

The promise of precision, every time.



MACWELD
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www.mac-weld.com

ORIFICE PLATES & MORE

Orifice Plates | Orifice Assemblies | Orifice Unions | Blinds and more



MACWELD
m a c h i n i n g

At Mac-Weld we promise precision, every time. We're proud of our work, and we work closely with our customers. We design and develop products that perform best under the most challenging conditions. We don't crack under pressure. We don't melt under heat. We measure the flow, and we're measured in our response. We stand by our quality, our time, and our price. We're Mac-Weld, and our promise is, to be the best.



The promise of precision, every time.

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Mac-Weld reserves the right to update and/or change our product line at any time without written notice. Drawings may differ slightly from the final product. For the most up-to-date and accurate drawing, please contact your Mac-Weld Sales representative today at 1-877-622-9353. Revised April 2024.



Custom Orifice Plates



Flow Meter Grounding Rings



Integral Orifice Assembly



Meter Run Assembly



Multi-Stage Restriction Orifice



Orifice Plate with Carrier Ring Set



Orifice Flange Union



Orifice Wafer Assembly



Paddle Orifice Plates



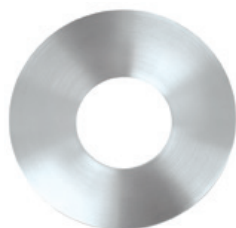
Restriction Orifice Unions



R.T.J. (Ring Type Joint) Orifice Plates



Spectacle Blinds,
Spades & Ring Spacers



Universal Orifice Plates



Vented Paddle Blinds

Mac-Weld Orifice Plates

Orifice plates for flow measurement and flow restriction

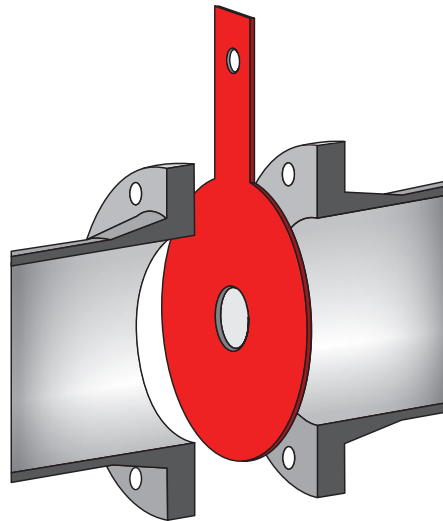
Orifice plates, also known as restricting plates, provide the most reliable and accurate flow measurement for gas, liquid, and steam across a variety of industries. With established standards for manufacturing, Mac-Weld orifice plates perform reliably under the most challenging installation and process conditions.

Precision | Quality | On-time Delivery

Precision bored from one piece. Orifice plates are primary element differential products for rate of flow measurement. They are also used for flow restriction applications. Orifice plate diameters are precision-bored to exact tolerances. Dimensional verification with a CMM (coordinate measurement machine).

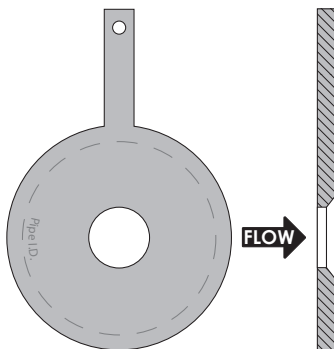
The universal-size orifice plates are the most economical style of plates available because of their low initial cost, low maintenance, and minimal storage space required. The necessity of stocking plates for various pressure ratings is eliminated.

- All orifice plates are manufactured in house, quality checked and tested before being shipped out.
- Dozens of material options available
- CRN approved orifice plates.
- Various NDT options
- Plates are surface finished up to 30 microinch tolerance, based on clients requirements.
- All plates are water cut to prevent any type of warping or distortion usually associated with higher heat cutting methods.
- Special application plate designs are available based of client standards
- Custom stamping is available

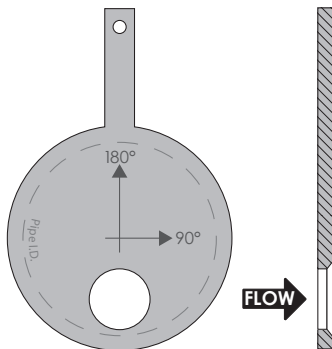




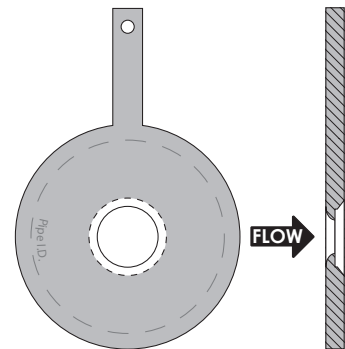
A Concentric Edge Bore



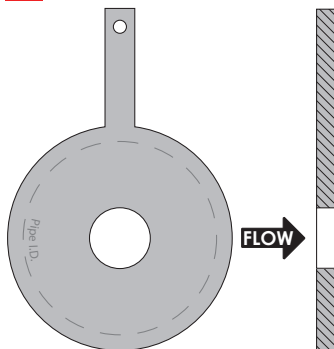
B Eccentric Bore



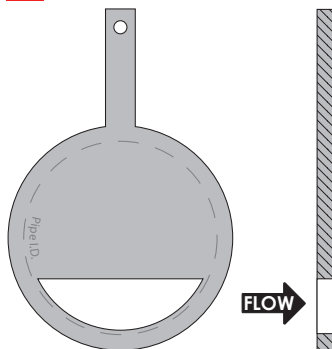
C Quadrant Edge Bore



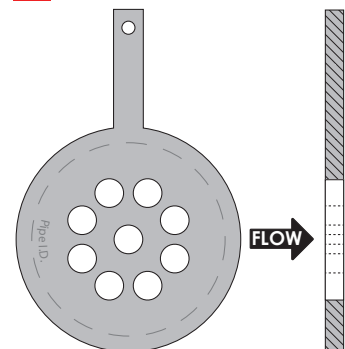
D Square-Edge (Restricted)



E Segmental Bore



F Multi-Bore



Types of Orifice Plates

All orifice plates are manufactured on-site

Orifice Plate Designs

Mac-Weld orifice plates are designed and built to meet our client's requirements. Our orifice plates are manufactured under strict guidelines and tolerances for surface finish, flatness, bore diameter, and any imperfections in machining such as nicks and wire edges on the bore. Whether they are custom designed or standard, they are shipped out only after they are tested, measured, and ready to install.

A. Concentric Flow (Beveled) Bore

The most common style orifice plate. This design is very reliable and easy to install since the plate is uni-directional, indicating which side is upstream. The square-edge orifice plate is ideal for liquid applications, along with gases and steam.

B. Eccentric Bore

Eccentric bore orifice plates are plates with the hole located off-center; this allows the undesired portions of the fluids to pass through the orifice rather than building up. These plates are commonly used in processes that contain foreign matter that may block the orifice, including petrochemicals, steel, paper, heavy chemicals, etc.

C. Quadrant Edge Bore

The quadrant edge bore is designed for viscous fluids such as heavy crude oil, slurries, and syrups with Reynolds numbers between 5,000 and 100,000. The quadrant edge bore is an orifice with the inlet edge rounded. The upstream bore is shaped like a flow nozzle, while the downstream is similar to a sharp edge plate.

D. Concentric Restriction (No Bevel) Bore

The restriction design has a square edge on both sides of the plate. This means the square edge is one of the few plates, if not the only, that can be installed in either direction.

E. Segmental Bore

Segmentally bored orifice plates are commonly used in situations where solids are entrained in a gas or liquid flow stream. The segmental opening may be placed either at the bottom or top of the pipe. Segmental bores are generally used in these industries: sewage treatment, paper, steel, chemical, water conditioning, and petrochemical.

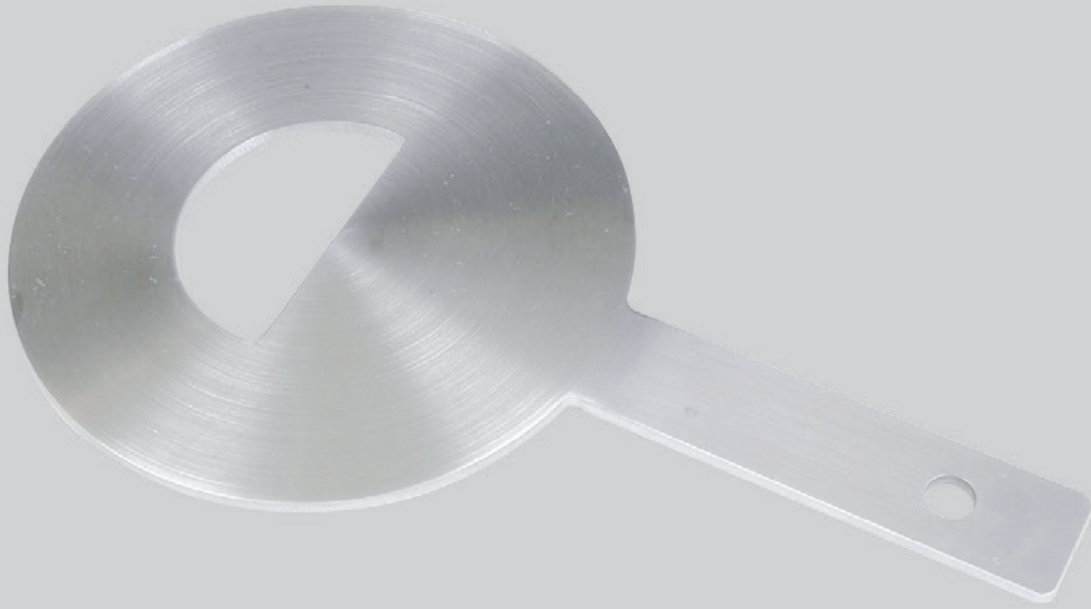
F. Multi-Bore

Multi-bore orifice plates consist of two or more holes and are often used as a restriction plate to reduce noise or cavitation. Calculations can be done to determine the optimal number of holes needed based on the required application.

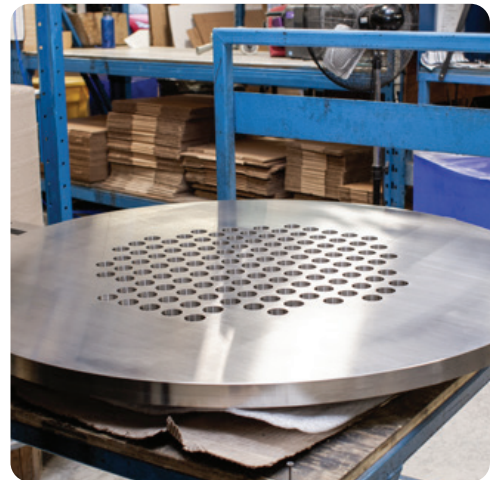
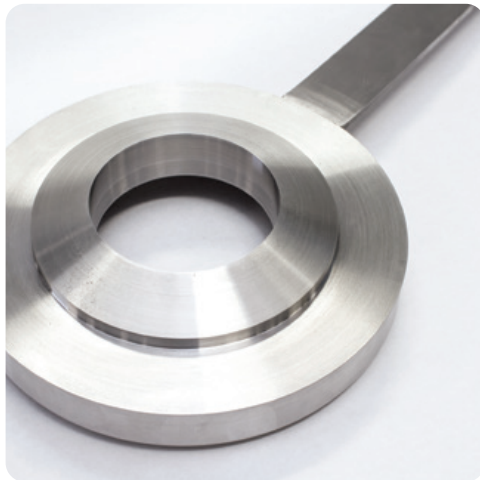


Drain and Vent Holes (Weep Holes)

Depending on your application, a drain or vent hole may be required. The drain hole is located in the lower region of the plate; this allows liquids that may be present to pass. The vent hole can be found on the upper region of the orifice plate; this helps prevent any gas from building up. Flow measurement accuracy may be affected by drain and vent holes.



