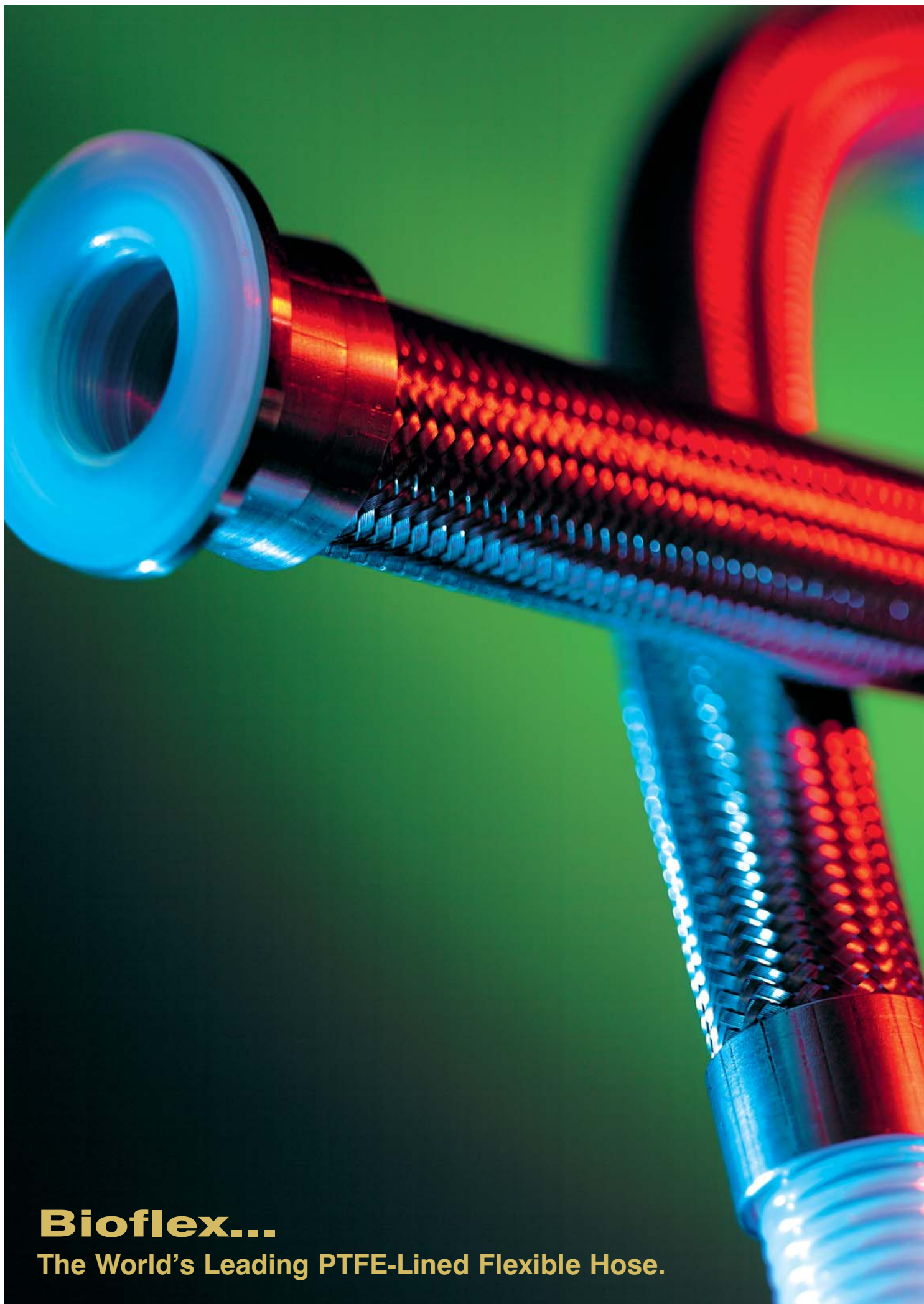


# Bioflex

Smoothbore, Flexible PTFE Lined Hose



FLEXIBLE • HYGIENIC • SELF CLEANING • CHEMICAL RESISTANT



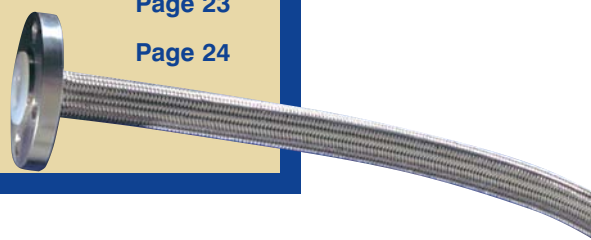
