R-35	1288	M-70	R-35-A	1.206	30.6	1.321	33.5
1-1/2" 38.1mm	8	1.170	29.7	1289	M-69	R-34	1290	M-69	R-34-A	1.145	29.0	1.260	32.0
	9	1.204	30.5	1285	M-70	R-34	1286	M-70	R-34-A	1.177	29.9	1.294	32.8
	10	1.232	31.2	1287	M-70	R-35	1288	M-70	R-35-A	1.206	30.6	1.321	33.5
	11	1.260	32.0	1291	M-70	R-36	1292	M-70	R-36-A	1.235	31.3	1.350	34.2
	12	1.282	32.5	1293	M-70	R-37	1294	M-70	R-37-A	1.257	31.9	1.372	34.8
	13	1.310	33.2	1295	M-71	R-37	1296	M-71	R-37-A	1.285	32.6	1.400	35.5
	14	1.334	33.8	1295	M-71	R-37	1296	M-71	R-37-A	1.285	32.6	1.400	35.5
	15	1.356	34.4	1297	M-71	R-38	1298	M-71	R-38-A	1.331	33.8	1.446	36.7
	16	1.370	34.8	1297	M-71	R-38	1298	M-71	R-38-A	1.331	33.8	1.446	36.7
	17	1.384	35.1	1299	M-72	R-38	1300	M-72	R-38-A	1.331	33.8	1.472	37.3
	18	1.402	35.6	1299	M-72	R-38	1300	M-72	R-38-A	1.331	33.8	1.472	37.3
19	1.416	35.9	1299	M-72	R-38	1300	M-72	R-38-A	1.331	33.8	1.472	37.3	
20	1.430	36.3	1299	M-72	R-38	1300	M-72	R-38-A	1.331	33.8	1.472	37.3	

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"1200" SERIES 5-ROLL TUBE EXPANDER



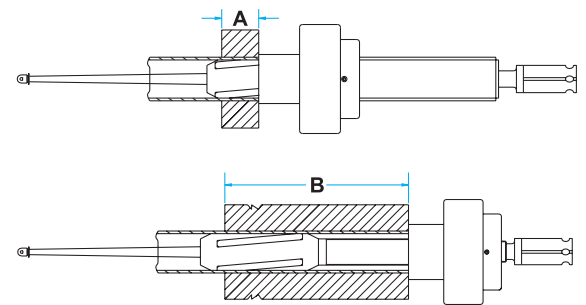
Features

1200 series 5-roll expanders are ideally suited to expand thin wall tubes of Titanium, Stainless Steel, Incoloy and other exotic metals with thick tube sheets. Gives a more concentric and even expansion when expanding thin wall tubes vs. conventional 3-roll expander

For tube sizes 3/4" 14 Gauge to 1 1/2" 20 Gauge, Roll Sets 1 1/2" or 2 1/4" and Roll Depths adjustable from: STD Reach 1 1/2" to 6" - A Reach from 1 1/2" to 8" - B Reach from 1 1/2" to 10" - C Reach from 1 1/2" to 12" for 1 1/2" Roller Lengths; STD Reach from 2 1/4" to 6 3/4" - A Reach from 2 1/4" to 8 3/4" - B Reach from 2 1/4" to 10 3/4" - C Reach from 2 1/4" to 12 3/4" for 2 1/4" Roller Lengths.

Note: Model 1223-5 to 1258-5 expanders come with 3/8" square mandrel drives and Model 1263-5 to 1300-5 expanders come with 1/2" square mandrel drives.

Tube I.D. Sizes
.584" - 1.43" (14.8mm - 36.3mm)



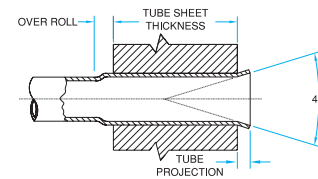
Tube O.D.	BWG	Tube I.D.		Expander with 1-1/2" (38.1mm) Long Rollers			Expander with 2-1/4" (57.1mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
3/4" 19.05mm	14	.584	14.8	1223-5	M-1224-5	R-6-5	1224-5	M-1224-5	R-6-A-5	.574	14.5	.639	16.2
	15	.606	15.3	1225-5	M-1226-5	R-7-5	1226-5	M-1226-5	R-7-A-5	.596	15.1	.661	16.7
	16	.620	15.7	1227-5	M-63	R-7-5	1228-5	M-63	R-7-A-5	.605	15.3	.685	17.4
	17	.634	16.1	1229-5	M-1230-5	R-7-5	1230-5	M-1230-5	R-7-A-5	.619	15.7	.699	17.7
	18	.652	16.5	1229-5	M-1230-5	R-7-5	1230-5	M-1230-5	R-7-A-5	.619	15.7	.699	17.7
	19	.666	16.9	1231-5	M-63	R-9-5	1232-5	M-63	R-9-A-5	.642	16.3	.722	18.3
	20	.680	17.2	1231-5	M-63	R-9-5	1232-5	M-63	R-9-A-5	.642	16.3	.722	18.3
	21	.686	17.4	1231-5	M-63	R-9-5	1232-5	M-63	R-9-A-5	.642	16.3	.722	18.3
1" 25.40mm	22	.694	17.6	1231-5	M-63	R-9-5	1232-5	M-63	R-9-A-5	.642	16.3	.722	18.3
	14	.834	21.1	1249-5	M-1250-5	R-12-5	1250-5	M-1250-5	R-12-A-5	.810	20.5	.909	23.1
	15	.856	21.7	1251-5	M-1251-5	R-13-5	1252-5	M-1251-5	R-13-A-5	.837	21.2	.936	23.7
	16	.870	22.1	1251-5	M-1251-5	R-13-5	1252-5	M-1251-5	R-13-A-5	.837	21.2	.936	23.7
	17	.884	22.4	1255-5	M-1256-5	R-13-5	1256-5	M-1256-5	R-13-A-5	.865	21.9	.964	24.4
	18	.902	22.9	1255-5	M-1256-5	R-13-5	1256-5	M-1256-5	R-13-A-5	.865	21.9	.964	24.4
	19	.916	23.2	1255-5	M-1256-5	R-13-5	1256-5	M-1256-5	R-13-A-5	.865	21.9	.964	24.4
	20	.930	23.6	1255-5	M-1256-5	R-13-5	1256-5	M-1256-5	R-13-A-5	.865	21.9	.964	24.4
1-1/8" 28.58mm	21	.936	23.8	1257-5	M-71-3/8	R-15-5	1258-5	M-71-3/8	R-15-A-5	.833	22.4	.982	24.9
	22	.944	24.0	1257-5	M-71-3/8	R-15-5	1258-5	M-71-3/8	R-15-A-5	.833	22.4	.982	24.9
	12	.907	23.0	1257-5	M-71-3/8	R-15-5	1258-5	M-71-3/8	R-15-A-5	.883	22.4	.982	24.9
1-1/2" 38.10mm	15	.981	24.9	1263-5	M-1263-5	R-18-5	-	-	-	.962	24.4	1.071	27.2
	16	.995	25.2	1263-5	M-1263-5	R-18-5	-	-	-	.962	24.4	1.071	27.2
	17	1.384	35.1	1299-5	M-1299-5	R-29-5	M-1300-5	M-1299-5	R-29-A-5	1.331	33.8	1.472	37.3
	18	1.402	35.6	1299-5	M-1299-5	R-29-5	M-1300-5	M-1299-5	R-29-A-5	1.331	33.8	1.472	37.3
	19	1.416	36.0	1299-5	M-1299-5	R-29-5	M-1300-5	M-1299-5	R-29-A-5	1.331	33.8	1.472	37.3
20	1.430	36.3	1299-5	M-1299-5	R-29-5	M-1300-5	M-1299-5	R-29-A-5	1.331	33.8	1.472	37.3	

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"114" SERIES TUBE EXPANDER



Features

Very Popular Expander for expanding and flaring boiler tubes. Compact design for use through small hand holes, headers, etc. Overlapping rolls prevent ridging of tube. Self retained rolls in cage.

Tube sizes 2" 4 Gauge to 4 1/2" 12 Gauge and Roll Depths available for the following combinations: 1/2" to 7/8", 3/4" to 1 1/8", 1 1/8" to 1 5/8", 1 5/8" to 2 1/8", 2 1/8" to 2 5/8".

Tube O.D. (in)	BWG	Tube O.D. (in)	BWG	Tube Expander Model Number					Spare Rollers Set Model Number					Minimum I.D. Tool Enters		Maximum Expansion of Tool	
				Tube Sheet Thickness Range					Tube Sheet Thickness Range					(in)	(mm)	(in)	(mm)
				1/2" to 7/8"	3/4" to 1 1/8"	1 1/8" to 1 5/8"	1 5/8" to 2 1/8"	2 1/8" to 2 5/8"	1/2" to 7/8"	3/4" to 1 1/8"	1 1/8" to 1 5/8"	1 5/8" to 2 1/8"	2 1/8" to 2 5/8"				
2	4 & 5	1 3/4	11 - 13	-	14172	14174	14176	14178	-	34872	34874	34878	34948	1.444	(36.7)	1.696	(43.1)
2	6 & 7	1 3/4	14 - 16	-	14182	14184	14186	14188	-	34879	34881	34883	34949	1.507	(38.3)	1.755	(44.6)
2	7 & 8	-	-	14191	14192	14194	14196	14198	34878	34879	34881	34883	34949	1.570	(39.9)	1.826	(46.4)
2	9 & 10	2 1/4	13	14201	14202	14204	14206	14208	34878	34879	34881	34883	34949	1.633	(41.5)	1.889	(48.0)
2	11 - 13	2 1/4	4 & 5	14211	14212	14214	14216	14218	34885	34886	34888	34890	34950	1.696	(43.1)	1.952	(49.6)
2 1/2	2	2 1/4	6 - 8	-	14222	14224	14226	14228	-	34893	34895	34897	34951	1.791	(45.5)	2.070	(52.6)
2 1/2	3 & 4	2 1/4	9 - 11	-	14232	14234	14236	14238	-	34893	34895	34897	34951	1.856	(47.1)	2.133	(54.2)
2 1/2	4 - 6	2 1/4	12 - 15	-	14242	14244	14246	14248	-	34893	34895	34897	34951	1.929	(49.0)	2.255	(57.3)
2 1/2	7 - 10	2 3/4	2 & 3	-	14252	14254	14256	14258	-	34900	34902	34904	34952	2.043	(51.9)	2.381	(60.5)
2 1/2	11 - 13	2 3/4	4 & 5	14261	14262	14264	14266	14268	34899	34900	34902	34904	34952	2.169	(55.1)	2.507	(63.7)
3	1 - 3	2 3/4	6 - 10	-	14272	14274	14276	14278	-	34907	34909	34911	34953	2.259	(57.4)	2.622	(66.6)
3	4 - 6	2 3/4	11 - 15	-	14282	14284	14286	14288	-	34907	34909	34911	34953	2.385	(60.6)	2.755	(70.0)
3	7 - 11	3 1/4	1 - 4	-	14292	14294	14296	14298	-	34914	34916	34918	34954	2.511	(63.8)	2.909	(73.9)
3	10 - 12	3 1/4	4 - 7	14301	14302	14304	14306	14308	34913	34914	34916	34918	34954	2.635	(66.9)	3.043	(77.3)
3 1/2	1 - 4	3 1/4	7 - 11	-	14312	14314	14316	14318	-	34921	34923	34925	34955	2.759	(70.1)	3.153	(80.1)
3 1/2	4 - 7	3 1/4	10 - 15	-	14322	14324	14326	14328	-	34921	34923	34925	34955	2.874	(73.0)	3.283	(83.4)
3 1/2	7 - 11	3 3/4	2 & 3	-	14332	14334	14336	14338	-	34921	34923	34925	34955	3.000	(76.2)	3.417	(86.8)
3 1/2	10 - 12	3 3/4	4 & 5	-	14342	14344	14346	14348	-	34921	34923	34925	34955	3.122	(79.3)	3.535	(89.8)
4	1 - 4	3 3/4	6 - 10	-	14352	14354	14356	14358	-	34928	34930	34932	34956	3.248	(82.5)	3.661	(93.0)
4	4 - 7	3 3/4	11 - 15	-	14362	14364	14366	14368	-	34928	34930	34932	34956	3.374	(85.7)	3.779	(96.0)
4	7 - 11	4 1/4	2 & 3	-	14372	14374	14376	14378	-	34928	34930	34932	34956	3.500	(88.9)	3.881	(98.6)
4	8 - 12	4 1/4	3 & 5	-	14382	14384	14386	14388	-	34935	34937	34939	34957	3.562	(90.5)	4.027	(102.3)
4 1/2	1 - 4	4 1/4	6 - 9	-	14392	14394	14396	14398	-	34935	34937	34939	34957	3.748	(95.2)	4.122	(104.7)
4 1/2	3 - 8	4 1/4	10 - 13	-	14402	14404	14406	14408	-	34935	34937	34939	34957	3.874	(98.4)	4.342	(110.3)
4 1/2	6 - 12	-	-	-	14412	14414	14416	14418	-	34942	34944	34946	34958	4.000	(101.6)	4.468	(113.5)

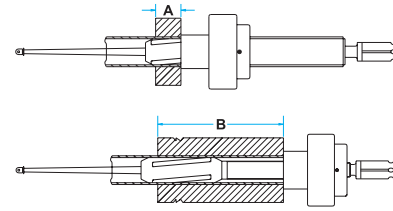
Tube O.D. (in)	BWG	Tube O.D. (in)	BWG	Mandrel Dr Size inch	Spare Mandrel Model Number				Minimum I.D. Tool Enters		Maximum Expansion of Tool	
					Drum Type	Header Type	Short Series 5 1/8 inch	Short Series 7 1/8 inch	(in)	(mm)	inch	mm
2	4 & 5	1 3/4	11 - 13	3/4	32269	32289	32308 32309 32310 32311	34876 34948	1.444	(36.7)	1.696	(43.1)
2	6 & 7	1 3/4	14 - 16	3/4	32269	32289	32309 32310 32311	-	1.507	(38.3)	1.755	(44.6)
2	7 & 8	-	-	3/4	32270	32290	32309 32310 32311 32312	-	1.570	(39.9)	1.826	(46.4)
2	9 & 10	2 1/4	13	3/4	32271	32291	32311 32312 32313	32346	1.633	(41.5)	1.889	(48.0)
2	11 - 13	2 1/4	4 & 5	3/4	32270	32290	32310 32311 32312	32345	1.696	(43.1)	1.952	(49.6)
2 1/2	2	2 1/4	6 - 8	3/4	32270	32290	32310 32311 32312 32313	-	1.791	(45.5)	2.070	(52.6)
2 1/2	3 & 4	2 1/4	9 - 11	3/4	32271	32291	32311 32312 32313 32314	-	1.856	(47.1)	2.133	(54.2)
2 1/2	4 - 6	2 1/4	12 - 15	3/4	32272	32292	32312 32313 21214 32315 32316	-	1.929	(49.0)	2.255	(57.3)
2 1/2	7 - 10	2 3/4	2 & 3	3/4	32272	32292	32312 32313 21214 32315 32316	32347 32348 32349	2.043	(51.9)	2.381	(60.5)
2 1/2	11 - 13	2 3/4	4 & 5	3/4	32273	32293	32315 32316 32317	33630 33631	2.169	(55.1)	2.507	(63.7)
3	1 - 3	2 3/4	6 - 10	3/4	32273	32293	32315 32316 32317 32318 32319	-	2.259	(57.4)	2.622	(66.6)
3	4 - 6	2 3/4	11 - 15	1	32274	32294	32317 32318 32319 32320 32321	-	2.385	(60.6)	2.755	(70.0)
3	7 - 11	3 1/4	1 - 4	1	32274	32294	32318 32319 32320 32321 32322	33632 33633 33634 33635	2.511	(63.8)	2.909	(73.9)
3	10 - 12	3 1/4	4 - 7	1	32275	32295	32320 32321 32322	33634 33635	2.635	(66.9)	3.043	(77.3)
3 1/2	1 - 4	3 1/4	7 - 11	1	32274	32294	32318 32319 32320 32321 32322	-	2.759	(70.1)	3.153	(80.1)
3 1/2	4 - 7	3 1/4	10 - 15	1	32275	32295	32321 32322 32323 32324 32325	-	2.874	(73.0)	3.283	(83.4)
3 1/2	7 - 11	3 3/4	2 & 3	1	32276	32296	32323 32324 32325 32326 32327	-	3.000	(76.2)	3.417	(86.8)
3 1/2	10 - 12	3 3/4	4 & 5	1	32277	32297	32324 32325 32326 32327 32328	-	3.122	(79.3)	3.535	(89.8)
4	1 - 4	3 3/4	6 - 10	1	32276	32296	32324 32325 32326 32327 32328	-	3.248	(82.5)	3.661	(93.0)
4	4 - 7	3 3/4	11 - 15	1	32277	32297	32326 32327 32328 32329 32330	-	3.374	(85.7)	3.779	(96.0)
4	7 - 11	4 1/4	2 & 3	1	32278	32298	32328 32329 32330 32331 32332	-	3.500	(88.9)	3.881	(98.6)
4	8 - 12	4 1/4	3 & 5	1	32277	32297	32324 32325 32326 32327 32328	-	3.562	(90.5)	4.027	(102.3)
4 1/2	1 - 4	4 1/4	6 - 9	1	32278	32298	32329 32330 32331 32332 32350	-	3.748	(95.2)	4.122	(104.7)
4 1/2	3 - 8	4 1/4	10 - 13	1	32279	32299	32331 32332 32350 32337 32338	-	3.874	(98.4)	4.342	(110.3)
4 1/2	6 - 12	-	-	1	32278	32298	32326 32327 32328 32329 32330	-	4.000	(101.6)	4.468	(113.5)

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"8012" SERIES TUBE EXPANDER



Features

A great choice for larger diameter tubes and thick tube sheets. To expand tubes in Air Heaters, Boilers and Refinery Tubes. Can be used to expand thick tube sheets (up to 8").

Tube sizes 1 3/4" 8 Gauge to 5" 16 Gauge and Roll Depth Adjustable: STD Reach from 1/2" to 4"; 6" Reach from 1/2" to 6"; 8" Reach from 1/2" to 8".

TUBE I.D. SIZES:
1.420" - 4.870" (36.1mm - 123.7 mm)

ROLLER LENGTH:	ROLL DEPTH:	
	MINIMUM A	MAXIMUM B
2-1/4" (57.1mm)	STD. REACH	1/2" (12.7mm) 4" (101.4mm)
	- 6" REACH	1/2" (12.7mm) 6" (152.4mm)
	- 8" REACH	1/2" (12.7mm) 8" (203.2mm)

*For Mandrels in 6" & 8" reach - ADD suffix 6 or 8 to Mandrel Model No.

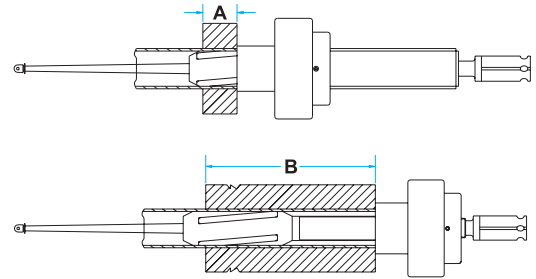
Tube O.D. (in) (mm)	BWG	Tube I.D.		Expander with 2 1/4" (57.15 mm) Long Rollers			Minimum I.D.Tool Enters		Maximum Expansion of Tool	
		(in)	(mm)	Complete Tool	Mandrel	Roll Set	(in)	(mm)	(in)	(mm)
1 3/4" (44.45mm)	8	1.420	(36.1)	8012-1.3/4-8	M-90	R-33-A	1.368	(34.7)	1.550	(39.3)
	10	1.482	(37.6)	8012-1.3/4-10	M-90	R-37-A	1.420	(36.0)	1.607	(40.8)
	11	1.510	(38.3)	8012-1.3/4-11	M-90	R-42	1.454	(36.9)	1.635	(41.5)
	12	1.532	(38.9)	8012-1.3/4-12	M-90	R-44	1.482	(37.6)	1.657	(42.0)
	13	1.560	(39.6)	8012-1.3/4-13	M-90	R-46	1.510	(38.3)	1.685	(42.7)
2" (50.80mm)	14	1.584	(40.2)	8012-1.3/4-14	M-90	R-48	1.532	(38.9)	1.709	(43.4)
	7	1.640	(41.6)	8012-2-7	M-91	R-46	1.570	(39.8)	1.770	(45.0)
	8	1.670	(42.4)	8012-2-8	M-91	R-48	1.595	(40.5)	1.795	(45.6)
	10	1.732	(43.9)	8012-2-10	M-91	R-50	1.640	(41.6)	1.857	(47.1)
	11	1.760	(44.7)	8012-2-11	M-91	R-52	1.670	(42.4)	1.885	(47.8)
	12	1.782	(45.2)	8012-2-12	M-91	R-54	1.704	(43.2)	1.907	(48.4)
	13	1.810	(45.9)	8012-2-13-18	M-91	R-56	1.732	(43.9)	1.956	(49.6)
	14	1.834	(46.5)	8012-2-13-18	M-91	R-56	1.732	(43.9)	1.956	(49.6)
	15	1.856	(47.1)	8012-2-13-18	M-91	R-56	1.732	(43.9)	1.956	(49.6)
	16	1.870	(47.4)	8012-2-13-18	M-91	R-56	1.732	(43.9)	1.956	(49.6)
2 1/4" (57.15mm)	17	1.884	(47.9)	8012-2-13-18	M-91	R-56	1.732	(43.9)	1.956	(49.6)
	18	1.902	(48.3)	8012-2-13-18	M-91	R-56	1.732	(43.9)	1.956	(49.6)
	10	1.982	(50.3)	8012-2.1/4-10	M-92	R-56	1.890	(48.0)	2.107	(53.5)
	11	2.010	(51.0)	8012-2.1/4-11	M-92	R-58	1.920	(48.7)	2.135	(54.2)
	12	2.032	(51.6)	8012-2.1/4-12	M-92	R-60	1.954	(49.6)	2.157	(54.7)
	13	2.060	(52.3)	8012-2.1/4-13-16	M-92	R-62	1.982	(50.3)	2.185	(55.4)
2 1/2" (63.50mm)	14	2.084	(52.9)	8012-2.1/4-13-16	M-92	R-62	1.982	(50.3)	2.185	(55.4)
	15	2.106	(53.4)	8012-2.1/4-13-16	M-92	R-62	1.982	(50.3)	2.185	(55.4)
	16	2.120	(53.8)	8012-2.1/4-13-16	M-92	R-62	1.982	(50.3)	2.185	(55.4)
	7-8	2.146	(54.5)	8012-2.1/2-7-8	M-92	R-45-A	2.050	(52.0)	2.335	(59.3)
	9	2.204	(56.0)	8012-2.1/2-9	M-93	R-46-A	2.106	(53.5)	2.380	(60.4)
	10	2.232	(56.6)	8012-2.1/2-10-12	M-93	R-64	2.140	(54.3)	2.407	(61.1)
	11	2.260	(57.4)	8012-2.1/2-10-12	M-93	R-64	2.140	(54.3)	2.407	(61.1)
	12	2.282	(57.9)	8012-2.1/2-10-12	M-93	R-64	2.140	(54.3)	2.407	(61.1)
	13	2.310	(58.6)	8012-2.1/2-13-18	M-94	R-64	2.232	(56.6)	2.450	(62.2)
	14	2.334	(59.2)	8012-2.1/2-13-18	M-94	R-64	2.232	(56.6)	2.450	(62.2)
2 3/4" (69.85mm)	15	2.356	(59.8)	8012-2.1/2-13-18	M-94	R-64	2.232	(56.6)	2.450	(62.2)
	16	2.370	(60.1)	8012-2.1/2-13-18	M-94	R-64	2.232	(56.6)	2.450	(62.2)
	17	2.384	(60.6)	8012-2.1/2-13-18	M-94	R-64	2.232	(56.6)	2.450	(62.2)
	18	2.402	(61.0)	8012-2.1/2-13-18	M-94	R-64	2.232	(56.6)	2.450	(62.2)
	10	2.482	(63.0)	8012-2.3/4-10-16	M-96	R-66	2.390	(60.7)	2.702	(68.6)
	11	2.510	(63.7)	8012-2.3/4-10-16	M-96	R-66	2.390	(60.7)	2.702	(68.6)
2 3/4" (69.85mm)	12	2.532	(64.3)	8012-2.3/4-10-16	M-96	R-66	2.390	(60.7)	2.702	(68.6)
	13	2.560	(65.0)	8012-2.3/4-10-16	M-96	R-66	2.390	(60.7)	2.702	(68.6)
	14	2.584	(65.6)	8012-2.3/4-10-16	M-96	R-66	2.390	(60.7)	2.702	(68.6)
	15	2.606	(66.1)	8012-2.3/4-10-16	M-96	R-66	2.390	(60.7)	2.702	(68.6)
	16	2.620	(66.5)	8012-2.3/4-10-16	M-96	R-66	2.390	(60.7)	2.702	(68.6)

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"8012" SERIES TUBE EXPANDER



Note: Model 8012-1.3/4-8 to 8012-2.1/2-13-18 expanders come with 3/4" square mandrel drives. Model 8012-2.3/4-10-16 to 8012-5-10-18 expanders come with 1" square mandrel drives.

