

BVT

TECHbrief

Wyatt-Badger Venturi Tubes
Cast Iron Primary Elements



FEATURES:

- High Accuracy
- Reliable Operation
- Energy Efficient
- Different Options for a Variety of Applications

B
V
T

1
0
/
1
0

P
R
E
P
U
B

Description

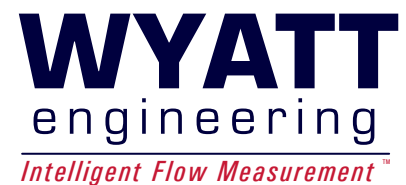
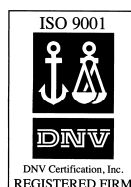
The Wyatt-Badger Venturi Tube is a differential-producing primary flow element that accurately and repeatably measures the flows of liquids or gases in closed, full-pipe conditions. The cast iron Wyatt BVT incorporates an efficient hydraulic shape with static pressure taps in the throat and inlet sections. The BVT can be provided with either 125 or 250 PSI flanges.

Application

The cast iron series is often used in municipal water and wastewater applications. Known for longevity of service with minimal maintenance, BVT meters are ideal for metering potable water, sludge, slurries, as well as gases and clean fluids. The Model BVT-C is uniquely designed for rate-of-flow control applications, while the BVT-S is designed to prevent clogging of the pressure taps for applications with solids-bearing fluids.

Flow Measurement Accuracy

For pipe Reynolds numbers greater than 75 000 and with a normalized piping configuration, the Wyatt-Badger Venturi Tube provides a flow measurement accuracy of $\pm 0.50\%$ without flow calibration. With independent flow calibration, Wyatt-Badger's BVTs provide the user with $\pm 0.25\%$ accuracy.



BVT-IF

TECHbrief

Wyatt-Badger Venturi Tubes
Insert-Type Fabricated Primary Elements



FEATURES:

- Low Pressure Loss
- High Accuracy
- Low Installed Cost
- Custom Designed
- Short Laying Length

Description

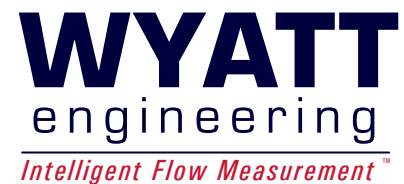
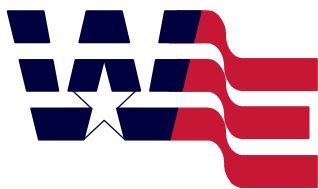
The Wyatt-Badger BVT-IF is a fabricated insert venturi flow element that offers repeatability and accuracy over a greater range of flow rates and has lower permanent pressure loss than orifice plates, flow nozzles, or traditional venturi meters. These units can be manufactured from virtually any material to address the needs of your applications. The BVT-IF is designed for insertion within the interior of a pipeline and is secured by the adjacent pipe flanges. These venturi elements are characterized by longevity of service and flexibility in design.

Application

The fabricated insert BVT-IF is designed to measure the flow of gases and liquids that have low solids loading. The BVT-IF can operate over extreme temperature and/or pressure ranges with highly corrosive fluids or gases. The BVT-IF has the distinct advantages of minimal weight, cost, and laying length. Typical applications range from potable water, cooling water, process water, steam, air flow for fine bubble aeration, combustion air, and natural and process gases.

Flow Measurement Accuracy

For pipe Reynolds numbers greater than 75 000 and with a normalized piping configuration, the Wyatt-Badger Venturi Tube provides a flow measurement accuracy of $\pm 0.50\%$ without flow calibration. With independent flow calibration, Wyatt-Badger's BVTs provide the user with $\pm 0.25\%$ accuracy.