**Bioflex...**

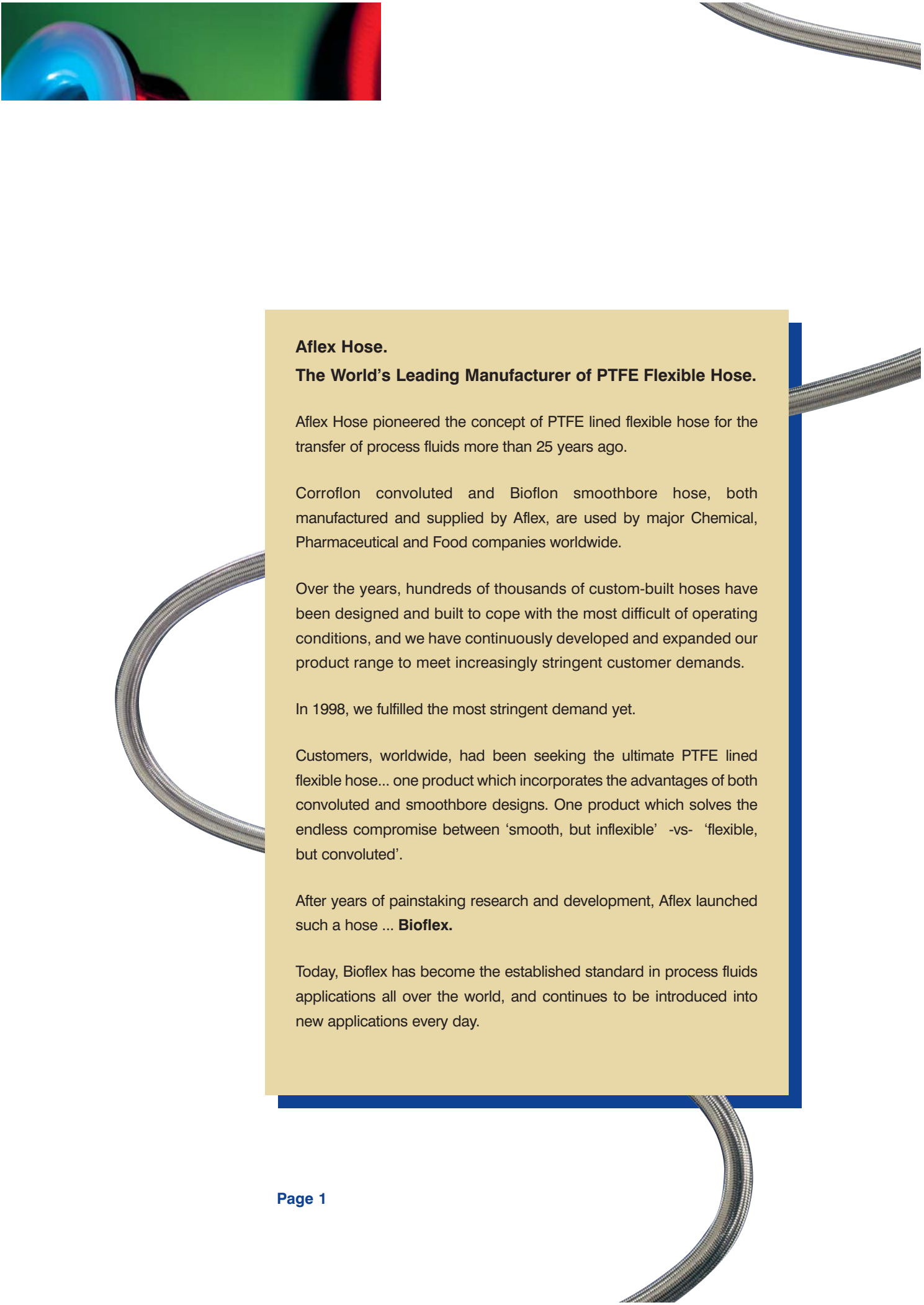
**The World's Leading PTFE-Lined Flexible Hose.**



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## Aflex Hose.