Tube O.D.	BWG	Tube I.D.		Expander with 2 1/4" (57.15 mm) Long Rollers			Minimum I.D. Tool Enters		Maximum Expansion of Tool	
		inch	mm	Complete Tool	Mandrel	Roll Set	inch	mm	inch	mm
3" (76.20mm)	8	2.670	(67.8)	8012-3-8-9	M-97	R-67	2.560	(65.0)	2.829	(71.8)
	9	2.704	(68.6)	8012-3-8-9	M-97	R-67	2.560	(65.0)	2.829	(71.8)
	10	2.732	(69.3)	8012-3-10-18	M-96	R-67	2.640	(67.0)	2.952	(74.9)
	11	2.760	(70.1)	8012-3-10-18	M-96	R-67	2.640	(67.0)	2.952	(74.9)
	12	2.782	(70.6)	8012-3-10-18	M-96	R-67	2.640	(67.0)	2.952	(74.9)
	13	2.810	(71.3)	8012-3-10-18	M-96	R-67	2.640	(67.0)	2.952	(74.9)
	14	2.834	(71.9)	8012-3-10-18	M-96	R-67	2.640	(67.0)	2.952	(74.9)
	15	2.856	(72.5)	8012-3-10-18	M-96	R-67	2.640	(67.0)	2.952	(74.9)
	16	2.870	(72.8)	8012-3-10-18	M-96	R-67	2.640	(67.0)	2.952	(74.9)
3 1/2" (88.9mm)	13	3.311	(84.1)	8012-3.1/2-10-18	M-99	R-70	3.190	(81.0)	3.464	(88.0)
	14	3.334	(84.7)	8012-3.1/2-10-18	M-99	R-70	3.190	(81.0)	3.464	(88.0)
	15	3.354	(85.2)	8012-3.1/2-10-18	M-99	R-70	3.190	(81.0)	3.464	(88.0)
	16	3.370	(85.6)	8012-3.1/2-10-18	M-99	R-70	3.190	(81.0)	3.464	(88.0)
	17	3.385	(86.0)	8012-3.1/2-10-18	M-99	R-70	3.190	(81.0)	3.464	(88.0)
4" (101.6mm)	3	3.480	(88.4)	8012-4-3-4	M-100	R-71	3.425	(87.0)	3.780	(96.0)
	4	3.527	(89.6)	8012-4-3-4	M-100	R-71	3.425	(87.0)	3.780	(96.0)
	8	3.670	(93.2)	8012-4-8-9	M-101	R-71	3.582	(91.0)	3.940	(100.0)
	9	3.704	(94.1)	8012-4-8-9	M-101	R-71	3.582	(91.0)	3.940	(100.0)
	10	3.732	(94.8)	8012-4-10-18	M-101	R-72	3.661	(93.0)	3.960	(100.6)
	11	3.760	(95.5)	8012-4-10-18	M-101	R-72	3.661	(93.0)	3.960	(100.6)
	12	3.783	(96.1)	8012-4-10-18	M-101	R-72	3.661	(93.0)	3.960	(100.6)
	13	3.811	(96.8)	8012-4-10-18	M-101	R-72	3.661	(93.0)	3.960	(100.6)
	14	3.834	(97.4)	8012-4-10-18	M-101	R-72	3.661	(93.0)	3.960	(100.6)
4 1/2" (114.3mm)	3	3.980	(101.1)	8012-4.1/2-3-4	M-102	R-73	3.940	(100.0)	4.291	(109.0)
	4	4.030	(102.3)	8012-4.1/2-3-4	M-102	R-73	3.940	(100.0)	4.291	(109.0)
	8	4.170	(105.9)	8012-4.1/2-8-9	M-102	R-74	4.020	(102.0)	4.370	(111.0)
	9	4.204	(106.8)	8012-4.1/2-8-9	M-102	R-74	4.020	(102.0)	4.370	(111.0)
	10	4.232	(107.5)	8012-4.1/2-10-18	M-103	R-74	4.100	(104.0)	4.450	(113.0)
	12	4.283	(108.8)	8012-4.1/2-10-18	M-103	R-74	4.100	(104.0)	4.450	(113.0)
5" (127.0mm)	16	4.370	(111.0)	8012-4.1/2-10-18	M-103	R-74	4.100	(104.0)	4.450	(113.0)
	3	4.480	(113.8)	8012-5-3-4	M-105	R-76	4.410	(112.0)	4.763	(121.0)
	4	4.527	(115.0)	8012-5-3-4	M-105	R-76	4.410	(112.0)	4.763	(121.0)
	8	4.670	(118.6)	8012-5-8-9	M-105	R-77	4.566	(116.0)	4.921	(125.0)
	9	4.704	(119.5)	8012-5-8-9	M-105	R-77	4.566	(116.0)	4.921	(125.0)
	10	4.732	(120.2)	8012-5-10-18	M-105	R-78	4.606	(117.0)	4.960	(126.0)
	11	4.763	(121.0)	8012-5-10-18	M-105	R-78	4.606	(117.0)	4.960	(126.0)
	12	4.783	(121.5)	8012-5-10-18	M-105	R-78	4.606	(117.0)	4.960	(126.0)
5" (127.0mm)	14	4.834	(122.8)	8012-5-10-18	M-105	R-78	4.606	(117.0)	4.960	(126.0)
	16	4.870	(123.7)	8012-5-10-18	M-105	R-78	4.606	(117.0)	4.960	(126.0)

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"A" "AB" "AF3" "ABF3" SERIES TUBE EXPANDER

Equivalent to "Series 40" Elliott Expanders



Features		With Bearings	With Flare	Drum Mandrels	Header Mandrels	Short Mandrels
"A" Series	Best value for parallel rolling; 3 rollers; 5 lengths			✓	✓	✓
"AF3" Series	Best value when flaring tube ends; 3 flaring rollers; 5 lengths; 30 degree flare angle		✓	✓	✓	✓
"AB" Series	A Series + special thrust bearings; 3 rollers; 5 lengths	✓		✓		
"ABF3" Series	ABF3 Series + special thrust bearings; 3 flaring rollers; 5 lengths; 30 degree flare angle	✓	✓	✓		

***X-**
For Tube Expander Part #'s Substitute:
"A" = A Series
"AF3" = AF3 Series
"AB" = AB Series
"ABF3" = ABF3 Series

***R-**
For Spare Roll Sets Substitute the Following:
"RS" = A or AB Series
"F3S" = AF3 or ABF3 Series

For Short Series:
to 1 3/4" 8 GA add (2)
to 3" 13GA add (3)
All others add (4)

***# -**
For tube Sheet Thickness Substitute the Following:
-2 = 1/2" to 7/8"
-3 = 3/4" to 1 1/8"
-4 = 1 1/8 to 1 5/8"
-5 = 1 5/8" to 2 1/8"
-6 = 2 1/8" to 2 5/8"

***M-**
For Mandrels Substitute the Following:
"DM" = A or AF3 Series
"HM" = A or AF3 Series
"SM" = A or AF3 Series
"DMB" = AB or ABF3 Series

Tube O.D. (in)	Tube BWG	Tube O.D. (in)	Tube BWG	Tube Expander	Roll Set	Spare Mandrel	Minimum I.D. Tool Enters (in) (mm)		Maximum Expansion of Tool (in) (mm)		Dr Size inch
7/8	15	1	10	*X-31-#	15-#-R	*M-11	.712	(18.1)	.803	(20.4)	3/8
	16			*X-32-#	15-#-R		.724	(18.4)	.814	(20.7)	
	17	1	11	*X-33-#	16-#-R	*M-12	.740	(18.8)	.830	(21.1)	
	18	1	12	*X-34-#	20-#-R		.763	(19.4)	.850	(21.6)	
	19 & 20	1 1/8	8	*X-35-#	17-#-R	*M-13	.775	(19.7)	.877	(22.3)	
1	13			*X-36-#	18-#-R	*M-12	.791	(20.1)	.881	(22.4)	
	14		9	*X-37-#	18-#-R		.811	(20.6)	.909	(23.1)	
	15 & 16	1 1/8	10	*X-38-#	19-#-R	*M-13	.838	(21.3)	.937	(23.8)	
	17 & 18		11	*X-39-#	21-#-R		.866	(22.0)	.964	(24.5)	
	19 & 20		12	*X-40-#	21-#-R		.881	(22.4)	.984	(25.0)	
			13	*X-41-#	22-#-R	*M-14	.917	(23.3)	1.019	(25.9)	
1 1/4	9	1 1/8	14	*X-42-#	23-#-R		.937	(23.8)	1.043	(26.5)	
	10		15 & 16	*X-43-#	24-#-R	*M-15	.960	(24.4)	1.070	(27.2)	
	11			*X-44-#	26-#-R		.992	(25.2)	1.102	(28.0)	
	12		*X-45-#	27-#-R	*M-16	1.011	(25.7)	1.122	(28.5)		
	13	1 3/8	8	*X-46-#	31-#-R		1.027	(26.1)	1.133	(28.8)	
	14			*X-47-#	28-#-R		1.039	(26.4)	1.149	(29.2)	
	15	1 3/8	9	*X-48-#	29-#-R	*M-17	1.059	(26.9)	1.169	(29.7)	
	16		10	*X-49-#	30-#-R		1.086	(27.6)	1.196	(30.4)	
	7		11	*X-50-#	30-#-R		1.114	(28.3)	1.228	(31.2)	
	1 1/2	8	1 3/8	12	*X-51-#	32-#-R	*M-18	1.133	(28.8)	1.248	(31.7)
9		13 & 14		*X-52-#	28-#-R		1.161	(29.5)	1.314	(33.4)	
10		15 & 16		*X-53-#	29-#-R		1.181	(30.0)	1.342	(34.1)	
11 & 12				*X-54-#	30-#-R	*M-20	1.204	(30.6)	1.370	(34.8)	
13		1 3/4	5	*X-55-#	33-#-R		1.236	(31.4)	1.401	(35.6)	
14 & 15			6	*X-56-#	32-#-R		1.283	(32.6)	1.448	(36.8)	
			7	*X-57-#	36-#-R	*M-21	1.314	(33.4)	1.500	(38.1)	
			8	*X-58-#	37-#-R		1.346	(34.2)	1.523	(38.7)	

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Continued from previous page.

Tube O.D. (in)	Tube BWG	Tube O.D. (in)	Tube BWG	Tube Expander	Roll Set	Spare Mandrel	Minimum I.D. Tool Enters (in)	(mm)	Maximum Expansion of Tool (in)	(mm)	Dr Size (in)
2	3	1 3/4	9 & 10	*X-59-#	33-#-R	*M-22	1.377	(35.0)	1.598	(40.6)	3/4
	4		11 & 12	*X-60-#	37-#-R		1.440	(36.6)	1.661	(42.2)	
	5 & 6		13 & 14	*X-61-#	38-#-R		1.503	(38.2)	1.712	(43.8)	
	7 & 8		15 & 16	*X-62-#	39-#-R		1.566	(39.8)	1.787	(45.4)	
	9 & 10	2 1/4	3	*X-63-#	40-#-R	*M-23	1.629	(41.4)	1.850	(47.0)	
	11 - 13		4	*X-64-#	40-#-R		1.688	(42.9)	1.948	(49.5)	
	14 - 16		6 & 7	*X-65-#	41-#-R		1.751	(44.5)	2.011	(51.1)	
	17 & 18		8 & 9	*X-66-#	42-#-R		1.814	(46.1)	2.074	(52.7)	
			10 & 11	10 & 11	*X-67-#		43-#-R	*M-23	1.877	(47.7)	
2 1/2	4 & 5	2 1/4	12 & 13	*X-68-#	44-#-R	*M-23	1.940		(49.3)	2.200	(55.9)
	6 & 7		14 - 16	*X-69-#	43-#-R		2.000	(50.8)	2.275	(57.8)	
	8 & 9		2 3/4	3	*X-70-#		44-#-R	*M-24	2.062	(52.4)	2.338
	10 & 11	4		*X-71-#	45-#-R	2.125	(54.0)		2.401	(61.0)	
	12 - 14	5 & 6		*X-72-#	47-#-R	2.188	(55.6)		2.519	(64.0)	
	15 & 16	7 & 8		*X-73-#	46-#-R	2.251	(57.2)		2.582	(65.6)	
	3	3	2 3/4	9 & 10	*X-74-#	47-#-R	*M-25	2.307	(58.6)	2.637	(67.0)
4		11 - 13		*X-75-#	48-#-R	2.377		(60.4)	2.708	(68.8)	
5 & 6		14 - 16		*X-76-#	49-#-R	2.448		(62.2)	2.771	(70.4)	
7 & 8				*X-77-#	50-#-R	2.503		(63.6)	2.834	(72.0)	
9 & 10		3 1/4	3	*X-78-#	51-#-R	*M-25	2.559	(65.0)	2.889	(73.4)	
11 - 13			4	*X-79-#	52-#-R		2.622	(66.6)	2.952	(75.0)	
14 - 16			5 & 6	*X-80-#	51-#-R		2.688	(68.3)	3.027	(76.9)	
3 1/2	2	3 1/4	7 & 8	*X-81-#	52-#-R	*M-26	2.751	(69.9)	3.090	(78.5)	
	3		9 & 10	*X-82-#	53-#-R		2.814	(71.5)	3.153	(80.1)	
	4		11 - 13	*X-83-#	54-#-R		2.877	(73.1)	3.216	(81.7)	
	5 & 6		14 - 16	*X-84-#	54-#-R		2.937	(74.6)	3.314	(84.2)	
	7 & 8	3 3/4	2	*X-85-#	55-#-R	*M-27	3.000	(76.2)	3.366	(85.5)	
	9 - 10		3	*X-86-#	56-#-R		3.062	(77.8)	3.440	(87.4)	
	12 - 16		4	*X-87-#	57-#-R		3.125	(79.4)	3.503	(89.0)	
4	2	3 3/4	5 & 6	*X-88-#	58-#-R	*M-27	3.188	(81.0)	3.566	(90.6)	
	3		7 & 8	*X-89-#	59-#-R		3.251	(82.6)	3.629	(92.2)	
	4		9 & 10	*X-90-#	60-#-R		3.314	(84.2)	3.692	(93.8)	
	5 & 6		11 - 13	*X-91-#	59-#-R		3.377	(85.8)	3.787	(96.2)	
	7 & 8	4 1/4	14 - 16	*X-92-#	60-#-R	*M-28	3.440	(87.4)	3.850	(97.8)	
	9 - 11		2	*X-93-#	61-#-R		3.503	(89.0)	3.913	(99.4)	
	12 - 16		3	*X-94-#	62-#-R		3.559	(90.4)	3.968	(100.8)	
4 1/2	2	4 1/4	4	*X-95-#	63-#-R	*M-29	3.622	(92.0)	4.031	(102.4)	
	3		5 & 6	*X-96-#	62-#-R		3.677	(93.4)	4.086	(103.8)	
	4 & 5		7 & 8	*X-97-#	63-#-R		3.740	(95.0)	4.149	(105.4)	
	6 & 7		9 - 11	*X-98-#	64-#-R		3.803	(96.6)	4.212	(107.0)	
	8 & 9	4 1/2	11 - 13	*X-99-#	63-#-R	*M-30	3.866	(98.2)	4.275	(108.6)	
	10 - 12			*X-100-#	64-#-R		3.984	(101.2)	4.330	(110.0)	
				*X-101-#	65-#-R		4.047	(102.8)	4.393	(111.6)	
			*X-102-#	66-#-R	4.110	(104.4)	4.456	(113.2)			

When Ordering Specify: (Example Below)

- 2" 14 ga AB Expander (Flange Rolls)
- 1 1/8" to 1 5/8" Tube sheet with Drum Mandrel
- Example Expander — PN#AF3-65-4-DM
- Example Square Roll Set — PN#41-4-F35
- Example Square Mandrel — PN#-DM-23
- Quantity
- Delivery Date

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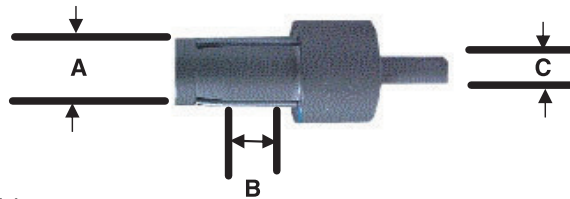
“AL” SERIES TUBE EXPANDER

Features

This expander enlarges the ends of copper, brass, and aluminum tubing so that another tube of the same size may be inserted into expanded section and soldered for leak-resistant joint. Designed to leave 0.015” clearance for slip fit.

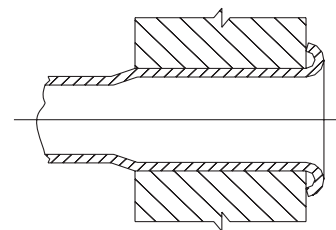
Tube sizes $\frac{5}{16}$ " to $\frac{15}{8}$ " and Roll Depths from $\frac{5}{8}$ " to 1".

Note: All “AL” series expanders are supplied with round mandrel drives.



Tube O.D.		Expander	Roll Set	“A”		“B”		“C”	
(in)	(mm)			Expansion (in)	Diameter (mm)	Roll Depth		Drive Size	
$\frac{5}{16}$	(7.93)	AL-312	ALR-312	0.33	(8.38)	$\frac{5}{8}$	(15.87)	$\frac{1}{4}$	(6.35)
$\frac{3}{8}$	(9.53)	AL-375	ALR-375	0.39	(9.90)	$\frac{5}{8}$	(15.87)	$\frac{1}{4}$	(6.35)
$\frac{7}{16}$	(11.11)	AL-407	ALR-407	0.45	(11.43)	$\frac{5}{8}$	(15.87)	$\frac{5}{16}$	(7.93)
$\frac{1}{2}$	(12.70)	AL-500	ALR-500	0.52	(13.20)	$\frac{5}{8}$	(15.87)	$\frac{5}{16}$	(7.93)
$\frac{9}{16}$	(14.28)	AL-562	ALR-562	0.58	(14.73)	$\frac{3}{4}$	(19.05)	$\frac{5}{16}$	(7.93)
$\frac{5}{8}$	(15.87)	AL-625	ALR-625	0.64	(16.25)	$\frac{3}{4}$	(19.05)	$\frac{5}{16}$	(7.93)
$\frac{3}{4}$	(19.05)	AL-750	ALR-750	0.77	(19.55)	$\frac{3}{4}$	(19.05)	$\frac{3}{8}$	(9.52)
$\frac{7}{8}$	(22.22)	AL-875	ALR-875	0.89	(22.60)	$\frac{3}{4}$	(19.05)	$\frac{3}{8}$	(9.52)
1	(25.40)	AL-1000	ALR-1000	1.01	(25.65)	1	(25.40)	$\frac{3}{8}$	(9.52)
$1\frac{1}{8}$	(28.57)	AL-1125	ALR-1125	1.14	(28.95)	1	(25.40)	$\frac{1}{2}$	(12.70)
$1\frac{1}{4}$	(31.75)	AL-1250	ALR-1250	1.27	(32.25)	1	(25.40)	$\frac{1}{2}$	(12.70)
$1\frac{3}{8}$	(34.92)	AL-1375	ALR-1375	1.39	(35.30)	1	(25.40)	$\frac{1}{2}$	(12.70)
$1\frac{1}{2}$	(38.10)	AL-1500	ALR-1500	1.52	(38.60)	1	(25.40)	$\frac{1}{2}$	(12.70)
$1\frac{5}{8}$	(41.27)	AL-1625	ALR-1625	1.64	(41.65)	1	(25.40)	$\frac{9}{16}$	(14.28)

COMBINATION BEADING EXPANDER



Features

Tube Expansion & Beading in a Single Operation!

Tube O.D.	BWG	Expansion Range		Model Number	Mandrel (Square)	Spare Roll Set	Beading Roll	Guide Roll
		(in)	(mm)					
2	10			41633-0010	42157 (3/4")	42811 Set of 4	41631-0010	41701-0010
	11	1.700 -	43.2 -	41633-0011			41631-0011	41701-0011
	12	1.906	76.6	41633-0012			41631-0012	41701-0012
	13			41633-0013			41631-0013	41701-0013
2 1/2	10			41634-0010	42158 (3/4")	41673 Set of 5	41651-0010	41702-0010
	11	2.200 -	55.9 -	41634-0011			41651-0011	41702-0011
	12	2.460	60.3	41634-0012			41651-0012	41702-0012
	13			41634-0013			41651-0013	41702-0013
3	10			41359-0010	42159 (1")	41676 Set of 5	41666-0010	41703-0010
	11	2.700 -	68.6 -	41359-0011			41666-0011	41703-0011
	12	2.980	73.7	41359-0012			41666-0012	41703-0012

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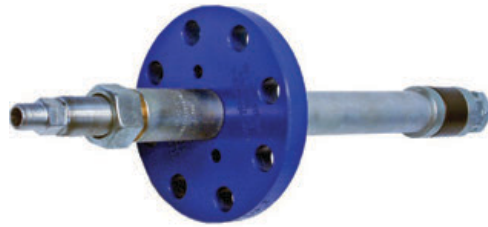
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EXPANDER ADAPTORS

Adapts one Morse Taper drive to multiple Square Sizes

TAPER SHANK - INTERCHANGEABLE FEMALE SQUARE



Morse Taper No.	Square Size	Model No.	Insert Square Size	Insert Model No.
2	3/8"	MM/2/95	3/8"	MDT/95
	1/2"	MM/2/127	1/2"	MDT/127
3	3/8"	MM/3/95	3/8"	MDT/95
	1/2"	MM/3/127	1/2"	MDT/127
	3/4"	MM/3/190	3/4"	MDT/190
	1"	MM/3/254	1"	MDT/254
4	3/8"	MM/4/95	3/8"	MDT/95
	1/2"	MM/4/127	1/2"	MDT/127
	3/4"	MM/4/190	3/4"	MDT/190
	1"	MM/4/254	1"	MDT/254
5	3/8"	MM/5/95	3/8"	MDT/95
	1/2"	MM/5/127	1/2"	MDT/127
	3/4"	MM/5/190	3/4"	MDT/190
	1"	MM/5/254	1"	MDT/254

TAPER SHANK - FEMALE SQUARE



Morse Taper No.	Square Size	Model No.
1	3/8"	MTM/1/95
	1/2"	MTF/1/127
2	3/8"	MTF/2/95
	1/2"	MTF/2/127
3	3/4"	MTF/3/190
	1"	MTF/3/254
4	3/4"	MTF/4/190
	1"	MTF/4/254

TAPER SHANK - MALE SQUARE



Morse Taper No.	Square Size	Model No.
1	3/8"	MTM/1/95
	1/2"	MTM/1/127
2	3/8"	MTM/2/95
	1/2"	MTM/2/127
3	3/4"	MTM/3/190
	1"	MTM/3/254
4	3/4"	MTM/4/190
	1"	MTM/4/254

Features:

Adapts one Morse • Taper drive to multiple • Square Sizes

TRIANGLE SHANK - FEMALE SQUARE



Square Size	Chuck Size	Model No.
3/8"	1/4"	MTC/95/63
	3/8"	MTC/95/95
	1/2"	MTC/95/127
1/2"	1/2"	MTC/127/127

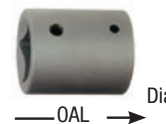
DRIVE EXTENSION Male x Male



Square Size	Model No.	OAL	Diameter
3/8"	EB/95/6	6"	1/2"
	EB/95/9	9"	
	EB/95/12	12"	
1/2"	EB/95/18	18"	5/8"
	EB/127/6	6"	
	EB/127/9	9"	
	EB/127/12	12"	
3/4"	EB/127/18	18"	1"
	EB/127/24	24"	
	EB/195/6	6"	
	EB/195/9	9"	
	EB/195/12	12"	
1"	EB/195/18	18"	1 1/4"
	EB/195/24	24"	
	EB/254/6	6"	
	EB/254/12	12"	
	EB/254/14	14"	
EB/254/18	18"		
EB/254/24	24"		

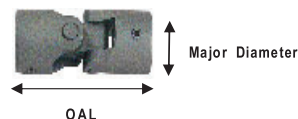
Features
Used to extend the reach of the operator for tube expanding.