CUSTOM ORIFICE PLATES



Custom Orifice Plates

Our custom orifice plates are designed and manufactured 100% in house

We design and manufacture a variety of custom orifice plates from bore & bevel to bore & counterbore, segmental, eccentric and quadrant (quarter round).

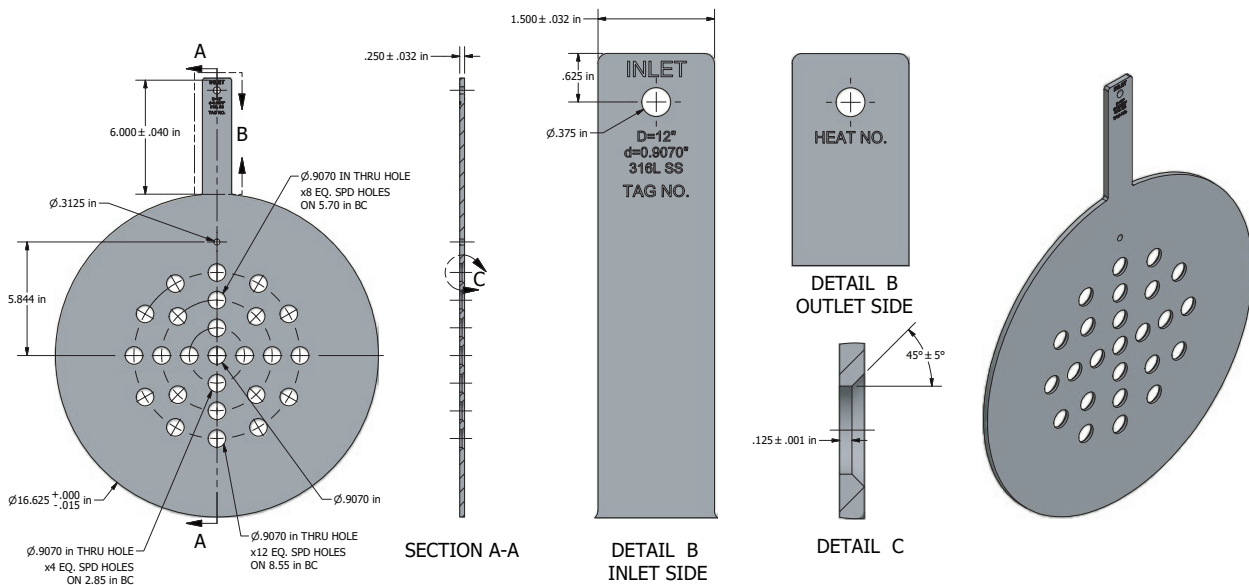
Our bore & bevel orifice plates are machined at a 45° angle to the desired edge thickness and typically beveled to 1/50 of the line I.D. or 1/8 of the orifice bore. In the bore & counterbore orifice plates, we use a special method to limit the plate edge thickness.

Our segmental and eccentric bore orifice plates have offset bores to operate in conditions with gas or liquid steam entrained with solids. Quadrant bores are designed for fluids of high viscosity, such as heavy crudes, syrups, and slurries.

- Custom bores and finishes available
- Custom engineered orifice plates
- Orifice plates available with a maximum line size of 48"
- 1/16" to 5" plate thickness available
- All Mac-Weld orifice plates are inspected and stamped before being released from production.



Custom Orifice Plate - Custom Multi-Bore

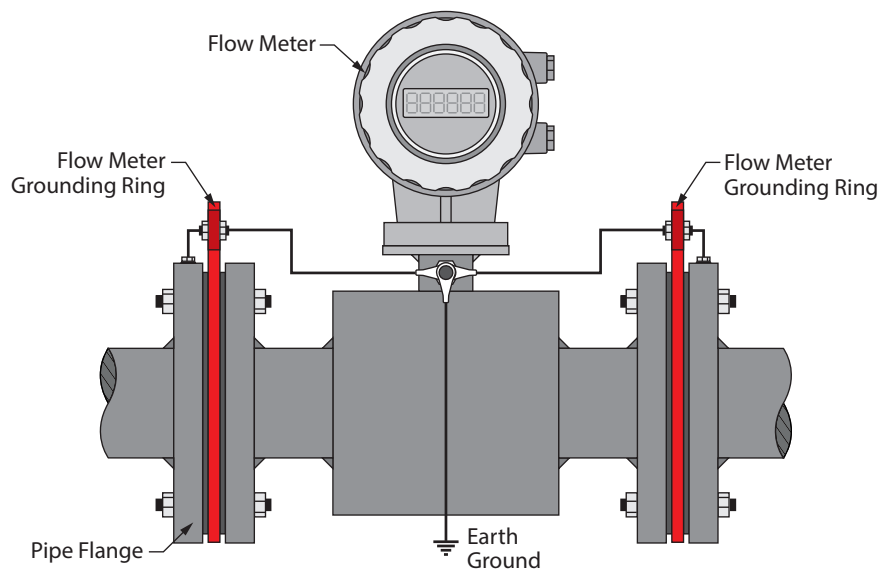


Material Options: Available in 316 Stainless Steel, Hastelloy – Monel. Also available in most alloy materials.

Industries: Any industry that requires flow measurement.



FLOW METER GROUNDING RINGS



Flow Meter Grounding Rings

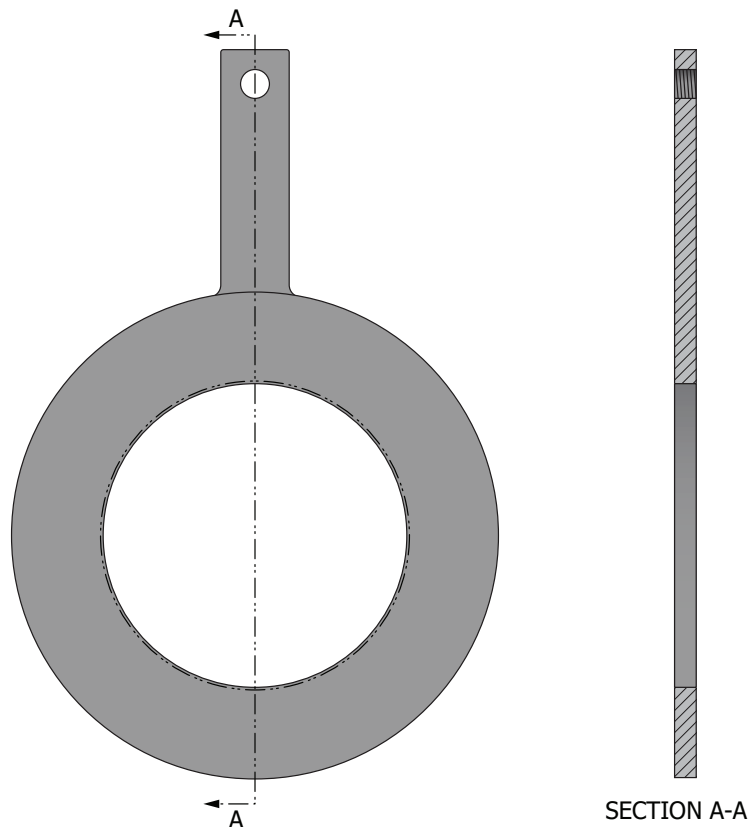
Improves meter performance in lined or non-metallic pipes

Flow meter grounding rings, or earth rings, ground the process and reduce noise delivered to the gauge by removing stray energy created by the process flow.

Also known as electromagnetic flow meter earthing rings, they form a connection between the sensor and the pipe to reduce interference and electrical noise in flow meters and help produce accurate readings. Grounding rings should match the meter size instead of the original pipe size for inline meters.

Mac-Weld flow meter grounding rings are available in pairs since they need to be installed upstream and downstream in order to effectively reduce electrical noise from the electromagnetic flow meter.

- Mac-Weld grounding rings are available in pairs
- All rings are inspected for accuracy and any possible imperfections before final approval
- Grounding rings are made from stainless steel, hastelloy and monel, however other materials are available.
- Installation kits available upon special request
- Large selection of materials available

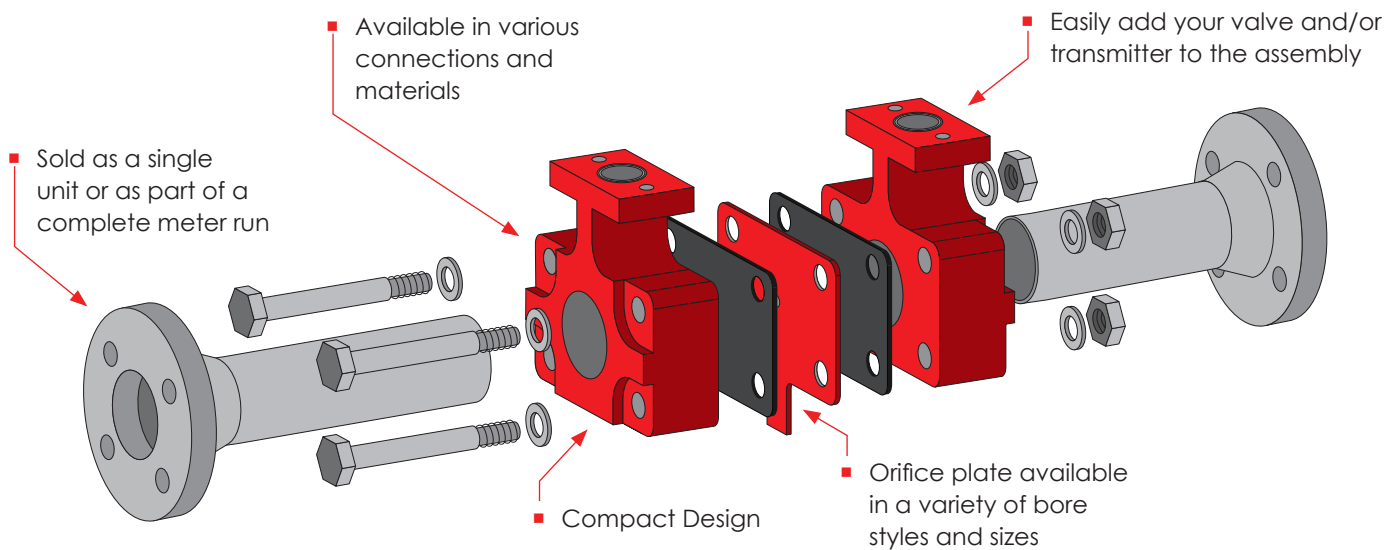


Material Options: Available in 316 Stainless Steel, Hastelloy – Monel. Also available in most alloy materials.

Industries: Any industry that requires flow measurement.