### The World's Leading Manufacturer of PTFE Flexible Hose.

Aflex Hose pioneered the concept of PTFE lined flexible hose for the transfer of process fluids more than 25 years ago.

Corroflon convoluted and Bioflon smoothbore hose, both manufactured and supplied by Aflex, are used by major Chemical, Pharmaceutical and Food companies worldwide.

Over the years, hundreds of thousands of custom-built hoses have been designed and built to cope with the most difficult of operating conditions, and we have continuously developed and expanded our product range to meet increasingly stringent customer demands.

In 1998, we fulfilled the most stringent demand yet.

Customers, worldwide, had been seeking the ultimate PTFE lined flexible hose... one product which incorporates the advantages of both convoluted and smoothbore designs. One product which solves the endless compromise between 'smooth, but inflexible' -vs- 'flexible, but convoluted'.

After years of painstaking research and development, Aflex launched such a hose ... **Bioflex**.

Today, Bioflex has become the established standard in process fluids applications all over the world, and continues to be introduced into new applications every day.



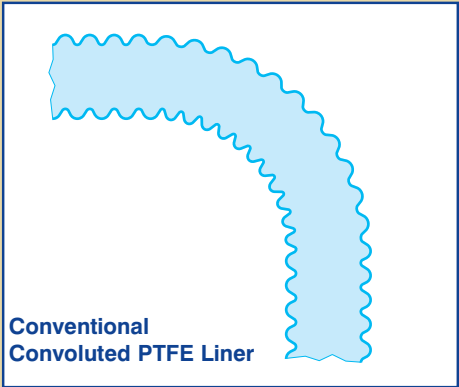


**Bioflex.**  
**The World's Leading PTFE Flexible Hose.**

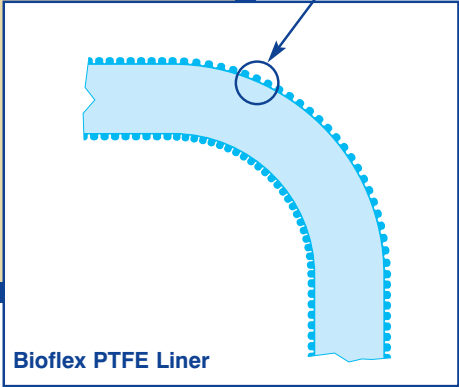
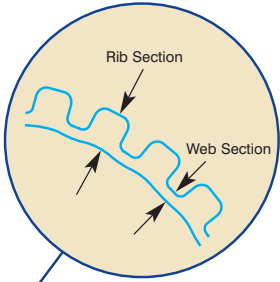
Bioflex is a smoothbore, highly flexible, PTFE lined hose. Its design overcomes the disadvantages of conventional smoothbore and convoluted flexible hose designs, dramatically improving on many of their individual technical performance parameters.

Bioflex's unique design is patent protected. It was invented by Andy Whitworth, whose father, Barrie Whitworth was responsible for the design of Corroflon 15 years earlier.

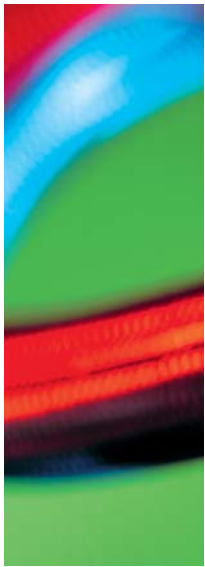
The Bioflex PTFE liner design comprises integral *rib* sections (which support the tube against kinking, vacuum and pressure) and highly compressed *web* sections (which give a smoothbore inner surface and excellent flexibility).



