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A Guide to the Selection of **STOURFLEX** Pump Connectors

Introduction

The purpose of this section is to provide an overview for the STOURFLEX range of Pump Connectors and enable customers to select and specify the correct unit to meet their particular requirement.

Stourflex Pump Connectors fall into two categories. These are:

- 1) Rubber Pump Bellows
- 2) Stainless Steel Pump Connectors

Rubber Pump Bellows

Where are they used?

Rubber Bellows are primarily used on pumps, chillers and other reciprocating machinery to reduce noise and vibration. Whilst a rubber bellows has the capabilities of compensating small amounts of axial, lateral and angular pipe work movement we would always recommend a specifically designed stainless steel expansion joint to accommodate pipe movements in an axial, lateral or angular plane.

The Rubber Bellows selection process should include the following

- 1) Grade of Rubber
- 2) Installation Length
- 3) Service Conditions
- 4) Size and Mating Connections
- 5) DIN 4809 Specification
- 6) Tied or Untied



Grade of Rubber

The majority of rubber bellows are used on heating and chilled water systems. For these applications we offer an ethylene propylene diene monomer (EPDM) elastomer with a nylon reinforced body. EPDM exhibits excellent compatibility with hot and cold water. We also offer other grades of rubber for different media.

STOURFLEX use a colour coding system as a means of identifying different grades of rubber. This is labelled on the outside of the bellows carcass or shown as a band.

These are:

Grade of Rubber	Reinforcement	Service	Colour Code
EPDM	Nylon	Heating and Chilled Water up to 82 deg C	Red Band
EPDM	Kevlar	Heating and Chilled Water up to 105 deg C DIN4809 Specification	Double Red Band
Nitrile with biological secure white liner	Nylon	Drinking Water, Food & Beverage production	White Band
Nitrile	Nylon	Oil Service	Yellow Band
Hypalon	Nylon	Chemical Service	Green Band
Viton	Nylon	Aggressive Oil & Chemical Service	Purple Band



Installation lengths

The majority of Stourflex rubber bellows have a supplied length of 130mm which is an industry standard. If different supplied lengths are required please see our Type JP03 and JP04 Rubber Bellows. Should site conditions require a special installed length which is not listed below we can manufacture bespoke requirements.

Installation lengths in mm for Stourflex Rubber Bellows									
	JP01 /JP02	JP03/ JP04	JP03/ JP04	JP05/ JP06	JP07/ JP08	JP09/ JP10	JP11/ JP12	JP13/ JP14	JP18/ JP19
20		A	B						203
25	130								203
32	130	95	150	130	130	130	130	130	203
40	130	95	150	130	130	130	130	130	203
50	130	105	150	130	130	130	130	130	203
65	130	115	150	130	130	130	130	130	
80	130		150	130	130	130	130	130	
100	130		150	130	130	130	130	130	
125	130	170	150	130	130	130	130	130	
150	130	180	150	130	130	130	130	130	
200	130	205	150	130	130	130	130	130	
250	130	240	205	130	130	130	130	130	
300	130	260	205	130	130	130	130	130	
350		265	205						
400		265	205						
450		265	205						
500		265	205						
600		265							



Service Conditions

In order to select the correct rubber bellows the following must be established:-

Source of Movement

Identify the item of equipment from which the noise and vibration needs to be controlled.
For example pumps, chillers, cold water booster set or air handling unit.

Media

What is passing through the pipework system that will come into contact with the rubber bellows?

Pressure

The minimum and maximum working pressure that the rubber bellows will be working under. If a hydraulic pressure test is to be carried out on a system containing rubber bellows ensure that the anchors are correctly fitted before the test is performed. Also ensure that the test pressure (usually 1.5 x working) does not exceed the maximum test pressure of the rubber bellows.

The system pressure will determine if Tied or Untied bellows are required. See section **TIED or UNTIED** for further guidance.

When rubber bellows are fitted to the suction side of a pump please ensure the negative pressure does not exceed the bellows capabilities as vacuum support rings may need to be fitted to prevent the bellows from collapsing.

Temperature

What is the minimum and maximum operating temperature of the system?

Size and Mating Connection

The information required for size and mating connections should include:

- The diameter of the pipe or pump suction and discharge connection size
- The material specification of the pipe
- Mating end connections. i.e. flange dimensions or type of thread connections

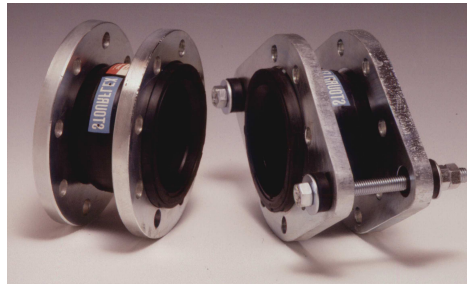
DIN 4809 Specification

For applications in which a consultant has specified a rubber bellows conforming to DIN 4809 then the JP05 or JP06 EPDM rubber bellows with Kevlar reinforced body should be selected as this conforms fully to this specification.