INTEGRAL ORIFICE ASSEMBLY



Integral Orifice Assembly

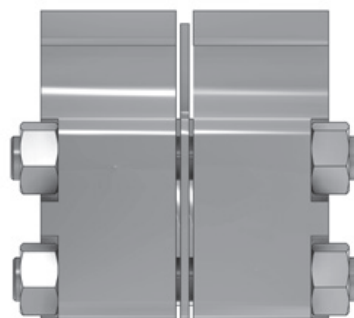
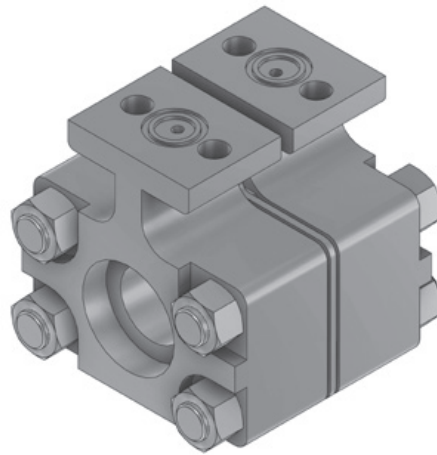
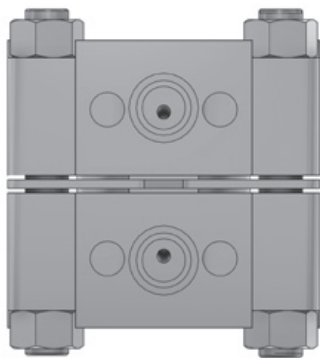
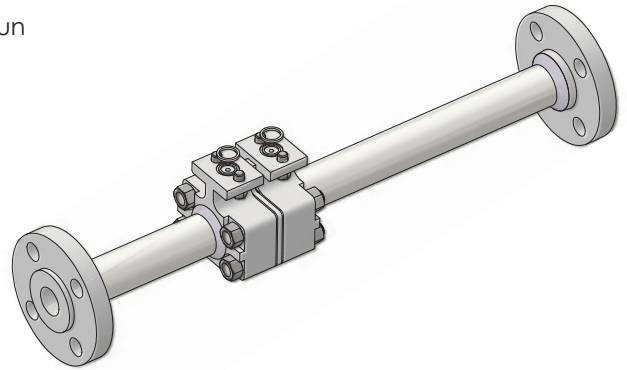
Ideal for liquid, gas and steam applications

Mac-Weld integral orifice assemblies help eliminate measurement inaccuracies possible with small orifice line installations.

An integral flow orifice assembly is used when a differential pressure transmitter must be directly mounted on the orifice assembly. This eliminates the cost of the installation of a differential pressure transmitter with impulse piping up to the orifice assembly. This fully integrated flow meter eliminates the need for fittings, tubing, valves, adapters, and mounting brackets, thereby reducing welding and installation time.

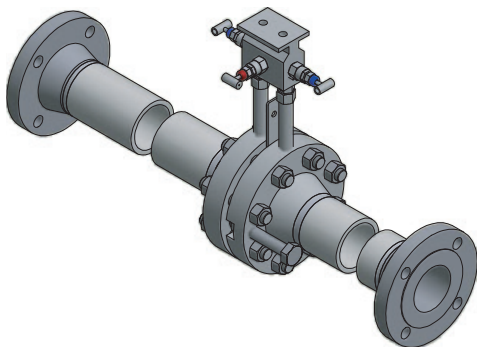
The transmitter can be remote-mounted or mounted directly to the orifice assembly through either a H or T style manifold valve.

- Higher rate or accuracy in volumetric flow rate
- Light weight design compared to orifice flange
- Allows direct mounting of manifold valves and transmitters
- Sold as a single unit or as part of a complete meter run
- Line sizes available up to a maximum of 1.5"
- Available connections; socket weld and threaded
- Large selection of materials available
- Custom designs available upon request
- NACE compliant

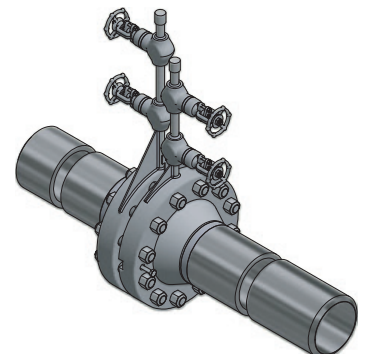
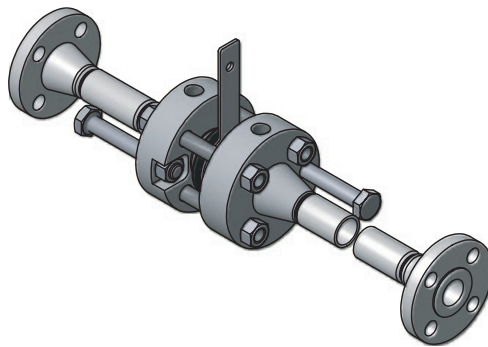




METER RUN ASSEMBLY



Flanged Connections



Weld-in Connection

Meter Run Assembly

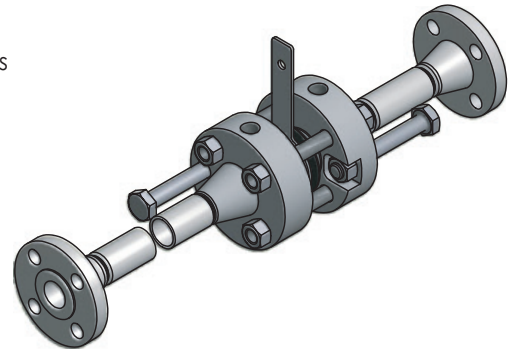
When high accuracy flow measurement of the process is required

Mac-Weld meter run assemblies are designed as a complete unit, allowing for easy installation while also improving overall reliability.

Meter runs are commonly manufactured to standard lengths; however, they can be designed for custom applications, which will help achieve optimal efficiency at the transmitter.

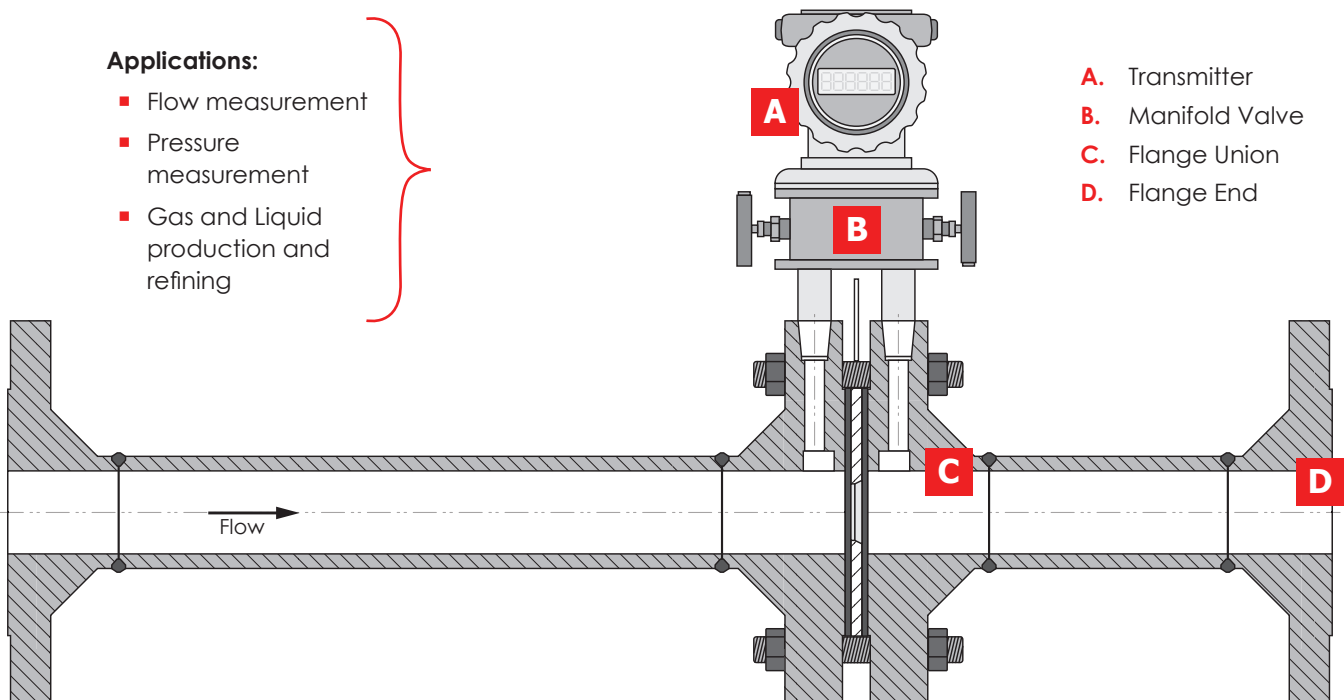
Mac-Weld meter run assemblies are delivered as a single unit, which includes flange union, orifice plate, and either flanged, threaded, or weld bevel connections. We can also pre-install manifolds and transmitters when requested (transmitters supplied by the client).

- Supplied fully assembled and ready for installation
- Available with flanges, threads or weld bevel connections
- Designed for line sizes up to 12"
- Meter runs above 12" available upon request
- Suitable for steam, gas and liquid flow measurement
- Large selection of materials available
- NACE compliant
- CRN's available upon request, see factory for details
- Dye Pen, X-Ray and Hydro testing available



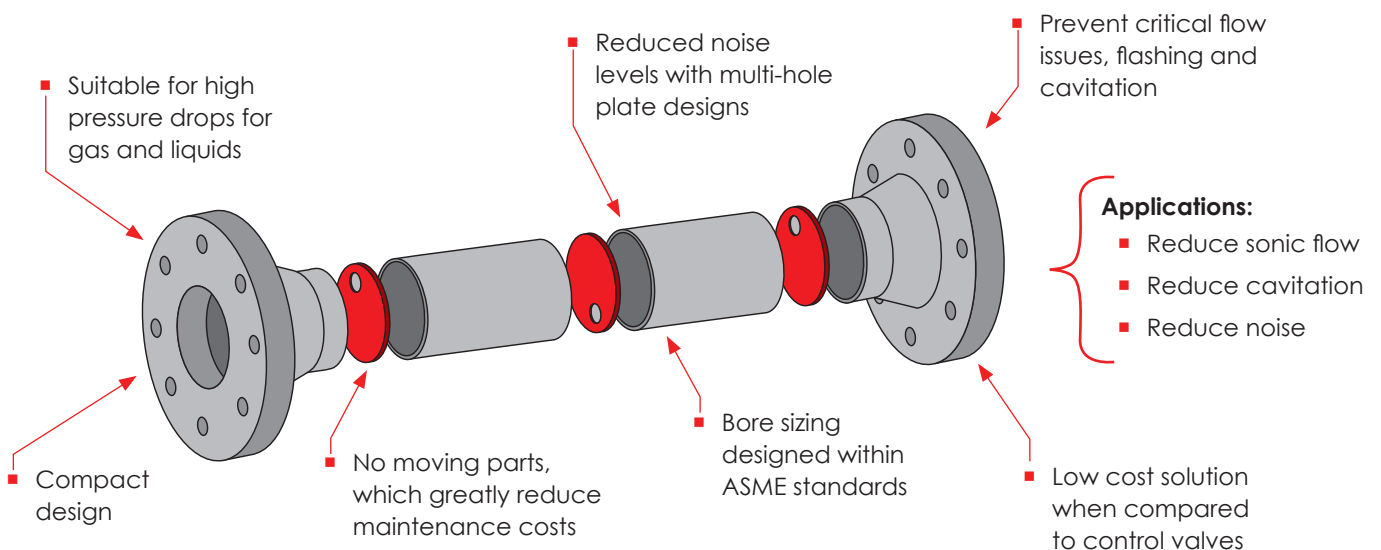
Applications:

- Flow measurement
- Pressure measurement
- Gas and Liquid production and refining