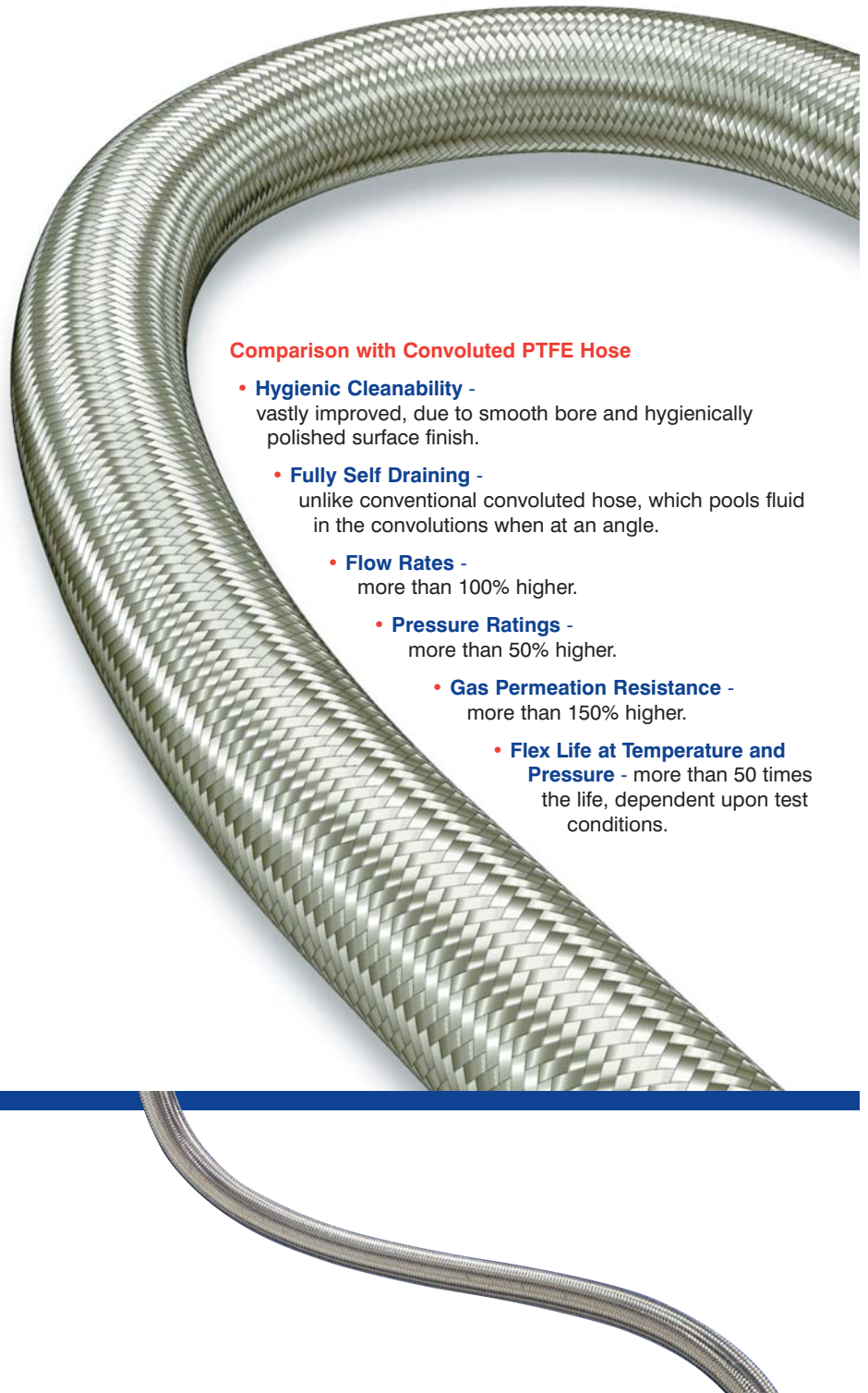
**Conventional  
Convoluted PTFE Liner**