FEMALE COUPLING Female x Female



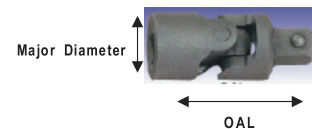
Square Sizes	Model No.	OAL	Diameter
3/8" x 3/8"	EC/95/95	1 7/16"	1 3/16"
3/8" x 1/2"	EC/95/127	1 9/16"	1 1/16"
3/8" x 5/8"	EC/95/158	1 1/2"	1 1/4"
1/2" x 1/2"	EC/127/127	1 11/16"	1 1/16"
1/2" x 5/8"	EC/127/158	1 5/8"	1 1/4"
1/2" x 3/4"	EC/127/195	1 5/8"	1 3/8"
1/2" x 7/8"	EC/127/222	1 5/8"	1 5/8"
1/2" x 1"	EC/127/254	1 5/8"	1 7/8"
5/8" x 3/4"	EC/158/195	1 9/16"	1 3/8"
5/8" x 7/8"	EC/158/222	2"	1 5/8"
5/8" x 1"	EC/158/254	1 13/16"	1 7/8"
3/4" x 3/4"	EC/195/195	1 5/8"	1 7/16"
3/4" x 7/8"	EC/195/222	1 5/8"	1 3/4"
3/4" x 1"	EC/195/254	1 13/16"	1 7/8"
7/8" x 7/8"	EC/222/222	1 11/16"	1 3/4"
7/8" x 1"	EC/222/254	2 1/8"	2 1/8"
1" x 1"	EC/254/254	2 1/16"	1 7/8"

UNIVERSAL JOINT - Female x Female



Square Sizes	Model No.	OAL	Major Diameter
3/8"	UJ/95	2 1/4"	7/8"
1/2"	UJ/127	2 5/8"	1"
3/4"	UJ/195	3"	1 1/2"
1"	UJ/254	3 3/4"	1 3/4"

UNIVERSAL JOINT - Male x Female



Square Sizes	Model No.	OAL	Major Diameter
3/8"	UC/95	2 1/4"	7/8"
1/2"	UC/127	2 19/32"	1"
3/4"	UC/195	3 9/32"	1 1/2"
1"	UC/254	4"	1 3/4"

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DOUBLE UNIVERSAL JOINT Female — Female



Square Sizes	Model No.	OAL	Major Diameter
3/8"	DUJ/95	3 15/16"	1 1/8"
1/2"	DUJ/127	4"	1 5/16"
3/4"	DUJ/195	4 11/16"	1 5/8"
1"	DUJ/254	6 1/32"	2 1/4"

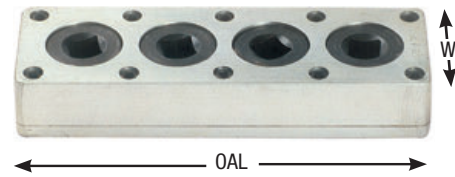
Features
Used to extend the reach of the operator for tube expanding.

EXTENSION UNIVERSAL JOINT Female — Male



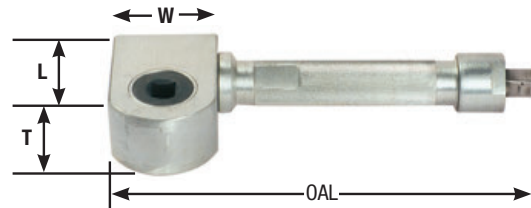
Square Size Female	Square Size Male	Model No.	OAL	Major Diameter
3/8"	3/8"	UE/95/6	6"	1 1/8"
		UE/95/9	9"	
		UE/95/12	12"	
3/8"	1/2"	UE/95S/9	9"	1 1/8"
		UE/95S/12	12"	
		UE/95S/16	16"	
1/2"	1/2"	UE/127/6	6"	1 5/16"
		UE/127/9	9"	
		UE/127/12	12"	
		UE/127/16	16"	
		UE/127/20	20"	
3/4"	3/4"	UE/195/9	9"	1 3/4"
		UE/195/12	12"	
		UE/195/16	16"	
		UE/195/20	20"	
1"	1"	UE/254/9	9"	2 1/4"
		UE/254/12	12"	
		UE/254/16	16"	

GEAR DRIVES PARALLEL



Square Size	Number of Openings	Model No.	Replacement Parts				Dimensions	
			Double Hub Gear		Center Gear		OAL	Width (W)
			Model No.	Nos. Reqd.	Model No.	Nos. Reqd.		
3/8"	3	BG/3/95	BGH/3/95	3	BGC/3/95	4	8 1/2"	2"
1/2"	3	BG/3/127	BGH/3/127	3	BGC/3/127	4	8 1/2"	2"
	4	BG/4/127	BGH/4/127	4	BGC/4/127	3		
3/4"	3	BG/3/195	BGH/3/195	3	BGC/3/195	4	9"	2 1/2"
	4	BG/4/195	BGH/4/195	4	BGC/4/195	3		
1"	4	BG/4/254	BGH/4/254	4	BGC/4/254	3	9"	2 1/2"

RIGHT ANGLE WORM GEAR



Male Square	Female Square	Model No.	OAL	Gear Housing			Minimum Hand Hole Diameter	Gear Ratio
				Length (L)	Width (W)	Thick (T)		
1/2"	1/2"	RW/127/127	10 3/16"	3 3/16"	2 1/4"	1 3/8"	3 3/8"	4 1/2 to 1
	3/4"	RW/127/195						
3/4"	3/4"	RW/195/195	11 9/32"	3 27/32"	2 5/8"	1 7/8"	4"	
	1"	RW/195/254						

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TUBE ROLLING SYSTEMS PNEUMATIC ROLL MOTORS



Model 720 Series



Features

Torque controlled expansion

Available in the following sizes:

- 550 RPM - Torque 2 to 75 in-lbs - 1/4" Sq Drive
Recommended Max Tube Size - 1/2"
- 1,800 RPM - Torque 2 to 27 in-lbs - 1/4" Sq Drive
Recommended Max Tube Size - 3/8"
- 2,500 RPM - Torque 2 to 75 in-lbs - 1/4" Sq Drive
Recommended Max Tube Size - 1/4"

Model 850 Push/Pull Series



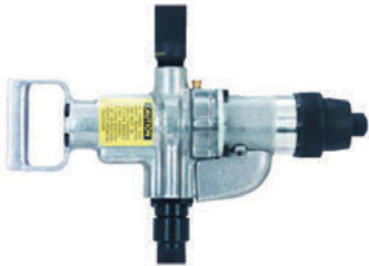
Features

Torque controlled expansion

Available in the following sizes:

- 1,250 RPM - Torque 9.6 to 126 in-lbs - 3/8" Sq Drive
Recommended Tube Size - 3/4"
- 600 RPM - Torque 14.4 to 230 in-lbs - 3/8" Sq Drive
Recommended Tube Size - 1"

Model 1050 Series



Features

Torque controlled expansion

Available in the following sizes:

- 400 RPM - Torque 3.3 to 26.4 ft-lbs - 1/2" Sq Drive
Recommended Tube Size - 1 1/4"

Model 1550 Series



Features

Torque controlled expansion

Available in the following sizes:

- 900 RPM - Torque 4.7 to 30.7 ft-lbs - 1/2" Sq Drive
Recommended Tube Size - 1 1/2"
- 250 RPM - Torque 14.3 to 109.9 ft-lbs - 1/2" Sq Drive
Recommended Tube Size - 2 1/2"

Right Angle Drive Roll Motor



Features

Designed for expanding boiler tubes in steam, mud drums, fire tube & related equipment.

- 190 RPM - Torque 70 to 140 ft-lbs - 5/8" Sq Drive
Recommended Tube Size - 2 1/2"
- 90 RPM - Torque 150 to 305 ft-lbs - 3/4" Sq Drive
Recommended Tube Size - 4"

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ELECTRIC ROLL MOTORS AND CONTROLS

All of our Electric Drive controllers are “Wattage” based to provide “**Consistently Repeatable Expansions**”. Wattage based controllers monitor the total effective power of your source (Voltage & Current) eliminating the inconsistencies of the “Current” based controllers of the past.

PR2000 DIGITAL TORQUE CONTROLLER WITH INTEGRAL PRINTER AND REMOTE CONTROL

Features

- Automated Expansion Cycles:
 - Start Expansion Cycle.
 - Expansion set point reached, 1 second or less pause
 - Motor reverses to back out expander for user defined time
 - User defined pause to allow Expander to be placed into next tube
 - The cycle Automatically starts over
 - Manual Overrides allow for Operator control of each cycle
- Record & Printout capabilities are available for up to 2,000 expansions, providing total documentation of each one
- Statistical print outs of under/over expanded tubes with specific tube numbers makes quality control of expanded tubes easier and faster
- When connecting a drive, controller automatically recognizes the drive model and sets the maximum trip wattage
- **Many more features and benefits**



Program Memory (EPROM):	Built in
Data Storage Memory (E2PROM):	1K
Real Power Measurement up to:	2KW
Voltage, current sampling rate:	50 times/sec.
No. of values that can be stored:	950
Printer:	Built In/External

Model	Voltage Single Phase 50/60 Hz	Weight lbs
PR-2000-110	110 V	42
PR-2000-230	230 V	42

TCW 2000 SERIES

Features

- Automated Expansion Cycles:
 - Start Expansion Cycle
 - Expansion set point reached, 1 second or less pause
 - Motor reverses to back out expander for user defined time
 - User defined pause to allow Expander to be placed into next tube
 - The cycle automatically starts over
 - Manual Overrides allow for Operator control of each cycle
- When connecting a drive, controller automatically recognizes the drive model and sets the maximum trip wattage
- Superior SCR technology (Silicon Controlled Rectifier) has been incorporated for the drive controller. SCRS have much better voltage, current & dv/dt ratings than systems used in the past which leads to much greater reliability
- Over 1000 TCW Torque Controllers in active use worldwide
- **Many more features and benefits**



Model	Voltage Single Phase 50/60 Hz	Weight lbs
TCW-110	110 V	24.25
TCW-230	230 V	24.25

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[**www.USAIndustries.com**](http://www.USAIndustries.com)



ELECTRIC CONTROL MOTORS FOR USE WITH PR-2000 OR TCW CONTROLLERS

All our Electric Drive Roll Motors are built by "Milwaukee" to provide maximum life and double insulated for safety.

Model MPB-0



Model MPB-1



Model MPB-2



Model MPB-3



Supply Voltage Single Phase	Drive Model	Speed I/II	No Load R.P.M.	Expansion Range				Drive Weight lbs
				Steel Tube O.D.		Copper Tube O.D.		
				inch	mm	inch	mm	
230 V	MPB-0N	I	2200	1/4" - 3/8"	6 - 10	1/4" - 1/2"	6 - 12	4.5
	MPB-1N	I	1000	3/8" - 5/8"	10 - 16	3/8" - 3/4"	13 - 20	5.5
		II	1900	5/16" - 3/8"	8 - 13	5/16" - 1/2"	8 - 13	
	MPG-2N	I	480	5/8" - 1 3/4"	16 - 45	5/8" - 2"	16 - 50	16.5
		II	1080	5/8" - 1 1/4"	16 - 32	5/8" - 1 1/2"	16 - 38	
	MPG-3N	I	130	1" - 3"	25 - 76	1" - 4"	25 - 102	19
II		430	1" - 2"	25 - 50	1" - 3"	25 - 76		
110 V	MPB-0L	I	2200	1/4" - 3/8"	6 - 10	1/4" - 1/2"	6 - 12	4.5
	MPB-1L	I	1000	3/8" - 5/8"	10 - 16	3/8" - 3/4"	13 - 20	5.5
		II	1900	5/16" - 3/8"	8 - 13	5/16" - 1/2"	8 - 13	
	MPG-2L	I	480	5/8" - 1 3/4"	16 - 45	5/8" - 2"	16 - 50	16.5
		II	1080	5/8" - 1 1/4"	16 - 32	5/8" - 1 1/2"	16 - 38	
	MPG-3L	I	130	1" - 3"	25 - 76	1" - 4"	25 - 102	19
II		430	1" - 2"	25 - 50	1" - 3"	25 - 76		

**IN-STOCK ITEMS
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HYDRAULIC TUBE ROLLING SYSTEMS POWERPACK

HEP-300, 500 or 1000

Features

- Guaranteed to be the most reliable and quickest tube expansion system available
- Greatly Superior to any Pneumatic or Electric Tube Rollers
- Uses any make or model Tube Expanders
- Virtually silent during use
- Available in 3 different pump model configurations with 4 separate roll motors
- Automated Expansion Cycles:
 - Start Expansion Cycle
 - Motor set point reached, 1 second or less pause
 - User defined pause to allow Expander to be placed into next tube
 - The cycle automatically starts over
 - Manual overrides allow for Operator control of each cycle



	Hydraulic Pump Models		
	HEP-300	HEP-500	HEP-1000 TWIN HEAD
Oil Tank Capacity (Quarts)	30	45	138
Hydraulic Oil	SAE VG 68	SAE VG 68	SAE VG 68
Maximum Working Pressure (psi)	100	100	100
Net Weight (lbs)	176.37	220.46	485.02
Overall Dimensions (inches)	24.01x10.63x38.78	32.28x12.60x38.78	69.88x21.65x47.24
Electric Motor	3 hp. Single phase	5 hp. 3 phase	10 hp. 3 phase
Voltage	230 v / 110 v	415 v	415 v
Standard Hose Size (Length)	1/2" (10 mtrs.)	1/2" (10 mtrs.)	1/2" (10 mtrs.)

Hydraulic Drive Units

Features

- Safe, smooth, virtually silent operation. Best suited for boiler tube expansion inside drums or Shop Production Environments.



Note: For Shop Production use with our Trolley and Accessories.

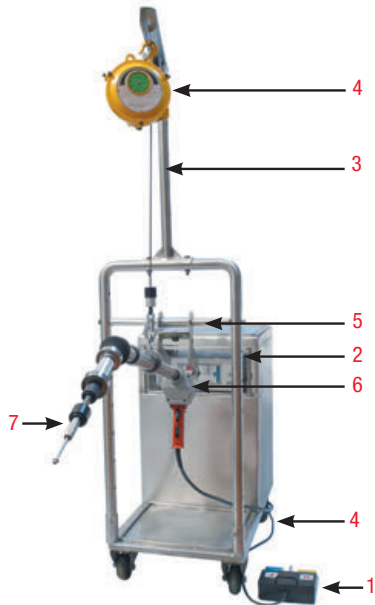
TUBE EXPANSION RANGE				DRIVE		DRIVE NO LOAD Speed (RPM)	Drive Weight lbs
Steel Tube O.D.		Copper Tube O.D.		Model Number	Square Socket inch	With HEP-300/500/1000	
inch	mm	inch	mm				
5/8 - 1	15 - 25	1 - 1 1/2	25 - 38	HM-3	3/8	620/954/800	21
3/4 - 1 1/2	19 - 38	1 1/4 - 2 1/2	32 - 64	HM-4	3/8 & 1/2	350/480/400	21
1 1/2 - 3	38 - 76	2 - 4	50 - 102	HM-5	1/2 & 3/4	62/84/70	24
2 - 4	50 - 102	-	-	HM-6	3/4 & 1	40/62/54	25

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TUBE ROLLING EQUIPMENT ACCESSORIES



Features

Used with either the Electric or the Hydraulic Roll Motor Control systems and drive units. Designed to reduce Operator fatigue and especially suited for shop environments.

Item No.	Description
1	Foot Switch
2	Torque Controller
3	SS Trolley Assembly
4	Spring Balancer
5	Swivel Bracket
6	Drive Motor
7	Telescopic Shaft

SPRING BALANCER



Features

Used to suspend the Drive Units to relieve the operator from their weight. Four models available cover all combinations of Drive Units and accessories.

Model	Capacity range (lbs)	Travel (ft)	Weight (lbs)
SEW-9	9 - 20	4.3	8
SEW-15	19 - 33		9
SEW-22	33 - 49	4.9	11
SEW-30	48 - 66		20
SEW-40	67 - 88		23
SEW-50	89 - 110		24
SEW-60	111 - 132		26
SEW-70	133 - 154		27
SEW-85	155 - 187		49
SEW-100	188 - 220		54
SEW-120	221 - 264		59

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VISA

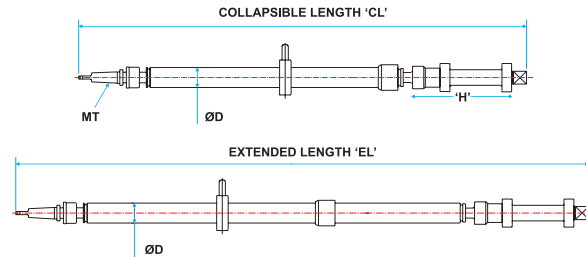


TELESCOPIC SHAFTS



Features

Used with Trolley Assembly to free the operator from handling the drive units. The sturdy construction absorbs all torque during tube expansion.



Model Number	MT Shank	Closed Length inch	Extended Length inch	Handle Length 'H' inch	D inch	For use with Electric Drive Model	For use with Hydraulic Drive Model	Weight lbs	Supplied with Quick Change Chucks and Adaptors of Following Sizes
TS-1 E	2 MT	33	49	8	1.5	EM-2	HM 3,4 or 5	6	3/8", 1/2", 3/4"

QUICK CHANGE CHUCKS AND ADAPTORS

Features

For use directly with Rolling Motors - Electric, Hydraulic and Pneumatic or for use with Telescopic Shafts. Any combination possible for use with any manufacturers' equipment.

QUICK CHANGE CHUCK

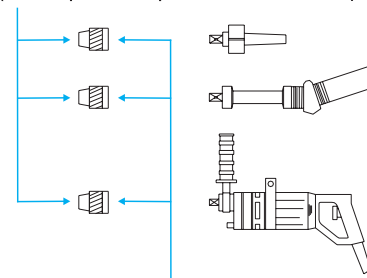


Specify Square Size
(to couple to expander mandrel square)

ADAPTOR



Specify Square Size
(to couple to expander mandrel square)



Specify Square or thread size
(to couple to rolling motor / telescopic shaft)

When Ordering Specify:

- Square size
- Thread type (if applicable) on either end of quick change chuck/adaptor
- Quantity
- Delivery Date

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INSTALLATION TOOLS GROOVING TOOL — ST SERIES

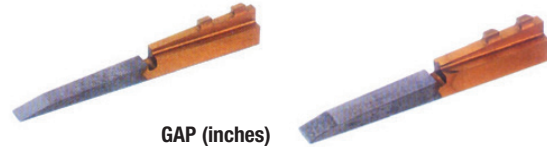
**RENTALS
AVAILABLE!**



Tube Sheet Hole ID (Tube OD) Inch (mm)	Tool Model No.	Spare Tool Bits 1/8" x "X" x 1/8" Spacing
3/8 (9.53)	GTST-375	GTST-3703-X
1/2 (12.7)	GTST-500	GTST-5003-X
5/8 (15.87)	GTST-625	GTST-6203-X
3/4 (19.05)	GTST-750	GTST-7503-X
7/8 (22.22)	GTST-875	
1 (25.4)	GTST-1000	
1 1/4 (31.75)	GTST-1250	
1 1/2 (38.1)	GTST-1500	
1 3/4 (44.45)	GTST-1750	
2 (50.8)	GTST-2000	
2 1/4 (57.15)	GTST-2250	
2 1/2 (63.5)	GTST-2500	
2 3/4 (69.85)	GTST-2875	
3 (76.2)	GTST-3000	
3 1/4 (82.55)	GTST-3250	
3 1/2 (88.9)	GTST-3500	

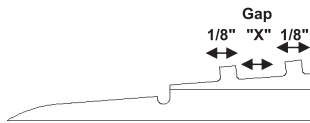
Features

- High production tool with thousands in use - manufactured & designed to provide years of trouble free life
- Titanium Nitride treated tool bit insures maximum life
- Ideally suited for CNC applications due to 1 piece mandrel construction and short design



GAP (inches)

When ordering substitute the Following #'s for "X"						
1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"
-0125	-0187	-0250	-0312	-0375	-0437	-0500



When ordering BITS provide the "Gap" needed between teeth. Special configurations can be provided. 1, 2 or 3 tooth combinations available, consult factory.

*Special sizes available upon request.

GROOVING TOOL — NW SERIES



Features

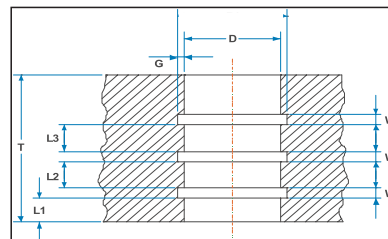
- One tool fits multiple tube sizes simply by changing the pilot nose and cutter.
- Location and depth of cut easy to adjust.
- Ready to fit CNC drill machines, lathes and boring machines.



Bore Range inch (mm)	Tool	Pilot Nose	Circular Form	Tool Bit Holder	Spare Tool Bit
3/8 - 1 1/4 (9 - 32)	GT1 NW - 2 MT	GT1 NW - PN	GT1 NW - CF	GT1 NW - TBH	GT1 NW - TB
5/8 - 1 3/4 (16 - 45)	GT2 NW - 3 MT	GT2 NW - PN	GT2 NW - CF	GT2 NW - TBH	GT2 NW - TB
3/4 - 1 7/8 (19 - 48)	GT4 NW - 4 MT	GT4 NW - PN	GT4 NW - CF	GT4 NW - TBH	GT4 NW - TB
1 1/2 - 4 (38 - 102)	GT6 NW - 5 MT	GT6 NW - PN	GT6 NW - CF	GT6 NW - TBH	GT6 NW - TB

When ordering bits, please provide the following info:

Label	Description	Symbol
A)	Bore Dia after reaming with Tolerances	D
B)	Tube Sheet Thickness	T
C)	Distance of First Groove from Face	L1
D)	Total Number of Grooves	N
E)	Spacing of Grooves	L2, L3
F)	Groove Width	W
G)	Groove Depth	G



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TUBE END FACERS

Tube O.D.		Tube Thickness BWG	Complete Tool	Spare Tool Bits
Inch	(mm)			
3/8	(9.53)	16-22	TEF-375	TEF-375-BIT
1/2	(12.70)	15-20	TEF-500	TEF-500-BIT
5/8	(15.87)	14-18	TEF-625	TEF-625-BIT
3/4	(19.05)	10-18	TEF-750	TEF-750-BIT
7/8	(22.22)	13-18	TEF-875	TEF-875-BIT
1	(25.40)	11-18	TEF-1000	TEF-1000-BIT
1 1/8	(28.57)	11-18	TEF-1125	TEF-1125-BIT
1 1/4	(31.75)	11-18	TEF-1250	TEF-1250-BIT
1 3/8	(34.92)	11-18	TEF-1375	TEF-1375-BIT
1 1/2	(38.10)	11-18	TEF-1500	TEF-1500-BIT
1 5/8	(41.27)	11-18	TEF-1625	TEF-1625-BIT
1 3/4	(44.45)	11-18	TEF-1750	TEF-1750-BIT
1 7/8	(47.62)	11-18	TEF-1875	TEF-1875-BIT
2	(50.80)	11-18	TEF-2000	TEF-2000-BIT
2 1/4	(57.15)	11-18	TEF-2250	TEF-2250-BIT
2 1/2	(63.50)	11-18	TEF-2500	TEF-2500-BIT



Different Pilots for each I.D.

Features

- Ideal for quick facing of tube ends with the bits easily replaced
- One Tool for each tube OD with pilots provided for the different gauges
- Tool bits coated with Titanium Nitride to give 3 times the life of uncoated HSS bits

**Specify gauge on 3/8" End Facers*

NOTE: Tube End Facers include pilots, except 3/8"

TUBE GUIDES

Features

Tube Guides are designed to protect the tube ends from damage while guiding them thru the tube sheet and baffles. They are lightweight and fit easily into the tube end with a replaceable nylon brush which also cleans the inside of the tube prior to expanding.

- Available for 1/2" thru 3" OD tubes and all Gauges



When Ordering Specify:

- Tube O.D.
- Tube Gauge
- Quantity
- Delivery Date

TUBE SHEET HOLE BRUSH POWER 200 SERIES

Features

- Used to clean tube sheet holes to provide a clean surface prior to expanding the tube
- For Tube O.D.'s 1/4" thru 3"
- Available in Carbon or Stainless Steel



When Ordering Specify:

- Tube O.D.
- Brush Material Type
- Quantity
- Delivery Date

TUBE END FLARING

Features

- Used to flare tube ends after expanding
- Available for tube sizes from 1/4" - 5" OD



When Ordering Specify:

- Tube O.D.
- Shank Type - 01 or 06 Shank
- Quantity
- Delivery Date

3-BALL MICROMETERS

Features

- Used to accurately Gauge the tube ID's
- Available in 1/2" thru 1" OD Tube Sizes



When Ordering Specify:

- Tube O.D.
- Tube Gauge Range
- Quantity
- Delivery Date

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TESTING EQUIPMENT

SALES &
RENTALS
AVAILABLE!

VLD 2500 VACUUM LEAK DETECTOR

Pin points leaks in tubes 3/16" to 3" OD



Quick, Reliable, Durable & Proven Design. When trying to locate leaking tubes the Vacuum Leak Detector VLD-2500 is the Industry standard. Manufactured with the end user in mind, it is virtually foolproof and indestructible. Seal off one end of the suspect tube(s) with either a rubber tube plug (see our Tube Plug section for sizes) or the T-Handle with an attached nozzle; then insert the Vacuum Leak Detector into tube to be tested and depress the trigger, a loss of vacuum indicates a leaking tube. The VLD-2500 has a filter system to prevent debris inside the tube from clogging the tool.

- Simple to use
- Identifies leaks in 1/4" to 3" OD tubes - in seconds
- With optional pads, can test tubes up to 6" OD
- Kit includes VLD-2500 detector gun, 2 nozzles, T-handle, rubber plugs and carrying case
- Uses standard plant air supplies from 70 psi to 100 psi
- Nozzles are very pliable for easily seating onto tubes



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TESTING EQUIPMENT

SALES & RENTALS AVAILABLE!