MULTI-STAGE RESTRICTION ORIFICE



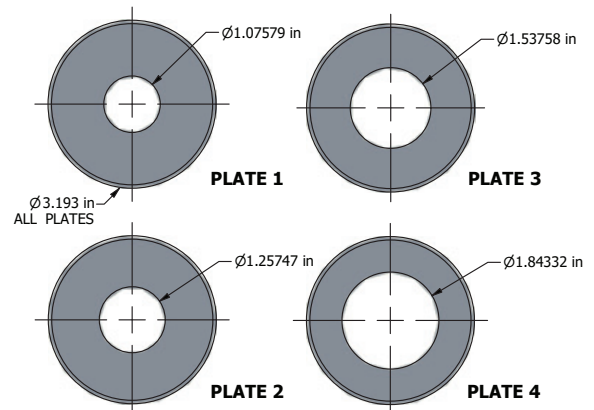
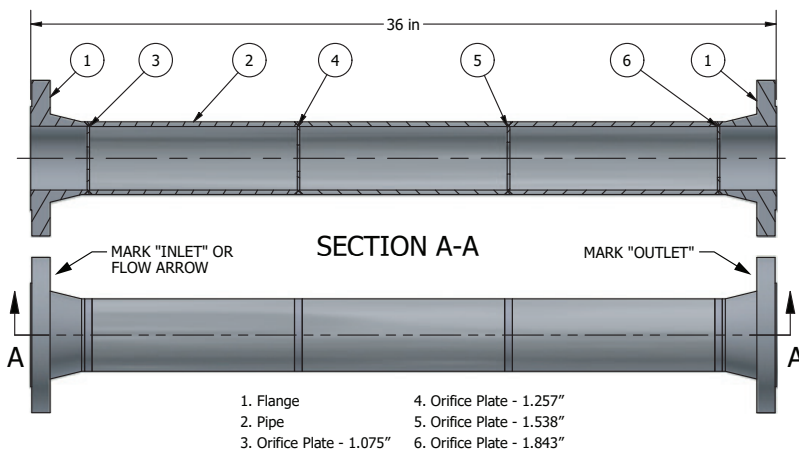
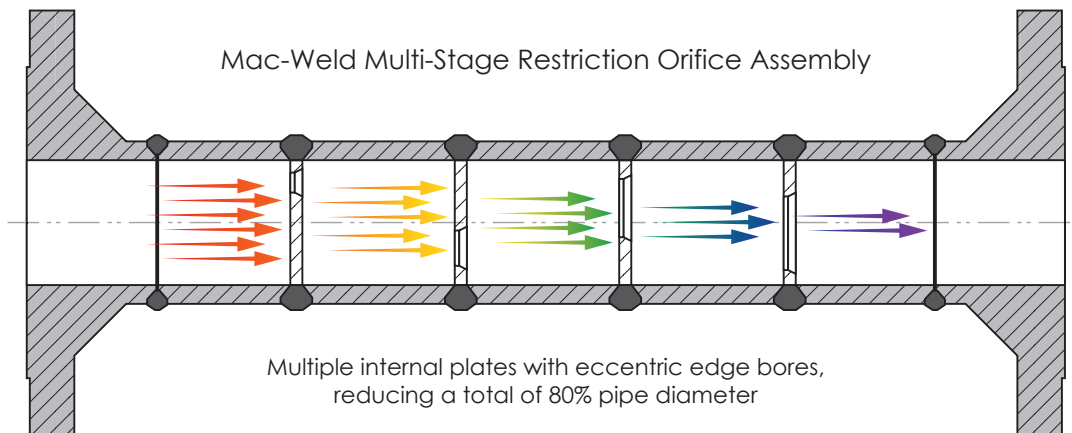
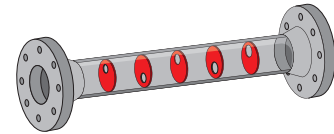
Multi-Stage Restriction Orifice

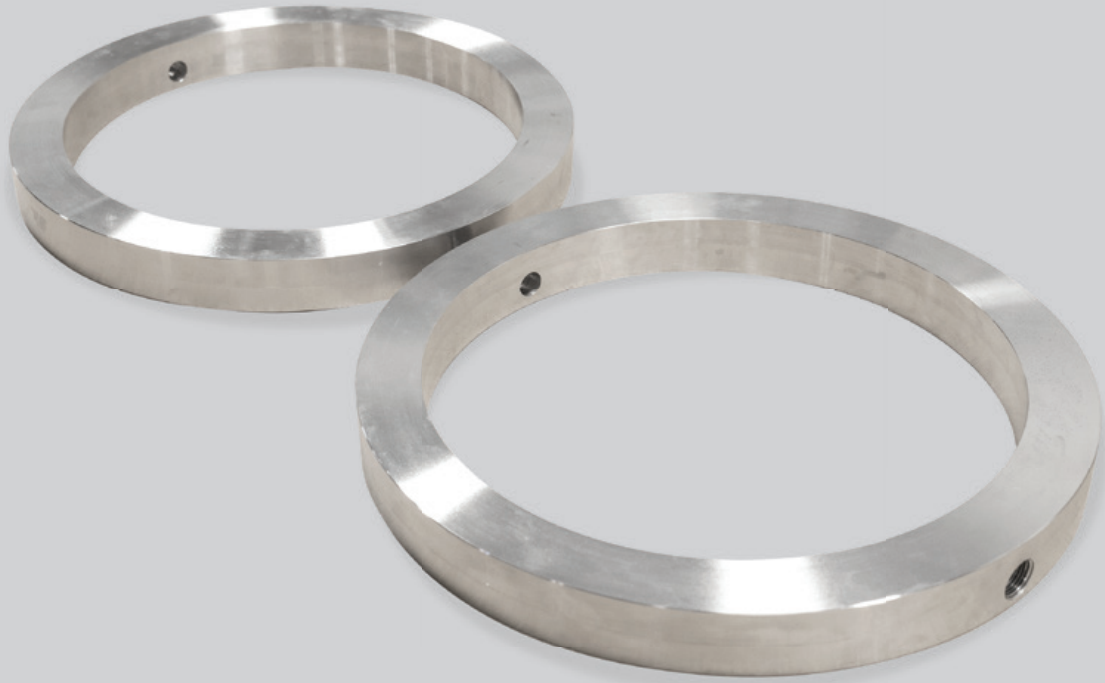
Designed to reduce the pressure in a process

Mac-Weld multi-stage restriction orifice is the perfect solution when the required pressure drop is not possible with a single plate.

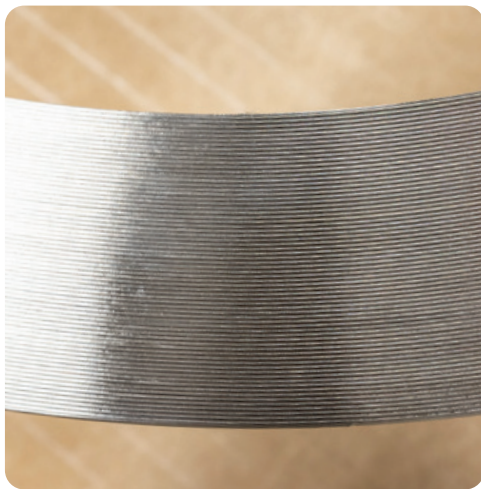
It is made up of multiple orifice plates, each reducing pressure with calculated reduction steps to achieve the required drop in pressure. A restricted orifice run can also greatly reduce noise and vibrations, as well as flashing or cavitation in the line. Our multi-stage restriction orifice assembly can reduce pressure for a simple, maintenance-free, and economical solution.

- Reduce the pressure drop, not achievable with a single plate.
- Prevents flashing, cavitation and other critical flow problems.
- Single hole multistage design along with multi-hole, multi-stage designs available.
- Line sizes: 1/2" - 24". Flange Rating: 150# - 2500#
- Built to optimize the pressure drop across each stage
- Suitable for both high flow/pressure liquids and gases
- Bore sizing based on ASME.MFC.3M, ISO 5167 or AGA-3
- Low maintenance costs





ORIFICE PLATE
WITH CARRIER RING



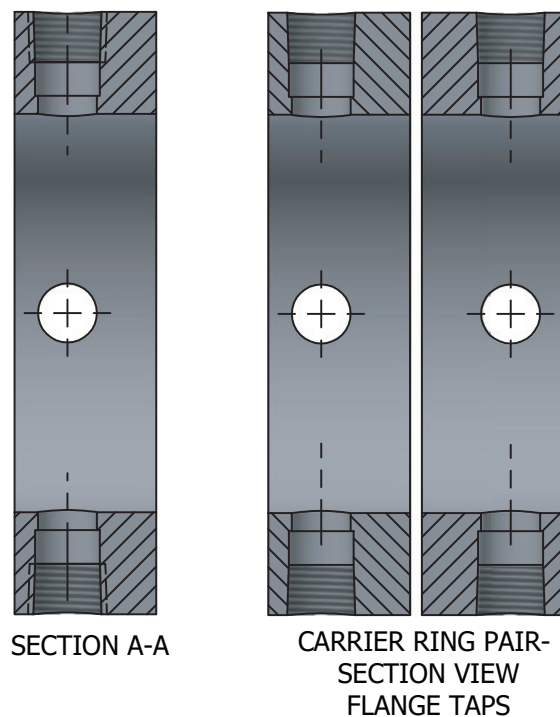
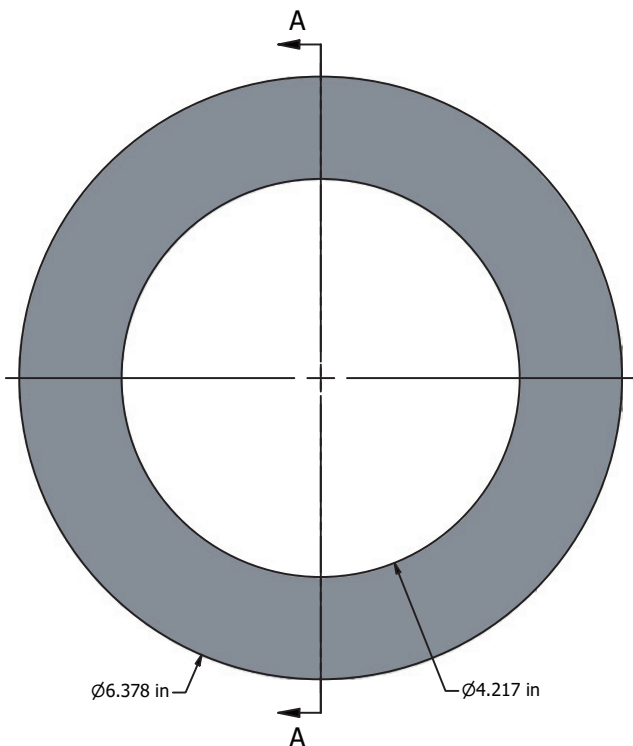
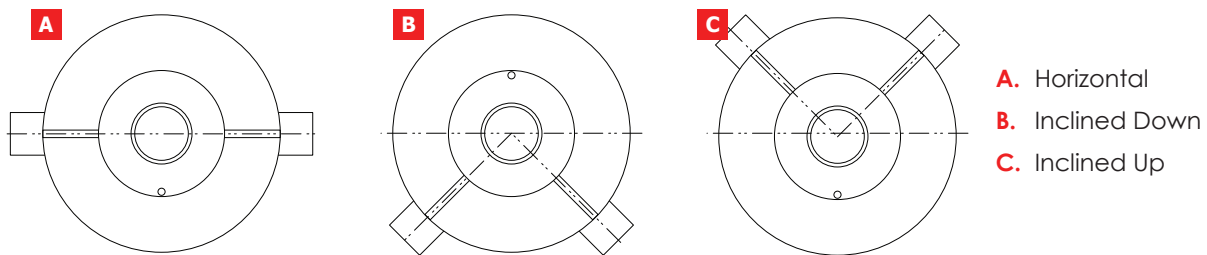
Orifice Carrier Ring Set

Orifice carriers are designed to be mounted between standard pipe flanges.

Mac-Weld orifice carrier ring sets are available with flange or corner taps. These offer a low-cost solution when compared to alternative options.