**Bioflex PTFE Liner**



## Bioflex. The World's Leading PTFE-Lined Flexible Hose.

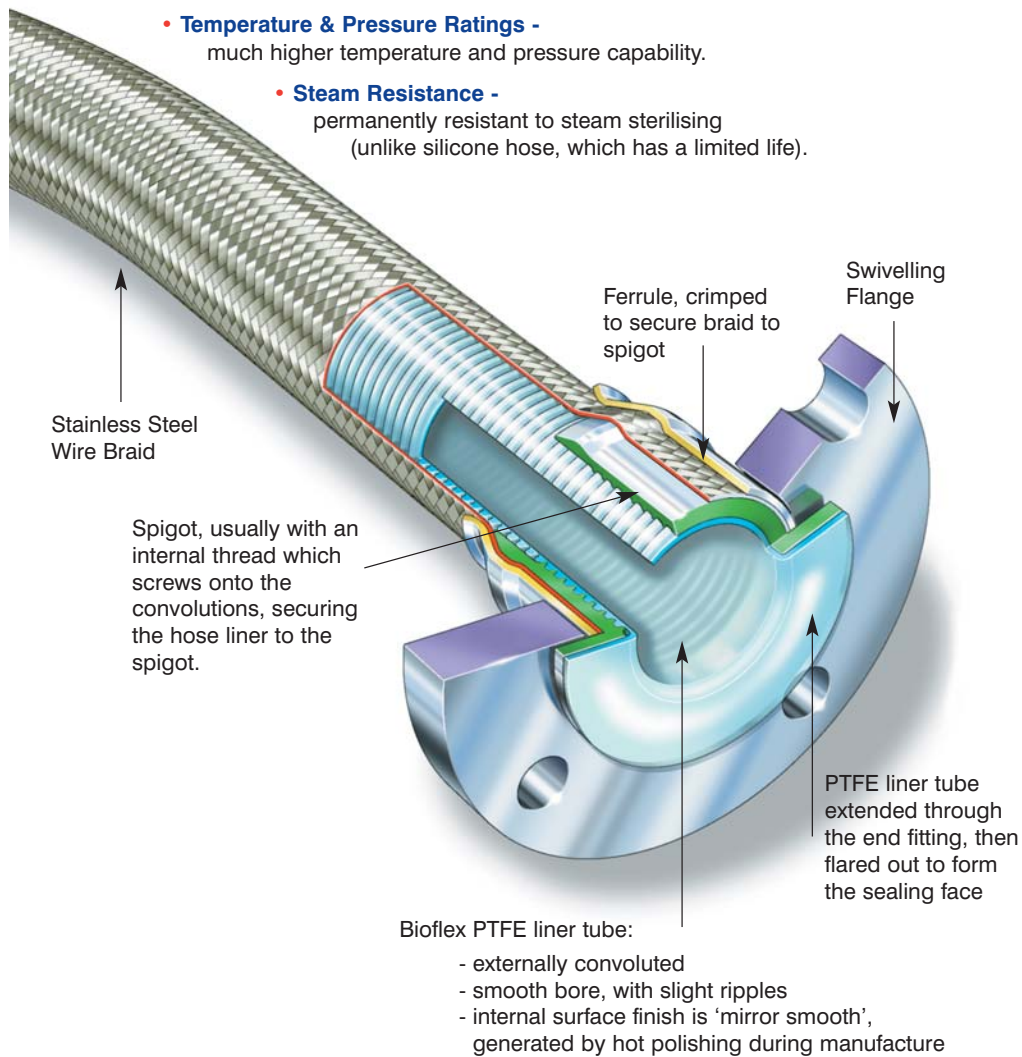


### Comparison with Convoluted PTFE Hose

- **Hygienic Cleanability** -  
vastly improved, due to smooth bore and hygienically polished surface finish.
- **Fully Self Draining** -  
unlike conventional convoluted hose, which pools fluid in the convolutions when at an angle.
- **Flow Rates** -  
more than 100% higher.
- **Pressure Ratings** -  
more than 50% higher.
- **Gas Permeation Resistance** -  
more than 150% higher.
- **Flex Life at Temperature and Pressure** - more than 50 times the life, dependent upon test conditions.

### Comparison with Silicone Rubber Hose

- **Hygienic Cleanability** -  
much better, due to highly polished inner surface finish.
- **Chemical Resistance** -  
considerably improved, particularly to strong oxidising acids and bases.
- **Temperature & Pressure Ratings** -  
much higher temperature and pressure capability.
- **Steam Resistance** -  
permanently resistant to steam sterilising  
(unlike silicone hose, which has a limited life).



## The Bioflex Test Programme.

Bioflex has been designed to fulfil the most demanding of customer expectations and, as such, has been subjected to a highly complex and rigorous Hose Testing Programme, parts of which are described here.