BVT-IP

TECHbrief

Wyatt-Badger Venturi Tubes
Insert-Type Composite Primary Elements



FEATURES:

- High Accuracy
- Economical Design
- Low Pressure Loss
- Reliable Performance

B
V
T
I
P

8
/
0
9

P
R
E
P
U
B

Description

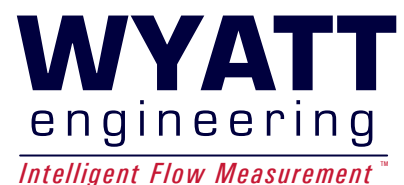
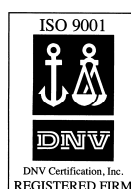
The Wyatt-Badger BVT insert venturi is available in two configurations: The standard BVT-IP, made entirely of engineered materials, and the BVT-IL, which uses a metallic throat and mounting flange and a fiberglass reinforced body. The BVT-IP and BVT-IL are designed for insertion within the interior of a pipeline and are secured by adjacent pipe flanges. Wyatt-Badger insert venturis are low-weight and cost effective alternatives to other meter geometries and designs.

Application

The BVT insert venturi design provides higher accuracy over a wider range of flow rates, and lower permanent pressure loss than orifice plates, flow nozzles, or conventional venturi meters. Designed to measure clean liquids and gases in full pipes, the insert BVT can be manufactured to fit virtually any pipe size. In applications where solids contaminate the line fluid, an auxiliary high pressure tap can be provided for installation in the upstream pipe.

Flow Measurement Accuracy

For pipe Reynolds numbers greater than 75 000 and with a normalized piping configuration, the Wyatt-Badger BVT-IP and BVT-IL provide a flow measurement accuracy of $\pm 0.25\%$ with independent flow calibration. Without independent flow calibration, the Wyatt-Badger BVT-IP and BVT-IL provide a flow measurement accuracy of $\pm 0.50\%$.



BVT-U

TECHbrief

Wyatt-Badger Venturi Tubes
Fabricated Primary Elements



FEATURES:

- High Accuracy
- Low Pressure Loss
- Application-Specific Design
- Static Pressure Sensation
- Documented Performance

B
V
T
U

1
0
1
/
0
9

P
R
E
P
U
B

Description

Wyatt-Badger Venturi Tubes are available as a fabricated series of modified venturi flow elements that can be used to measure the flow of gases and liquids over an extreme range of temperatures and pressures in full pipes. The fabricated BVT maintains its accuracy over a greater range of flow rates, and incurs lower permanent pressure loss than either the ISO or ASME venturi designs. Wyatt-Badger's fabricated BVT series can be manufactured from virtually any metal or alloy. Each unit, therefore, can be designed specifically for your application.

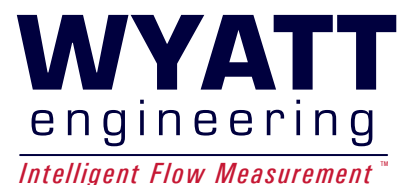
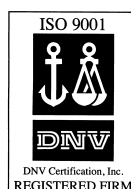
Application

The fabricated series of BVTs are often used in applications where the flow stream demands specific material selection due to pressure and/or temperature, or the corrosive/erosive properties of the fluid being measured. BVT installations are found in:

- Power Plants
- Refineries
- Petrochemical Plants
- Cryogenic Processes
- Coal Gasification Plants
- Steam Custody Transfer

Flow Measurement Accuracy

For pipe Reynolds numbers greater than 75 000 and with a normalized piping configuration, the Wyatt-Badger BVT-U provides a flow measurement accuracy of $\pm 0.50\%$ without flow calibration. With independent flow calibration, Wyatt Engineering's venturi meters provide the user with $\pm 0.25\%$ accuracy.



LVM

TECHbrief

Liberty Venturi Meter
Cast Iron Primary Elements



FEATURES:

- High Accuracy
- Reliable Operation
- Energy Efficient
- Flexible Design for a Variety of Applications

L
V
M

0
7
/
1
0

P
R
E
P
U
B

Description

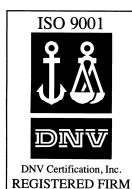
Wyatt Engineering's Liberty Venturi Meter is a differential-producing primary flow element that accurately and repeatably measures the flows of liquids or gases in closed, full-pipe conditions. The cast iron Wyatt LVM incorporates an efficient hydraulic shape with static pressure taps in the throat and inlet sections. The LVM can be provided with either 125 or 250 PSI flanges.