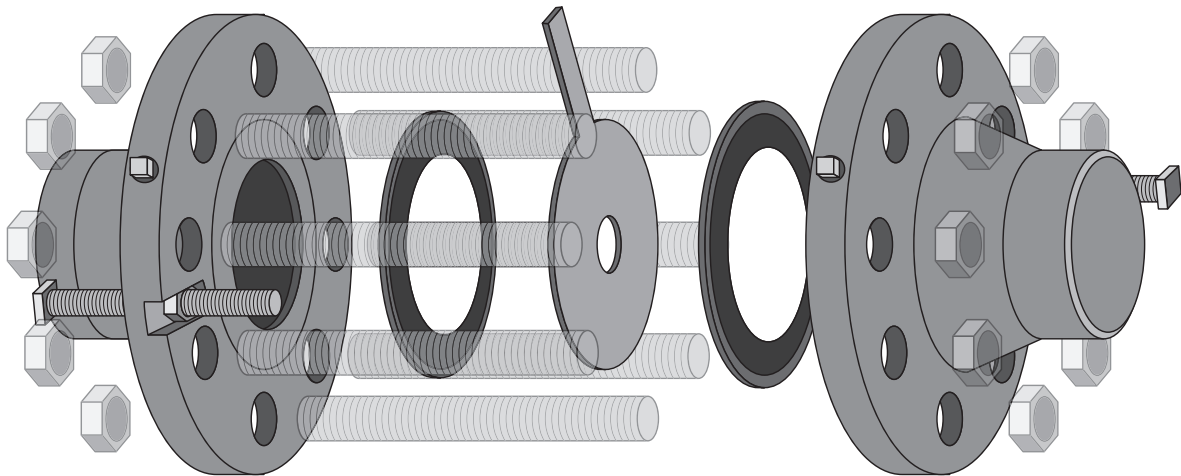
We have the ability to manufacture various types of orifice carrier assemblies, designed to meet your specific job requirements. All Mac-Weld carrier rings are quality checked and tested for any flaws before they are approved for shipping.

- Orifice carriers are available in sizes to suite B16.5 flanges
- Available with flange or corner taps
- Large selection of materials available
- Available in various port configurations and locations
- Used in flow measurement of liquid, gas and steam





ORIFICE FLANGE UNION



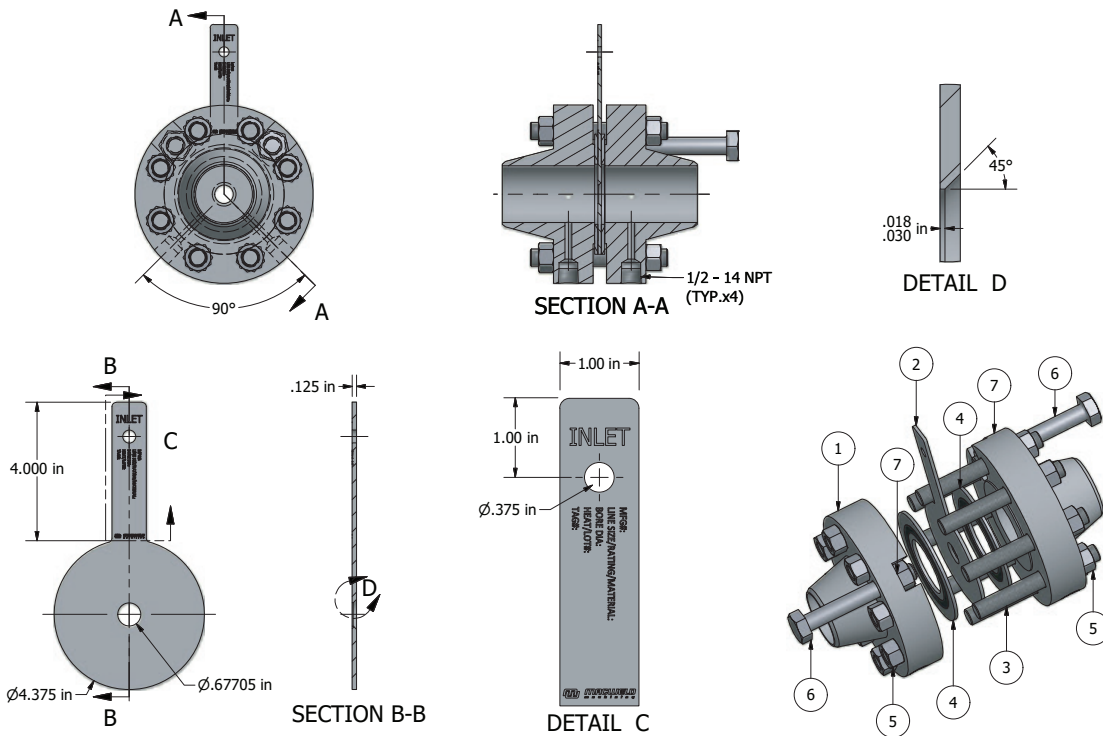
Orifice Flange Union (Assembly)

Designed to provide an accurate & convenient solution for installing metering orifice plates

Mac-Weld orifice flange unions are available in threaded tap or socket-weld connections, and are engineered for high pressure and temperature applications.

Our flange unions are designed to hold the orifice plates in place for accurate and reliable flow measurement. Available in a variety of materials, including A105 carbon steel & 316L stainless steel. Also known as a orifice union, an orifice flange set, or an orifice pair, Mac-Weld flange unions are supplied with all the necessary hardware to make installation hassle-free, including nuts, studs, gaskets, and pipe plugs. All our flange unions meet or exceed ASME specifications.

- Flanges include pressure taps for convenient service in the field
- Mac-Weld orifice flange unions are supplied complete with nuts, bolts, gaskets and plugs, for easy installation
- Greatly reduce maintenance time and cost with basic fitting design with minimal parts
- Available in various line sizes between 1" - 24"
- Designed for most liquid, gas and steam applications
- Paddle orifice plate sold separately
- NACE compliant



Part List					
Item	Qty	Size	Descriptions	Material	
1	1	2"-300# SCH. 40	Orifice Planges c/w (x2) 1/2" NPT Ports	SA182 A105	
2	1	2"-300#, 1/8" Thk.	Concentric Orifice Plate	SA240 316/L SS	
3	8	5/8" Dia., 5" Lg.	Stud	SA193-B7	
4	2	2"-300#, 1/16" Thk.	Non-Asbestos Gasket	C4433 or equivalent	
5	16	5/8"	Nex Nuts	SA194-2H	
6	2	5/8" Dia., 4.5" Lg.	Jack Bolt	GR.8 Yellow Zinc Plated	
7	2	5/8"	Heavy Hex Nut	SA194-2-H Yellow Zinc Plated	

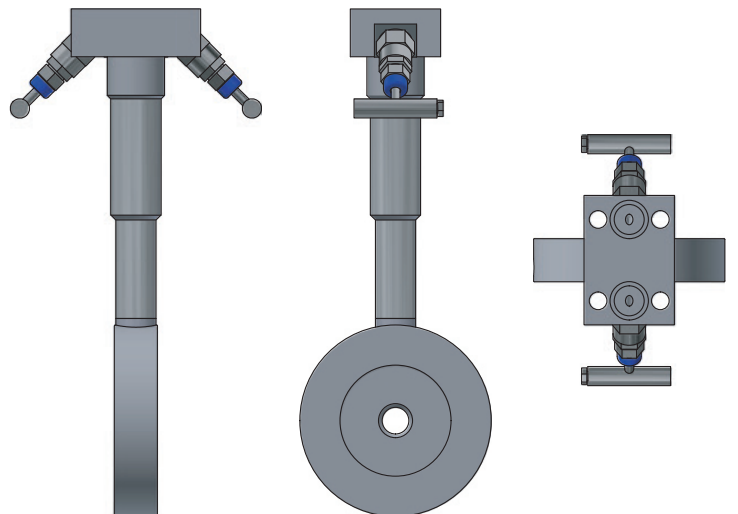


ORIFICE WAFER ASSEMBLY

Mac-Weld's orifice wafer assemblies can reduce installation time and maintenance, since they offer the benefits of several key components in one compact unit. Custom sizes and materials also available, see factory for details.

Orifice Flow Meter Specifications:

- Size for Flanged Design: 1" - 24"
- Process Flange Materials: SS304L, SS316L, Carbon Steel (A105) and other materials on request.
- Wafer Materials: SS304L, SS316L, Hast C, Monel, Coated or Clad, see factory for details
- Gasket: SS Spiral Wound, PTFE, PVC, Fiber, Rubber, other materials as per special request.



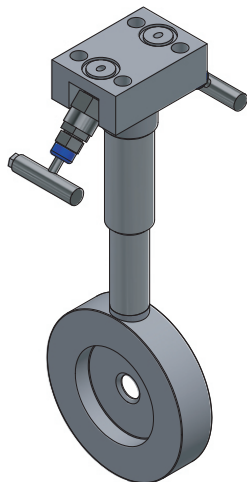
Orifice Wafer Assembly

A new space saving design to make flow measurement easier.

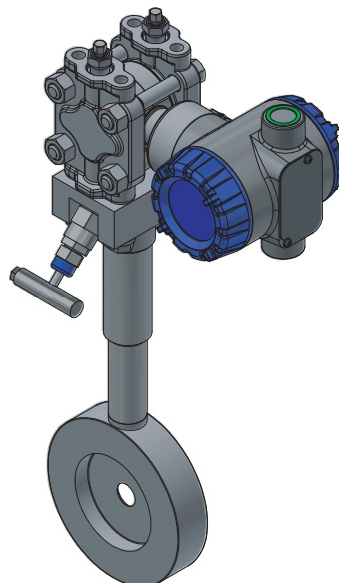
Mac-Weld's orifice wafer assembly can be installed between 150#-2500# flanges. We can also manufacture these with an integral isolation valve.

Our wafer assemblies combine the primary orifice plate element with the connection and manifold hardware. These units offer a space saving design, with the same quality and reliability Mac-Weld is known for in the industry. Improve accuracy and performance with our new orifice wafer assemblies.

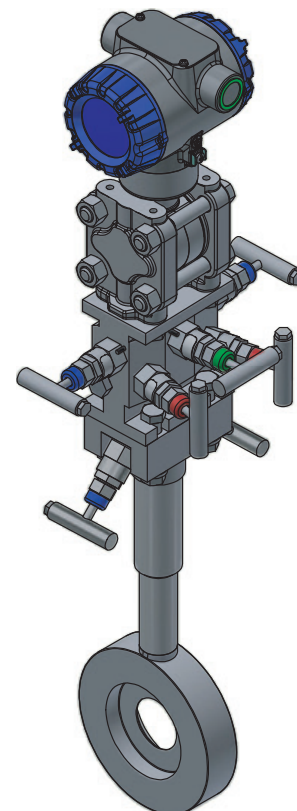
- Compact design
- Manufactured to fit almost any flange material and design
- Can be installed between 150#-2500# flanges
- Fully leak-tested and configured
- Reduced installation costs
- Integral Isolation valves;
3 & 5 Valve H-Style manifolds can also be mounted directly to assembly
- Highly stable and durable
- Direct mount compatible (see factory for details)
- Orifice wafer assembly is suitable for use in liquid, gas or steam services
- Multi-hole orifice plate improves accuracy and dramatically reduces straight pipe requirements