### Test No. 1. The 'Flip-Flop' Test.

The 'Flip Flop' test was invented by Aflex Hose to combine the extremes of flexing, temperature and pressure simultaneously. The hose is flexed to its Minimum Bend Radius in two opposing directions through a 240° arc. It is cycled through this flexing profile 20 times per minute, while pressurised to its Maximum Working Pressure, inside an oven heated to 180°C.

#### Results

Bioflex consistently achieves more than 50 times the life of standard convoluted hose. Typically, a 1" Bioflex hose is still intact tested at **50 Bar** for 100,000 cycles, whilst a 1" convoluted hose tested at **30 Bar** fails due to the inner tube bursting after 1,300 cycles.

Similar results were also achieved when tested without pressure, at room temperature.

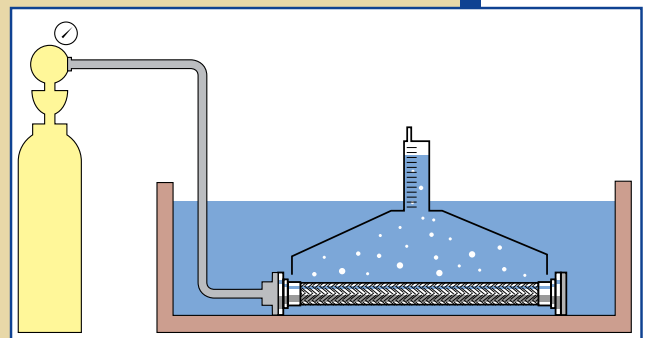
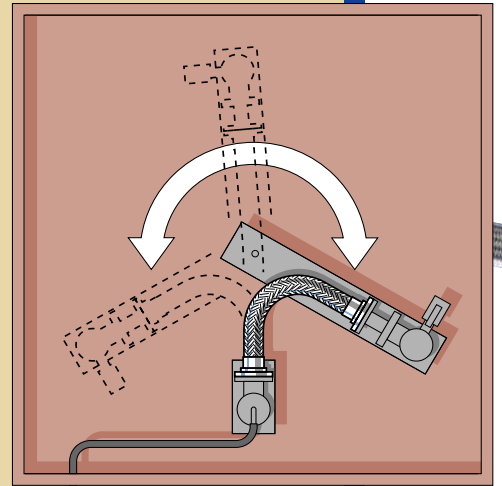
### Test No. 2. The Permeability Test.

Fixed lengths of Bioflex were pressurised to 30 Bar with Helium Gas, and compared with samples of standard convoluted PTFE hose.

#### Results

Bioflex has more than 2.5 x the permeation resistance of standard convoluted hose. Millilitres of Helium which permeated hose, per metre, per hour:

|               |   |     |
|---------------|---|-----|
| 1" Bioflex    | = | 138 |
| 1" Convoluted | = | 371 |





### Test No. 3. The Flow Rate Test.

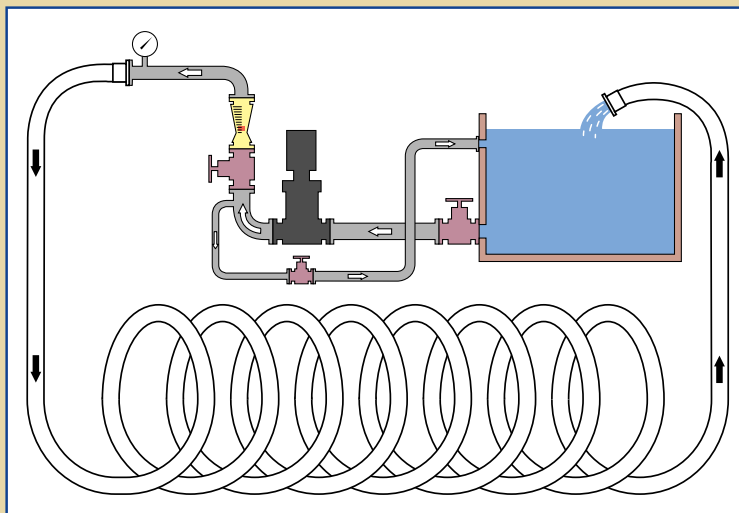
The test apparatus illustrated below was used to measure the flow rate of Bioflex, both in a straight configuration and coiled to its Minimum Bend Radius. The test medium was water.

