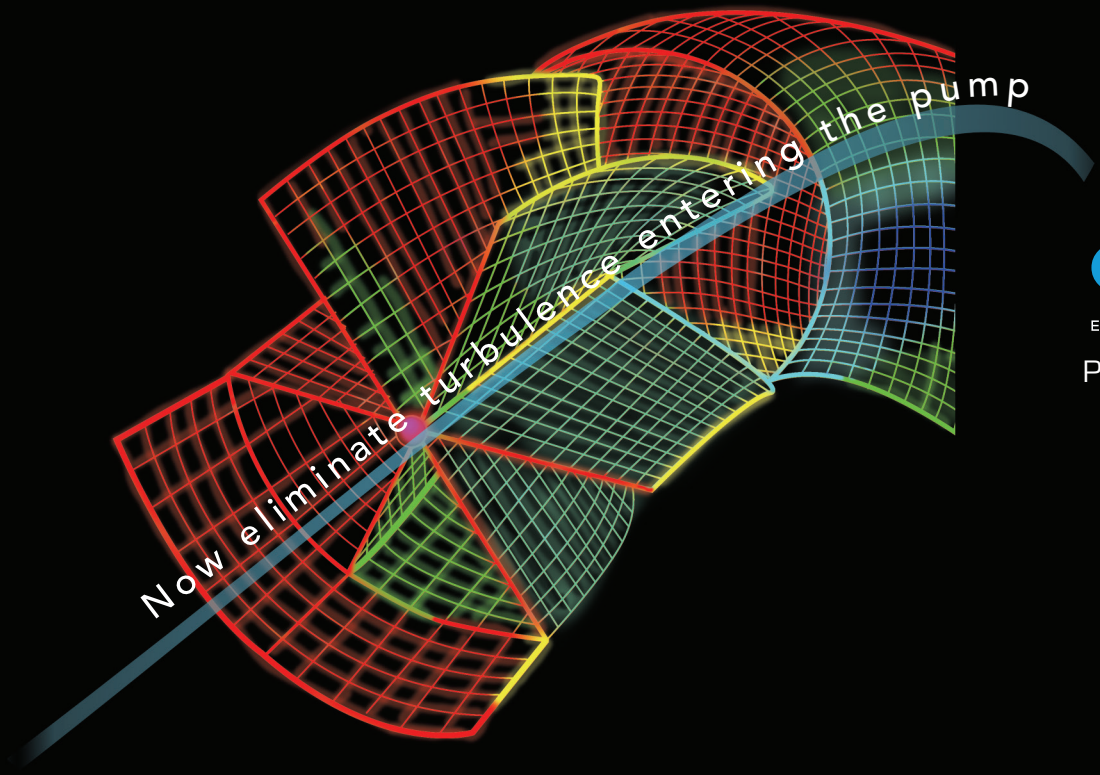


epiphene

ENERGY SAVING PUMP PROTECTION SOLUTIONS

Presenting innovative solutions
in partnership with

Metraflex
for pipes in motion

INTRODUCING THE NEW

HIGH PERFORMANCE PUMP PACKAGE

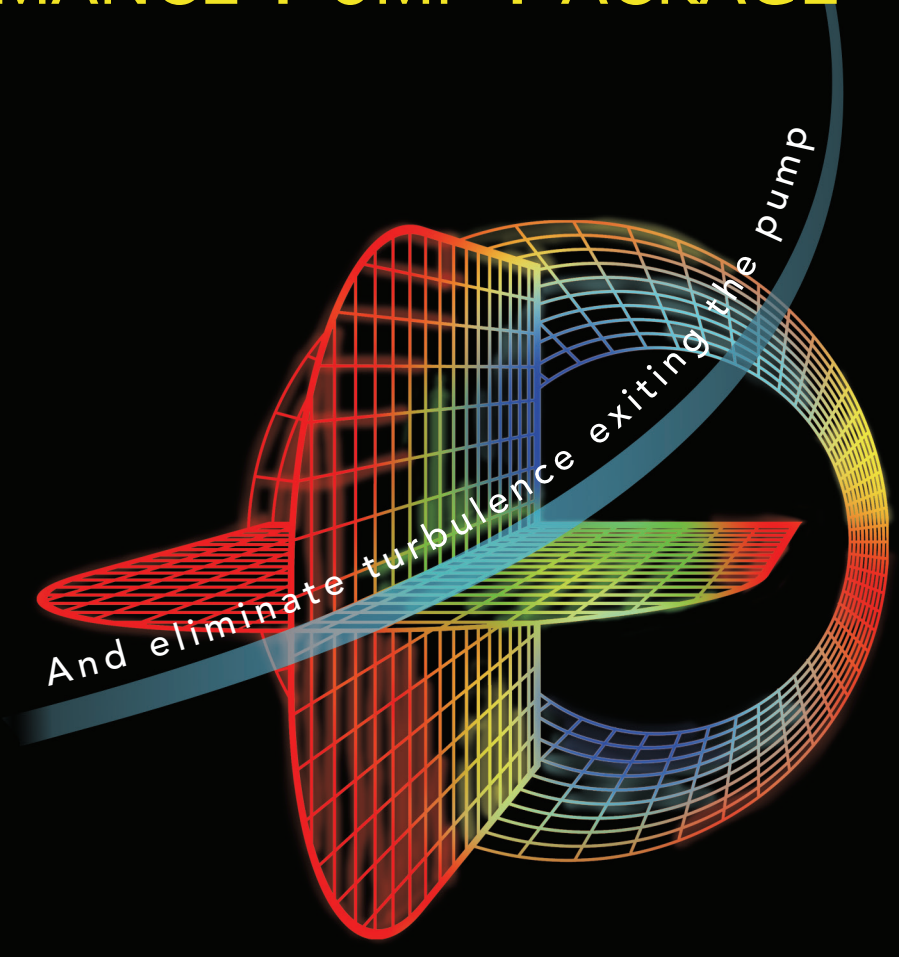
Impacts Pump Selection

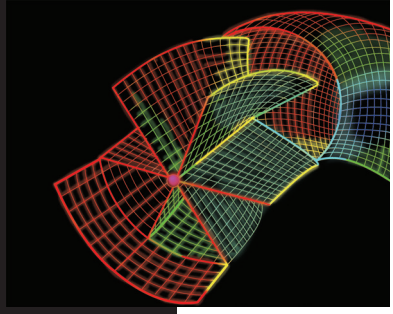
Improves Design

Saves Energy

Extends Asset Life

Improves Valve & Flowmeter Performance





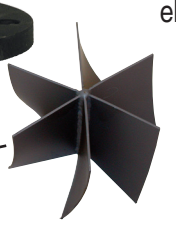
SUCTION DIFFUSER FLEX

< < < SUCTION SIDE

IMPROVE PUMP PERFO

Introducing a more efficient, energy-saving solution to condition flow entering the pump and quickly straighten flow leaving the pump…the unique Suction Diffuser Flex™ and Vane Flex™...a powerful duo of smartly engineered pump connectors that cost less and measurably improve performance.

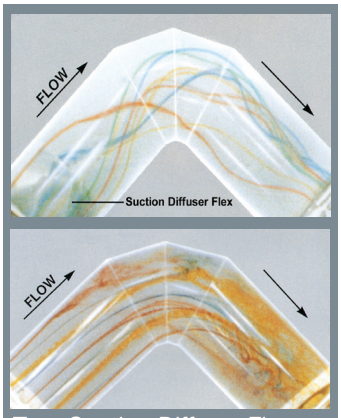
Stationary, curved fins rotate flow so it moves smoothly through the elbow.



Installed upstream of the suction-side elbow, the Suction Diffuser Flex replaces the brutish functionality of the suction diffuser with a simple, elegant, cost-saving solution.

A more efficient design

The Suction Diffuser Flex technology consists of a specially designed set of stationary vanes placed in the suction-side pump connector just upstream of an elbow. These vanes eliminate the turbulence normally caused by fluid passing through an elbow by rotating the fluid as it enters the elbow. The fluid negotiates the turn uniformly, and enters the pump with a flat velocity profile. The result is improved pump performance.



