Now eliminate turbulence entering the pump. And eliminate turbulence exiting the pump.

Introducing the new High Performance Pump Package

Balancing valve manufacturer requires length of pipe equal to 5 to 10 pipe diameters from pump to valve.

Turbulence from pump can damage valve and make balancing impossible.

Suction diffuser causes significant pressure drop as it converts turbulent flow prior to entering pump.

Rarely cleaned, screen is not designed for debris collection. When cleaned, it requires complete system shutdown.

Uses more energy • More costly to run • Needs more maintenance

2325 W. HUBBARD ST. CHICAGO, IL 60612
312-738-3800 FAX 312-738-0415
www.metraflex.com

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Turbulence from pump can damage valve and make balancing impossible.

Uses more energy, more costly to run, needs more maintenance.

Rarely cleaned, screen is not designed for debris collection. When cleaned, it requires complete system shutdown.

Optional suction diffuser flex and vane flex™ configurations.

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

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Printed in U.S.A.
**High Performance Debris Collection.** Screen designed for Diffuser Flex Suction elbow. Isolates vibration in-service cleaning. Blow down permits standard long or fraction of the space, and smooths turbulent flow in a Vane Flex. More accurate with even less flow. Flow enters valve significantly smoother and flows with less cost, less space, and less maintenance.

**Improved Pump Performance and Save.** Introducing a more efficient, energy-saving solution to cooling flow entering the pump and quickly straighten flow leaving the pump...the unique Suction Diffuser Flex™ and Vane Flex™ by Metraflex...a powerful duo of smartly engineered pump connectors that cost less and measurably improve performance.

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**Suction Diffuser Flex** isolates vibration and smooth turbulent flow in a section of the space. The Suction Diffuser Flex delivers ideal flow conditions to the pump, better NPSH with new cost, new space, and low pressure drop than any other method.

**Vane Flex** isolates vibration and smooths turbulent flow through the elbow.

**Vane Flex vs. Suction Diffuser Flex**

**Why is turbulence so damaging?** Vane Volute is a passing... turbulent flow causes disc flutter, which causes wear, and is why older valves won't close completely. Useful in this respect, and most important, results in poor balancing. A spool piece of 5 pipe system (Figure 1, C.) is why older valves won't close completely. Useful in this respect, and most important, results in poor balancing. A spool piece of 5 pipe system (Figure 1, C.)

**Turbulence testing** exhibited a marked reduction in flow turbulence, far exceeding even the 10 pipe diameters required by every system. Balancing valve maker. This is why older valves won't close completely. Useful in this respect, and most important, results in poor balancing. A spool piece of 5 pipe system (Figure 1, C.)

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

Vane Flex pump connector: The testing showed Vane Flex exhibited a marked reduction in flow turbulence, far exceeding even the 10 pipe diameters required by every system. Balancing valve maker. This is why older valves won't close completely. Useful in this respect, and most important, results in poor balancing. A spool piece of 5 pipe system (Figure 1, C.)

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**Pipe Diameter**

| 2                  | 12 ft                      |
| 3                  | 10 ft                      |
| 4                  | 8 ft                       |
| 5                  | 6 ft                       |
| 6                  | 4 ft                       |
| 8                  | 2 ft                       |

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**HIGH PERFORMANCE**

- Uses less energy
- Less costly to run
- Needs less maintenance

---

**IMPACTS AND BENEFITS**

- **Debris Collection**
- **Screen Design**
- **Diffuser Flex Elbow**
- **Entry and Exit from Valve**
- **“Y” Strainer Design**
- **Blow Down**
- **Plus**

---

**SUCTION DIFFUSER FLEX**

- **Flex vs. 10 Pipe diameters – Independent testing at the Milwaukee School of Engineering**
- **Visual FLEX Tests Conducted in the School’s Hydraulics Lab**
- **Turbulence Reduction**
- **Vane Flex vs. 10 Pipe diameters**

---

**IMPROVE PUMP PERFORMANCE AND SAVE**

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™ by Metraflex...a powerful duo of smartly engineered pump connectors that cost less and measurably improve performance.