VLD 2500 VACUUM LEAK DETECTOR

Pin points leaks in tubes 3/16" to 3" OD






Complete VLD-2500 consists of:

- VLD-2500 Vacuum Leak Detector w/Carrying Case
- Nozzle - for 3/16" - 1 1/8" ID Tubes (other sizes Available)
- Extension Tube - 12"
- T-Handle
- Rubber Tube Plugs (Qty 4) - to fit 5/8" 13-24 gauge tubes
- Rubber Tube Plugs (Qty 4) - to fit 3/4" 14-24 gauge tubes
- Rubber Tube Plugs (Qty 4) - to fit 1" 11-24 gauge tubes



Spare Nozzles/Disks		
For Tube ID's	Size	
3/16" - 1 1/8"	1	Nozzle
1 1/8" - 2"	2	
2 - 3"	3	

VLD-2500 VACUUM LEAK DETECTOR ACCESSORIES		
<p>Rubber Plugs used to plug opposite end of tube being tested. See Chart Sec. 4, page TP-93.</p>	<p>VLD Nozzles - works with VLD and T-Handle for tube sizes:</p> <ul style="list-style-type: none"> • Nozzle for 3/16" to 1-1/8" ID • Nozzle for 1-1/8" to 2" ID • Nozzle for 2" to 3" ID 	<p>T-Handle - for use with Nozzles to plug tube end being tested.</p>
		

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TLD-2500 USA TUBE LEAK DETECTOR PRESSURE GUNS



Features

Finds leaks by pressurizing the tube with air while plugging the other end. Insert guns into the tube to be tested. Actuate pressurizing gun by depressing the trigger, the plugging gun supply seals automatically when pressurizing. After supply pressure is reached, or 100 PSIG (whichever is less), release trigger. If the pressure holds...the tube is OK, if it drops...the tube is leaking - Simple.

- Quick and safe pressure testing of 7 to 8 tubes per minute
- Interchangeable seal sets allow testing of tube ID's from .310" (7.75mm) to 1.2" (30.63mm)
- Uses standard plant air supplies from 70 psi to 100 psi
- Silent during use and ergonomic design makes testing effortless
- Each Kit packed in easy to carry case & includes:
 - 1 - Pressure & Plugging Gun
 - 1 - Set of Compression Tube / Nozzle for All Tube Sizes
 - 3 - Tube Seal sizes of your choice



Additional Tube Seals purchased separately must be used with proper compression tube / nozzle.

JLD-6500 USA VACUUM JOINT LEAK DETECTOR



Features

Tests rolled or welded tube sheet joints by vacuum pressure.

Insert nozzle into the tube and press face of the gun into the clean tube sheet joint being tested. Actuate gun to generate the vacuum, if pressure fails to hold...there is a leak.

- Simple, Quick and Reliable testing of up to 7 to 8 tube joints per minute
- Interchangeable seal sets allow testing of tube ID's from .310" (7.75mm) to 1.21" (30.63mm)
- Uses standard plant air supplies from 70 psi to 100 psi
- Silent during use and Ergonomic design makes testing effortless
- Each Kit packed in easy to carry case & includes:
 - 1 - Joint Leak Detector Gun
 - 1 - Set of Compression Collars for All Tube Sizes
 - 3 - Tube Seal sizes of your choice



Additional Tube Seals purchased separately must be used with proper compression tube / nozzle.

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USA TUBE LEAK DETECTOR



Part Number	TUBE I.D. RANGE				Seal O.D.		Washer O.D.		Compression Tube/Nozzle
	Begin		End		in	mm	in	mm	
	in	mm	inch	mm					
TLD-C-SK-0300	0.300	(7.62)	0.405	(10.287)	0.295	(7.493)	0.287	(7.290)	1
TLD-C-SK-0375	0.375	(9.525)	0.475	(12.065)	0.354	(8.992)	0.346	(8.788)	
TLD-C-SK-0480	0.480	(12.192)	0.540	(13.716)	0.457	(11.608)	0.449	(11.405)	
TLD-C-SK-0445	0.445	(11.303)	0.515	(13.081)	0.425	(10.795)	0.417	(10.592)	2
TLD-C-SK-0500	0.500	(12.7)	0.570	(14.478)	0.480	(12.192)	0.472	(11.989)	
TLD-C-SK-0563	0.563	(14.3)	0.630	(16.002)	0.543	(13.792)	0.535	(13.589)	
TLD-C-SK-0626	0.626	(15.9)	0.685	(17.399)	0.606	(15.392)	0.598	(15.189)	
TLD-C-SK-0670	0.670	(17.018)	0.735	(18.669)	0.649	(16.485)	0.642	(16.307)	
TLD-C-SK-0690	0.728	(18.491)	0.795	(20.193)	0.708	(17.983)	0.701	(17.805)	
TLD-C-SK-0728	0.795	(20.193)	0.845	(21.463)	0.775	(19.695)	0.768	(19.507)	
TLD-C-SK-0752	0.815	(20.701)	0.866	(21.996)	0.791	(20.091)	0.783	(19.888)	3
TLD-C-SK-0795	0.690	(17.526)	0.755	(19.177)	0.669	(16.993)	0.611	(16.789)	
TLD-C-SK-0815	0.752	(19.101)	0.810	(20.574)	0.732	(18.593)	0.724	(18.390)	
TLD-C-SK-0874	0.874	(22.200)	0.935	(23.749)	0.854	(21.692)	0.846	(21.488)	
TLD-C-SK-0922	0.922	(23.419)	0.980	(24.872)	0.901	(22.885)	0.894	(22.708)	
TLD-C-SK-0937	0.937	(23.8)	1.001	(25.425)	0.917	(23.292)	0.909	(23.089)	
TLD-C-SK-1010	1.010	(25.654)	1.070	(27.178)	0.992	(25.197)	0.984	(24.994)	
TLD-C-SK-1065	1.065	(27.051)	1.120	(28.448)	1.055	(26.797)	1.047	(26.594)	
TLD-C-SK-1100	1.100	(27.94)	1.160	(29.464)	1.082	(27.483)	1.075	(27.305)	
TLD-C-SK-1160	1.160	(29.464)	1.206	(30.632)	1.149	(29.185)	1.142	(29.007)	

Set comprises 2 seals and 2 washers

Please call our factory for more information on our Vacuum Joint Leak Detector.

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TUBE REMOVAL RHINO SR. RUNNER TUBE PULLING SYSTEM



**RENTALS
AVAILABLE!**

Shown with Pulling Gun

Features

Finally, a Great Solution for those hard Field or Shop re-tubes. Simply screw the mandrel into the tube and the puller does the rest. Quick & Powerful 2 speed Pump provides continuous, Heavy Duty pulling speed at up to a whopping 28 feet/minute, with a maximum pulling force of an incredible 45 tons!

The pullers are mounted on wheels for easy maneuvering and are made of all stainless steel construction, and can be either Electric, Electro-Pneumatic or All Pneumatic power driven.

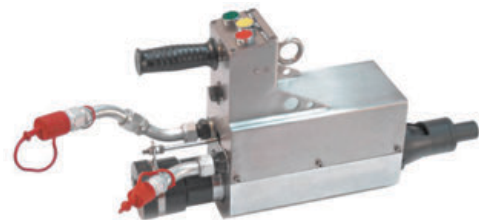
All units provided with 15' of Hydraulic hose.

Model	Motor	Volts/ Phase	Power hp	Oil Tank Cap. Gals	Net Wt lbs	Dimensions inches	Air Supply
TPP-50	Siemens	415/3	5	24	485	47 x 30 x 39	
TPP-75	Siemens	415/3	7.5	36	595	48 x 31 x 40	
TPP-30	Siemens	230/1	3	20	400	20 x 16 x 30	
PPP-50 (Pneumatic)	Gast	110/1 (Control Power)	9	24	485	28 x 22 x 19	100 psi

RHINO SR. RUNNER PULLING GUNS

Features

- HPG-15 used for High Speed & light duty condenser work
- HPG-30 used for heavy duty heat exchanger and light boiler work
- HPG-45 for seriously heavy duty pulling jobs
- Spring Balancer for weightless support of Pulling Gun (optional)



Rugged Construction, Proven Performance

Gun Model	Pulling Capacity tons	Max Tube O.D. thru Gun inch	Weight lbs	Free Pulling Speed (feet/min) with Powerpack #			
				TPP-50	TPP-75	TPP-30	PPP-50
HPG-15	15	1	57	17.1	27.6	5.9	18.4
HPG-30	30	1 1/2	84	9.8	12.1	7.9	11.5
HPG-45	45	3	172	6.6	8.9	6.6	7.5

SPECIAL NOTE

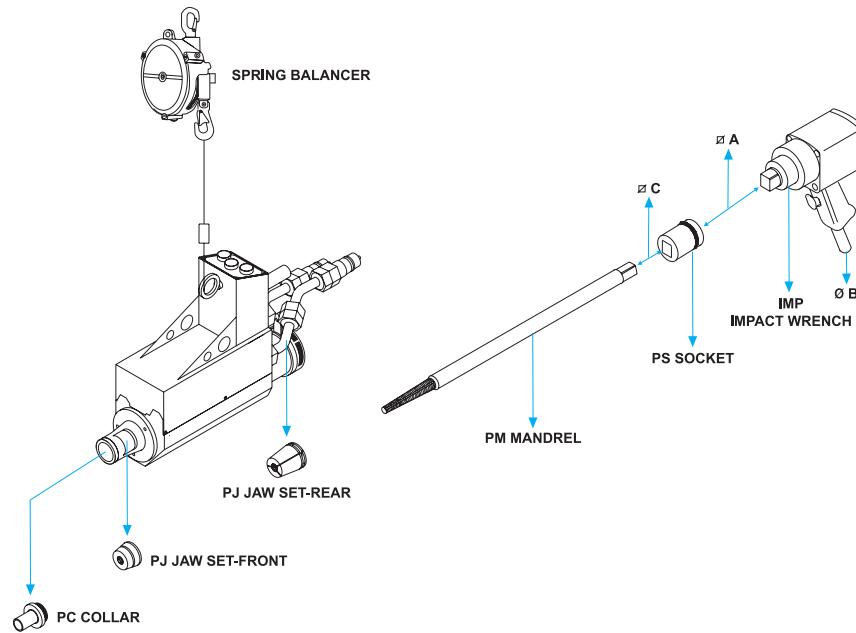
All our Rhino Sr. Runner Consumables will REPLACE & INTERCHANGE with the "Tuberunner" OR "Maus" Pullers.

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RHINO SR. RUNNER ACCESSORIES



Features

- Spears (PM)
- Front & Rear Jaw Sets (PJ)
- Nose Piece (PC)
- Spring Balancer for supporting the Pulling Gun (SEW)

TUBERUNNER, MAUS, RHINO SR. RUNNER

SPECIAL NOTE

All our Rhino Sr. Runner Consumables will REPLACE & INTERCHANGE with the "Tuberunner" OR "Maus" Pullers.

Spring Balancer - see chart in TUBE ROLLING SYSTEMS - Page HE-28

"IMPACT" WRENCH

Model	Suited for Mandrel Model Numbers	Weight lbs	A Drive Size	B Air Supply Connection Size
IMP-1	PM-7 to PM-37	11.0	3/4"	3/8"
IMP-2	PM-19 to PM-95/102	23.0	1"	1/2"

"PS" SOCKET

Model	A Impact	C Spear
TRPS-1	3/4"	3/8"
TRPS-2	3/4"	1/2"
TRPS-3	3/4"	5/8"
TRPS-4	3/4"	3/4"
TRPS-5	3/4"	1"
TRPS-6	1"	3/4"
TRPS-7	1"	1"
TRPS-8	1"	1 1/2"

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RHINO SR. WORKING CONSUMABLES - CONTINUOUS TUBE PULLER

Tube Size		Expanded Tube ID		Mandrel		Jaw Set			Collar		
				Model	Square Size	For HPG-15	For HPG-30	For HPG-45	For HPG-15	For HPG-30	For HPG-45
Ø	bwg	inch	(mm)	TRPM #	Ø	TRPJ #	TRPJ #	TRPJ #	TRPC#	TRPC #	TRPC #
3/8"	17-19	0.260-0.295	(6.5-7.5)	7	5/16"	15-1	30-1		15-11	30-11	
	20-24	0.295-0.335	(7.5-8.5)	8							
1/2"	14-16	0.335-0.375	(8.5-9.5)	9	3/8"	15-2	30-2		15-15	30-15	
	17-18	0.375-0.415	(9.5-10.5)	10							
	19-21	0.415-0.455	(10.5-11.5)	11							
	24	0.455-0.495	(11.5-12.5)	12							
5/8"	16-17	0.495-0.535	(12.5-13.5)	13 A	1/2"	15-3	30-3		15-18	30-18	
	19-21	0.535-0.570	(13.5-14.5)	14 A							
	23-24	0.570-0.610	(14.5-15.5)	15 A							
3/4"	11	0.495-0.535	(12.5-13.5)	13	5/8"	15-4	30-4		15-21	30-21	
	12-13	0.535-0.570	(13.5-14.5)	14							
	14-15	0.570-0.610	(14.5-15.5)	15							
	16-17	0.610-0.650	(15.5-16.5)	16							
	18-20	0.650-0.690	(16.5-17.5)	17							
7/8"	21-24	0.690-0.730	(17.5-18.5)	18	5/8"	15-4/A	30-4/A		15-25	30-25	
	14	0.690-0.730	(17.5-18.5)	18 S							
1"	16-17	0.730-0.770	(18.5-19.5)	19 S	3/4"	15-5	30-5	45-5	15-28	30-28	45-28
	18-19	0.770-0.810	(19.5-20.5)	20 S							
	10-11	0.730-0.770	(18.5-19.5)	19							
	12	0.770-0.810	(19.5-20.5)	20							
	13-14	0.810-0.845	(20.5-21.5)	21							
	15-16	0.845-0.885	(21.5-22.5)	22							
1 1/4"	18	0.885-0.925	(22.5-23.5)	23	1"	30-7	45-7		30-34	45-34	
	19-20	0.925-0.965	(23.5-24.5)	24							
	10	0.965-1.005	(24.5-25.5)	25							
	11-12	1.005-1.045	(25.5-26.5)	26							
	13	1.045-1.085	(26.5-27.5)	27							
	14-15	1.085-1.125	(27.5-28.5)	28							
	16-18	1.125-1.160	(28.5-29.5)	29							
1 1/2"	19-22	1.160-1.200	(29.5-30.5)	30	1"	30-9	45-9		30-41	45-41	
	23-24	1.200-1.240	(30.5-31.5)	31							
	10-11	1.240-1.280	(31.5-32.5)	32							
	12-13	1.280-1.320	(32.5-33.5)	33							
	14	1.320-1.360	(33.5-34.5)	34							
1 3/4"	15-17	1.360-1.400	(34.5-35.5)	35	1"	45-11			45-48		
	18-20	1.400-1.440	(35.5-36.5)	36							
	21-24	1.440-1.475	(36.5-37.5)	37							
	10-11	1.475-1.515	(37.5-38.5)	38							
	12	1.515-1.555	(38.5-39.5)	39							
	13-14	1.555-1.595	(39.5-40.5)	40							
2"	15-16	1.595-1.635	(40.5-41.5)	41	1"	45-13			45-54		
	18-19	1.635-1.675	(41.5-42.5)	42							
	20-24	1.675-1.715	(42.5-43.5)	43							
	11-12	1.870-1.910	(44.5-45.5)	45							
	13	1.910-1.950	(45.5-46.5)	46							
2 1/4"	14-15	1.950-1.990	(46.5-47.5)	47	1 1/2"	45-14			45-60		
	16-18	1.870-1.910	(47.5-48.5)	48							
	19-22	1.910-1.950	(48.5-49.5)	49							
2 1/2"	9-10	1.950-1.990	(49.5-50.5)	50	1 1/2"	45-16			45-66		
	11	1.990-2.030	(50.5-51.5)	51							
	12-13	2.030-2.070	(51.5-52.5)	52							
	7	2.015-2.145	(53.5-54.5)	54							
3"	8	2.145-2.185	(54.5-55.5)	55	1 1/2"	45-17			45-80		
	9	2.185-2.225	(55.5-56.5)	56							
	10	2.225-2.265	(56.5-57.5)	57							
	7	2.580-2.620	(66.5-67.5)	67							
3"	8	2.620-2.660	(67.5-68.5)	68	1 1/2"	45-17			45-80		
	9-10	2.660-2.695	(68.5-69.5)	69							
	11	2.695-2.735	(69.5-70.5)	70							

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RHINO SR. CONTINUOUS JENNY PULLER

Features

An Economical alternative to the Sr. Runner Pullers. Smaller and slower, yet is a powerful 30 Ton Puller.

- Has one Jaw set that “grips” the spear AND the Tube
- An economical alternative to the Rhino Sr. Runner tube puller
- 6” of stroke and 30 tons of force
- Uses the same spears as the Sr. Runner Puller



TUBE TUGGER, SUPER JENNY & RHINO SR. CONTINUOUS JENNY

SPECIAL NOTE

These items will REPLACE & INTERCHANGE with the “Tube Tugger” OR “Super Jenny” Pullers from other companies.

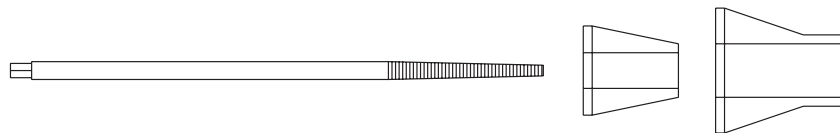
RHINO SR. CONTINUOUS JENNY ACCESSORIES

Features

- Spears
- Rear Jaw Sets
- Collar
- Spring Balancer for “weightless” support of the Pulling Gun (optional)

When Ordering Specify:

- Tube O.D.
- Tube Gauge
- # and Size Spears
- # and Size Jaw Sets
- # and Size Nose Pieces
- Delivery Date



USA Industries is available to meet all your Heat Exchanger tool requirements.

We are available to help you when you need us 24/7.

See our EZ Torque® gasket for Shoulder/Header Plugs - Section 4

And our “Through the Tube” plugging system - Snap It® Jr. and Sr. plugs - Section 4

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RHINO JR. HYDRAULIC SPEAR TUBE PULLER CAPTAIN AMERICA PULLER — HTPS 1000

Features

This is really a GREAT Puller and is a fully self-contained Workhorse Designed & Proven to provide years of trouble free service.

- Our “Captain America” puller - Fast, Easy, Dependable pulling unit used to pull stubs or entire tubes with 10 tons of “Power”
- Single person operation and full self-contained system
- Ideally suited for removing 1/4” to 1” OD tubes of all gauges in up to 4” thick tube sheets
- Unit comes complete with Pulling Gun and Hydraulic pump
- Hydraulic Power Unit operates off of 110VAC
- Spring Balancer for “weightless” support of the Pulling Gun (*optional*)

RENTALS AVAILABLE!



Consumables include the following:



Tube O.D.	BWG	Spears	Nose Piece	Nose Piece Holder	Spearlock	Spearlock Removal Tool	Releasing Tool	Square Drive Connector
1/4"	20-21	HTPS-0250-20/21	HTPS-NP-0250	HTPS-NPH-0250	HTPS-SL-0250	HTPS-SRT	HTPS-RT	HTPS-DS
	22-24	HTPS-0250-22/24						
	28-29	HTPS-0250-28/29						
3/8"	20-21	HTPS-0375-20/21	HTPS-NP-0375	HTPS-NPH-0375	HTPS-SL-0375			
	22-23	HTPS-0375-22/24						
1/2"	16-17	HTPS-0500-16/17	HTPS-NP-0500	HTPS-NPH-0500	HTPS-SL-0500			
	18-19	HTPS-0500-18/19						
	20-21	HTPS-0500-20/21						
5/8"	14-15	HTPS-0625-14/15	HTPS-NP-0625	HTPS-NPH-0625	HTPS-SL-0625			
	16-17	HTPS-0625-16/17						
	18-19	HTPS-0625-18/19						
	20-21	HTPS-0625-20/21						
3/4"	12-13	HTPS-0750-12/13	HTPS-NP-0750	HTPS-NPH-0750	HTPS-SL-0750			
	14-15	HTPS-0750-14/15						
	16-17	HTPS-0750-16/17						
	18-19	HTPS-0750-18/19						
	20-21	HTPS-0750-20/21						
1"	12-13	HTPS-1000-12/13	HTPS-NP-1000	HTPS-NPH-1000	HTPS-SL-1000			
	14-15	HTPS-1000-14/15						
	16-17	HTPS-1000-16/17						
	18-19	HTPS-1000-18/19						
	20-21	HTPS-1000-20/21						

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RHINO JR. PINE JENNY HOLLOW CORE RAM PULLER

Features

- One of the most commonly used style of pullers around, used to pull stubs or entire tubes with 30 tons of "Power"
- 6" of pull in single stroke, when used with the "Double Horseshoe Adaptor" can pull up to 12" without resetting
- Proven in performance and usefulness
- Can be used to pull tubes from 1/2" up to 3" of all gauges and tube sheet up to 8" thick
- Foolproof construction and simple to operate



PINE JENNY HOLLOW CORE RAM, STUB TUGGER ACCESSORIES

SPECIAL NOTE

These items will REPLACE & INTERCHANGE with the "Stub Tugger" OR "Pine Jenny" Pullers from other companies

PINE JENNY STYLE TUBE PULLER SPEARS

Features

- Compatible with other manufacturers same style (Pine Jenny, Hollow Core Ram, etc...)
- Manufactured to enhance performance & increase longevity
- Available for 1/2" thru 3" tubes of all gauges

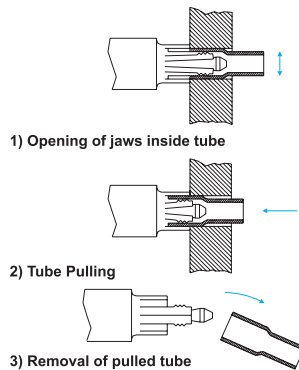
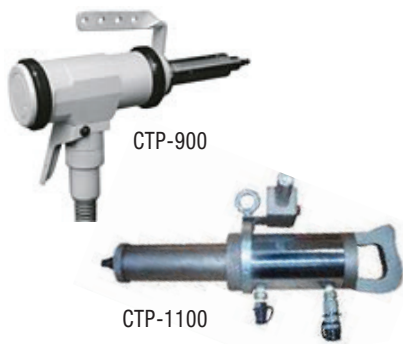


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RHINO JR. COLLET PULLER



Stub Pulling Gun Specifications

Model	CTP-900	CTP-1100
Tube Capacity	1/2 - 1 1/4	1 1/4 - 2
Maximum stroke	2.36	3.94
Weight	51	60
Max. Pulling Force (ton)	13	31

Hydraulic Powerpack Specifications

Model	PPP-35	EPP-15
Power	Pneumatic	Electric
Motor H.P.	3.5	1.5
PSI	1.2 GPM @ 1,100 psi .47 @ 10,000	.93 @ 1,100 .13 @ 10,000
Tank capacity (lbs)	2.6	2.6
Wt. including oil (lbs)	88	110

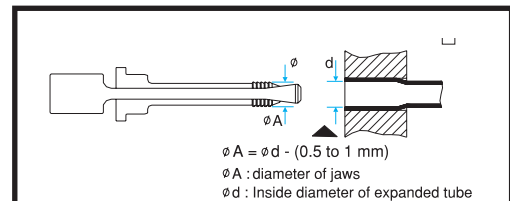
Model	Tube Size I.D. inch (mm)	Stub Pulling Gun	Hydraulic Powerpack	Spring Balancer
ASP-1	1/2-1 1/4 (13 - 31)	CTP-900	PPP-35/EPP-15	SEW-22
ASP-2	1 1/4-2 (31 - 51)	CTP-1100	PPP-35/EPP-15	SEW-40

Features

Designed for fast removal of all tube types from Condensers, Heat Exchangers and Boilers. A rapid stroke allows the removal of up to 10 tubes a minute with minimal operator effort. Gripping and pulling performed in single operation. Insert puller into the tube and actuate, the jaws will grip the tube ID and pull out the tube.