Application

The cast iron series is often used in municipal water and wastewater applications. Known for longevity of service with minimal maintenance, LVM meters are ideal for metering potable water, sludge, slurries, as well as gases and clean fluids. The Model LVM-C is uniquely designed for rate-of-flow control applications, while the LVM-S is designed to prevent clogging of the pressure taps for applications with solids-bearing fluids.

Flow Measurement Accuracy

For pipe Reynolds numbers greater than 75 000 and with a normalized piping configuration, the Liberty Venturi Meter provides a flow measurement accuracy of $\pm 0.50\%$ without flow calibration. With independent flow calibration, Wyatt's LVMs provide the user with $\pm 0.25\%$ accuracy.



WYATT
engineering
Intelligent Flow Measurement™

LVM-U

TECHbrief

Wyatt Engineering Liberty Venturi Meters
Fabricated Primary Elements



FEATURES:

- High Accuracy
- Low Pressure Loss
- Application Specific Design
- Static Pressure Sensation
- Documented Performance

L
V
M

1
0
1
/
0
9

P
R
E
P
U
B

Description

Wyatt Engineering's Liberty Venturi Meters are available as a fabricated series of modified venturi flow elements that can be used to measure the flow of gases and liquids over an extreme range of temperatures and pressures in full pipes. The fabricated LVM maintains its accuracy over a greater range of flow rates, and incurs lower permanent pressure loss than either the ISO or ASME venturi designs. Wyatt's fabricated LVM series can be manufactured from virtually any metal or alloy. Each unit, therefore, can be designed specifically for your application.

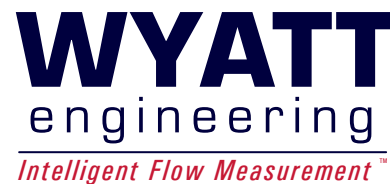
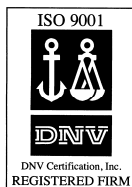
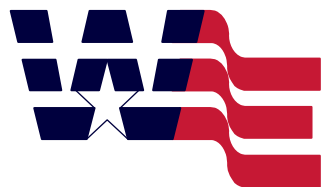
Application

The fabricated series of LVMs are most often used in industrial applications where the flow stream demands specific material selection due to pressure and/or temperature, or the corrosive/erosive properties of the fluid being measured. LVM installations are found in:

- Power Plants
- Refineries
- Petrochemical Plants
- Cryogenic Processes
- Coal Gasification Plants
- Steam Custody Transfer

Flow Measurement Accuracy

For pipe Reynolds numbers greater than 75 000 and with a normalized piping configuration, the Wyatt-Badger LVM-U provides a flow measurement accuracy of $\pm 0.50\%$ without flow calibration. With independent flow calibration, Wyatt Engineering's venturi meters will provide the user with $\pm 0.25\%$ accuracy.



PMT

TECHbrief

Wyatt-Badger Lo-Loss® Flow Tubes
Cast Iron Primary Elements



FEATURES:

- Lowest Pressure Loss
- Short Laying Length
- Economical Design
- Best Documented Flow Tube on the Market

Description

The cast iron Wyatt-Badger Lo-Loss® meter is a differential producing flow tube that maintains its accuracy over a wide range of flow rates. The hydraulic shape of the PMT Lo-Loss® meter incurs a lower permanent pressure loss than any other differential producing flow device. The PMT can be provided with either 125 or 250 PSIG flanges.

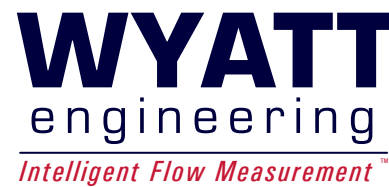
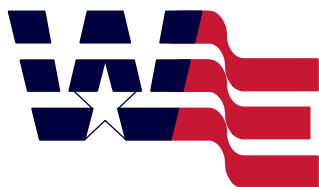
Application

The cast iron PMT series of Lo-Loss® meters is designed to accurately and reliably measure the flow rates of water, wastewater, sludge, clean fluids, and gases in full pipe conditions. The PMT series of meters is ideally suited to applications where permanent pressure loss must be kept to a minimum, such as in gravity-fed systems, or where a savings due to lower pumping costs can be realized. The Model PMT-C is designed for rate-of-flow control applications, while the PMT-S incorporates a rugged design for cleaning the pressure taps for solids-bearing fluids.