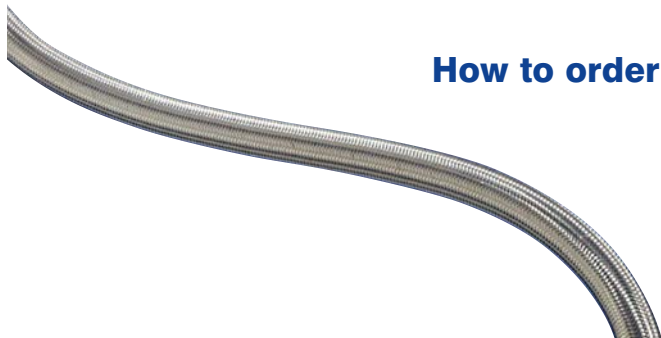
#### Results

Comparisons were made with samples of standard convoluted hose with the same diameter on the inside of the convolutions as the Bioflex inside diameter. These show that Bioflex is capable of delivering 2 - 3 times the flow rate of convoluted hose.

Additional tests have shown that the flow rate through a Bioflex hose is actually greater than that of a convoluted hose which is one size larger. For example, 1½" Bioflex has a higher flow rate than 2" convoluted hose. It is therefore possible to use a *smaller* Bioflex hose, fitted with full size end fittings, to replace a convoluted hose more effectively, *and* more economically!

This remarkable improvement is due to the fact that the turbulent flow created by the convolutions in the standard product is virtually eliminated by the much smoother bore of Bioflex.





## How to order Bioflex.

### Bioflex Hose Assemblies

Bioflex is always custom built to individual order and is supplied in the form of finished hose assemblies, after the length, liner, braid and end fittings have been decided upon.

### Selecting the Hose Grade

There are two types of PTFE liner available, natural (GP) and anti-static (AS) and three types of braid, stainless steel (SS) polypropylene (PB) and PVDF, or Kynar (KYB). These are described on pages 11 and 12. Rubber covering and other external protection systems are also available, described on pages 13 and 14.

A hose grade is specified by using the abbreviations given. For example, Bioflex AS,PB would describe a hose with an anti-static PTFE liner and a polypropylene braid.

### Selecting the End Fittings

Bioflex is available with a range of 'standard' end fittings (described on pages 15-22), normally supplied hygienically PTFE lined.

### Step-up End Fittings

The very high flow rates of Bioflex hose relative to convoluted hose make it possible to use Bioflex hose assemblies with 'Step-up' size end fittings, where the end fitting size is one size larger than the hose size. Thus, a lighter weight, more flexible hose can be used without compromising the flow rate!

### Selecting the Hose Length

Bioflex hose assemblies are made up to the specific lengths required. The hose length is taken as the length from the sealing face at one end of the hose to the same at the other end. The length tolerance is normally +5%-0%.

| Nominal Size of Hose |    | Minimum Hose Assembly Length* |     |                  |     | Max. Ass. Length |
|----------------------|----|-------------------------------|-----|------------------|-----|------------------|
|                      |    | Used Straight                 |     | Flexed thru' 90° |     |                  |
| in                   | mm | in                            | mm  | in               | mm  | mtrs             |
| 3/8                  | 10 | 4                             | 100 | 5                | 120 | 20               |
| 1/2                  | 15 | 6                             | 150 | 6                | 150 | 20               |
| 5/8                  | 16 | 6                             | 150 | 6 1/2            | 160 | 20               |
| 3/4                  | 20 | 6                             | 150 | 7                | 180 | 20               |
| 7/8                  | 22 | 8                             | 205 | 9                | 230 | 20               |
| 1                    | 25 | 9                             | 230 | 10               | 250 | 20               |
| 1 1/4                | 32 | 9                             | 230 | 11               | 280 | 20               |
| 1 3/8                | 35 | 9                             | 230 | 14               | 350 | 18               |
| 1 1/2                | 40 | 9                             | 230 | 15               | 380 | 17               |
| 1 7/8                | 48 | 10                            | 250 | 18               | 450 | 13               |
| 2                    | 50 | 10                            | 250 | 20               | 500 | 10               |

\* For SS or PB Braided hose only. For all other grades min length is increased by 33%.





