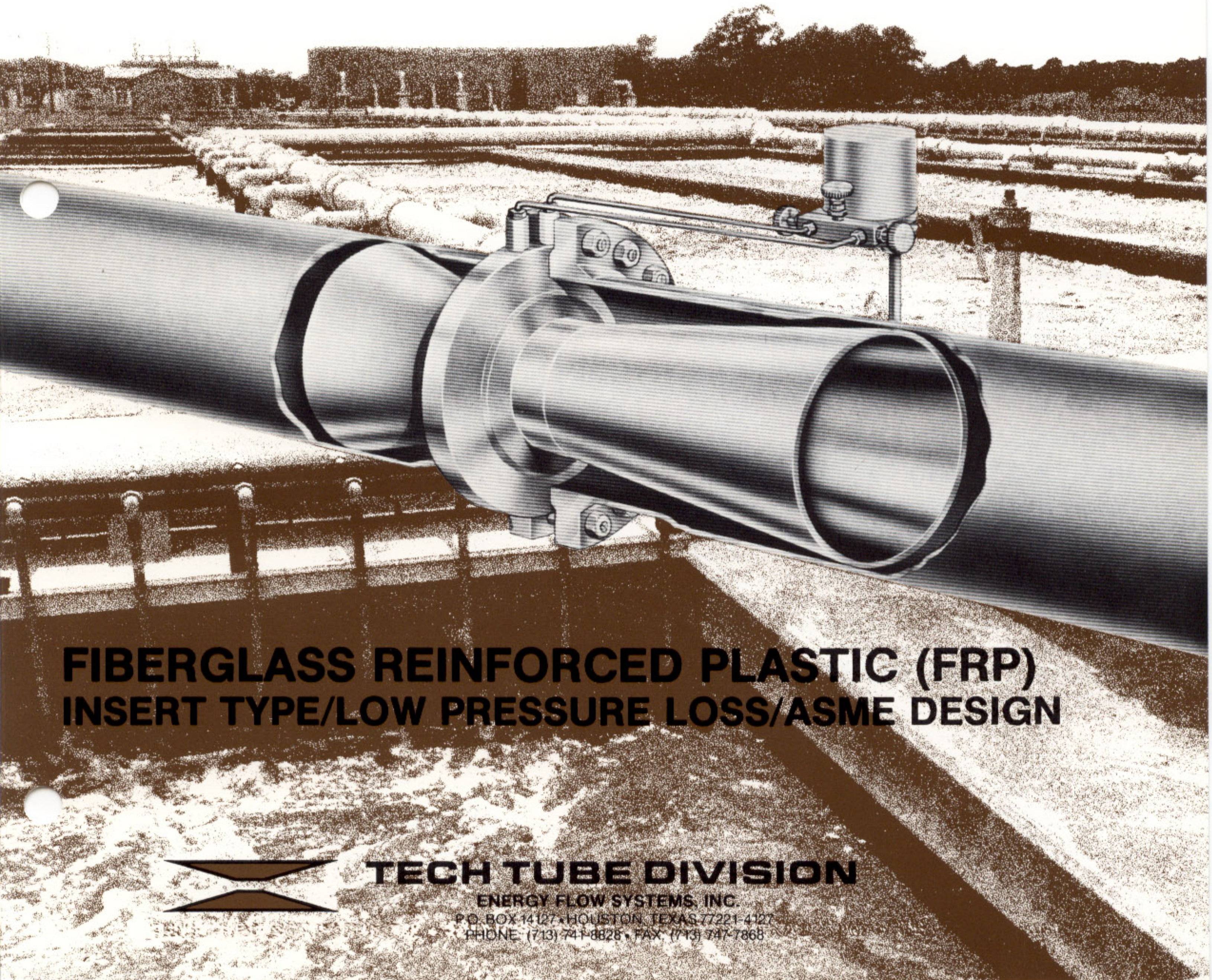
VENTURI TUBES



FIBERGLASS REINFORCED PLASTIC (FRP)
INSERT TYPE/LOW PRESSURE LOSS/ASME DESIGN

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TECH TUBE ASME TYPE VENTURI

The ASME Type Venturi as manufactured by Tech Tube Division was first developed as a practical differential pressure producing device for flow measurement by Clemens Herschel in 1887. For many years it has been universally accepted as the most efficient primary device available. No other type of venturi or flow tube design has been more thoroughly researched, tested, and proven than the Herschel or ASME Type.

