

8695 Orifice Plates are machined to ± 0.001 " for highly accurate fluid metering. They can be used with:

- 8763 Orifice Flanges (flange taps)
- ANSI threaded flange unions
- 8766 ANSI Welding Flange Unions
- 8768 RPM Flanges.

The last three use vena-contracta taps or pipe taps.

The Fives North American COMBUSTION HANDBOOK, Vol. I, and Handbook Supplement 54 provide information on tap locations, straight pipe requirements, and pressure recovery.

8695 Orifice Plates nest inside the bolt circle of the flange specified with the plate order. An identification tab projects beyond the edge of the flanges. This tab has orifice bore in inches stamped on its **upstream face**. Installation instructions are shipped with the plate.

Sizes available:

- $\frac{1}{8}$ " thick Type 304 Stainless Steel (SST) or 400 Monel (MON) for $1\frac{1}{2}$ " through 14" pipe size.
- $\frac{1}{4}$ " thick SST for 16" pipe size and larger.

(Orifice plates of other materials are available upon request.)

Order must specify: plate thickness bore
 pipe size type of flanges

North American will calculate the bore if the following data is provided:

- | | |
|------------------------------|---------------------------|
| fluid being measured | line pressure |
| specific gravity at stp | line temperature |
| design flow rate in scfh | elevation above sea level |
| design pressure differential | type taps. |
| pipe ID | |

8763 Orifice Flanges have built-in taps for measuring pressure upstream and downstream of orifice plate sandwiched between them.

The $\frac{1}{2}$ " fpt connections are $\frac{15}{16}$ " from the machined face (with a $\frac{1}{16}$ " gasket, this provides the 1" tap spacing specified for "flange taps").

Flange dimensions are somewhat larger than standard ANSI flanges of comparable pressure rating. 8763 Flanges are supplied with gaskets, bolts, and nuts.

Types available:

- 250 psi threaded semi-steel (8763A)
- 300 psi raised-face, forged-steel:
 - threaded (8763B)
 - slip-on welding (8763C)
 - welding neck (8763D).

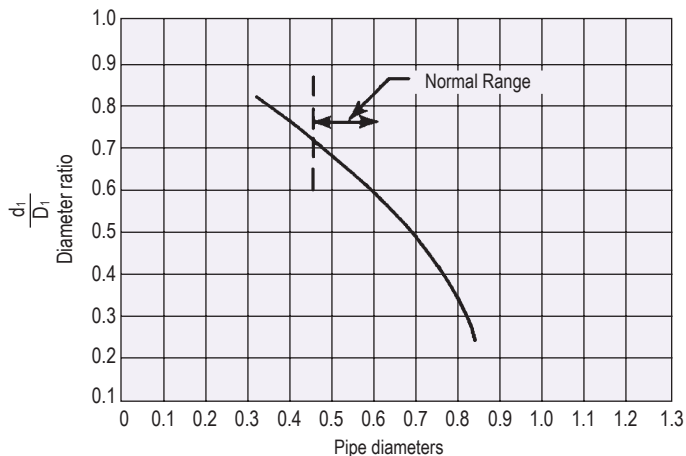
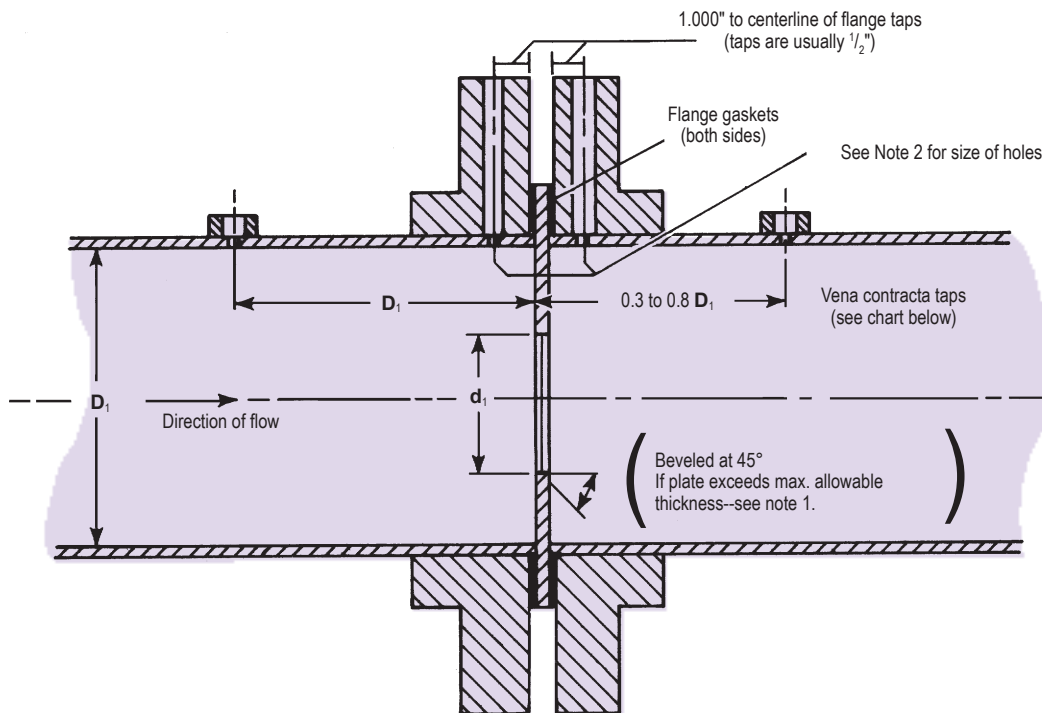
Orifice Installation Instructions