- Available in two sizes:
- CTP-900 for 5/8" 17 Gauge thru 1 1/4" 24 Gauge
- CTP-1100 for 1 1/2" 10 Gauge thru 2" 24 Gauge
- Pneumatic or Electric powered hydraulic pump standard
- Spring Balancer for "weightless" support of the Pulling Gun (optional)

Gun Model	Jaws Model	Tie Rod Model	Support Collar	Sleeve Model	Pulling Collar Model
CTP-900	960/120 to 960/140	970/55	SC-980	S-990	PC-950 refer chart below
	960/150 to 960/180	970/60			
	960/190 to 960/200	970/80			
	960/210 to 960/240	970/120			
CTP-1100	960/250 to 960/300	970/160	SC-1180	S-1190	PC-1150 refer chart below
	1160/310 to 1160/350	1170/220			
	1160/360 to 1160/400	1170/270			
	1160/410 to 1160/450	1170/320			
	1160/460 to 1160/500	1170/370			



JAW SETS

CTP-900

CTP-1100

Tube I.D. inch (mm)	Model	Tube I.D. inch (mm)	Model
.472 (11.99)	960/120	1.220 (30.99)	1160/310
.512 (13.00)	960/130	1.260 (32.00)	1160/320
.551 (14.00)	960/140	1.299 (33.00)	1160/330
.591 (14.99)	960/150	1.339 (34.01)	1160/340
.630 (16.00)	960/160	1.378 (35.00)	1160/350
.669 (16.99)	960/170	1.417 (36.00)	1160/360
.709 (18.01)	960/180	1.457 (37.01)	1160/370
.748 (19.00)	960/190	1.496 (38.00)	1160/380
.787 (19.99)	960/200	1.535 (38.99)	1160/390
.827 (21.01)	960/210	1.575 (40.01)	1160/400
.866 (22.00)	960/220	1.614 (41.00)	1160/410
.906 (23.01)	960/230	1.654 (42.01)	1160/420
.945 (24.00)	960/240	1.693 (43.00)	1160/430
.984 (24.99)	960/250	1.732 (43.99)	1160/440
1.024 (26.01)	960/260	1.772 (45.01)	1160/450
1.063 (27.00)	960/270	1.811 (46.00)	1160/460
1.102 (27.99)	960/280	1.850 (47.00)	1160/470
1.142 (29.01)	960/290	1.890 (48.01)	1160/480
1.181 (30.00)	960/300	1.929 (49.00)	1160/490
		1.969 (50.01)	1160/500

COLLARS

CTP-900

CTP-1100

TUBE O.D. inch (mm)	MODEL	TUBE O.D. inch (mm)	MODEL
5/8" (15.87)	PC-950/190	1 1/2" (38.10)	PC-1150/410
3/4" (19.05)	PC-950/220	1 5/8" (41.27)	PC-1150/440
7/8" (22.22)	PC-950/250	1 3/4" (44.45)	PC-1150/480
1" (25.40)	PC-950/290	1 7/8" (47.62)	PC-1150/510
1 1/8" (28.57)	PC-950/320	2" (50.80)	PC-1150/540
1 1/4" (31.75)	PC-950/350	2 1/8" (53.97)	PC-1150/570
1 3/8" (34.92)	PC-950/380		

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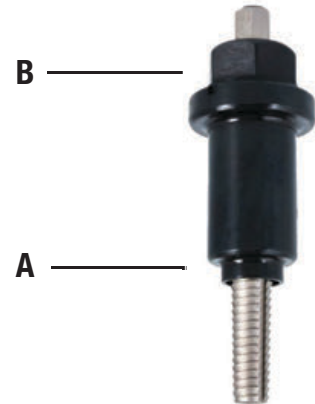
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RHINO JR. MANUAL TUBE PULLER

Features

- Used for small, light duty pulling jobs
- Using a wrench screw, screw the spear "A" into the tube then begin pulling by turning nut "B". After tube is free from the tube sheet, remove by unscrewing the spear "A" while holding the tube with channellocks or a pipe wrench.
- Available for 1/4" thru 1 3/8" tubes of all Gauges.



Order PN's by the following: Example is for 1/2" 16 gauge tube

**For Complete Tool: MTP-(Tube O.D.)-(Tube Gauge) = MTP-1/2"-16
For Spare Spears: MTPS-(Tube O.D.)-(Tube Gauge) = MTPS-1/2"-16**

ONE REV INTERNAL TUBE CUTTER & REPLACEMENT BITS

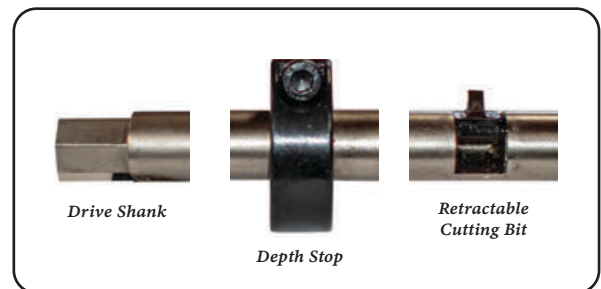


One Revolution Internal Tube Cutters are used for the following applications:

1. The "Piercing" of tubes prior to inserting tube plugs
2. The "Complete Cutting" of ferrous or copper tubes on one end prior to tube removal - can include nonferrous light wall tubes. Used with a wrench, simply adjust the depth collar stop so the cutter bit is past the tube sheet, then rotate in a clockwise direction. After the bit starts cutting, make 1/4 revolution to puncture or one full revolution to cut

PRODUCT FEATURES:

- Available for 1/2" thru 2-1/2" tubes of all gauges
- Standard reach of 10", longer reaches available
- Bits are made from high quality tool steel and hardened to provide the maximum cutting edge retention
- Available for 1/2" thru 2-1/2" tube cutters
- Directly interchangeable with Airetool Bits



Order product number by the following:

For Complete Cutter: ORC-(Tube O.D.)-(Tube Gauge) = ORC-1/2"-16
For Cutter Bits: ORC-(Tube O.D.)-BIT = ORC-1/2"-BIT

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**AMERICAN
EXPRESS**

PUSH CUTTER INTERNAL TUBE CUTTER AND REPLACEMENTS



Features

The Push Type cutter is used to quickly cut tubes in large numbers, they are especially suited for toughest tube cutting applications such as Stainless Steel, Inconel, Monel, Titanium, etc.

The unit can be used with any drill or one of our driving units with the cutting speed regulated for your particular tube material to maximize the cutters life.

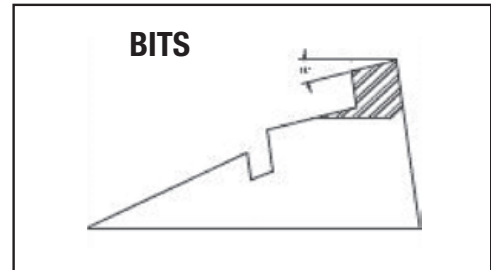
To operate, adjust the collar depth, insert it into the tube, apply power, press inward and the tube will be cut in a few seconds.

- Available for 5/8" thru 1-1/2" tubes of all Gauges
- Bits are easily removed
- Adjustable reaches available: "STD" = 4",
"A" = 6", "B" = 8", "C" = 10"

Our bits are made from high quality tool steel, hardened, and Titanium Nitrate coated to provide the maximum cutting edge retention.

Longer reach available upon request.

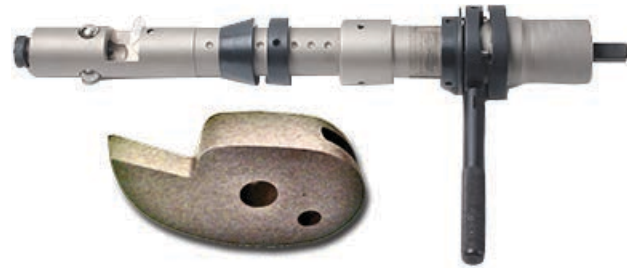
Tube O.D.	Tube Gauge (BWG)	Tube Cutter Model No. (Std. Reach)	Spare Cutting Bit Model No.
5/8"	14 - 22	ATP-625	ATP-625-BIT
3/4"	14 - 22	ATP-750	ATP-750-BIT
7/8"	14 - 22	ATP-875	ATP-875-BIT
1"	12 - 22	ATP-1000	ATP-1000-BIT
1 1/4 "	12 - 22	ATP-1250	ATP-1250-BIT
1 1/2"	12 - 22	ATP-1500	ATP-1500-BIT



BOILER TUBE CUTTER AND REPLACEMENT BITS

Features

- PR-68 tube cutters are ideal for cutting thick walled boiler tubes of 2" O.D. and higher
- The unit can be operated with any drill
- For Boiler tube sizes 2" thru 4-1/2" all Gauges
- Available in standard reach of 4", Additionally reaches in increments of 4" are available up to 16"



Tube I.D. Range		Part Number (Reach = 4" 8" 12" or 16") Example: 4" Reach BTC-T-04-1.181-1.378	Tool Model Number	Spare Bit Part Number	Spare Bit Model Number	Max. Tube O.D.		Body Diameter		Drive Square Male
in	mm					in	mm	in	mm	
1.181 - 1.378	(30 - 35)	BTC-T-(REACH)-1.181-1.378	0682901	BTC-C-BIT-1	1682901	1.693	-43	1.142	-29	1/2"
1.378 - 1.575	(35 - 40)	BTC-T-(REACH)-1.378-1.575	0683301			1.890	(48)	1.299	(33)	
1.575 - 1.969	(40 - 50)	BTC-T-(REACH)-1.575-1.969	0683801			2.126	(58)	1.496	(38)	
1.969 - 2.362	(50 - 60)	BTC-T-(REACH)-1.969-2.362	0684801	BTC-C-BIT-2	1684801	2.677	(68)	1.890	(48)	3/4"
2.165 - 2.559	(55 - 65)	BTC-T-(REACH)-2.165-2.559	0685301			2.874	(73)	2.087	(53)	
2.559 - 2.953	(65 - 75)	BTC-T-(REACH)-2.559-2.953	0686301			3.268	(83)	2.480	(63)	
2.953 - 3.346	(75 - 85)	BTC-T-(REACH)-2.953-3.346	0687301	BTC-C-BIT-3	1687301	3.661	(93)	2.874	(73)	
3.346 - 3.740	(85 - 95)	BTC-T-(REACH)-3.346-3.740	0688301			4.055	(103)	3.268	(83)	
3.740 - 4.134	(95 - 105)	BTC-T-(REACH)-3.740-4.134	0689301			4.449	(113)	3.661	(93)	

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COLLAPSING/KNOCKOUT TOOLS

RENTALS AVAILABLE!

CHIPPING HAMMER

Features

Chipping Hammer (15 lb. Gun) for use with Tube Drifts/ Collapsing Tools using the 01 or 06 Shank Style.



JUMBO RIVET BUSTER

Features

Jumbo Rivet Buster (30 lb. Gun) for use with Tube Drifts/Knockout Punches using the 15 Shank Style.



COLLAPSING TOOL



Order PN's by the following: Example is for 3/4" tube with a 06 Shank			
CT-	(Tube OD)-	(Shank)	
CT-	3/4"	06	

Features

Collapsing Tools are designed to collapse tubes for removal from the tube sheet using a Chipping Hammer. Manufactured using the highest quality metal and heat treatment available.

- Available in 01 or 06 type shanks
- Stocked sizes from 3/8" thru 2" tube OD's
- Use Reamers for reducing the tube thickness when collapsing heavy gauge tubes.

When Ordering Specify:

- Tube O.D.
- Quantity
- Shank Style — 01 or 06
- Delivery Date

TUBE DRIFTS / KNOCKOUT PUNCHES



Order PN's by the following: Example is for 1" 14 Gauge tube with a 15 Shank			
TD-	(Tube OD)-	(Tube Gauge)-	(Shank)
TD-	1"	14-	15

Features

Tube Drifts/Knockout Punches are designed to knockout tubes from tube sheets using either a Chipping Hammer or Jumbo Rivet Buster. Our Drifts are manufactured using the highest quality metal and heat treatment available, PERIOD!

- Available in 01 or 06 or 15 Shank tool holders
- Stocked sizes from 1/2" thru 2-1/2" tube OD's and all gauges.

When Ordering Specify:

- Tube O.D.
- Quantity
- Shank Style — 01, 06 or 15
- Delivery Date
- Gauge

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BEVELING MACHINES



Portable and easy to use.

USA Mini

The USA MINI machine is a lightweight yet powerful pipe beveller. A favorite in areas such as power station and Petrochemical plant shut-down work, due to its ease of set-up and speed of operation. This unit is available with the unique “**auto-lock**” function, to set the jaws, just flip the switch — it’s that simple!

Range: .78” — 1.65” ID Standard (reduced shaft option from .49’ to .82” ID)

Functions: Weld Removal, Beveling, Facing, Counter-boring, Tube or Pipe Prep

Materials: Any kind of steel

Power: Pneumatic or Electric

Available Bits for Internal and External Beveling (37-1/2 degrees) or Flat Facing. Others available upon request.



Portable and easy to use.

USA Boiler Standard

A very popular versatile machine that is robust and extremely powerful. Used in many industries, but commonly found in tough Petrochemical plant environments. Electric version available or a conversion kit easily changes pneumatic to electric.

Range: 0.9” - 4.25” ID

Functions: Weld Removal, Beveling, Facing, Counter-boring, Tube or Pipe Prep

Materials: Any kind of steel

Power: Pneumatic or Electric

Available Bits for Internal and External Beveling (37¹/₂ degrees) or Flat Facing. Others available upon request.



Portable and easy to use.

USA Superboiler T5

A powerful machine able to produce fast accurate weld preps on any schedule and material of pipe effortlessly. Optional extras include, flange facing attachment.

Range: 2” - 8” ID

Functions: Weld Removal, Beveling, Facing, Counter-boring, Pipe Prep

Materials: Any kind of steel

Power: Pneumatic or Electric

Available Bits for Internal and External Beveling (37¹/₂ degrees) or Flat Facing. Others available upon request.

All units are supplied with all gripping segments to cover the full range of the machine as well as service tools, drawings, instruction manual and warranty certificate. Each machine is supplied with a protective metal carrying case.

Cutting Blades (Bits) For Beveling Machines

Internal Bevel Flat Facing External Bevel

When Ordering Specify:

- Bit Type(s)
- Delivery Date
- Quantity



Our bits are made of the highest quality tool steel and provide exceptional wear resistance and designed for Internal or External Beveling, Facing, or Weld Removal.

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CLEANING EQUIPMENT



FSC SERIES PORTABLE ELECTRIC TUBE CLEANERS

Features

- Water flushes through the shaft and helps remove deposits from tube, flow rate regulated as needed
- “Hands Free” controls provided via a foot switch
- Stainless steel cover for use in the harshest environments
- Shafts, bits, & brushes quickly & easily replaced
- Large wheels for easy transportation
- Water consumption can be regulated as needed

Electric Tube Cleaners are compact, powerful, reliable, and easily maneuverable units used to clean straight and curved tubes in heat exchangers, condensers, or boilers. They work by attaching a cleaning tool, such as a brush or boring bit onto a flexible shaft. The motor spins the shaft which is enclosed in a non-rotating casing. If needed water is connected to the cleaner and passes through the flexible shaft to flush out deposits from the tube.

All Cleaners are supplied with a foot switch for control.



Following models are available:

MODEL FSC-4 Chiller Tube Cleaning System — Most commonly used for cleaning up to 5/8” I.D. tubes of chiller units such as Trane, Blue Star, Thermax, Carrier, York and others. 1/2 HP motor @ 890 RPM.

MODEL FSC-5 Chiller Tube Cleaning System — Similar to the FSC-4 but has a more powerful 3/4 HP motor @ 890 RPM for removing tougher deposits and comes standard with a dual direction foot switch.

MODEL FSC-4X Tube Cleaning System — A Heavy Duty system for tube I.D.’s 1” and larger. This unit is provided with a powerful 1 HP motor @ 1780 RPM.

MODEL FSC-4X-2A Tube Cleaning System — Our Heaviest Duty system for the toughest jobs for 1” and larger tubes. This unit is provided with a workhorse 2 HP motor @ 1780 RPM.

Tube I.D. inch	Tube I.D. (mm)	Tube Cleaner	Motor Power hp	Motor Speed RPM	Weight lbs	Dimension		
						High	Wide	Deep
1/4-1	(6.4-25.4)	FSC-4	1/2	890	62	38"(975mm)	21" (535mm)	18" (457mm)
1/4-1	(6.4-25.4)	FSC-5	3/4	890	66	38"(975mm)	21" (535mm)	18" (457mm)
1 & Up	(25.4 & Up)	FSC-4X	1	1780	70	38"(975mm)	21" (535mm)	18" (457mm)
1 & Up	(25.4 & Up)	FSC-4X-2A	2	1780	84	40"(1015mm)	22" (560mm)	19" (482mm)

ALL CLEANERS CAN BE ORDERED INDIVIDUALLY OR AS A KIT

Each Kit is provided with the following:

- 1 ea - Tube Cleaner
- 1 ea - Foot Control Switch
- 2 ea - Flexible Shafts
- 20 ea - Nylon Brushes of your size choice
- 2 ea - Buffing Tools of your size choice
- 1 ea - Flexible Shaft repair kit

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CLEANING EQUIPMENT ACCESSORIES

Since the inner core of the shafts are the heart of the system and take most of the strain, we use the highest quality material in our shafts available, ensuring the longest life. When ordering specify tube ID and length required.

Tube I.D. Range inch (mm)	Flexible Shaft	Flexible Shaft Length feet (mtrs)	Shaft Core O.D. inch (mm)	Shaft Casing O.D. inch (mm)	Tool End Thread
7/16 - 1/2 (11.1-12.7)	FS-2	12 (3.7)	1/4 (6.4)	3/8 (9.5)	1/4 - 28 F
		17 (5.2)			
		25 (7.6)			
		35 (10.7)			
		45 (13.7)			
9/16 - 1 (14.3-25.4)	FS-3	12 (3.7)	5/16 (7.9)	1/2 (12.7)	1/4 - 28 F
		17 (5.2)			
		25 (7.6)			
		35 (10.7)			
		45 (13.7)			
		60 (18.3)			
		75 (22.9)			

- Tube sizes 1/4" & 3/8" have 8-32 thread female tooling connectors
- Tube sizes 7/16" thru 1" have 1/4"-28 thread female tooling connectors
- Tube Sizes 1" & larger have 1/4"-28 thread female tooling connectors

BRUSHES

USED WITH EITHER THE FLEX-SHAFT CLEANERS OR THE CG 625/1250



Nylon Brushes — "N"

Used for removing soft deposits in any tube material, especially useful for final 'finishing' of tubes.



Spin Grit — "SN"

Used for removing soft and light scale deposits in any tube material. The Nylon Brushes are impregnated with a Silicon Abrasive Grit to clean and polish.



Stainless Steel Brushes — "SS"

Used for removing soft and light scale deposits in carbon steel, stainless steel, monel, titanium, etc.



Brass Brushes — "B"

Used for removing soft and light scale deposits in copper, brass, and their alloyed tubes.



Flue - Carbon Steel & Nylon Brushes

Carbon Steel is recommended for removing soft and light scale deposits in ferrous tubes and Nylon for final polishing. Flue Brushes 4" & Larger sized in increments.

SPECIAL NOTE: Brushes larger than 1" are provided in 1/4" increments up to 8" OD.

When ordering, specify:

- Tube ID
- Quantity
- Use <= by 1/16" Increments
- Delivery Date
- Brush type

SPIN GRIT SIZES

Tube I.D. inch (mm)	Brush Size
.250-.375 (6.35-9.525)	0500
.375-.500 (9.525-12.7)	0625
.500-.625 (12.7-15.875)	0750
.625-.812 (15.875-20.624)	1000
.812-1.000 (20.624-25.4)	1125

NYLON, BRASS, SS SIZES

Tube I.D. inch (mm)	Brush Size
.281-.342 (7.137-8.687)	0250
.343-.405 (8.712-10.287)	0312
.406-.436 (10.312-11.074)	0375
.437-.499 (11.099-12.674)	0437
.500-.561 (12.7-14.249)	0500
.562-.624 (14.274-15.849)	0562
.625-.686 (15.875-17.424)	0625
.687-.749 (17.449-19.024)	0687
.750-.811 (19.05-20.599)	0750
.812-.874 (20.624-22.199)	0812
.875-.936 (22.225-23.774)	0875
.937-.999 (23.799-25.374)	0937
1.000-1.061 (25.4-26.949)	1000

NOTE:

1" & smaller tube brush sizes should be equal to or 1/16" smaller than Tube I.D.

Order PN's by the following: Example is for .625 Tube I.D., Nylon Brush
BRU- (Bristle Type)- (Brush Size)

BRU- N 0625

Nylon = N Stainless Steel = SS Brass = B Spin Grit = SN

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CG625/1250 PNEUMATIC TUBE CLEANING GUN

Cleans plugged tubes or piping safer, faster and cheaper than any other method.

The Tube Cleaning Gun turns a special brush or drill coupled to a hollow rigid shaft while supplying a stream of water to flush out deposits and increase drilling speed. The water flow is adjustable as needed.

Moderately plugged tubes can be cleaned with our Metal or Nylon brushes. Severely plugged tubes are first drilled out using either an Arrow or Carbide tip drill then followed up with a brush to remove the remaining deposits and "Polish" the tube. The hollow shaft extension tubes can be provided in 2' length increments up to 8', extensions are added to provide the total length needed. Adding extensions is fast and easy.



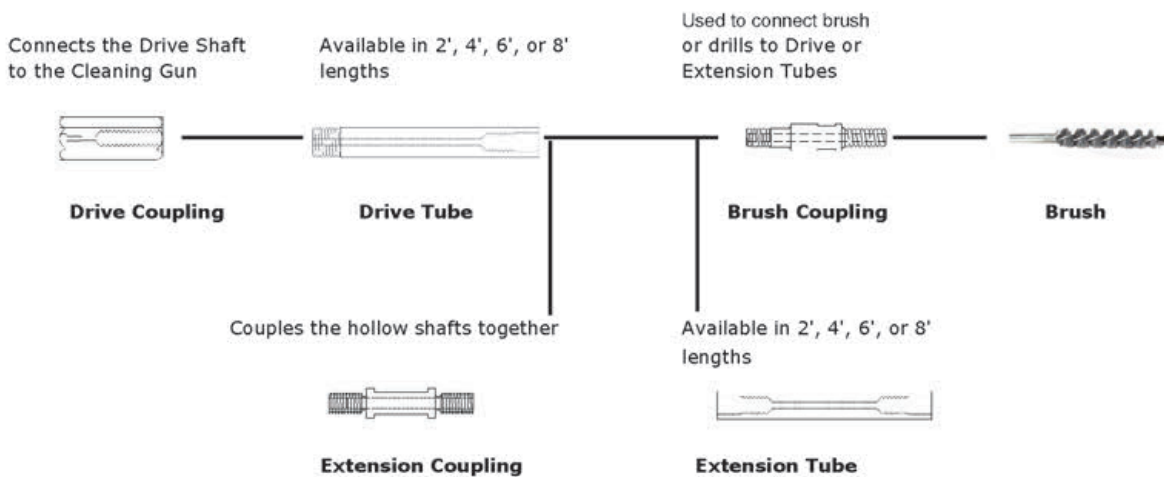
RENTALS AVAILABLE!