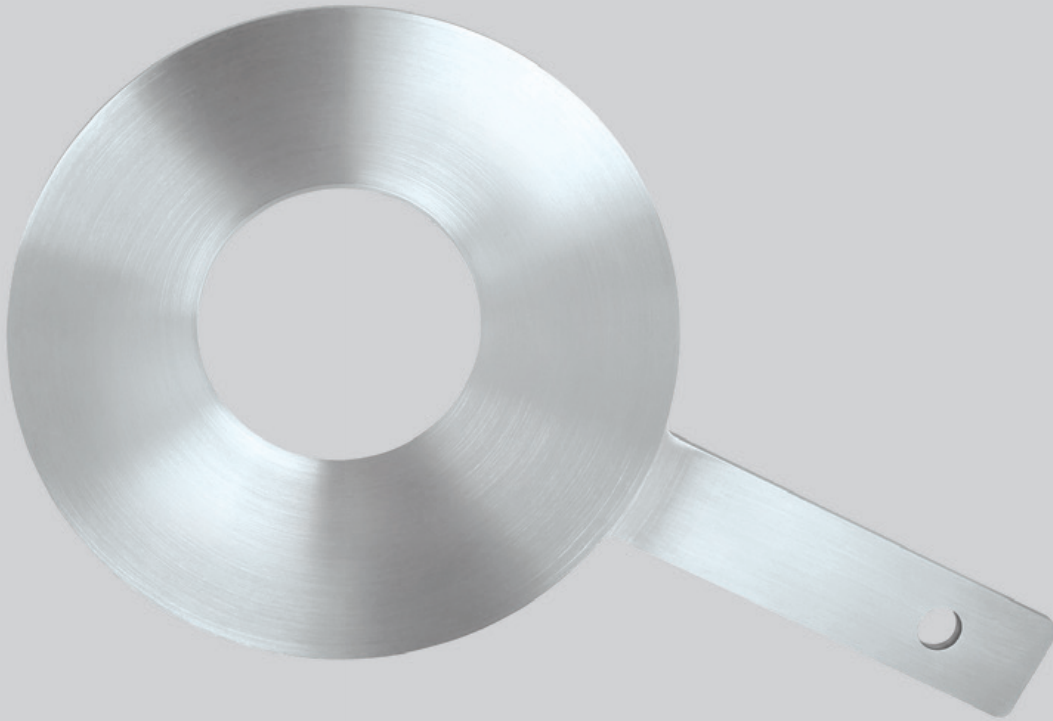
Orifice wafer assembly



Orifice wafer assembly
with transmitter



Orifice wafer assembly
with H-style valve & transmitter



PADDLE ORIFICE PLATES

Line Size	150#	300#	600#	900#	1500#	2500#	All Ratings			Material Density	150#	300#	600#	900#	1500#	2500#
	O.D.	O.D.	O.D.	O.D.	O.D.	O.D.	T	W	L	lb./in ³	Weight (lbs.)	Weight (lbs.)	Weight (lbs.)	Weight (lbs.)	Weight (lbs.)	Weight (lbs.)
1/2"	1.875	2.125	2.125	2.5	2.5	2.75	0.125	1	4	0.290	0.2	0.3	0.3	0.3	0.3	0.4
3/4"	2.25	2.625	2.625	2.75	2.75	3	0.125	1	4	0.290	0.3	0.3	0.3	0.4	0.4	0.4
1"	2.625	2.875	2.875	3.125	3.125	3.375	0.125	1	4	0.290	0.3	0.4	0.4	0.4	0.4	0.5
1-1/2"	3.375	3.75	3.75	3.875	3.875	4.625	0.125	1	4	0.290	0.5	0.5	0.5	0.6	0.6	0.8
2"	4.125	4.375	4.375	5.625	5.625	5.75	0.125	1	4	0.290	0.6	0.7	0.7	1.0	1.0	1.1
2-1/2"	4.875	5.125	5.125	6.5	6.5	6.625	0.125	1	4	0.290	0.8	0.9	0.9	1.3	1.3	1.4
3"	5.375	5.875	5.875	6.625	6.875	7.75	0.125	1	4	0.290	1.0	1.1	1.1	1.4	1.5	1.9
4"	6.875	7.125	7.625	8.125	8.25	9.25	0.125	1	4	0.290	1.5	1.6	1.8	2.0	2.1	2.6
5"	7.75	8.5	9.5	9.75	10	11	0.125	1	4	0.290	1.9	2.2	2.7	2.9	3.0	3.6
6"	8.75	9.875	10.5	11.375	11.125	12.5	0.125	1	4	0.290	2.3	2.9	3.3	3.8	3.7	4.6
8"	11	12.125	12.625	14.125	13.875	15.25	0.25	1.5	6	0.290	3.8	4.5	4.9	6.0	5.8	6.9
10"	13.375	14.25	15.75	17.125	17.125	18.75	0.25	1.5	6	0.290	5.4	6.1	7.4	8.7	8.7	10.3
12"	16.125	16.625	18	19.625	20.5	21.625	0.25	1.5	6	0.290	15.5	16.4	19.1	22.6	24.6	27.3
14"	17.75	19.125	19.375	20.5	22.75	—	0.375	1.5	6	0.290	18.6	21.5	22.0	24.6	30.1	—
16"	20.25	21.25	22.25	22.625	25.25	—	0.375	1.5	6	0.290	24.0	26.4	28.8	29.8	37.0	—
18"	21.5	23.375	24	25	27.625	—	0.375	1.5	6	0.290	27.0	31.8	33.5	36.2	44.1	—
20"	23.75	25.625	26.75	27.375	29.625	—	0.5	1.5	6	0.290	32.8	38.0	41.4	43.3	50.6	—
24"	28.125	30.375	31	32.875	35.375	—	0.5	1.5	6	0.290	45.7	53.2	55.4	62.2	71.9	—

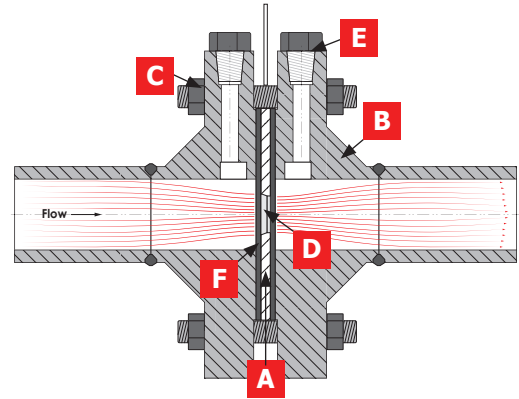
Paddle Orifice Plates

Mac-Weld paddle orifice plates are available in a variety of bore styles

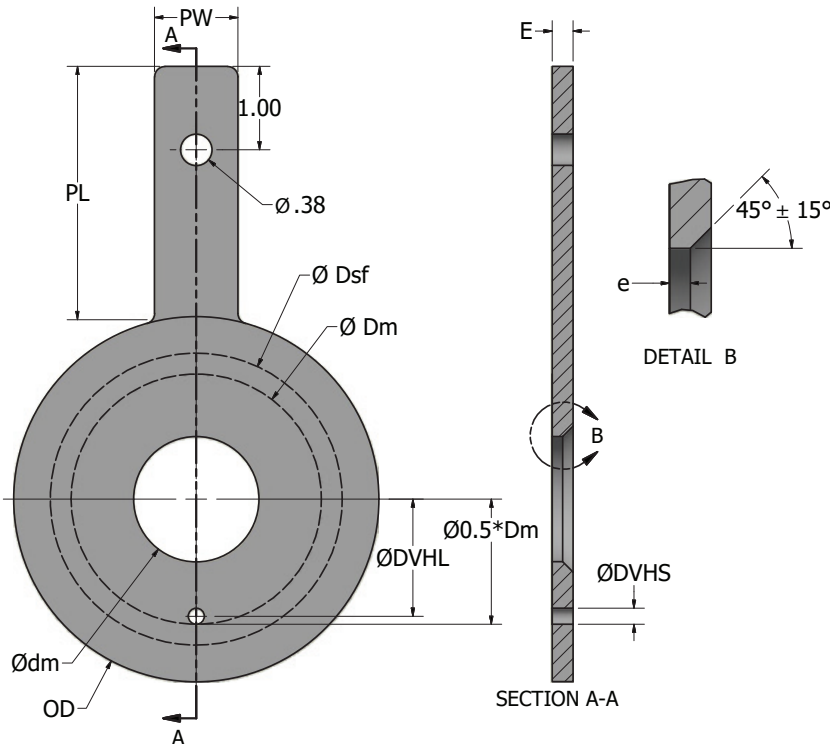
Mac-Weld orifice plates are manufactured to stringent requirements, only leaving our plant once they have passed rigorous testing.

Stainless steel plates are specifically purchased for the job required. Individual plates are water-cut ensuring no heat distortion happens; distortion is a possibility with conventional cutting.

- Standard sizes: 1/2" to 24" (also available in metric)
- Standard surface finish of 15 to 30 micro-inch
- Standard ratings from 150# to 2500# (also available in metric)
- Documentation and certificates available upon request
- Approved Canadian Registration Number (CRN) on most designs
- Orifice flange unions available upon request
- Available in various alloy materials including 316 Stainless Steel, Hastelloy®, Monel®, and other exotic alloys



- A. Orifice Plate
- B. Flange
- C. Stud Bolts
- D. Flow Through Hole
- E. Pressure Tappings
- F. Seal Rings



Custom Laser Stamping

Bore Styles:

- Beveled
- Restriction
- Quadrant
- Segmental
- Eccentric

Material Options: Available in 316 Stainless Steel, Hastelloy – Monel. Also available in most alloy materials.

Industries: Any industry that requires flow measurement.



RESTRICTION ORIFICE UNIONS

■ Pipe diameter:
1/8" up to 2"

■ Seals will not loosen, even under
extreme pressure and surges

■ Available in
threaded and
socket-weld
connections

■ Pressure ratings
of 3000 psig. and
6000 psig.

■ Pressed Plates

Restriction Orifice Unions

An alternative design to control flow, with a wide range of options

Restriction orifice unions feature a single-piece metal orifice plate that fits perfectly into the union seat, eliminating the need for a gasket.

Orifice unions are commonly used in fire pump systems, since they have the ability to handle higher levels of pressure while maintaining a smaller overall pipe size.

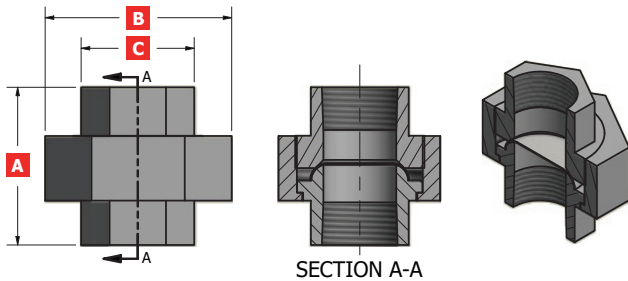
Our plates are available in a pressed (cup style) design. All our restriction orifice union cups can be bored to specifications based on the customer's application. Large order discounts are available, talk to your Mac-Weld expert today for complete details.

- Available with pressure ratings of 3000 and 6000 psig.
- Threaded and socket-weld connections available
- Unions are available in A105 carbon steel or 316 stainless steel, along with other materials
- Available in pipe sizes ranging from 1/8" - 2"
- Union cups also sold separately

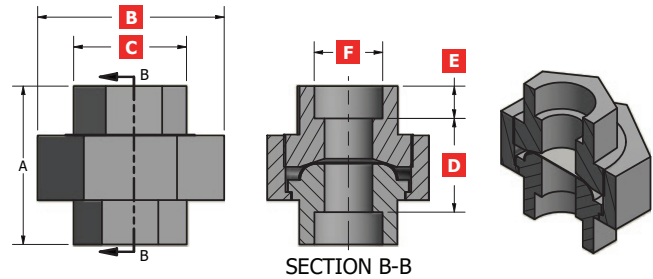


Union Cup

Threaded Unions - CL3000#



Socket Weld Unions - CL3000#



CL3000 Threaded and Socket Weld Unions Dimensions

Pipe Size	A	B	C	D	E	F	Weight (lbs.)
1/8"	1 11/16"	1 31/64"	53/64"	25/32"	7/16"	0.420-0.430	0.380
1/4"	1 11/16"	1 31/64"	53/64"	25/32"	7/16"	0.555-0.565	0.360
3/8"	1 27/32"	1 11/16"	1"	31/32"	7/16"	0.690-0.700	0.500
1/2"	2	1 15/16"	1 3/16"	1 3/32"	7/16"	0.855-0.865	0.695
3/4"	2 5/16"	2 3/8"	1 15/32"	1 5/32"	9/16"	1.065-1.075	1.175
1"	2 7/16"	2 25/32"	1 25/32"	1 3/8"	9/16"	1.330-1.340	1.640
1 1/4"	2 7/16"	3 23/64"	2 7/32"	1 45/64"	9/16"	1.675-1.685	2.590
1 1/2"	3	3 23/64"	2 35/64"	1 7/8"	9/16"	1.915-1.925	3.410
2"	3 1/2"	4 27/64"	3 1/16"	2 1/16"	1 1/16"	2.406-2.416	5.120
2 1/2"	4 1/4"	5 15/64"	3 9/16"	2 3/8"	7/8"	2.906-2.921	8.750
3"	4 7/16"	6 5/32"	4 9/32"	2 7/16"	1"	3.535-3.550	12.625

Material Options: A105 carbon steel or 316 stainless steel

Industries: Any industry that requires flow measurement, including coolants, gases, steam and water.