Tech Tube venturis have been in operation in municipal water and sewage plants and industrial process plants since 1964. They are used wherever low pressure loss, high accuracy, piping restrictions, or fluids containing solids are encountered.

Tech Tube FRP/Low Loss Venturi Model VTI-P.

For water and air applications in municipal plants Tech Tube recommends its all FRP construction. Only fiberglass reinforced plastic is in contact with the fluid except for the stainless steel connections in the holding flange. The FRP construction provides a durable, dimensionally stable flow element with the highest degree of corrosion resistance for most applications.

Many modified versions of the venturi, often referred to as flow tubes, have been developed in recent years. These designs sometimes provide a slightly lower permanent pressure loss, but they do so at the expense of accuracy, stability of differential pressure signal, or longer upstream piping requirements.

Shortest Laying Length. Reduced Piping Costs.

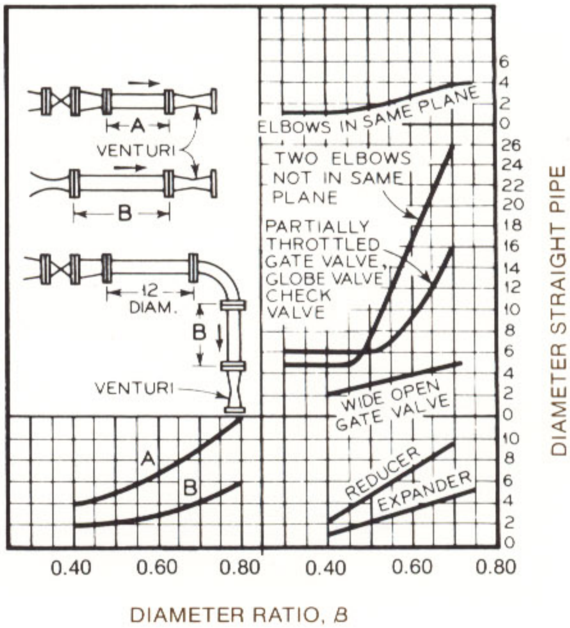
Figure 1 shows the piping requirements upstream of the ASME Type Venturi in order to obtain accurate measurement. With one 90° elbow in the upstream piping and with a beta ratio of .5, the Tech Tube venturi would require two pipe diameters upstream of the inlet to the venturi. Since the Tech Tube Low Loss Venturi requires the least amount of straight pipe upstream, it has the shortest overall length of any primary flow element.

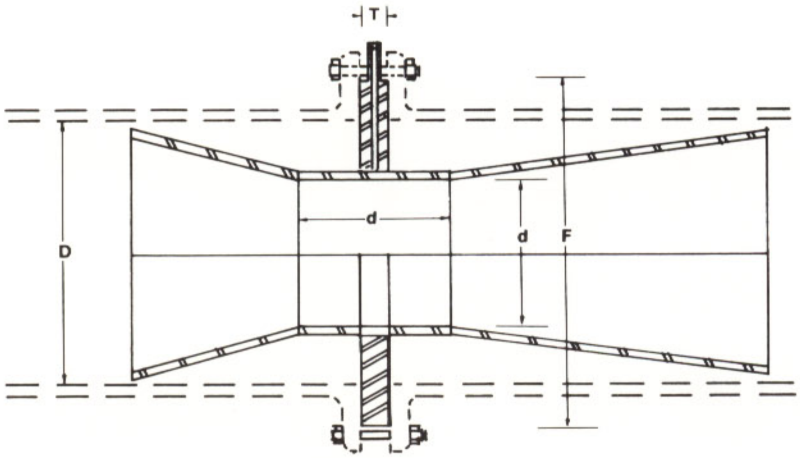
Highest Accuracy.

The completeness of published research data permits Tech Tube to provide the ASME venturi design with the highest accuracy of any differential producing flow element.

A variety of proprietary flow tubes on the market do not have the same recognition from the ASME. In fact, the latest ASME Research Report on Fluid Meters states in paragraph 11-111-48 Proprietary Flow Tubes, "If one of these flow tubes is to be used, it should be calibrated with the piping section in which it is to be used and over the full range of rates of flow to which it will be subjected when in use."

Fig. 1





NOTE 1 To obtain capacity for a design differential other than 100" W.C. multiply capacity at 100" by $\sqrt{\frac{\text{DIFFERENTIAL DESIRED}}{100}}$

NOTE 2 Sizes smaller than 6" and larger than 48" are available. Also other throat sizes can be furnished.