1. Handle orifice plates with care. A bend in the plate or a nick in the internal bore can create a large error.
2. Plate should be accompanied by instructions concerning tap locations to correspond to bore calculation. Follow specified tap location dimensions precisely.
3. Allow 15 pipe diameters of straight pipe upstream and 5 pipe diameters of straight pipe downstream from orifice if possible. See Fives North American Handbook Supplement No. 54 for exceptions to this rule.
4. Taps should be on top or side of pipe to avoid moisture or dirt accumulation in them.
5. If orifice flanges are used, tighten each flange on pipe as far as it will go. (For very precise measurements, end of pipe must be flush with machined face of flange.) Most pipe threads will allow pipe to come only within about $\frac{1}{8}$ " of machined face, which is satisfactory for most ratio control systems. Pipe should never extend beyond machined face, because it must not bend orifice plate.
6. Carefully run an $\frac{11}{16}$ " drill through the $\frac{1}{2}$ " fpt tap connections, drilling through the pipe. Remove all burrs from the drilled hole; smooth inside surface of the pipe around the drilled holes, and clean all chips from pipe and tap connection.
7. Orifice plates have data **stamped on upstream face** for easy identification after installation.
8. Make sure flange gaskets do not extend inside pipe line.

To order, specify:"8695-(pipe size code)-(material: SST for stainless or MON for monel) Orifice Plate per attached Sheet 8695-2" and submit pertinent data on Sheet 8695-2.

Examples: 8695-4-SST Orifice Plate per attached Sheet 8695-2
 8695-4-MON Orifice Plate per attached Sheet 8695-2

LOCATION AND SIZES OF PRESSURE TAPS



Distance from inlet face of orifice plate to outlet pressure tap for vena-contracta taps (Instruction 2 on front side).

Notes:

- For pipe sizes 6" and smaller, orifice plates should not exceed $\frac{1}{8}$ " thickness.

For pipe sizes 6" to 16" inclusive, orifice plates should not exceed $\frac{1}{4}$ " in thickness.

For pipes larger than 16", $\frac{3}{8}$ " or $\frac{1}{2}$ " thick orifice plates may be used.
- Actual diameter of pressure holes at inner surface of pipe should not exceed:

 $\frac{1}{4}$ " for 2 $\frac{1}{2}$ " pipe and smaller,
 $\frac{3}{8}$ " for 3" pipe,
 $\frac{1}{2}$ " for pipes 4" and over.

Remove all burrs from inside pipe after drilling for pressure taps.

On horizontal runs, all taps should be on top of pipe to prevent fouling with dirt and moisture.

- Orifice flanges should be mounted with pipe extending to inner face of flange, allowing smooth full pipe diameters at faces of plate. Flange gaskets should be centered and should be diameter of raised face.

WARNING: Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Parts of this product may exceed 160F in operation and present a contact hazard. Fives North American urges compliance with National Safety Standards and insurance Underwriters recommendations, and care in operation.

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