RING TYPE JOINT ORIFICE PLATES



Fig. 1A



Fig. 1B

Mac-Weld Specialty RTJ Orifice Plates

Since we manufacture all of our orifice plates on site, we have the ability to design plates based on the specific requirements of our clients.

- Side A - RTJ Plate (Fig. 1A)
- Side B - Lens Ring (Fig. 1B)

RTJ (Ring Type Joint) Orifice Plates & Holders

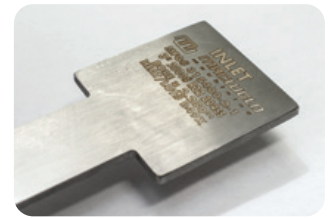
Our RTJ orifice plates are designed and manufactured 100% in house

Mac-Weld offers both RTJ orifice plates, and RTJ plate holder assemblies, which include the required universal orifice plate.

RTJ plate holders are a great solution for applications where frequent size changes or replacements are expected. Ring type joint orifice plates contain an intergral gasket that mounts between the ring tougue joint flanges. Plate thickness is calculated based on line size and pressure; this helps prevent the plate from possible failure.

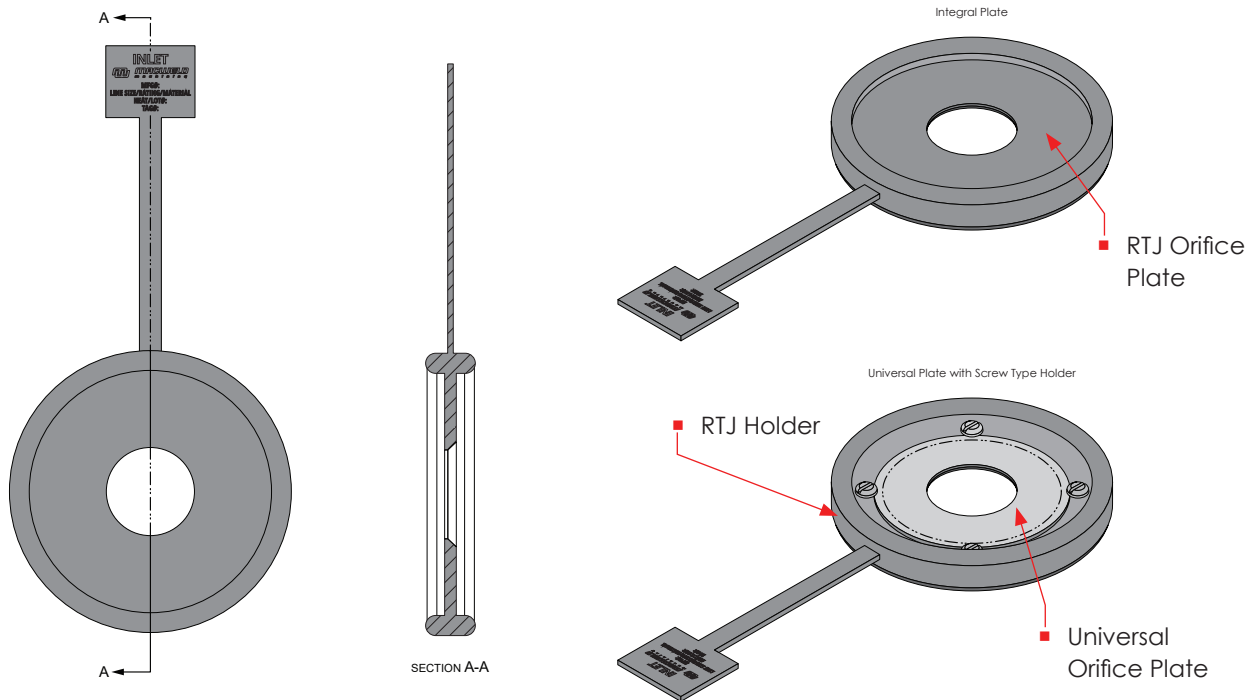
Mac-Weld RTJ orifice plates are available in a variety of materials, and bore configurations. RTJ's are recommended for high-temperature and high-pressure applications, involving clean liquids, gases, and slower steam flows.

- Custom designs available based on clients application requirements
- Available as single machined piece or two pieces; orifice plate and holder
- Recommended for high temperature and/or pressure applications
- Large selection of materials available
- Stamped with mill traceable material and heat number
- NACE compliant



Custom Laser Stamping

Integral | Holder | Grooved

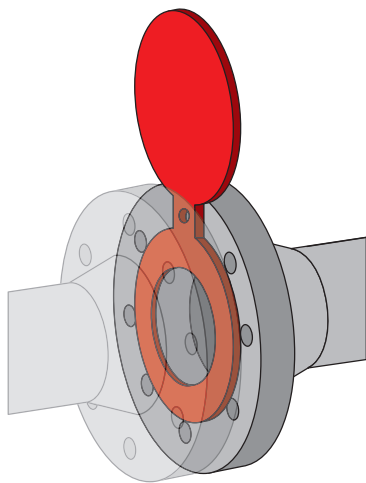


Material Options: Available in 316 Stainless Steel, Hastelloy – Monel. Also available in most alloy materials.

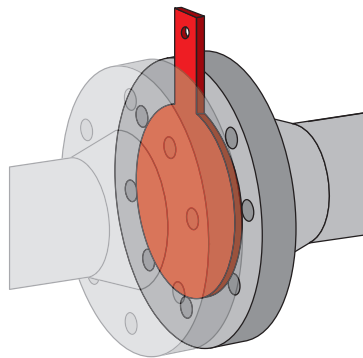
Industries: Any industry that requires flow measurement.



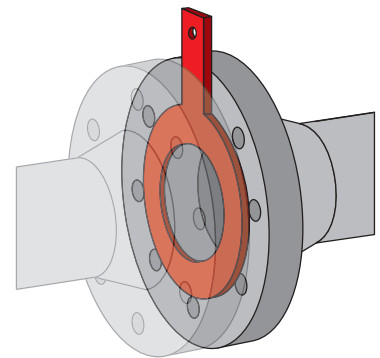
SPECTACLE BLINDS, SPADES & RING SPACERS



**Spectacle Blind
(Figure-8)**



Spade



Spacer Ring

Spectacle Blinds, Spades & Ring Spacers

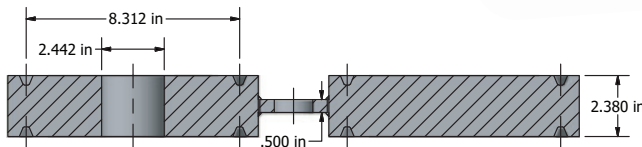
Designed to blind pipelines, either temporarily or permanently.

Spectacle blinds are applied to systems that regularly need to be separated from other connections, since they are usually permanently installed in the line.

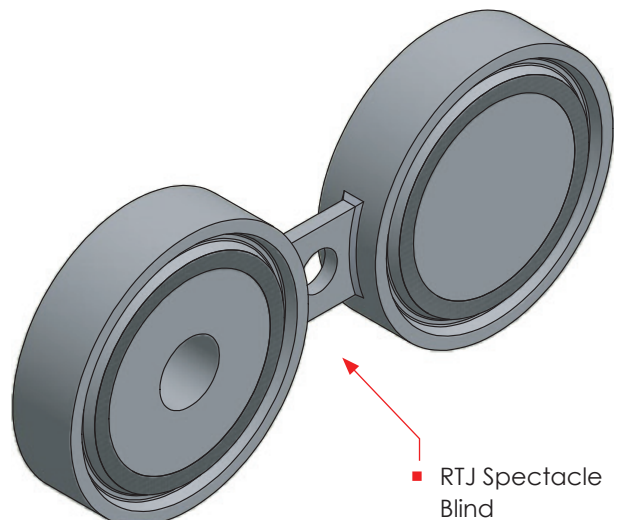
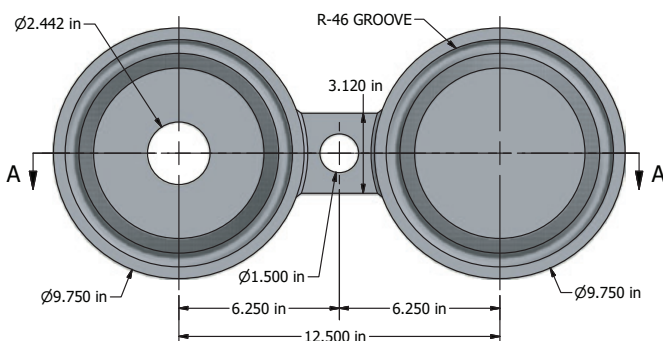
Mac-Weld spectacle blinds are manufactured from a single piece of plate, providing the strength, quality, and precision needed for the toughest job. Also called "spectacle flanges", our blinds are available in a variety of configurations, blind types, and bore designs.

Spades and ring spacers are similar to blinds, except they are not attached to each other. With larger flange sizes, the spade alone can weigh several hundred pounds. Separating the two removes the unneeded weight from the flange connection. Spade and ring spacers can also be an advantage if space is limited.

- Temporarily or permanently isolate part(s) of the system
- Spectacle blinds available in sizes up to 24" diameter depending on thickness and materials
- Blinds are easily identified between open and closed positions
- Maintenance free, cost effective alternative to isolation valves
- Large selection of materials available
- Built to ASME B16.48 standards
- Custom designs available upon request

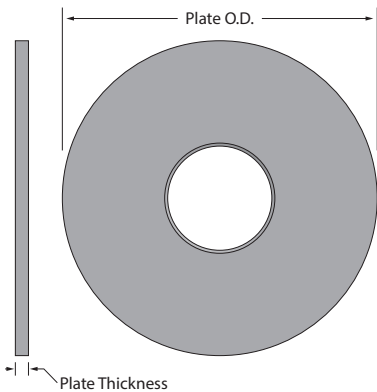


SECTION A-A





UNIVERSAL ORIFICE PLATES



Line Size	Plate O.D.	Plate Thickness	Blank WT. (lbs.)
1/2"	1.000	1/8"	0.06
3/4"	1.125	1/8"	0.06
1"	1.3125	1/8"	0.06
1-1/2"	2.000	1/8"	0.11
2"	2.4375	1/8"	0.17
2-1/2"	2.8125	1/8"	0.25
3"	3.4375	1/8"	0.34
4"	4.4062	1/8"	0.55
6"	6.4375	1/8"	1.18
8"	8.4375	1/8"	2.03
10"	10.6875	1/4"	6.41

Line Size	Plate O.D.	Plate Thickness	Blank WT. (lbs.)
12"	12.5938	1/4"	9.61
14"	14.000	1/4"	11.91
16"	16.000	3/8"	15.41
18"	18.000	3/8"	18.45
20"	20.000	3/8"	22.78
24"	24.000	3/8"	32.80
26"	26.000	3/8"	62.00
30"	30.000	1/2"	112.00
34"	34.000	1/2"	134.00
36"	36.000	1/2"	156.00
42"	42.000	3/4"	338.00