Dimensions and Capacity Tables

Size	Line I.D. D	Throat I.D. d (Note 2)	Overall Length L	Flange Thick T	Flange O.D. F	Flow Rates of Water at 60°F And 100" W. C. Differential (Note 1) GPM	MGD
6A	6.00	2.680	23.1	0.875	8.75	409	0.589
6B	6.00	3.580	18.0	0.875	8.75	766	1.103
6C	6.00	4.320	13.7	0.875	8.75	1218	1.754
8A	8.00	3.580	31.1	0.875	11.00	730	1.051
8B	8.00	4.770	24.3	0.875	11.00	1359	1.957
8C	8.00	5.760	18.7	0.875	11.00	2166	3.119
10A	10.00	4.770	37.4	0.875	13.375	1304	1.878
10B	10.00	5.760	31.8	0.875	13.375	1963	2.827
10C	10.00	7.200	23.6	0.875	13.375	3384	4.873
12A	12.00	5.760	44.9	0.875	16.125	1903	2.740
12B	12.00	7.200	36.7	0.875	16.125	3102	4.467
12C	12.00	8.640	28.5	0.875	16.125	4873	7.017
14A	14.00	6.260	55.2	0.875	17.75	2232	3.214
14B	14.00	8.640	41.6	0.875	17.75	4506	6.489
14C	14.00	10.080	33.4	0.875	17.75	6632	9.550
16A	16.00	7.200	63.0	0.875	20.25	2955	4.255
16B	16.00	10.080	46.5	0.875	20.25	6179	8.898
16C	16.00	11.520	38.3	0.875	20.25	8662	12.470
18A	18.00	8.640	67.9	0.875	21.625	4282	6.166
18B	18.00	10.080	59.6	0.875	21.625	5973	8.601
18C	18.00	12.960	43.2	0.875	21.625	10960	15.782
20A	20.00	10.080	72.7	0.875	23.875	5864	8.441
20B	20.00	11.520	64.4	0.875	23.875	7652	11.020
20C	20.00	14.400	48.0	0.875	23.875	13530	19.480
24A	24.00	11.520	90.5	0.875	28.25	7612	10.960
24B	24.00	14.400	74.0	0.875	28.25	12410	17.870
24C	24.00	17.040	57.5	0.875	28.25	18770	27.020
30A	30.00	12.960	121.3	0.875	34.75	9543	13.740
30B	30.00	17.040	96.6	0.875	34.75	17120	24.650
30C	30.00	21.600	71.9	0.875	34.75	30450	43.850
36A	36.00	17.040	135.7	1.000	41.25	16630	23.950
36B	36.00	21.600	111.0	1.000	41.25	27910	40.190
36C	36.00	25.920	86.3	1.000	41.25	43850	63.140
42A	42.00	18.720	166.6	1.125	48.00	19960	28.740
42B	42.00	25.920	125.4	1.125	48.00	40560	58.410
42C	42.00	30.240	100.7	1.125	48.00	59690	85.950
48A	48.00	21.600	189.2	1.250	54.50	26590	38.290
48B	48.00	30.240	139.8	1.250	54.50	55610	80.080
48C	48.00	34.560	115.1	1.250	54.50	77960	112.260

Typical Specifications For FRP Insert Type Low Head Loss Flow Element.

The primary flow element shall be of the differential producing type using static pressure only sensed at the throat and at the mounting flange for the inlet (upstream) pressure.

The inlet section shall consist of a reducing cone portion with an included angle of 20° to 22°. The throat section shall be a straight cylindrical portion with its length equal to one throat diameter. The outlet section shall be an expanding cone with an included angle of 10°, and may be truncated as necessary to minimize the laying length and the non-recoverable head loss.

The mounting flange shall be incorporated into the exterior of the throat section to hold the primary flow element between the pipe flanges of the line in which it is to be installed. The high and low pressure taps shall be installed through the mounting flange.

The primary flow elements shall have a coefficient of discharge that is independent of line size and beta ratio and is constant over the normally used range of flow.

The primary flow element shall provide an accuracy of measurement within .75% of actual flow rate without laboratory flow calibration when installed in a pipe line of the inside dimensions as specified.

The entire primary flow element and mounting flange shall be fabricated of thermo-setting resin reinforced with not less than 25% fiberglass by weight. The pressure connections shall be type 316 stainless steel.

Additional Specifications:

- ☐ Maximum continuous operating temperature: 200° F (Special construction available for higher temperatures)
- ☐ Standard connections at taps: ¼" NPT Female
- ☐ Permanent pressure loss: Less than 10% of the differential

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