---

**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 dynamically change the flow normally caused by fluid passing through an elbow by rotating as it enters the elbow.

---

**“The Suction Diffuser Flex delivers ideal flow conditions to the pump, better NPSH with no cost, noise, space, and long pressure drop than any other method.”**

---

**Piping Engineers** now have a more compact, efficient solution to reduce turbulence and straighten flow. The new Vane Flex™ pump connector not only performs better and more accurately...than 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 minimum 10 pipe diameters from the pump (Figure 1, A.), the Vane Flex provides the same stress relief and vibration damping in the same face-to-face size as a standard pump connector to a custom fabrication.

---

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

Visual FLEX 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.

---

**Why is turbulence so damaging?**

Vane FLEX & pipe balancing...Turbulence causes disc flutter, which causes wear, and is why older valves won’t close completely. Useful 90% is restored, 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 improve flow.

---

**Turbulence Testing**

- **Turbulence Out of a Pump**
- **Feel the Difference**
- **Turbulence Drop**
- **Flow Characteristics**

---

**Standard Long-Radius Short Radius Elbow**

**Vane Flex**

- **Vane Flex**
- **Suction Diffuser Flex**
- **Suction/vibration and “turns” flow to create a smooth entry and exit from elbow.**

---

**“V” strainer with large screen designed for debris collection.**

---

**Table: Pressure Drop**

<table>
<thead>
<tr>
<th>Diameter (Pipe)</th>
<th>Pressure Drop</th>
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<tbody>
<tr>
<td>1.0</td>
<td>1.0 ft</td>
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<td>2.0</td>
<td>2.0 ft</td>
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<tr>
<td>3.0</td>
<td>3.0 ft</td>
</tr>
<tr>
<td>4.0</td>
<td>4.0 ft</td>
</tr>
</tbody>
</table>

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**Figure 1**

- **A**
- **B**
- **C**

---

**Figure 2**

- **Turbulence Drop** by Vane Flex.
**HIGH PERFORMANCE**

USES LESS ENERGY • LESS COSTLY TO RUN • NEEDS LESS MAINTENANCE

**screen designed for**

“Y” strainer with large suction side elbow. 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 dramatically reduce pressure drop, normally caused by fluid passing through an elbow by rotating as it enters the elbow. The fluid negotiates the turn uniformly, and enters the pump with a flat velocity profile. This results in improved pump performance.

**A more efficient design**

The Suction Diffuser Flex technology creates a smoother flow through the valve was the universal fix suggested to reduce turbulence and straighten flow. The new Vane Flex™ pump connector not only accesses 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 flow 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 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 50º turns in their rocket engine test tunnels. Performance was confirmed in 1996 NIST (National Institute of Standards and Technology) testing at the Milwaukee School of Engineering.

**Why is turbulence so damaging?**

Valve failure & poor performance—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 reduce turbulence and straighten flow. The new Vane Flex™ pump connector provides better flow straightening and turbulence reduction.

**Piping engineers have a more**

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

**Independent testing at the Milwaukee School of Engineering**

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

**Pipe diameters**

Pipe vs. 10 pipe diameters – Independent testing at the Milwaukee School of Engineering. Visual Flow Tests conducted in the school’s hydraulic lab compared a length of pipe equivalent to 10 diameters, a standard flexible connector, and the Vane Flex. The results were dramatic.

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<tr>
<td>1-1/2</td>
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<td>2</td>
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Now eliminate turbulence entering the pump

Introducing the new High Performance Pump Package

Standard Suction Diffuser Flex Configurations

Standard Vane Flex Configurations

Balancing valve

Balancing valve manufacturer requires length of pipe equal to 5 to 10 pipe diameters from pump to valve.

Turbulence from pump can damage valve and make balancing impossible.

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