Top, Suction Diffuser Flex smooths the flow through elbow. Above, turbulent flow through elbow.

"The Suction Diffuser Flex delivers ideal flow conditions to the pump, better NPSH with less cost, less space, and less pressure drop than any other method."

Pressure drop: Suction diffusers are notorious energy hogs and cause significant pressure drops. Suction Diffuser Flex technology creates a smoother flow through the elbow and into the pump. For example, a new 8-inch suction diffuser with a clean screen has a pressure drop equivalent to 75 feet of pipe! The 8-inch Suction Diffuser Flex coupled with long-radius elbow offers an equivalent pipe length of only 14.33 ft., or as chart below illustrates a 60.67 ft. or 81% savings in equivalent length of pipe when compared to the 75 ft. Brand "B" below:

PRESSURE DROP (Equivalent Feet of Pipe)

Pipe Size*	SDF w/LRE**	Suction diffuser manufacturers A	B	T	M
2-1/2	**5.67 ft**	12 ft	18 ft	–	24 ft
3	**6.54 ft**	18 ft	30 ft	22 ft	19 ft
4	**7.95 ft**	22 ft	33 ft	22 ft	20 ft
6	**11.42 ft**	45 ft	51 ft	27 ft	43 ft
8	**14.33 ft**	62 ft	75 ft	43 ft	64 ft

**See web site for sizes 1-1/2 thru 16 inches. Calculations made with clean screens in suction diffuser. **LRE = Long Radius Elbow*

No maintenance: Most diffusers operate with their screen partially clogged, further impacting performance. The Suction Diffuser Flex requires no maintenance.