Each Kit is provided with the following:

- 1 ea — Cleaning Gun
- 1 ea — Storage Case
- 2 ea — 10' hoses for air and water connections
- 1 ea — Drive Coupling
- 1 ea — Arrow drill & Brush of your size choice

When ordering, specify:

- Tube Size
- Length of Tubing
- Brush or Drill type
- Quantity
- Delivery Date



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ACCESSORIES FOR CG 625/1250

**TO ORDER
SELECT THE
OUTSIDE
DIAMETER
AND GAUGE
WALL OF THE
TUBE(S)**

**TO ORDER
SELECT THE
INSIDE DIAMETER
OF THE TUBE(S)
IN THE TUBE I.D.
SECTION BELOW**

TUBE O.D. (BWG)	TUBE I.D.	DRIVING COUPLING	DRIVING TUBE	TUBE COUPLING	EXTENSION TUBE	BRUSH COUPLING	ARROW POINT		CARBIDE TWIST	BRUSHES
							AP-DRILLS	CTD-DRILLS		
1/4" (23-24)	3/8" (14)	.212-.227	DC-187	DT-187	N/A	N/A	N/A	N/A	CTD-187	S E E
3/8" (14-15)		.228-.243	DC-187	DT-187	N/A	N/A	N/A	N/A	CTD-218	
3/8" (15-16)	1/2" (10)	.244-.259	DC-218	DT-218	TC-218	ET-218	N/A	AP-234	CTD-234	
3/8" (17)	1/2" (11)	.260-.275	DC-218	DT-218	TC-218	ET-218	N/A	AP-250	CTD-250	
3/8" (18)	1/2" (11)	.275-.290	DC-218	DT-218	TC-218	ET-218	N/A	AP-265	CTD-265	
3/8" (19)		.291-.301	DC-250	DT-250	TC-250	ET-250	N/A	AP-281	CTD-281	
3/8" (20-22)	1/2" (13)	.306-.321	DC-250	DT-250	TC-250	ET-250	N/A	AP-296	CTD-296	
1/2" (14)	5/8" (9)	.322-.337	DC-250	DT-250	TC-250	ET-250	N/A	AP-312	CTD-312	
1/2" (14)		.338-.353	DC-250	DT-250	TC-250	ET-250	N/A	AP-328	CTD-328	
1/2" (15-17)	5/8" (10-11)	.359-.389	DC-312	DT-312	TC-312	ET-312	BC-312	AP-343	CTD-343	
1/2" (18)	5/8" (12)	.390-.420	DC-312	DT-312	TC-312	ET-312	BC-312	AP-375	CTD-375	
5/8" (13)		.421-.452	DC-375	DT-375	TC-375	ET-375	BC-375	AP-406	CTD-406	
5/8" (14-15)	3/4" (9-10)	.453-.483	DC-375	DT-375	TC-375	ET-375	BC-375	AP-437	CTD-437	
5/8" (16-17)	3/4" (11)	.484-.514	DC-437	DT-437	TC-437	ET-437	BC-437	AP-468	CTD-437	
5/8" (18)	3/4" (12)	.515-.545	DC-437	DT-437	TC-437	ET-437	BC-437	AP-500	CTD-500	
3/4" (13)		.546-.577	DC-437	DT-437	TC-437	ET-437	BC-437	AP-531	CTD-531	
3/4" (14-15)		.578-.608	DC-437	DT-437	TC-437	ET-437	BC-437	AP-562	CTD-562	
3/4" (14-15)		.578-.608	DC-500	DT-500	TC-500	ET-500	BC-500	AP-562	CTD-562	
3/4" (16-17)	7/8" (11)	.609-.639	DC-500	DT-500	TC-500	ET-500	BC-500	AP-593	CTD-593	
3/4" (18)	7/8" (12)	.640-.675	DC-500	DT-500	TC-500	ET-500	BC-500	AP-625	CTD-625	
7/8" (13)		.676-.706	DC-500	DT-500	TC-500	ET-500	BC-500	AP-656	CTD-656	
7/8" (14-15)	1" (9)	.707-.737	DC-500	DT-500	TC-500	ET-500	BC-500	AP-687	CTD-687	
7/8" (16-17)	1" (10-11)	.738-.769	DC-562	DT-562	TC-562	ET-562	BC-562	AP-718	CTD-718	
7/8" (18)	1" (12)	.770-.800	DC-562	DT-562	TC-562	ET-562	BC-562	AP-750	CTD-750	
1" (13)	1 1/4" (5)	.801-.831	DC-562	DT-562	TC-562	ET-562	BC-562	AP-781	CTD-781	
1" (14-15)	1 1/4" (6)	.832-.862	DC-625	DT-625	TC-625	ET-625	BC-625	AP-812	CTD-812	
1" (16-17)		.863-.894	DC-625	DT-625	TC-625	ET-625	BC-625	AP-843	CTD-843	
1" (18)	1 1/4" (7-8)	.895-.925	DC-625	DT-625	TC-625	ET-625	BC-625	AP-875	CTD-875	
1 1/2" (2)		.926-.956	DC-625	DT-625	TC-625	ET-625	BC-625	AP-906	CTD-906	
1 1/4" (9-10)		.957-.987	DC-625	DT-625	TC-625	ET-625	BC-625	AP-937	CTD-937	
1 1/4" (11)	1 1/2" (3)	.988-1.024	DC-625	DT-625	TC-625	ET-625	BC-625	AP-968	CTD-968	
1 1/4" (12)	1 1/2" (4)	1.025-1.055	DC-625	DT-625	TC-625	ET-625	BC-625	AP-1000	CTD-1000	
1 1/4" (13)	1 1/2" (5)	1.025-1.086	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1031	CTD-1031	
1 1/4" (14-15)	1 1/2" (6)	1.087-1.117	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1062	CTD-1062	
1 1/4" (16-17)	1 1/2" (7)	1.118-1.149	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1093	CTD-1093	
1 1/4" (18)	1 1/2" (8)	1.150-1.180	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1125	CTD-1125	
1 1/2" (9)	1 3/4" (2)	1.181-1.211	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1156	CTD-1156	
1 1/2" (10)	1 3/4" (3)	1.212-1.242	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1187	CTD-1187	
1 1/2" (11)		1.243-1.280	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1218	CTD-1218	
1 1/2" (12)	1 3/4" (4)	1.281-1.311	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1250	CTD-1250	
1 1/2" (13-14)	1 3/4" (5)	1.312-1.342	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1281	CTD-1281	
1 1/2" (15-16)	1 3/4" (6)	1.343-1.374	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1312	CTD-1312	
1 1/2" (17-18)	1 3/4" (7)	1.375-1.405	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1343	CTD-1343	
1 3/4" (8)	2" (1)	1.406-1.436	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1375	CTD-1375	
1 3/4" (9)	2" (2)	1.437-1.467	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1406	CTD-1406	
1 3/4" (10)	2" (3)	1.468-1.499	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1437	CTD-1437	
1 3/4" (11)	2" (4)	1.500-1.530	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1468	CTD-1468	
1 3/4" (12)		1.531-1.561	DC-750	DT-750	TC-750	ET-750	BC-750	AP-1500	CTD-1500	
1 3/4" (13)	2" (5)	1.562-1.592	DC-1000	DT-1000	TC-1000	ET-1000	BC-1000	AP-1531		
1 3/4" (14-15)	2" (6)	1.562-1.592		DT-1000	TC-1000	ET-1000	BC-1000	AP-1562		
1 3/4" (16-17)	2" (7)	1.625-1.655		DT-1000	TC-1000	ET-1000	BC-1000	AP-1593		
1 3/4" (18-19)	2" (8)	1.656-1.686		DT-1000	TC-1000	ET-1000	BC-1000	AP-1625		
1 3/4" (20-21)	2" (9)	1.687-1.717		DT-1000	TC-1000	ET-1000	BC-1000	AP-1656		
2" (10)		1.718-1.749		DT-1000	TC-1000	ET-1000	BC-1000	AP-1687		
2" (11)	2 1/4" (3)	1.750-1.780		DT-1000	TC-1000	ET-1000	BC-1000	AP-1718		
2" (12)	2 1/4" (4)	1.781-1.811		DT-1000	TC-1000	ET-1000	BC-1000	AP-1750		
2" (13-14)	2 1/4" (5)	1.812-1.842		DT-1000	TC-1000	ET-1000	BC-1000	AP-1781		
2" (15-16)	2 1/4" (6)	1.843-1.874		DT-1000	TC-1000	ET-1000	BC-1000	AP-1812		
2" (17-18)	2 1/4" (7)	1.875-1.905		DT-1000	TC-1000	ET-1000	BC-1000	AP-1843		
2" (19-20)	2 1/4" (8)	1.906-1.936		DT-1000	TC-1000	ET-1000	BC-1000	AP-1875		
2" (21-22)	2 1/4" (9)	1.937-1.967		DT-1000	TC-1000	ET-1000	BC-1000	AP-1906		

Note: Larger sizes available, consult factory

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SHIP SAME DAY**

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CLEANING GUN TOOLS

Used with either the Flex-Shaft cleaner or the CG 625/1250

- Best suited to remove medium buildup in tubes
- Drills available in 1/16" increments — starting at 1/4" through 1 1/2" Tube I.D.

See CG625/1250 Accessories chart, Page HE-50

When ordering, specify:

- Tube I.D.
- Quantity
- Type of Drill
- Delivery Date

ARROW POINT ALLOY METAL



- Best suited to remove Heavy buildup in plugged tubes
- Drills available in 1/16" increments — starting at 1/4" through 1 1/2" Tube I.D.

See CG625/1250 Accessories chart, Page 50H

When ordering, specify:

- Tube I.D.
- Quantity
- Type of Drill
- Delivery Date

CARBIDE TWIST DRILL



BUFFING TOOLS

Used with either the Flex-Shaft cleaners or the CG 625/1250

Buffing Tools are used for final polishing or removal of light and soft deposits from ferrous and non-ferrous tubes that have been previously cleaned. Used in straight or very large radius tubes in a clockwise direction only.

Tube I.D. inch	Tube I.D. (mm)	Buffing Tool	With Drill Tip	Replacement Blades	Adjusting Jig
5/16 - 3/8	(7.9 - 9.5)	PTC-203	PTC-203DT	PTC-207	PTC-209
3/8 - 1/2	(9.5 - 12.7)	PTC-204	PTC-204DT	PTC-207	PTC-209
1/2 - 9/16	(12.7 - 14.3)	PTC-205	PTC-205DT	PTC-208A	-
5/8 - 1	(15.9 - 25.4)	PTC-206	PTC-206DT	PTC-208B	-

Buffing Tool



TRIANGULAR WIRE SCRAPERS

Used with either the Flex-Shaft cleaners or CG625/1250



Adjustable scrapers for 1" thru 3" ID tubes. Used to remove tough and hard scale deposits.

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FAST SHOT CLEANING GUN

EASY TO USE — LIGHT WEIGHT — LONG LIFE



REMOVES:

- MUD
- SLIME
- SILT
- BARNACLES
- ALGAE
- SPORE
- MUSSELS AND MORE!

The Fast Shot Tube Cleaning Gun uses a combination of water and air pressure to propel a brush, or a fiber or plastic scrubber through the tube for the purpose of cleaning it. The Brush or Scrubber is inserted into the tubes to be cleaned, the nozzle of the Gun is inserted into the tubes and a single trigger operates both water and air simultaneously. The water valve is set to operate slightly ahead of the air valve. This produces a quantity of water in and around the brush prior to the full blast of air and water which propels it the entire length of the tube. Due to the design of the nozzle, air and water is forced through the tube in the form of a whirling spray. Various air and water pressure combinations may be selected to suit the application of the gun.

USED WITH THE FAST SHOT GUN

ORANGE NYLON BRUSHES TO REMOVE SOFT DEPOSITS

- For tube OD's 3/8" - 1 1/4"
- Used with the Fast Shot Gun
- When ordering specify either wood, plastic, or rubber ends and tube size

SHOOT THRU BRUSHES 5/8" - 1" I.D.



Color	Scrubber O.D.		Tube I.D.		Hardness	Model
	inch	inch (mm)	inch	(mm)		
Yellow	0.560	0.495-0.541 (12.57-13.74)			Soft	BRU-TS-0560-S
	0.560	0.527-0.555 (13.39-14.10)			Hard	BRU-TS-0560-H
Brown	0.630	0.570-0.620 (14.50-15.75)			Soft	BRU-TS-0630-S
	0.630	0.590-0.630 (15.00-16.00)			Hard	BRU-TS-0630-H
Red	0.695	0.620-0.675 (15.75-17.15)			Soft	BRU-TS-0695-S
	0.695	0.652-0.694 (16.56-17.63)			Hard	BRU-TS-0695-H
Purple	0.750	0.660-0.730 (16.76-18.54)			Soft	BRU-TS-0750-S
	0.750	0.710-0.750 (18.03-19.05)			Hard	BRU-TS-0750-H
White	0.825	0.730-0.800 (18.54-20.32)			Soft	BRU-TS-0825-S
	0.825	0.777-0.819 (19.74-20.80)			Hard	BRU-TS-0825-H
Green	0.870	0.780-0.850 (19.81-21.60)			Soft	BRU-TS-0870-S
	0.870	0.825-0.870 (20.96-22.10)			Hard	BRU-TS-0870-H
Blue	0.960	0.870-0.944 (22.10-24.00)			Soft	BRU-TS-0960-S
	0.960	0.886-0.950 (22.50-24.13)			Medium	BRU-TS-0960-M
	0.960	0.902-0.956 (22.91-24.28)			Hard	BRU-TS-0960-H
Black	1.100	1.000-1.085 (25.40-27.56)			Soft	BRU-TS-1100-S
	1.100	1.027-1.106 (26.09-28.09)			Hard	BRU-TS-1100-H

In most cases hard Tube Scrubbers are recommended for removing light to medium deposits in condensers. They work by being 'Shot Thru' the tubes with a high pressure air gun.

Order Tube Scrubbers by Model and Color.

- For tube ID's .495" - 1.106"
- Used with the Fast Shot Gun
- When ordering specify tube ID and whether it is a light or hard deposit

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TUBE PLUGS

“Plugs from the Tube Plug Pros”

From our top-of-the-line, **SUPERIORLY DESIGNED** mechanical **Snap It® Tube Plugs** with pressure ratings of up to 7,000 psid and through-the-tube plugging capabilities, to our metal tapered stock sizes (*stocked in over 20 metals*), we maintain the most comprehensive line of tube plugs available. See our stock of cork, wood, fiber, rubber tapered and expandable rubber plugs or we can custom manufacture plugs to your material and size specifications.

Snap It® Jr.		TP-84	Shoulder / Header		TP-94
Snap It® Sr.		TP-87	EZ Torque® Gasket		TP-95
Metal Tapered		TP-90	Low & High Pressure Expandable Rubber		TP-96
Two-Piece		TP-91	Threaded Tapered		TP-97
Non-Metal Tapered		TP-92	Zinc Anode		TP-97
Cork		TP-92			
Rubber Tapered		TP-93	Boiler & Condenser Tube Size Charts		TP-98

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SNAP IT® JR

Simply “Snap It” in Place

Environmentally Superior Due to POSITIVE SEALING* with Superior Design!



THE FASTEST, LEAST EXPENSIVE, AND VERY SAFE WAY TO PLUG TUBES IN REFINERIES, PETRO-CHEMICAL AND POWER PLANTS.

“CONSISTENT, CONTROLLED INSTALLATION” & “THROUGH-THE-TUBE PLUGGING CAPABILITIES”

Tube Plugging has never been easier - simply brush the tube end to prepare the surface, insert the plug and “Snap It” in place. The entire procedure takes less than 1 minute per tube.

Snap It Jr. plugs are proven with rated holding pressures of 1,000 psid. When installed properly, these plugs remove all the guess work related to installation. **NO WELDING, NO TUBE SHEET DAMAGE, NO LEAKS, NO WORRY.** Use our complete line of plugging equipment, including tube preparation and installation tools to properly install near or far end applications. “Through-the-tube plugging” saves an enormous amount of time, as neither the channel or floating head covers must be removed.

Features and Benefits:

- All tooling is fully compatible with competitor systems
- Safety -
 - High safety factor with blowout pressures exceeding 15,000 PSID (dependent on the tube plug size)
 - Requires no welding, thus eliminating sparks or open flames
 - Design greatly reduces the chance of plugs turning into dangerous projectiles, especially during removal
- Savings, time & expense -
 - No need to remove the rear head cover when through-the-tube plugging is performed
 - Ease, and quickness of installation time per plug takes just a few minutes resulting in a labor cost savings of up to 80+% while greatly reducing downtime
 - Eliminates the possibility of damage to tube sheets and tube sheet ligaments from welding or overdriving a tapered pin
- Guaranteed to provide a leak-free helium seal to 1×10^{-9} c/sec
- When used to plug tubular reactors, due to the plugs design and ability to not hinder the catalyst loading systems it significantly decreases reloading times
- **Ideally suited to plug Fin-Fan® headers** quickly & reliably
- Cost of installation and removal equipment is inexpensive and can be purchased or rented
- Each plug fits multiple tube sizes and is available in numerous materials (see chart).

WARNING: Never stand in front of an installed plug under pressure.
Plugs ejected under pressure can cause serious bodily injury.



View our video online.

SNAP IT® JR continued

Plug #	Plug Range - Tube ID IN. (mm)	Pin Length IN. (mm)	Brush Kit	Positioner	Pull Rod	Channel Head Pull Rod
JR - 471 - "<>"	0.472 - 0.515 (11.99 - 13.08)	1.63 (41.4)	JRA - 471 - "[]"	PP-471	I	CHPRA - "{ }" - I
JR - 491 - "<>"	0.492 - 0.540 (12.50 - 13.72)	1.67 (42.4)	JRA - 491 - "[]"	PP-491		
JR - 512 - "<>"	0.513 - 0.562 (13.03 - 14.27)	1.59 (40.3)	JRA - 512 - "[]"	PP-512		
JR - 524 - "<>"	0.525 - 0.585 (13.34 - 14.86)	1.28 (32.5)	JRA - 524 - "[]"	PP-524		
JR - 555 - "<>"	0.556 - 0.616 (14.12 - 15.65)	1.40 (35.6)	JRA - 555 - "[]"	PP-555		
JR - 584 - "<>"	0.585 - 0.649 (14.86 - 16.48)	1.32 (35.5)	JRA - 584 - "[]"	PP-584	II	CHPRA - "{ }" - II
JR - 621 - "<>"	0.622 - 0.689 (15.80 - 17.50)	1.57 (39.9)	JRA - 621 - "[]"	PP-621		
JR - 649 - "<>"	0.650 - 0.713 (16.51 - 18.11)	1.32 (35.5)	JRA - 649 - "[]"	PP-649		
JR - 670 - "<>"	0.671 - 0.740 (17.04 - 18.80)	1.66 (42.2)	JRA - 670 - "[]"	PP-670		
JR - 712 - "<>"	0.713 - 0.777 (18.11 - 19.74)	1.32 (35.5)	JRA - 712 - "[]"	PP-712		
JR - 735 - "<>"	0.736 - 0.810 (18.69 - 20.57)	1.68 (42.7)	JRA - 735 - "[]"	PP-735	III	CHPRA - "{ }" - III
JR - 774 - "<>"	0.775 - 0.838 (19.69 - 21.29)	1.32 (35.5)	JRA - 774 - "[]"	PP-774		
JR - 804 - "<>"	0.805 - 0.890 (20.45 - 22.61)	1.7 (43.2)	JRA - 804 - "[]"	PP-804		
JR - 837 - "<>"	0.838 - 0.902 (21.29 - 22.91)	1.32 (35.5)	JRA - 837 - "[]"	PP-837		
JR - 853 - "<>"	0.854 - 0.949 (21.69 - 24.10)	1.72 (43.7)	JRA - 853 - "[]"	PP-853		
JR - 899 - "<>"	0.900 - 0.963 (22.86 - 24.46)	1.32 (35.5)	JRA - 899 - "[]"	PP-899		
JR - 919 - "<>"	0.920 - 1.019 (23.37 - 25.88)	1.76 (44.7)	JRA - 919 - "[]"	PP-919		
JR - 962 - "<>"	0.963 - 1.027 (24.46 - 26.09)	1.32 (35.5)	JRA - 962 - "[]"	PP-962		
JR - 979 - "<>"	0.980 - 1.079 (24.89 - 27.41)	1.82 (46.2)	JRA - 979 - "[]"	PP-979		
JR - 1024 - "<>"	1.025 - 1.088 (26.04 - 27.64)	1.32 (35.5)	JRA - 1024 - "[]"	PP-1024		
JR - 1054 - "<>"	1.055 - 1.156 (26.80 - 29.31)	1.90 (48.3)	JRA - 1054 - "[]"	PP-1054		
JR - 1087 - "<>"	1.088 - 1.152 (27.65 - 29.26)	1.32 (35.5)	JRA - 1087 - "[]"	PP-1087		
JR - 1103 - "<>"	1.104 - 1.203 (28.04 - 30.56)	1.90 (48.3)	JRA - 1103 - "[]"	PP-1103		
JR - 1149 - "<>"	1.150 - 1.213 (29.21 - 30.81)	1.32 (35.5)	JRA - 1149 - "[]"	PP-1149		
JR - 1171 - "<>"	1.172 - 1.270 (29.77 - 32.26)	2.00 (50.8)	JRA - 1171 - "[]"	PP-1171		
JR - 1212 - "<>"	1.213 - 1.336 (30.81 - 33.93)	2.00 (50.8)	JRA - 1212 - "[]"	PP-1212		

"<>"

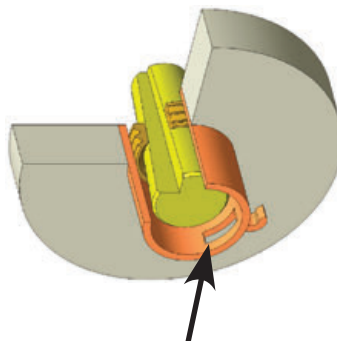
Substitute the suffix "<>" with the following material code: **C** - carbon steel, **S** - 316 stainless steel, **B** - brass, **Y** - Cr/Moly, **M** - monel, **K** - 90/10 CuNi, **J** - 70/30 CuNi. Other materials available.

"[]"

For brass, copper, or copper-nickel tubes add the suffix - **LD** to the Brush Kit Tube Preparation Brushes

"{ }"

Channel Head Pull Rod Assemblies are available in 2', 4', or 6' lengths. Insert the appropriate # for the length required.



Vent tube using our One Rev tool (see page HE-43)

WHEN ORDERING, SPECIFY:

- Tube ID or OD and bwg/wall thickness
- Material
- Maximum temperature and pressure
- The type of tube or tube sheet joint (rolled, welded, etc.)
- # of Brush Kits required
- If Pull Rod, Channel Head Pull Rod or Plug Positioner is needed
- Quantity
- Delivery Date

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SNAP IT® JR PLUG ROLLED TUBE SIZING CHART

	TUBE GAUGE		TUBE O.D. (in.)						
	BWG	WALL THICKNESS	5/8	3/4	7/8	1	1-1/4	1-1/2	
ROLLED I.D.	8	-	-	-	.578	.703	.953	1.203	AVAILABLE UPON REQUEST
NEAR END	8	-	-	-	555- "<>"	670- "<>"	919- "<>"	1171- "<>"	
FAR END	8	-	-	-	524- "<>"	649- "<>"	899- "<>"	1171- "<>"	
ROLLED I.D.	9	0.148	-	.484	.609	.734	.984	1.234	
NEAR END	9	0.148	-	471- "<>"	584- "<>"	712- "<>"	979- "<>"	1212- "<>"	
FAR END	9	0.148	-	471- "<>"	555- "<>"	670- "<>"	919- "<>"	1171- "<>"	
ROLLED I.D.	10	0.134	-	.509	.634	.759	1.009	1.259	
NEAR END	10	0.134	-	491- "<>"	621- "<>"	735- "<>"	979- "<>"	1212- "<>"	
FAR END	10	0.134	-	471- "<>"	584- "<>"	712- "<>"	962- "<>"	1171- "<>"	
ROLLED I.D.	11	0.12	-	.534	.659	.784	1.034	1.284	
NEAR END	11	0.12	-	524- "<>"	649- "<>"	774- "<>"	1024- "<>"	1212- "<>"	
FAR END	11	0.12	-	491- "<>"	621- "<>"	735- "<>"	979- "<>"	1212- "<>"	
ROLLED I.D.	12	0.109	-	.554	.679	.804	1.054	1.304	
NEAR END	12	0.109	-	524- "<>"	670- "<>"	774- "<>"	1024- "<>"	1212- "<>"	
FAR END	12	0.109	-	512- "<>"	621- "<>"	735- "<>"	979- "<>"	1212- "<>"	
ROLLED I.D.	13	0.095	-	.579	.704	.829	1.079	1.329	
NEAR END	13	0.095	-	555- "<>"	670- "<>"	804- "<>"	1054- "<>"	1212- "<>"	
FAR END	13	0.095	-	524- "<>"	649- "<>"	774- "<>"	1024- "<>"	1212- "<>"	
ROLLED I.D.	14	0.083	.476	.601	.726	.851	1.101		
NEAR END	14	0.083	471- "<>"	584- "<>"	712- "<>"	837- "<>"	1087- "<>"		
FAR END	14	0.083	-	555- "<>"	670- "<>"	804- "<>"	1054- "<>"		
ROLLED I.D.	15	0.072	.495	.620	.745	.870	1.120		
NEAR END	15	0.072	491- "<>"	584- "<>"	735- "<>"	853- "<>"	1103- "<>"		
FAR END	15	0.072	471- "<>"	584- "<>"	712- "<>"	837- "<>"	1054- "<>"		
ROLLED I.D.	16	0.065	.508	.633	.758	.883	1.133		
NEAR END	16	0.065	491- "<>"	621- "<>"	735- "<>"	853- "<>"	1103- "<>"		
FAR END	16	0.065	471- "<>"	584- "<>"	712- "<>"	837- "<>"	1054- "<>"		
ROLLED I.D.	17	0.058	.521	.646	.771	.896	1.146		
NEAR END	17	0.058	512- "<>"	621- "<>"	735- "<>"	853- "<>"	1103- "<>"		
FAR END	17	0.058	491- "<>"	584- "<>"	735- "<>"	853- "<>"	1103- "<>"		
ROLLED I.D.	18	0.049	.537	.662	.770	.912	1.162		
NEAR END	18	0.049	524- "<>"	649- "<>"	774- "<>"	899- "<>"	1149- "<>"		
FAR END	18	0.049	491- "<>"	621- "<>"	735- "<>"	853- "<>"	1103- "<>"		
ROLLED I.D.	19	0.042	.549	.674	.799	.924	1.174		
NEAR END	19	0.042	524- "<>"	649- "<>"	774- "<>"	899- "<>"	1149- "<>"		
FAR END	19	0.042	512- "<>"	621- "<>"	735- "<>"	853- "<>"	1149- "<>"		
ROLLED I.D.	20	0.035	.562	.687	.812	.937	1.187		
NEAR END	20	0.035	524- "<>"	649- "<>"	774- "<>"	899- "<>"	1149- "<>"		
FAR END	20	0.035	524- "<>"	649- "<>"	774- "<>"	853- "<>"	1149- "<>"		
ROLLED I.D.	21	0.032	.567	.692	.817	.942	1.192		
NEAR END	21	0.032	555- "<>"	670- "<>"	804- "<>"	919- "<>"	1171- "<>"		
FAR END	21	0.032	524- "<>"	649- "<>"	774- "<>"	853- "<>"	1149- "<>"		
ROLLED I.D.	22	0.028	.575	.700	.825	.950	1.200		
NEAR END	22	0.028	555- "<>"	670- "<>"	804- "<>"	919- "<>"	1171- "<>"		
FAR END	22	0.028	524- "<>"	649- "<>"	774- "<>"	919- "<>"	1171- "<>"		
ROLLED I.D.	23	0.025	.580	.705	.830	.955	1.205		
NEAR END	23	0.025	555- "<>"	670- "<>"	804- "<>"	919- "<>"	1171- "<>"		
FAR END	23	0.025	555- "<>"	670- "<>"	804- "<>"	919- "<>"	1171- "<>"		
ROLLED I.D.	24	0.022	.585	.710	.835	.960	1.210		
NEAR END	24	0.022	555- "<>"	670- "<>"	804- "<>"	919- "<>"	1171- "<>"		
FAR END	24	0.022	555- "<>"	670- "<>"	804- "<>"	899- "<>"	1171- "<>"		

All tube inner diameters listed are based upon a 10% wall reduction

NOTES:

- 1) Tube ID's often vary between inlet & outlet due to corrosion and/or erosion, this chart used as Reference only.
- 2) Tube Preparation Brushes are required for use with all Jr Plugs.