Flow Measurement Accuracy

For pipe Reynolds numbers greater than 100 000 and a normalized piping configuration, the Wyatt-Badger PMT Lo-Loss® meter provides a flow measurement accuracy of $\pm 0.25\%$ with independent flow calibration and $\pm 1.00\%$ without flow calibration.

Lo-Loss® is a registered trademark of Wyatt Engineering.



PMT-IF

TECHbrief

Wyatt-Badger Lo-Loss® Flow Tubes
Insert-Type Fabricated Primary Elements



FEATURES:

- **Lowest Pressure Loss**
- **Light Weight**
- **Low Cost of Ownership**
- **Custom Designed**
- **Short Laying Length**
- **Best Documented Flow Tube on the Market**

Description

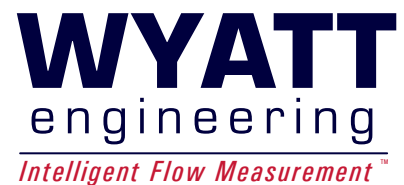
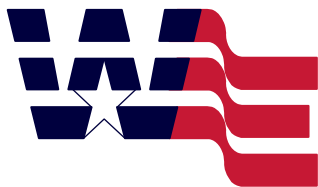
The Wyatt-Badger Lo-Loss® PMT-IF is a fabricated insert venturi flow element that offers repeatability and accuracy over a wide range of flow rates and has lower permanent pressure loss than orifice plates, flow nozzles, and any other venturi or flow tube on the market. The PMT-IF can be manufactured from virtually any material. It is designed for insertion within the interior of a pipeline and is secured by the adjacent pipe flanges. This unique design is characterized by longevity of service and flexibility in installation and application.

Application

The fabricated insert PMT-IF is designed to measure the flow of gases and liquids with low solids content. It can operate over extreme temperature and/or pressure ranges, and with highly corrosive fluids or gases. The Lo-Loss® fabricated insert has the distinct advantages of minimal weight, cost, and laying length. Typical applications include potable water, cooling water, process fluids, steam, air flow for aeration, and gas flow for combustion applications.

Flow Measurement Accuracy

For pipe Reynolds numbers greater than 100 000 and with a normalized piping configuration, the Wyatt-Badger PMT-IF Lo-Loss® Tube provides a flow measurement accuracy of $\pm 0.25\%$ with independent flow calibration and $\pm 1.00\%$ without flow calibration.



PMT-IP

TECHbrief

Wyatt-Badger Lo-Loss® Flow Tubes
Insert-Type Composite Primary Elements



FEATURES:

- Lowest Pressure Loss
- Light Weight
- Cost Effective
- Short Laying Length
- Best Documented Flow Tube on the Market

Description

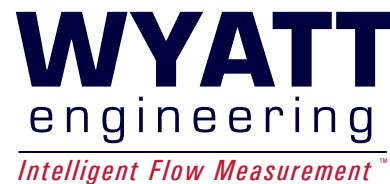
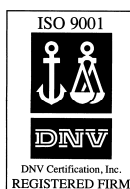
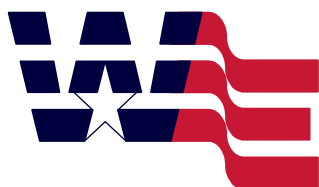
The Wyatt-Badger Lo-Loss® insert series of differential producers is designed for installation within a pipe, and is secured in place by the adjacent pipe flanges. Lo-Loss® insert venturi meters are available in two configurations: PMT-IP and PMT-IL. The standard PMT-IP is made entirely of engineered materials such as FRP, PVC, and other thermoplastic compounds. The PMT-IL employs similar construction, but offers a metallic throat section and mounting flange. Their permanent pressure loss, expressed as a percent of differential pressure, is lower than any other venturi or flow tube on the market.