TIED or UNTIED

Bellows terminology Tied or Untied relates to whether a rubber bellows is fitted with oval flanges and restraining tie bars (Tied) or is supplied unrestrained with loose swivel round flanges (Untied).



UNTIED

TIED

For sizes 25mm to 300mm both Tied and Untied Units are suitable for a maximum operating pressure of 16bar (at ambient temperature). As with any other unrestrained expansion joint, rubber bellows will extend under pressure.

Tied units are designed to stop the bellows from elongating and prevent the pressure thrust being transmitted onto the pumps and associated pipework. Stourflex rubber bellows are supplied with fully threaded tie rods whose primary function is to maintain the supplied length of the rubber bellows under pressure while permitting only lateral deflection.

All STOURFLEX Tied Bellows are supplied with Oval flanges complete with fully threaded tie bar assemblies. The majority of these are manufactured from flame cut zinc plated carbon steel, however they can also be produced from other materials to suit your requirements. For example Stainless Steel.

The Tie bar assemblies are supplied with four rubber top hat washers which stop metal to metal contact between the flange and the tie rod assembly. This prevents a transmission path for noise and vibration across a STOURFLEX Tied Pump Connector

We never recommend the use of steel gusset plates as a means of restraining rubber bellows as they are less substantial by design than oval tied flanges. The reduced thickness of steel gusset plates will not provide the strength to contain the forces that a high pressure pipework system will generate.

Stourflex always recommend that Tied Rubber Bellows should be used on applications where the pipework is 3" (80mm) and above and / or the working pressure is 3 bar and above.

Tied bellows should always be used on pumps mounted on inertia bases.



Stainless Steel Pump Connectors

Application

Stainless Steel Pump Connectors are primarily used on pumps, chillers and other reciprocating machinery to reduce noise and vibration.

All of the Stourflex Stainless Steel Pump Connector range has been approved by the Water Regulations advisory Scheme (WRAS) which means they are also suitable for potable / wholesome water applications.

Stourflex Stainless Steel Pump Connectors offer significant benefits to the customer and should be used as an alternative to rubber bellows when:-

- The application exceeds the temperature limitations of rubber bellows
- The Bellows has to be a Water Regulations Approved Scheme (WRAS) approved product
- The Bellows are required for Potable Water or Domestic Hot Water Applications
- The bellows are being installed in a critical environment and benefits such as longer life expectancy are required

See Types JP20BS / JP21 / JP22VS / JP23VS

The table below shows installation lengths for the standard stock range of Stourflex Stainless Steel Pump Connectors. However as with all stainless steel convoluted bellows and hose products installations lengths can be manufactured to suit site conditions.

Installation Lengths for Stourflex Stainless Steel Pump Connectors

DN	JP20BS	JP21	JP22VS	JP23VS
15	220mm	220mm		
20	220mm	220mm		
25	250mm	250mm		
32	300mm	300mm	130mm	130mm
40	300mm	300mm	130mm	130mm
50	350mm	300mm	130mm	130mm
65		300mm	130mm	130mm
80		300mm	130mm	130mm
100		300mm	130mm	130mm
125		300mm	130mm	130mm
150		300mm	130mm	130mm
200			130mm	130mm
250			130mm	130mm
300			130mm	130mm



Bellows Selector

The table below is for guidance only designed to help in making a pump bellows selection. For further assistance please contact a STOURFLEX Sales Engineer.

Service	Temperature Deg. C	<u>STOURFLEX Product Selection</u>
Low Temperature Hot Water (LTHW)	71 - 82 °C	Type JP01 and JP02 Flanged Type JP18 and JP19 Screwed
Chilled Water (Ch W.)	6 - 12 °C	Type JP01 and JP02 Flanged Type JP18 and JP19 Screwed
Domestic Hot Water Service (DHWS) Potable / Wholesome Drinking Water / Booster Sets	60 °C 6 - 12 °C	Type JP22VS and JP23VS Flanged WRAS approved Type JP20BS Screwed WRAS Approved Type JP22VS and JP23VS Flanged WRAS approved Type JP20BS Screwed WRAS Approved
Medium Temperature Hot Water (MTHW)	85 - 120 °C	Type JP22VS and JP23VS Flanged WRAS approved Type JP20BS Screwed WRAS Approved
DIN 4809 Specified		Type JP05 & JP06 Flanged
High Temperature Hot Water (HTHW)	120 °C +	Type JP22VS and JP23VS Flanged WRAS approved Type JP20BS Screwed WRAS Approved
Oil Services	up to 60 °C	Type JP09 and JP10 Flanged Type JP20BS Screwed
Chemical Service	up to 60 °C	Type JP13 and JP14 Flanged Type JP20BS Screwed

If you have an application outside of the above, then please contact a Stourflex Sales Engineer who will be able to help and assist you.