Substitute the suffix "<>" with the following material code:

- | | | |
|------------------|-----------------|----------------|
| C = Carbon Steel | K = 90/10 CuNi | N = Nickel 200 |
| B = Brass | Y = Chrome/Moly | T = Titanium |
| S = 316 SS | M = Monel | H = Hastelloy |
| J = 70/30 CuNi | I = Inconel | Z = Zirconium |

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SNAP IT® SR

Simply “Snap It” in Place

Environmentally Superior Due to POSITIVE SEALING* with Superior Design!



FOR SUPER CRITICAL PRESSURE APPLICATIONS
“CONSISTENT, CONTROLLED INSTALLATION”

Our Snap It Sr. plugs are rated with holding pressure up to **7,000 PSID**, dependent on plug size. When properly installed, these plugs remove all the guess work related to installation. **NO WELDING, NO TUBE SHEET DAMAGE, NO LEAKS, NO WORRY.** Use our complete line of plugging equipment to properly install.

Tube Plugging has never been easier - simply brush the tube end to prepare the surface, insert the plug and “Snap It” in place. The entire procedure takes less than 1 minute per tube.

Features and Benefits:

- All tooling is fully compatible with competitor systems
- Safety -
 - High safety factor with blowout pressures exceeding 28,000 PSID (dependent on the tube plug size)
 - Requires no welding, thus eliminating sparks or open flames
 - Design greatly reduces the chance of plugs turning into dangerous projectiles, especially during removal
- Savings, time & expense -
 - Ease, and quickness of installation time per plug takes just a few minutes resulting in a labor cost savings of up to 80+% while greatly reducing downtime
 - Eliminates the possibility of damage to tube sheets and tube sheet ligaments from welding or overdriving a tapered pin
- Guaranteed to provide a leak-free helium seal to 1×10^{-9} c/sec
- Ideally suited to plug Fin-Fan® headers quickly & reliably
- Cost of installation and removal equipment is inexpensive and can be purchased or rented

PLUG SIZES			PRESSURE RATING	
0.400	→	0.680	=	7000 PSID
0.700	→	0.960	=	4500 PSID
0.980	→	2.000	=	2000 PSID

WARNING: Never stand in front of an installed plug under pressure.
 Plugs ejected under pressure can cause serious bodily injury.



SNAP IT® SR continued

SR KIT PART NO.	PLUG RANGE - TUBE ID IN. (MM)	BRUSH KIT	POSITIONER	PLUG POSITIONER	PULL ROD ASSEMBLY	CHANNEL HEAD PULL ROD
SR - 400 - "<>"	0.401 - 0.420 (10.16 - 10.68)	SRA - 400 - "[]"	PP - 400	PP 400 - 440	I	CHPRA - "{ }" - I
SR - 420 - "<>"	0.421 - 0.440 (10.69 - 11.19)	SRA - 420 - "[]"	PP - 420			
SR - 440 - "<>"	0.441 - 0.460 (11.20 - 11.70)	SRA - 440 - "[]"	PP - 440			
SR - 460 - "<>"	0.461 - 0.480 (11.71 - 12.21)	SRA - 460 - "[]"	PP - 460			
SR - 480 - "<>"	0.481 - 0.500 (12.22 - 12.72)	SRA - 480 - "[]"	PP - 480			
SR - 500 - "<>"	0.501 - 0.520 (12.73 - 13.22)	SRA - 500 - "[]"	PP - 500			
SR - 520 - "<>"	0.521 - 0.540 (13.23 - 13.73)	SRA - 520 - "[]"	PP - 520			
SR - 540 - "<>"	0.541 - 0.560 (13.74 - 14.24)	SRA - 540 - "[]"	PP - 540			
SR - 560 - "<>"	0.561 - 0.580 (14.25 - 14.75)	SRA - 560 - "[]"	PP - 560			
SR - 580 - "<>"	0.581 - 0.600 (14.76 - 15.26)	SRA - 580 - "[]"	PP - 580			
SR - 600 - "<>"	0.601 - 0.620 (15.27 - 15.76)	SRA - 600 - "[]"	PP - 600	PP 600 - 680	II	CHPRA - "{ }" - II
SR - 620 - "<>"	0.621 - 0.640 (15.77 - 16.27)	SRA - 620 - "[]"	PP - 620			
SR - 640 - "<>"	0.641 - 0.660 (16.28 - 16.78)	SRA - 640 - "[]"	PP - 640			
SR - 660 - "<>"	0.661 - 0.680 (16.79 - 17.27)	SRA - 660 - "[]"	PP - 660			
SR - 680 - "<>"	0.681 - 0.700 (17.28 - 17.79)	SRA - 680 - "[]"	PP - 680			
SR - 700 - "<>"	0.701 - 0.720 (17.80 - 18.30)	SRA - 700 - "[]"	PP - 700			
SR - 720 - "<>"	0.721 - 0.740 (18.31 - 18.81)	SRA - 720 - "[]"	PP - 720			
SR - 740 - "<>"	0.741 - 0.760 (18.82 - 19.32)	SRA - 740 - "[]"	PP - 740			
SR - 760 - "<>"	0.761 - 0.780 (19.33 - 19.83)	SRA - 760 - "[]"	PP - 760			
SR - 780 - "<>"	0.781 - 0.800 (19.84 - 20.34)	SRA - 780 - "[]"	PP - 780			
SR - 800 - "<>"	0.801 - 0.820 (20.35 - 20.84)	SRA - 800 - "[]"	PP - 800	PP 800 - 860	III	CHPRA - "{ }" - III
SR - 820 - "<>"	0.821 - 0.840 (20.85 - 21.35)	SRA - 820 - "[]"	PP - 820			
SR - 840 - "<>"	0.841 - 0.860 (21.36 - 21.86)	SRA - 840 - "[]"	PP - 840			
SR - 860 - "<>"	0.861 - 0.880 (21.87 - 22.37)	SRA - 860 - "[]"	PP - 860			
SR - 880 - "<>"	0.881 - 0.900 (22.38 - 22.87)	SRA - 880 - "[]"	PP - 880			
SR - 900 - "<>"	0.901 - 0.920 (22.88 - 23.38)	SRA - 900 - "[]"	PP - 900			
SR - 920 - "<>"	0.921 - 0.940 (23.39 - 23.87)	SRA - 920 - "[]"	PP - 920			
SR - 940 - "<>"	0.941 - 0.960 (23.88 - 24.40)	SRA - 940 - "[]"	PP - 940			
SR - 960 - "<>"	0.961 - 0.980 (24.41 - 24.89)	SRA - 960 - "[]"	PP - 960			
SR - 980 - "<>"	0.981 - 1.000 (24.90 - 25.40)	SRA - 980 - "[]"	PP - 980			
SR - 1000 - "<>"	1.001 - 1.020 (25.41 - 25.91)	SRA - 1000 - "[]"	PP - 1000	PP 980 - 1060		
SR - 1020 - "<>"	1.021 - 1.040 (25.92 - 26.42)	SRA - 1020 - "[]"	PP - 1020			
SR - 1040 - "<>"	1.041 - 1.060 (26.43 - 26.92)	SRA - 1040 - "[]"	PP - 1040			
SR - 1060 - "<>"	1.061 - 1.080 (26.93 - 27.43)	SRA - 1060 - "[]"	PP - 1060			
SR - 1080 - "<>"	1.081 - 1.100 (27.44 - 27.94)	SRA - 1080 - "[]"	PP - 1080			
SR - 1100 - "<>"	1.101 - 1.120 (27.95 - 28.45)	SRA - 1100 - "[]"	PP - 1100			
SR - 1120 - "<>"	1.121 - 1.140 (28.46 - 28.96)	SRA - 1120 - "[]"	PP - 1120			
SR - 1140 - "<>"	1.141 - 1.160 (28.97 - 29.46)	SRA - 1140 - "[]"	PP - 1140			
SR - 1160 - "<>"	1.161 - 1.180 (29.47 - 29.97)	SRA - 1160 - "[]"	PP - 1160			

NOTES: Standard Sr. Kit includes 10 plugs, 1 Brush and 1 "GO/NO GO" gauge; however, plugs and items can be ordered individually. **Consult factory for more information.**

"<>"

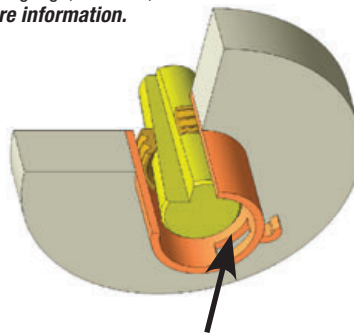
Substitute the suffix "<>" with the following material code: **C** - carbon steel, **S** - 316 stainless steel, **B** - brass, **Y** - Cr/Moly, **M** - monel, **K** - 90/10 CuNi, **J** - 70/30 CuNi. Other materials available.

"[]"

For brass, copper, or copper-nickel tubes add the suffix - **LD** to the Brush Kit Tube Preparation Brushes

"{ }"

Channel Head Pull Rod Assemblies are available in 2', 4', or 6' lengths. Insert the appropriate # for the length required.



Vent tube using our One Rev tool (see page HE-43)

WHEN ORDERING, SPECIFY:

- Tube ID
- Material
- Maximum temperature and pressure
- The type of tube or tube sheet joint (rolled, welded, etc.)
- If Pull Rod, Channel Head Pull Rod or Plug Positioner is needed
- Quantity
- Delivery Date

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SNAP IT® JR & SR TOOLS

TUBE PREPARATION

Use our special **brushes** to properly prep the tube for optimum sealing & holding forces — see Plug Size charts.

- Jr. Brush Kits come with 3 or 4 brushes per kit, dependent on plug size. Use the smallest brush in the kit that effectively cleans and preps the tube.
- Sr. brushes are provided for the specific tube size ordered.



INSTALLATION TOOLS

Hydraulic Tool — THE SIMPLEST, SAFEST AND EASIEST WAY TO INSTALL SNAP IT SR. OR JR. PLUGS! The Snap It Installation Kit is compact and lightweight (ram weighs just 7 lbs) yet has plenty of power to easily install all of our plugs. The pump is air driven and requires 80 to 120 lbs. of supply air @ 20 CFM during the few seconds it is operated and comes in a durable storage case on wheels. When ordering the complete kit - it comes with everything needed for installing Jr. or Sr. plugs for near end applications.

Through-the-tube plugging is performed with this tool by adding the appropriate number of extension assemblies with a Channel Head Pull Rod Assembly and following the “through-the-tube” instructions. Peace of mind — when you order this complete kit.

Pull Rod Assembly — used with the Hydraulic RAM, this installs the plug(s) in place. Our assemblies are fully interchangeable with competitor systems and have been designed to minimize your costs by utilizing multiple plug positioners with each pull rod size — See Plug Size Chart.

Channel Head Pull Rod Assemblies & Extension Sets — Used to operate the system and easily install plugs where Channel Heads are present. Also these are used in conjunction with the extension sets for "through-the-tube" plugging — See Plug Size chart.



REMOVAL TOOL

Plug Removal Tool — designed to easily and quickly remove installed plugs. The Plug Removal Tool removes both the pin and ring in seconds without damage to the tube it was installed in. Simply screw the Spear Stud into the installed pin, dislodge the pin with the slide hammer, screw the spear into the ring, then use the slide hammer to pull out all the pieces.

If required, a new plug can then be reinstalled in the same place!

NOTE: Contact Factory for Sizing Details.



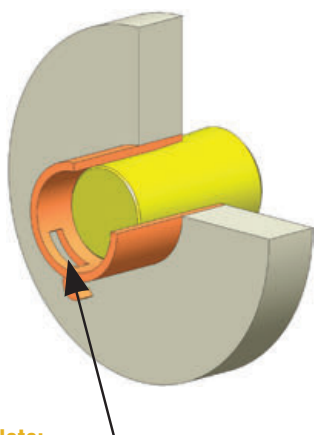
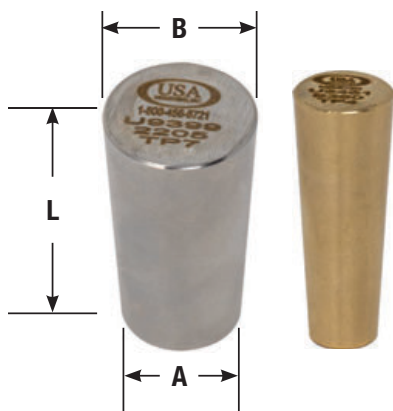
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METAL TAPERED TUBE PLUGS

"Any Metal, Any Size" The Mother of All Plugs



Note:
Always puncture the tube before installing any plug to ensure that pressure cannot build up in the tube and cause the plugs to loosen or blow out.

For puncturing tubes, see our One Rev Cutters on page HE-73.

WHEN ORDERING, SPECIFY:

- TP# based on size of your plug (see chart)
- Material of construction
- For custom plugs, provide "A" "B" & "L" dimensions
- Quantity
- Delivery Date

ALUMINUM BRONZE	ALLOY 20	2205 DUPLEX
Carbon Steel: A-36, A-105, LF2, 1018, 1200	Chrome / Moly: F-5, F-9, F-22	Stainless Steel: 204, 316, 321, 416, 17-4
Brass: 360, Naval, Admiralty	Copper-Nickel: 90 / 10, 70 / 30	Monel: 400, 405, 500
Inconel: 600, 625, 800	Hastelloy: B2, C276	Titanium
Special materials available such as: Ferrallium, Nitronic, Tantalum, Waspalloy, Zircalloy, Zirconium and many more.		

PART NO.	TUBE O.D. (in.)	GAUGE	DIMENSION (in.) + / - .005		
			"A" Small End	"B" Large End	"L" Length
TP - 1 - "<>"	1/4	18 - 24	0.141	0.235	1-1/4
	3/8	12 - 14			
TP - 2 - "<>"	3/8	15 - 24	0.213	0.371	1-3/4
	1/2	13 - 15			
TP - 3 - "<>"	1/2	15 - 24	0.337	0.495	
	5/8	12 - 14			
TP - 4 - "<>"	5/8	14 - 24	0.449	0.625	
	3/4	10 - 14			
TP - 5 - "<>"	3/4	14 - 24	0.564	0.750	
	7/8	10 - 13			
TP - 6 - "<>"	1	8 - 9	0.706	0.875	
	7/8	15 - 24			
TP - 7 - "<>"	1	10 - 15	0.776	0.934	
	1	13 - 18			
TP - 8 - "<>"	1	18 - 24	0.892	1.050	
	1-1/8	13 - 17			
TP - 9 - "<>"	1-1/8	15 - 24	0.949	1.125	2
	1-1/4	10 - 14			
TP - 10 - "<>"	1-1/4	13 - 19	1.010	1.186	
TP - 11 - "<>"	1-1/4	19 - 24	1.147	1.323	
TP - 12 - "<>"	1-1/2	10 - 24	1.200	1.495	
TP - 13 - "<>"	1-1/2	14 - 24	1.305	1.600	
	1-3/4	6 - 13			
TP - 14 - "<>"	1-3/4	14 - 22	1.575	1.870	3
	2	6 - 13			
TP - 15 - "<>"	2	12 - 22	1.700	1.995	
TP - 16 - "<>"	2-1/4	6 - 13	1.805	2.100	
TP - 17 - "<>"	2-1/2	5 - 18	2.000	2.375	
TP - 18 - "<>"	2-3/4	4 - 10	2.232	2.500	
TP - 19 - "<>"	3	5 - 12	2.524	2.834	4
	3	10 - 23			
TP - 20 - "<>"	3	10 - 23	2.625	3.000	
TP - 21 - "<>"	3-1/4	7 - 14	2.875	3.125	
TP - 22 - "<>"	3-1/4	13 - 23	3.010	3.250	
TP - 23 - "<>"	3-1/2	7 - 12	3.125	3.375	
TP - 24 - "<>"	3-1/2	13 - 23	3.260	3.500	
TP - 25 - "<>"	3-3/4	5 - 12	3.274	3.567	
TP - 26 - "<>"	3-3/4	13 - 23	3.510	3.750	
TP - 27 - "<>"	4	5 - 12	3.524	3.817	
TP - 28 - "<>"	4	13 - 23	3.782	4.000	

"<>" = replace "<>" with material of construction required - see Chart above.

WARNING: Never stand in front of an installed plug under pressure. Plugs ejected under pressure can cause serious bodily injury.

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METAL TAPERED TWO-PIECE TUBE PLUGS



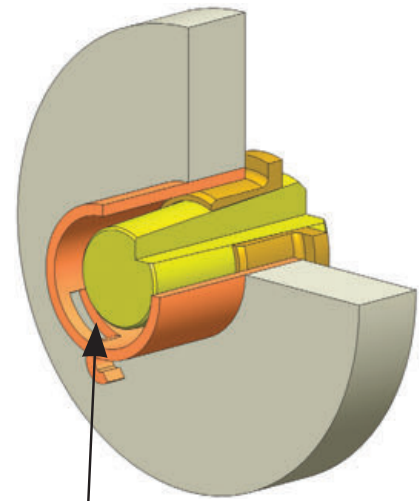
Designed to minimize damage to the tube sheet while sealing off leaky condenser and exchanger tubes - **Installation is Simple!** Insert ring into the tube, insert pin into the ring, hammer until properly sealed. Like the Metal Tapered plugs, these can be removed with a pipe wrench.

For more consistent & controlled installation, see our "Snap It" line of plugs on page TP-2

Available in sizes from 3/8" to 2" tubes

- Stocked materials: brass, carbon steel and stainless steel
- Custom sizes and materials available upon request

TUBE O.D. (in.)	TUBE I.D. RANGE	PIN SIZE	RING SIZE
3/8	0.283 - 0.377	TP - 1	TPR - 0375
1/2	0.283 - 0.377	TP - 1	TPR - 0500 - 1
	0.384 - 0.503	TP - 2	TPR - 0500 - 2
5/8	0.384 - 0.503	TP - 2	TPR - 0625 - 2
	0.480 - 0.635	TP - 3	TPR - 0625 - 3
3/4	0.480 - 0.635	TP - 3	TPR - 0750 - 3
	0.616 - 0.759	TP - 4	TPR - 0750 - 4
1	0.616 - 0.759	TP - 4	TPR - 1000 - 4
	0.730 - 0.840	TP - 5	TPR - 1000 - 5
	0.830 - 1.008	TP - 6	TPR - 1000 - 6
1-1/8	0.730 - 0.840	TP - 5	TPR - 1125 - 5
	0.830 - 1.008	TP - 6	TPR - 1125 - 6
	0.930 - 1.130	TP - 7	TPR - 1125 - 7
1-1/4	0.930 - 1.130	TP - 7	TPR - 1250 - 7
	0.992 - 1.261	TP - 8	TPR - 1250 - 8
1-1/2	1.180 - 1.240	TP - 9	TPR - 1500 - 9
	1.242 - 1.342	TP - 10	TPR - 1500 - 10
	1.344 - 1.495	TP - 11	TPR - 1500 - 11
	1.380 - 1.510	TP - 12	TPR - 1500 - 12
2	1.680 - 1.856	TP - 13	TPR - 2000 - 13
	1.742 - 2.020	TP - 14	TPR - 2000 - 14



Note:

Always puncture the tube before installing any plug to ensure that pressure cannot build up in the tube and cause the plugs to loosen or blow out.

For puncturing tubes, see our One Rev Cutters on page HE-73.

LOC-TITE

Loc-Tite is used to help set and keep plugs in place!



WHEN ORDERING, SPECIFY:

- Tube O.D.
- Tube I.D. (tube wall gauge thickness if unable to use a micrometer (mic))
- Material
- Quantity
- Delivery Date

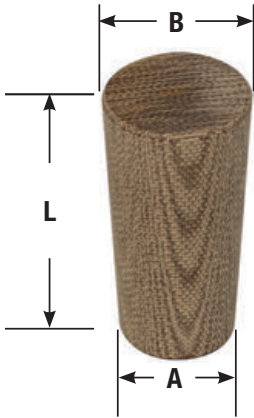
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NON-METAL TAPERED TUBE PLUGS

***SEE DIMENSIONS ON PAGE TP-8 CHART**
(Metal Tapered Tube Plug chart)



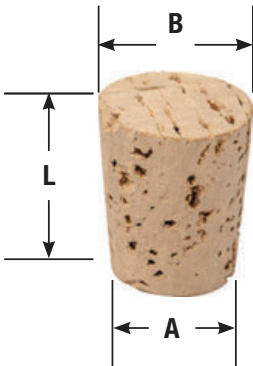
Available in fiber (Phenolic or Micarta) or wood. These plugs are safe, easy to use, corrosion resistant, and easily removed. Slightly hammer the plug into the tube, it will expand by hyroscopic action to make an excellent seal and will not damage the tube sheet.

- Rated up to 230° F
- Order by Tube Size and Gauge
- Use our standard sizes or Yours

WHEN ORDERING, SPECIFY:

- TP# based on size of your plug (see chart)
- Material of construction
- For custom plugs, provide "A" "B" & "L" dimensions
- Quantity
- Delivery Date

CORK TUBE PLUGS



WHEN ORDERING, SPECIFY:

- TP# based on size of your plug (see chart)
- Material of construction
- For custom plugs, provide "A" "B" & "L" dimensions
- Quantity
- Delivery Date

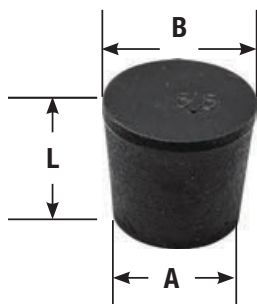
PART NO.	A	B	L
	DIMENSIONS (in.)		
TP - 0000 - C	0.094	0.187	0.500
TP - 000 - C	0.156	0.250	
TP - 00 - C	0.219	0.313	
TP - 0 - C	0.281	0.375	
TP - 1 - C	0.328	0.438	0.625
TP - 2 - C	0.375	0.500	0.688
TP - 3 - C	0.422	0.563	0.750
TP - 4 - C	0.468	0.625	0.813
TP - 5 - C	0.531	0.687	0.875
TP - 6 - C	0.578	0.750	0.938
TP - 7 - C	0.625	0.813	1.00
TP - 8 - C	0.672	0.875	1.063
TP - 9 - C	0.734	0.938	1.125
TP - 10 - C	0.766	1.000	1.250
TP - 11 - C	0.828	1.063	
TP - 12 - C	0.891	1.125	
TP - 13 - C	0.953	1.188	
TP - 14 - C	1.016	1.250	
TP - 15 - C	1.078	1.313	

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RUBBER TAPERED TUBE PLUGS



Used for low pressure isolation or vacuum testing applications *(especially with our Vacuum Leak Detector VLD-2500 - see Section 3, page HE-32).*

Stocked sizes range from 5/16" tube I.D. through 4-3/4" tube I.D. The plugs are made of neoprene and are reusable.

Temperature range: -25°F to +180°F (-31°C to 82°C).

WHEN ORDERING, SPECIFY:

- TP# based on size of your plug (see chart)
- Quantity
- Delivery Date

PART NO.	TUBE O.D. (in.)	GAUGE	DIMENSION (in.) + / - .005			DIMENSION (mm.) + / - .127		
			"A" SMALL	"B" LARGE	"L" LENGTH	"A" SMALL	"B" LARGE	"L" LENGTH
TP - 000 - R	1/2	14 - 24	0.313	0.500	0.875	7.950	12.700	22.225
TP - 00 - R	5/8	13 - 24	0.406	0.594	1.000	10.312	15.088	25.400
TP - 0 - R	3/4	11 - 17	0.500	0.656		12.700	16.662	
TP - 1 - R	3/4	14 - 24	0.563	0.750		14.300	19.050	
TP - 2 - R	7/8	11 - 17	0.625	0.781		15.875	19.837	
TP - 3 - R	7/8	15 - 24	0.719	0.938		18.263	23.825	
	1	10 - 19						
TP - 4 - R	1	11 - 24	0.750	1.000		19.050	25.400	
	1-1/8	7 - 14						
TP - 5 - R	1-1/8	13 - 19	0.906	1.063		23.012	27.000	
TP - 5 - 1/2 - R	1-1/8	16 - 24	0.969	1.109		24.613	28.169	
	1-1/4	10 - 13						
TP - 6 - R	1-1/4	13 - 24	1.031	1.250		26.187	31.750	
TP - 6 - 1/2 - R	1-3/8	7 - 16	1.063	1.344		27.000	34.138	
TP - 7 - R	1-3/8	14 - 24	1.188	1.438		30.175	36.525	
TP - 7 - 1/2 - R	1-1/2	7 - 20	1.125	1.500		28.575	38.100	
TP - 8 - R	1-1/2	14 - 24	1.312	1.625		33.325	41.275	
	1-5/8	10 - 20						
TP - 8 - 1/2 - R	1-5/8	16 - 24	1.406	1.688		35.712	42.875	
TP - 9 - R	1-3/4	10 - 20	1.469	1.750		37.313	44.450	
TP - 9 - 1/2 - R	1-3/4	12 - 24	1.500	1.813		38.100	46.050	
TP - 10 - R	2	7 - 15	1.625	1.969	41.275	50.013		
TP - 10 - 1/2 - R	2	12 - 20	1.750	2.078	44.450	52.781		
TP - 11 - R	2	18 - 24	1.875	2.203	47.625	55.956		
	2-1/4	8 - 18						
TP - 11 - 1/2 - R	2-1/2	8 - 14	2.000	2.469	50.800	62.713		
TP - 12 - R	2-1/2	12 - 18	2.125	2.500	53.975	63.500		
TP - 13 - R	2-3/4	6 - 13	2.281	2.688	57.937	68.275		
TP - 13 - 1/2 - R	2-3/4	12 - 18	2.438	2.969	61.925	75.413		
	3	6 - 16					34.925	
TP - 14 - R	3	12 - 18	3.000	3.500	76.200	88.900	25.400	
TP - 15 - R	3-1/2	13 - 18	3.250	4.000	82.550	101.600	38.100	
TP - 16 - R	4	7 - 18	3.500	5.000	88.900	127.000	25.400	

IN-STOCK ITEMS
SHIP SAME DAY

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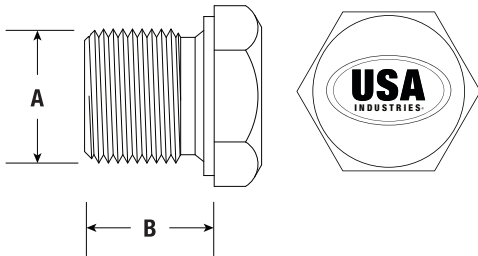
SHOULDER / HEADER PLUGS

Made for Fin-Fan® header boxes and available in carbon steel (coated or uncoated), stainless steel, brass and other materials.