Application

The PMT-IP and PMT-IL Lo-Loss® Meters can accommodate a wide range of flow rates, line fluids, and process conditions. They are designed to measure full-pipe, clean fluids and gases in virtually any pipe size. In applications where solids contaminate the line fluid, an auxiliary high pressure tap can be provided for installation in the upstream pipe. The Lo-Loss® insert meters have the advantages of minimal weight, low cost, and a short laying length.

Flow Measurement Accuracy

For pipe Reynolds numbers greater than 100 000 and a normalized piping configuration, the Wyatt-Badger PMT-IP and PMT-IL Lo-Loss® meters provide a flow measurement accuracy of $\pm 0.25\%$ with independent flow calibration and $\pm 1.00\%$ without flow calibration.



PMT-U

TECHbrief

Wyatt-Badger Lo-Loss® Flow Tubes
Fabricated Primary Elements



FEATURES:

- Low Installed Cost
- Short Laying Length
- Low Pressure Loss
- Cost Effective
- Best Documented Flow Tube on the Market

P
M
T
U

1
0
1
/
0
9

P
R
E
P
U
B

Description

Wyatt-Badger fabricated PMT Lo-Loss® meters are differential producers that maintain their accuracy over a wide range of flow rates, and incur lower permanent pressure loss than any other differential producing flow device. These units can be made from virtually any material to address the different requirements of your applications. Lo-Loss® flow tubes are characterized by longevity of service and flexibility in design.

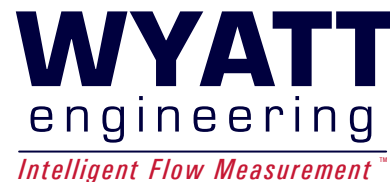
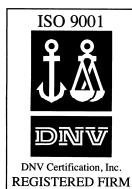
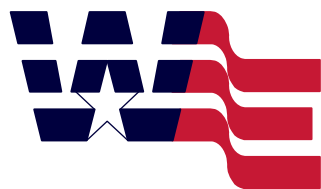
Application

The fabricated series of Lo-Loss® meters are often used in industrial applications where the flow stream demands intelligent decisions regarding materials of construction. This is due to extremes of pressure, temperature, or the aggressive nature of the fluid being metered. A short list of Lo-Loss® installations include:

Power Plants
Refineries
Petrochemical Plants
Chemical Processing
Natural Gas Custody Transfer

Flow Measurement Accuracy

For pipe Reynolds numbers greater than 100 000 and a normalized piping configuration, the Wyatt-Badger PMT-U Lo-Loss® meter provides a flow measurement accuracy of $\pm 0.25\%$ with independent flow calibration and $\pm 1.00\%$ without flow calibration.



Wyatt Orifice Flow Products Machined and Fabricated Primary Elements



FEATURES:

- **Reliable Performance**
- **Low Installed Cost**
- **Wide Regulatory Acceptance**
- **Flexible Designs for Different Applications**
- **Well Documented**

Description

Differential producers, specifically orifice plates, are used in flow measurement due to their simplicity, ease of installation, tolerance to extreme atmospheric and process conditions, and predictable and reliable performance. Orifice plates are the most common method of differential pressure flow measurement and are used in various industries, particularly in the hydrocarbon market. Due to their long history and dominance in the field of flow measurement, orifice plate designs and installation requirements have been well documented by national and international standards organizations.

Application

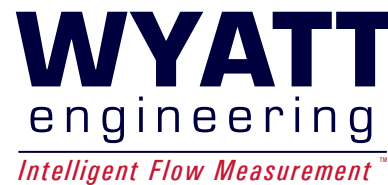
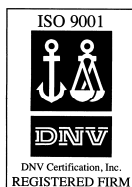
Wyatt Engineering orifice plates, flanges, and metering runs are used in a variety of applications where extremes of pressure, temperature, or the aggressive nature of the fluid being metered render other metering technologies unfeasible. Because of their reliability, low cost, and ease of installation, Wyatt orifice products are commonly used as the differential pressure device for the measurement of the flow of fluids, especially for clear water, steam, air, and most gases. Common installations include:

Natural Gas Transmission
Chemical and Pharmaceutical Processing
Power Generation
Refinery and Petrochemical

Documented Accuracy

Wyatt Engineering also provides application guidance to support the proper use of its equipment: Whether to use flange taps, corner taps, or pipe taps; whether a metering run with a flow straightener is necessary; whether to use a quadrant edge plate, or is another metering technology is required.