Design versatility

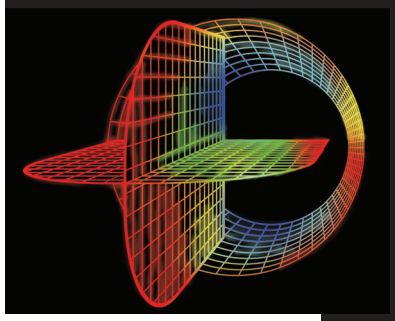
Suction Diffuser Flex technology increases your design options. Suction Diffuser Flex technology can be incorporated into in a wide range of configurations from a standard pump connector to a custom fabrication.

A proven technology

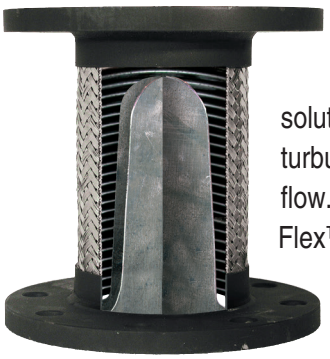
The Suction Diffuser Flex was originally developed under a NASA (National Aeronautics and Space Administration) grant to study the turbulence caused by 90° turns in their rocket engine test tunnels. Performance was confirmed in a 1996 NIST (National Institute of Standards and Technology) study.

More details and white papers available

RMANCE AND SAVE



Vane Flex...Equal to 5 to 10 pipe diameters – Isolates vibration and reduces turbulence

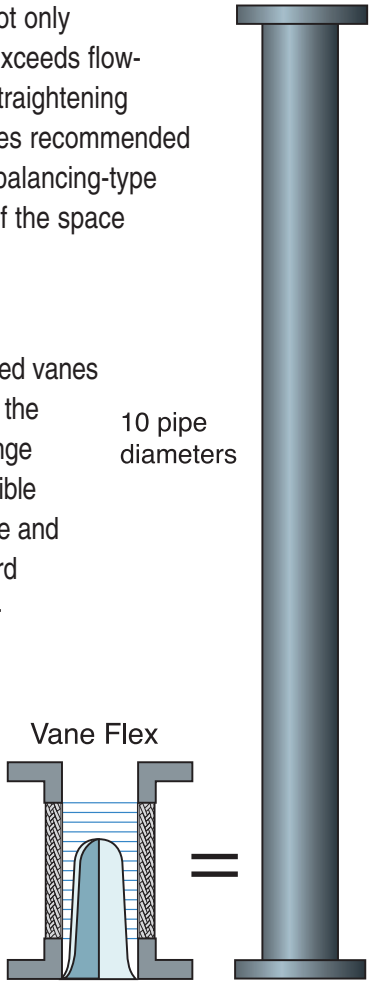


Piping engineers now have a more compact, efficient solution to reduce turbulence and straighten flow. The new Vane Flex™ pump connector not only exceeds flow-straightening values recommended by all major manufacturers of balancing-type valves, it does it in a fraction of the space normally required.

It's all in the vanes

Combining hydrodynamic-shaped vanes with a flexible pump connector, the Vane Flex maintains the full range of movement of a standard flexible connector, yet, at the same time and in the same space as a standard connector, provides better flow-straightening than a length of pipe equivalent to 5-to-10 diameters.

In addition, the Vane Flex provides the same stress relief and vibration dampening in the same face-to-face as a standard pump connector.



Why is turbulence so damaging?

Valve flutter & poor balancing – Turbulence causes disc flutter, which causes wear, and is why older valves won't close completely. Useful life is reduced, and most importantly, results in poor balancing. A spool piece of 5 to 10 diameters of pipe after the pump/before the valve was the universal fix suggested to minimize turbulence.

Vane flex vs. 10 pipe diameters – Independent testing at the Milwaukee School of Engineering

Visual Flow Tests conducted in the school's Hydraulics lab compared a length of pipe equivalent to 10 diameters, a standard flexible connector, and the Vane Flex. The results were dramatic.

10 pipe diameters: The testing showed there is still significant turbulence even at the recommended maximum 10 pipe diameters from the pump (Figure 1, A.)

Standard pump connector: Turbulence out of a pump connector that is connected directly to a pump offers no turbulence reduction (Figure 1, B.)

Vane Flex pump connector: The testing showed Vane Flex exhibited a marked reduction in flow turbulence, far exceeding even the 10 pipe diameters requested by every system balancing valve maker. This equates to a positive impact on the performance of the engineered pipe system (Figure 1, C.)