- Sizes available for 5/8" through 2" tube
- When ordering, specify the plug diameter & length (verify the thread and hex sizes are correct)
- Custom sizes & material available upon request
- Length under head available 3/4" - 3"
- Specify your needs for custom orders



Environmentally Superior Due to POSITIVE SEALING* with Superior Design!



WHEN ORDERING PLUGS, SPECIFY:

- Plug Threaded Hole Size (Plug Diameter)
- UNF Size (threads per inch)
- Length under Head
- Material of Construction
- Quantity
- Delivery Date

WHEN ORDERING GASKETS, SPECIFY:

- Flat Gasket or EZ Torque
- Plug Threaded Hole Size
- Material of Construction
- Quantity
- Delivery Date

*** MINIMUM TORQUE VALUES FOR AISI 1008 MATERIAL - CONSULT FACTORY FOR OTHER MATERIAL VALUES**

TYPICAL O.D. (in.)	"A" PLUG DIAMETER (in.)	TYPICAL U.N.F. THREAD	"B" LENGTH UNDER **HEAD	HEX SIZE	FLAT GASKET		EZ TORQUE® GASKET	
					STOCK #	TORQUE FT/LBS	STOCK #	TORQUE FT/LBS
5/8	3/4	16	3/4 - 1-1/2	1	SP - G - 0750 - "<>"	200	SP - G - EZ - 0750 - "<>"	*85 - 120
3/4	7/8	14		1-1/8	SP - G - 0875 - "<>"	265	SP - G - EZ - 0875 - "<>"	*115 - 165
7/8	1	12		1-1/4	SP - G - 1000 - "<>"	300	SP - G - EZ - 1000 - "<>"	*155 - 220
1	1-1/8			1-3/8	SP - G - 1125 - "<>"	395	SP - G - EZ - 1125 - "<>"	*200 - 285
1-1/8	1-1/4			1-1/2	SP - G - 1250 - "<>"	490	SP - G - EZ - 1250 - "<>"	*250 - 355
1-1/4	1-3/8			1-5/8	SP - G - 1375 - "<>"	580	SP - G - EZ - 1375 - "<>"	*305 - 435
1-3/8	1-1/2			1-3/4	SP - G - 1500 - "<>"	690	SP - G - EZ - 1500 - "<>"	*365 - 525
1-1/2	1-5/8			1-7/8	SP - G - 1625 - "<>"	800	SP - G - EZ - 1625 - "<>"	*430 - 620
1-5/8	1-3/4			2	SP - G - 1750 - "<>"	900	SP - G - EZ - 1750 - "<>"	*500 - 725
1-3/4	1-7/8			2-1/8	SP - G - 1875 - "<>"	1000	SP - G - EZ - 1875 - "<>"	*580 - 835
1-7/8	2			2-1/4	SP - G - 2000 - "<>"	1100	SP - G - EZ - 2000 - "<>"	*660 - 955
2	2-1/8			2-3/8	SP - G - 2125 - "<>"	1200	SP - G - EZ - 2125 - "<>"	*750 - 1085

* Torque values based on proper installation. ** Typically stocked lengths

Substitute the suffix "<>" with the following material code:

C = Carbon Steel Y = Chrome/Moly H = Hastelloy
 B = Brass M = Monel Z = Zirconium
 S = 316 SS I = Inconel
 J = 70/30 CuNi N = Nickel 200
 K = 90/10 CuNi T = Titanium

*Other alloys available.

Note 1: All values listed in Ft / lbs are recommended minimum torque values

Note 2: The Recommended Minimum Torque Values for the Flat Gaskets are based on ideal sealing surface conditions, meeting ASME Specs. Typically encountered surface area imperfections do not affect the values given for EZ Torque® Gaskets.

Note 3: The Minimum Recommended Torque Values given for EZ Torque® Gaskets are higher than the Theoretical Torque Values to ensure Thread Locking.

Available Coatings: Cadmium, Electroless Nickel, Galvanized, Nickel, Zinc or Uncoated. Other coatings available.

Fin-Fan® is a Registered Trademark of Hudson Products Corporation

WARNING: Never stand in front of an installed plug under pressure. Plugs ejected under pressure can cause serious bodily injury.

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EZ TORQUE® SURE SEAL GASKETS

**ENVIRONMENTALLY SUPERIOR
-NO LEAKS | POSITIVE SEALING***



USA Industries' EZ Torque Sure Seal Gaskets are designed to provide a positive seal and require less than half the installation torque required for typical soft iron gaskets. Lower torque means no more stripping of threads which prevents the gasket from sealing.

Our innovative design incorporates a graphite outer shell over a special machined metal inner core. The labyrinth design allows the graphite to be compressed and held in place, sealing against imperfections on the surface area. Due to the compressive load stored in the gasket's design, leaks due to typical thermal cycling are eliminated.

The graphite outer shell virtually eliminates the need to remachine the gasket surface areas due to roughness, nicks or scratches typically found in the field.

**MACHINED METAL CORE WITH
BONDED GRAPHITE FACE.**

USA Industries EZ TORQUE® CHART

Nominal Size (in)	EZ Torque Gasket ID (in)	Gasket OD (in)	AISI 1008		304 Stainless		316 Stainless		Nickel 200		Monel 400		2205 Duplex	
			Recommended Torque (lbs-ft)											
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
5/8	0.641	0.875	50	70	50	70	50	70	30	40	40	60	90	130
3/4	0.766	1.000	90	130	100	140	110	150	60	80	80	110	190	270
7/8	0.891	1.125	130	180	140	190	150	200	90	120	110	150	260	350
1	1.016	1.250	150	200	170	230	180	240	110	150	140	190	310	420
1 1/8	1.141	1.375	160	210	180	240	190	250	110	150	140	190	330	440
1 1/4	1.266	1.500	230	310	260	350	270	360	160	220	210	280	480	650
1 3/8	1.391	1.625	290	380	320	420	340	450	200	260	260	340	590	770
1 1/2	1.516	1.750	330	450	370	500	390	530	230	310	300	410	680	920
1 5/8	1.641	1.875	400	530	440	580	460	610	280	370	350	460	810	1070
1 3/4	1.766	2.000	450	600	500	670	530	710	310	420	400	540	930	1250
1 7/8"	1.891	2.125	540	700	600	780	630	820	370	480	480	620	1110	1440
2"	2.016	2.250	610	810	680	900	710	940	430	570	540	710	1260	1670
2 1/8"	2.141	2.375	680	910	750	1000	790	1050	470	630	600	800	1390	1850

NOTE: The minimum recommended torque values given for EZ Torque Gaskets are higher than the theoretical torque values to ensure thread locking.

BENEFITS

- Low torque design
- Eliminates stripping the threads by over-torquing to seal
- No environmental leaks
- Virtually eliminates field remachining
- Cost effective. Low cost of ownership.
- Saves time. During removal, graphite prevents gasket from seizing to header or plug.
- Graphite eliminates atmospheric corrosion
- Metal core available in any material type - 316SS, Inconel, Hastelloy, Nickel, etc.
- Can be used with existing plugs in the field
- Self-aligning when used with USA Industries, Inc.'s manufactured plugs
- Quick delivery - Available 24/7-365

**See Chart on page TP-94 for
size and part number**

When Ordering Gaskets Specify:

Plug Threaded Hole Size • Material of Construction
Quantity • Delivery Date

Material codes:

C = Carbon	K = 90/10 CuNi	N = Nickel
B = Brass	Y = Chrome/Moly	T = Titanium
S = 316SS	M = Monel	H = Hastelloy
J = 70/30 CuNi	I = Inconel	Z = Zirconium

Other alloys available.

* Based on proper installation.

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LOW & HIGH PRESSURE INTERNAL AND FLANGED TUBE PLUGS

The tube condenser plug that gives you **“Performance Under Pressure”** - up to 150 psi. Standard sizes listed in stock, giving you same day shipping on most plugs. Special sizes and plugs trimmed to your requirements are available upon request. The plugs are inserted into the tubing (if flanged, mate flange up to the tube) finger-tighten and then secure with the appropriate socket wrench unit the proper seal is made.

- Made of neoprene
- Grade K-2247-CF, ASTM-BC 412 45+/-5 Durometer hardness
- Resistant to oil and gasoline
- Temperature range: -45°F to +300°F (-43°C to 149°C)
- Easy to use and reusable
- Rated to 150 psi when installed properly
- Safety lanyards can be installed (at an additional cost) to assure operator’s protection
- Specify hardware: carbon steel, stainless steel, brass



WHEN ORDERING, SPECIFY:

- TP# based on size of your plug (see chart)
- Specify Internal or Flanged
- Specify Single or Double Seal
- Hardware (CS, SS, BRASS)
- Quantity
- Delivery Date

Note:
Always puncture the tube before installing any plug to ensure that pressure cannot build up in the tube and cause the plugs to loosen or blow out.

For puncturing tubes, see our One Rev Cutters on page HE-43.

FOR TUBE I.D.'S		PRESSURE RATING			
		120	150	120	150
(in.)	(mm)	INTERNAL SINGLE SEAL	INTERNAL DOUBLE SEAL	FLANGED SINGLE SEAL	FLANGED DOUBLE SEAL
1/2 - 5/8	12 - 16	EP-IS-0500	EP-ID-0500	EP-FS-0500	EP-FD-0500
5/8 - 3/4	16 - 19	EP-IS-0625	EP-ID-0625	EP-FS-0625	EP-FD-0625
3/4 - 7/8	19 - 22	EP-IS-0750	EP-ID-0750	EP-FS-0750	EP-FD-0750
7/8 - 1	22 - 25	EP-IS-0875	EP-ID-0875	EP-FS-0875	EP-FD-0875
1 - 1-1/8	25 - 29	EP-IS-1000	EP-ID-1000	EP-FS-1000	EP-FD-1000
1-1/8 - 1-1/4	29 - 32	EP-IS-1125	EP-ID-1125	EP-FS-1125	EP-FD-1125
1-1/4 - 1-3/8	32 - 35	EP-IS-1250	EP-ID-1250	EP-FS-1250	EP-FD-1250
1-3/8 - 1-1/2	35 - 38	EP-IS-1375	EP-ID-1375	EP-FS-1375	EP-FD-1375
1-1/2 - 1-5/8	38 - 41	EP-IS-1500	EP-ID-1500	EP-FS-1500	EP-FD-1500
1-5/8 - 1-3/4	41 - 45	EP-IS-1625	EP-ID-1625	EP-FS-1625	EP-FD-1625
1-3/4 - 1-7/8	45 - 48	EP-IS-1750	EP-ID-1750	EP-FS-1750	EP-FD-1750
1-7/8 - 2	48 - 51	EP-IS-1875	EP-ID-1875	EP-FS-1875	EP-FD-1875
2 - 2-1/8	51 - 54	EP-IS-2000	EP-ID-2000	EP-FS-2000	EP-FD-2000
2-1/8 - 2-1/4	54 - 57	EP-IS-2125	EP-ID-2125	EP-FS-2125	EP-FD-2125
2-1/4 - 2-3/8	57 - 60	EP-IS-2250	EP-ID-2250	EP-FS-2250	EP-FD-2250

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THREADED TAPERED TUBE PLUGS

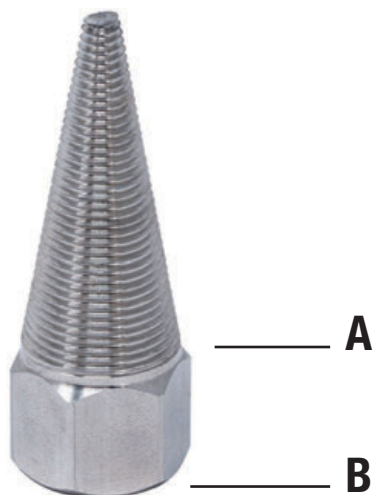
Plugs Holes Through Sides or Ends of Piping, Tubing, or Vessels

A fast and simple way to stop leaks in tanks, pipes, etc. Threaded plugs are manufactured using heat treated alloy steel or stainless steel. To install, use a standard Hex wrench or socket.

- Self tapping
- Stocked in: alloy steel and stainless steel

WHEN ORDERING, SPECIFY:

- TP# Based on size of your plug (see chart)
- Material of Construction
- Quantity
- Delivery Date



FOR HOLE SIZES UP TO	PART NO.	"A" LARGE END	"B" HEX SIZE (in.)
0.350	TTP-0375	.365	3/8
0.450	TTP-0500	.480	1/2
0.580	TTP-0625	.615	5/8
0.710	TTP-0750	.730	3/4
0.835	TTP-0875	.855	7/8
0.950	TTP-1000	.975	1
1.150	TTP-1125	1.100	1-1/8
1.200	TTP-1250	1.220	1-1/4
1.320	TTP-1375	1.345	1-3/8
1.450	TTP-1500	1.470	1-1/2

ANODE PLUGS

Zinc Corrosion Plugs

USA INDUSTRIES' zinc plugs help protect heat exchangers, pipelines, tanks, pumps and many other pieces of equipment from corrosion. The zinc rod is consumed by any electrolytic action that would otherwise attack and corrode equipment.

NOTE: For sizes larger than 1" NPT use 1" part numbers and install in a reducing bushing.

WHEN ORDERING, SPECIFY:

- Length of Anode
- Size of plug (see chart)
- Quantity
- Delivery Date



SIZE NPT (in.)	ROD DIAMETER (in.)	ROD LENGTH (in.)	PART NO.
1/4	1/4	1	AP-0250-1
1/4	1/4	2	AP-0250-2
1/4	1/4	3	AP-0250-3
1/4	1/4	6	AP-0250-6
3/8	3/8	2	AP-0375-2
3/8	3/8	3	AP-0375-3
3/8	3/8	6	AP-0375-6
1/2	1/2	3	AP-0500-3
1/2	1/2	6	AP-0500-6
1/2	1/2	8	AP-0500-8
3/4	3/4	4	AP-0750-4
3/4	3/4	6	AP-0750-6
3/4	3/4	8	AP-0750-8
1	1	4	AP-1000-4
1	1	6	AP-1000-6
1	1	10	AP-1000-10
1	1	14	AP-1000-14

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TUBE SERIES (B.W.G.)

All Dimensions Shown in Inches

TUBE O.D. (in.)	TUBE GAUGE																								TURF ID.			
	00	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22		23	24	
	WALL THICKNESS (in.)																											
0.380	0.340	0.300	0.284	0.259	0.238	0.220	0.203	0.180	0.165	0.148	0.134	0.120	0.109	0.095	0.083	0.072	0.065	0.058	0.049	0.042	0.035	0.032	0.028	0.025	0.022			
1/4												0.010	0.032	0.060	0.084	0.106	0.120	0.134	0.152	0.166	0.180	0.186	0.194	0.200	0.206			
3/8								0.015	0.045	0.079	0.107	0.135	0.157	0.185	0.209	0.231	0.245	0.259	0.277	0.291	0.305	0.311	0.319	0.325	0.331			
1/2					0.024	0.060	0.094	0.140	0.170	0.204	0.232	0.260	0.282	0.310	0.334	0.356	0.370	0.384	0.402	0.416	0.430	0.436	0.444	0.450	0.456			
5/8		0.025	0.057	0.107	0.149	0.185	0.219	0.265	0.295	0.329	0.357	0.385	0.407	0.435	0.459	0.481	0.495	0.509	0.527	0.541	0.555	0.561	0.569	0.575	0.581			
3/4	0.070	0.150	0.182	0.232	0.274	0.310	0.344	0.390	0.420	0.454	0.482	0.510	0.532	0.560	0.584	0.606	0.620	0.634	0.652	0.666	0.680	0.686	0.694	0.700	0.706			
7/8	0.115	0.195	0.307	0.357	0.399	0.435	0.469	0.515	0.545	0.579	0.607	0.635	0.657	0.685	0.709	0.731	0.745	0.759	0.777	0.791	0.805	0.811	0.819	0.825	0.831			
1	0.240	0.320	0.400	0.432	0.482	0.524	0.560	0.594	0.640	0.670	0.704	0.732	0.760	0.782	0.810	0.834	0.856	0.870	0.884	0.902	0.916	0.930	0.936	0.944	0.950	0.956		
1-1/8	0.365	0.445	0.525	0.557	0.607	0.649	0.685	0.719	0.765	0.795	0.829	0.857	0.885	0.907	0.935	0.959	0.981	0.995	1.009	1.027	1.041	1.055	1.061	1.069	1.075	1.081		
1-1/4	0.490	0.570	0.650	0.682	0.732	0.774	0.810	0.844	0.890	0.920	0.954	0.982	1.010	1.032	1.060	1.084	1.106	1.120	1.134	1.152	1.166	1.180	1.186	1.194	1.200	1.206		
1-1/2	0.740	0.820	0.900	0.932	0.982	1.024	1.060	1.094	1.140	1.170	1.204	1.232	1.260	1.282	1.310	1.334	1.356	1.370	1.384	1.402	1.416	1.430	1.436	1.444	1.450	1.456		
1-3/4	0.990	1.070	1.150	1.182	1.232	1.274	1.310	1.344	1.390	1.420	1.454	1.482	1.510	1.532	1.560	1.584	1.606	1.620	1.634	1.652	1.666	1.680	1.686	1.694	1.700	1.706		
2	1.240	1.320	1.400	1.432	1.482	1.524	1.560	1.594	1.640	1.670	1.704	1.732	1.760	1.782	1.810	1.834	1.856	1.870	1.884	1.902	1.916	1.930	1.936	1.944	1.950	1.956		
2-1/4	1.490	1.570	1.650	1.682	1.732	1.774	1.810	1.844	1.890	1.920	1.954	1.982	2.010	2.032	2.060	2.084	2.106	2.120	2.134	2.152	2.166	2.180	2.186	2.194	2.200	2.206		
2-1/2	1.740	1.820	1.900	1.932	1.982	2.024	2.060	2.094	2.140	2.170	2.204	2.232	2.260	2.282	2.310	2.334	2.356	2.370	2.384	2.402	2.416	2.430	2.436	2.444	2.450	2.456		
2-3/4	1.990	2.070	2.150	2.182	2.232	2.274	2.310	2.344	2.390	2.420	2.454	2.482	2.510	2.532	2.560	2.584	2.606	2.620	2.634	2.652	2.666	2.680	2.686	2.694	2.700	2.706		
3	2.240	2.320	2.400	2.432	2.482	2.524	2.560	2.594	2.640	2.670	2.704	2.732	2.760	2.782	2.810	2.834	2.856	2.870	2.884	2.902	2.916	2.930	2.936	2.944	2.950	2.956		
3-1/4	2.490	2.570	2.650	2.682	2.732	2.774	2.810	2.844	2.890	2.920	2.954	2.982	3.010	3.032	3.060	3.084	3.106	3.120	3.134	3.152	3.166	3.180	3.186	3.194	3.200	3.206		
3-1/2	2.740	2.820	2.900	2.932	2.982	3.024	3.060	3.094	3.140	3.170	3.204	3.232	3.260	3.282	3.310	3.334	3.356	3.370	3.384	3.402	3.416	3.430	3.436	3.444	3.450	3.456		
3-3/4	2.990	3.070	3.150	3.182	3.232	3.274	3.310	3.344	3.390	3.420	3.454	3.482	3.510	3.532	3.560	3.584	3.606	3.620	3.634	3.652	3.666	3.680	3.686	3.694	3.700	3.706		
4	3.240	3.320	3.400	3.432	3.482	3.524	3.560	3.594	3.640	3.670	3.704	3.732	3.760	3.782	3.810	3.834	3.856	3.870	3.884	3.902	3.916	3.930	3.936	3.944	3.950	3.956		
4-1/4	3.490	3.570	3.650	3.682	3.732	3.774	3.810	3.844	3.890	3.920	3.954	3.982	4.010	4.032	4.060	4.084	4.106	4.120	4.134	4.152	4.166	4.180	4.186	4.194	4.200	4.206		
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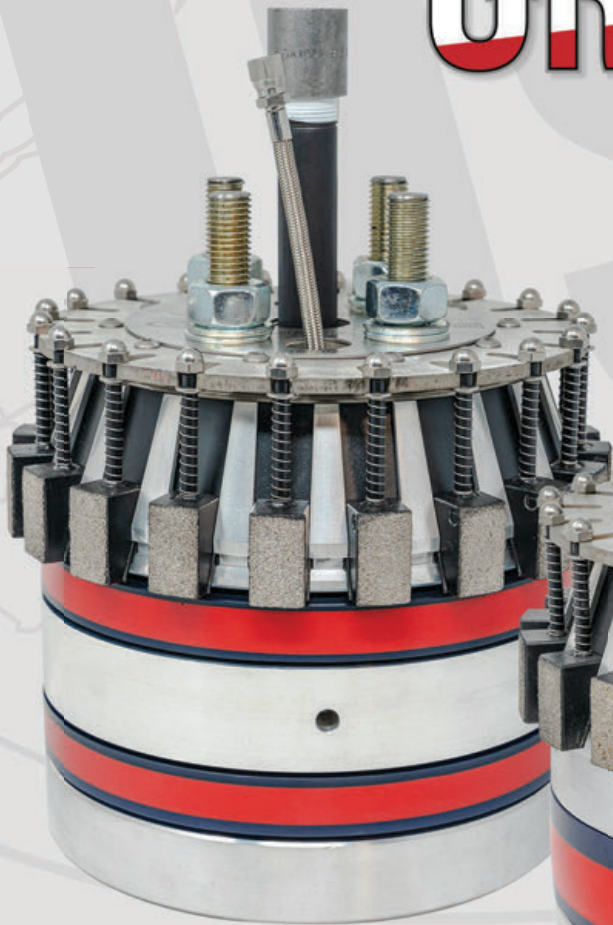
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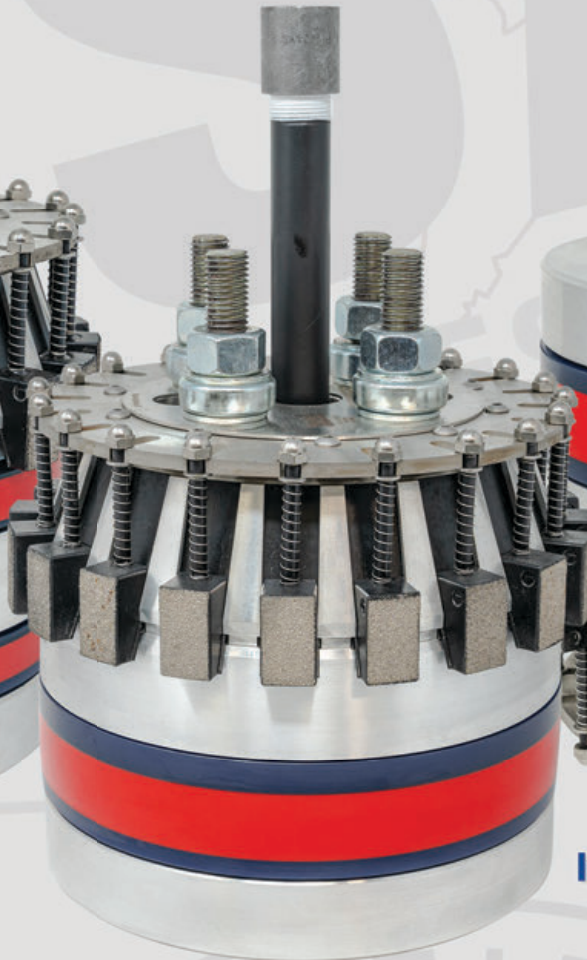
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See Section 1 - Page 12

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