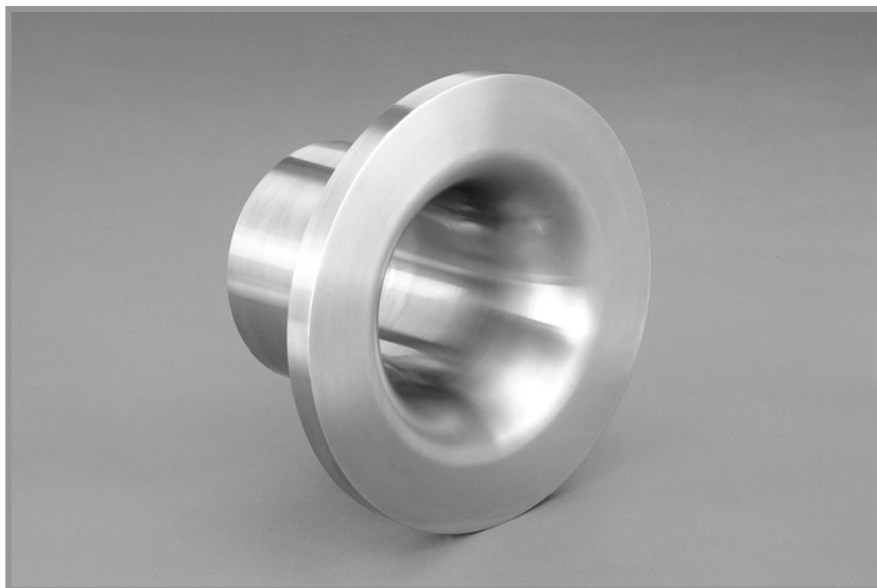
Unlike most providers of orifice products, Wyatt Engineering has extensive flow calibration data that reflects experience and depth of knowledge. Industry, national, and international codes can provide guidance to manufacturers, but only successful test results can assure the flow measurement results that are necessary in today's market.



FNP

TECHbrief

Wyatt Flow Nozzle Products
Machined and Fabricated Primary Elements



FEATURES:

- Long Term Reliability
- Widely Accepted
- Low Installed Cost
- Well Documented
- Flexible Designs for Different Applications

Description

Flow nozzles are often used in flow measurement due to their reliable performance and tolerance to extremes in process and environmental conditions. They offer advantages over orifice plates in that they require less upstream piping and incur lower permanent pressure loss. Accuracy can be sustained indefinitely since there are no sharp edges to wear.

Wyatt Engineering flow nozzles are used in various industries, particularly for steam flow in the power sector. Due to their long documented history, flow nozzle designs and installation requirements are known and recognized by national and international standards organizations.

Application

Wyatt Engineering flow nozzles and metering runs are used in a variety of applications where extremes of pressure, temperature, or the aggressive nature of the fluid being metered render other metering technologies unfeasible. Because of their long-term reliability and ease of installation, Wyatt nozzle products are commonly used as the differential pressure device for the measurement of the flow of fluids, especially for water, steam, air, and gases. Common installations include:

- Power Plants
- Refineries
- Petrochemical Plants
- Chemical Processing Facilities
- Steam and Condensate Flows

Documented Accuracy

Unlike most providers of flow nozzles products, Wyatt Engineering has extensive flow calibration data that reflects experience and depth of knowledge. Industry, national, and international codes can provide guidance to manufacturers, but only successful tests can assure the flow measurement results that are necessary in today's market.

Wyatt Engineering also provides application guidance to support the proper use of its equipment: Whether to use a flanged nozzle or a weld-in design; whether a metering run with a flow straightener is necessary; whether the use of a PTC-6 test section is warranted, or if another metering technology is required.

F
N
P

g
/
0
9

P
R
E
P
U
B