Universal Orifice Plates

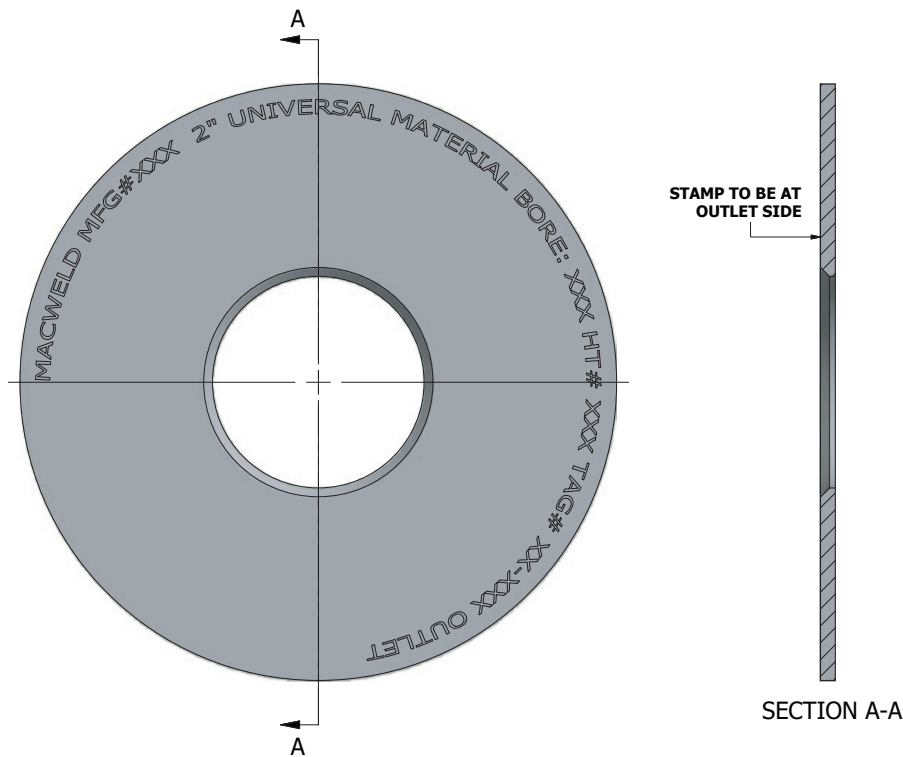
Engineered for all flow points and made to improve measurement performance

Mac-Weld universal orifice plates perform reliably under the most challenging conditions, while also making installation convenient and cost effective.

Orifice plates provide the most reliable and accurate flow measurement for gas, liquid, and steam across a variety of industries. Mac-Weld orifice plates are designed and built to meet our clients requirements, whether they are custom designed or standard. With established standards for manufacturing, all plates are shipped out only after they are tested, inspected, and ready to install.

The universal size orifice plates are the most economical style of plates available because of their low initial cost, low maintenance, and minimal storage space required. The necessity of stocking plates for various pressure ratings is eliminated.

- Orifice plates available with a maximum diameter of 48"
- All Mac-Weld orifice plates are inspected and stamped before being released from production.
- Custom designs available based on clients application requirements
- Large selection of materials available
- NACE compliant

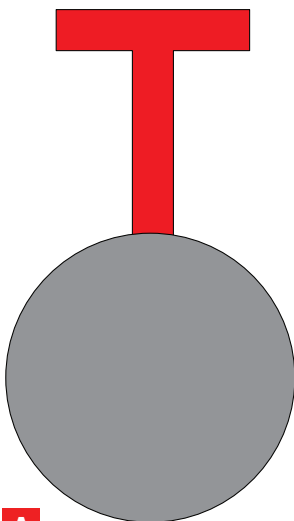


Material Options: Available in 316 Stainless Steel, Hastelloy – Monel. Also available in most alloy materials.

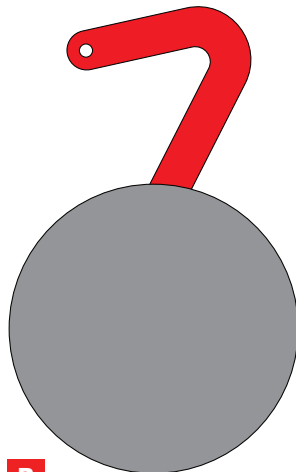
Industries: Any industry that requires flow measurement.



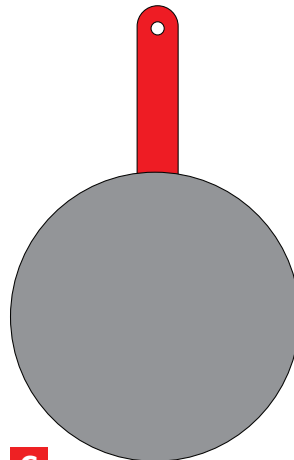
VENTED PADDLE BLINDS



A



B



C

Handle Styles:

- A.** "T" Handle
- B.** "7" Handle
- C.** "Straight" Handle

Vented Paddle Blinds

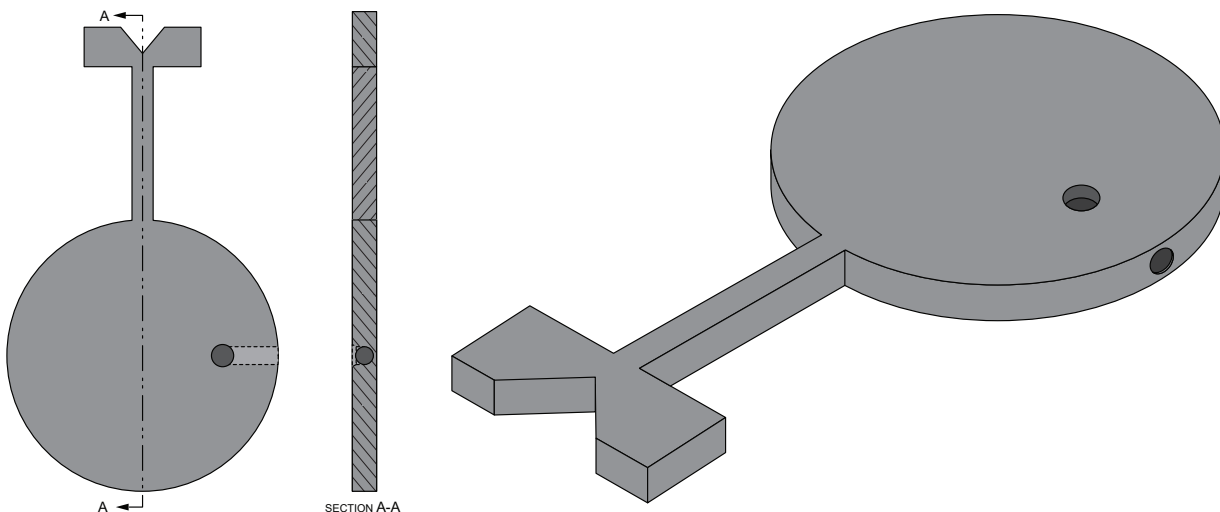
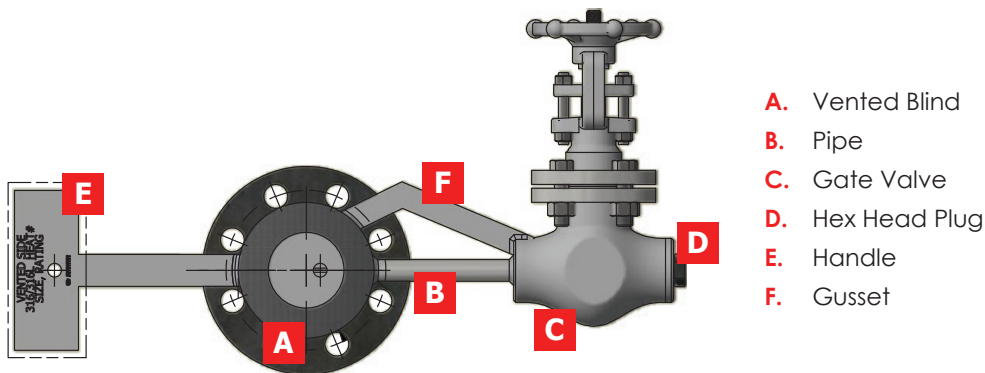
Designed to blind pipelines, either temporarily or permanently.

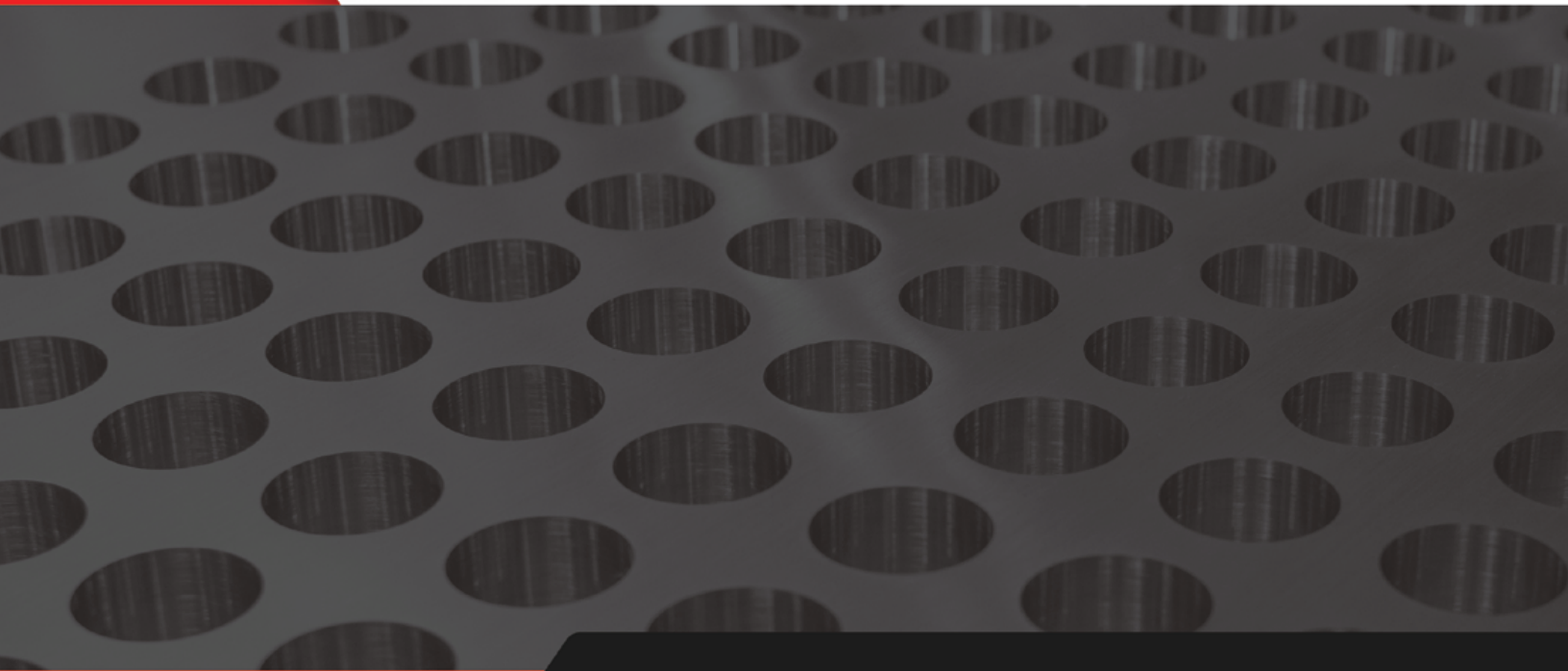
Vented blinds/paddles block flow on one side, while allowing pressure relief on the other side. This helps create a much safer downstream work condition.

Mac-Weld vented blinds/paddles provide an economical solution when a valve isn't available near your work site. Vented blinds have multiple benefits, including easy access to hydro-testing, a purge entry point, and line pressure release.

Looking for a custom port location? Our team of designers is on hand to help you manufacture the part to your specifications. Also known as bleed, spade, or slip blinds, we offer a large variety of sizes and materials to suit your project requirements.

- Blocks one side of the flange, while venting the opposite side
- Ring type joint, spectacle or paddle blind plates designs available
- Venting can be added to both sides, creating a multiport solution
- Easy access for hydro-testing.
- Handles are V notched for easy identification
- Available in both NPT or socket-weld ports
- Large selection of materials available





MACWELD
m a c h i n i n g

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