Visit www.epiphene.com for complete details on the High Performance Pump Package, or contact your local representative.

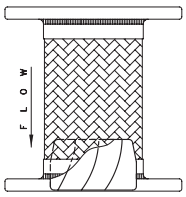
Figure 1
Turbulence testing by MSOE.

VANE FLEX CONNECTOR

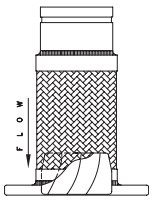
> > > DISCHARGE SIDE

Standard Suction Diffuser Flex Configurations

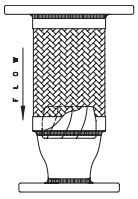
Long Radius Elbow



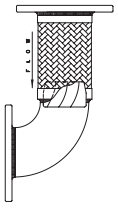
Suction Diffuser Flex with 150# plate flanges for connecting to a long radius elbow



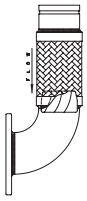
Suction Diffuser Flex with 150# plate flange x groove end for connecting to a long radius elbow



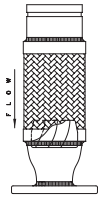
Suction Diffuser Flex with 150# plate flanges with concentric reducer for connecting to a long radius elbow



Suction Diffuser Flex with 150# plate flanges with long radius 90° elbow

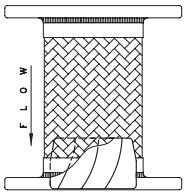


Suction Diffuser Flex with 150# plate flange x groove end with long radius 90° elbow

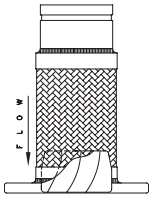


Suction Diffuser Flex with 150# plate flange x groove end with concentric reducer for connecting to a long radius elbow

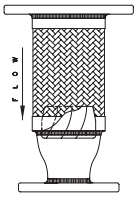
Short Radius Elbow



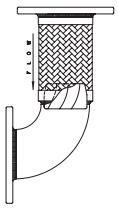
Suction Diffuser Flex with 150# plate flanges for connecting to a short radius elbow



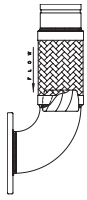
Suction Diffuser Flex with 150# plate flange x groove end for connecting to a short radius elbow



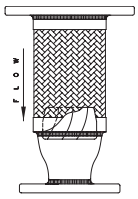
Suction Diffuser Flex with 150# plate flange with concentric reducer for connecting to a short radius elbow



Suction Diffuser Flex with 150# plate flanges with short radius 90° elbow

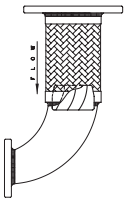


Suction Diffuser Flex with 150# plate flange x groove end with short radius 90° elbow

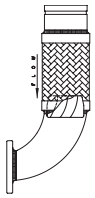


Suction Diffuser Flex with 150# plate flange x groove end with concentric reducer for connecting to a short radius elbow

90° Reducing Elbow



Suction Diffuser Flex with 150# plate flange with 90° reducing elbow

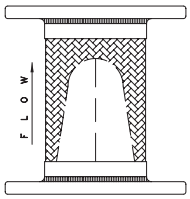


Suction Diffuser Flex with 150# plate flange x groove end with 90° reducing elbow

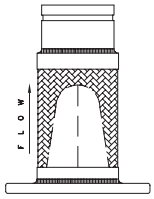
Optional Suction Diffuser Flex and Vane Flex™ Configurations

Install them in a Double Cablesphere®. Or, if you have a unique application, contact Epiphene for assistance. We're flexible so your design can be, too.

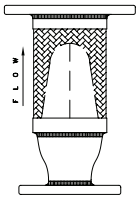
Standard Vane Flex Configurations



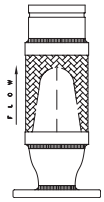
Vane Flex with 150# plate flanges



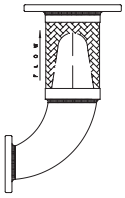
Vane Flex with 150# plate flange x grooved



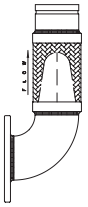
Vane Flex with 150# plate flanges with concentric reducer



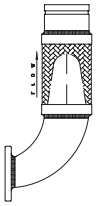
Vane Flex with 150# plate flange x grooved with concentric reducer



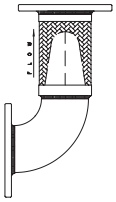
Vane Flex with 150# plate flanges with 90° reducing elbow



Vane Flex with 150# plate flange x groove with 90° elbow



Vane Flex with 150# plate flange x groove with 90° reducing elbow



Vane Flex with 150# plate flange with 90° elbow

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