## Bioflex Specifications. Temperatures, Pressures & Flow Rates.

### Temperature vs Pressure

Due to its extremely strong construction, Bioflex has outstanding resistance to temperature and pressure, much higher than that of conventional convoluted PTFE lined hose.

### Temperature vs Vacuum

All sizes of Bioflex GP,SS are usable at full vacuum up to 130°C. Above this, the vacuum resistance should be reduced 1% for every degree above 130°C.

### Flow Rates

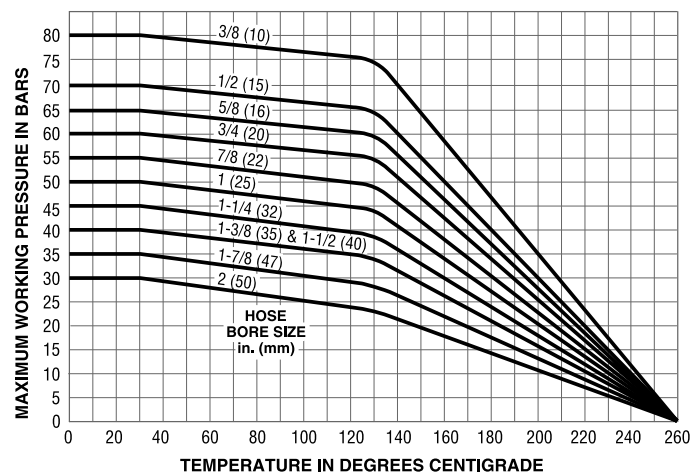
The flow rates shown in the formulas are for Bioflex hose in a straight configuration, using water as the test medium.

In practice, flow rates will vary with hose flexing, fluid viscosity, end fitting design and other parameters, but Bioflex hose flow rates are always around 2 times better than convoluted PTFE hose, when comparing hose assemblies with PTFE lined (non bore-restricted) end fittings.

### Non-Whistling

The 'whistling' noise created by turbulent flow when steam or gases are passed through a convoluted hose are completely eliminated when using Bioflex.

Temperature & Pressure Resistance Graph for Bioflex GP, SS and AS, SS



### Bioflex Hose - Flow Rate Formulas

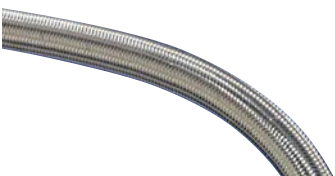
For a hose assembly, N metres long, with PTFE lined end fittings (no bore restriction).

$$\text{Pressure Drop in BAR} = \frac{(3.66 \times \text{Flow Rate in Cubic Metres per Hour})^2 \times 0.0383 \times N}{(3 \times \text{Hose Bore Size in Inches})^5}$$

or Flow Rate in Cubic Metres per Hour =

$$\sqrt{\frac{(3 \times \text{Hose Bore in Inches})^5 \times \text{Pressure Drop in BAR}}{0.0383 \times N}} \div 3.66$$

Where Pressure Drop in BAR = **the difference in the pressures between the inlet and outlet ends of the hose.** (Not the pump pressure, Not the pressure at the inlet end only, Not the "line", or "system" pressure).



## Bioflex Size Range and Specifications.

| Nominal Hose Bore Size |    | Actual Bore Size |      | O/D of Tube | Braid Type                              | O/D of Braid or Rubber                    | Minimum Bend Radius                      |
|------------------------|----|------------------|------|-------------|---|---|--|
| in                     | mm | in               | mm   | mm          |   | mm  | mm                                       |
| $\frac{3}{8}$          | 10 | $\frac{3}{8}$    | 9.5  | 11.75       | TO<br>SS                                | -<br>13                                   | 35<br>20                                 |
| $\frac{1}{2}$          | 15 | $\frac{1}{2}$    | 12.7 | 15.40       | TO<br>SS<br>PB<br>SS,RC/FP<br>SI<br>KYB | -<br>16.5<br>18.0<br>21.0<br>21.0<br>17.5 | 60<br>38<br>38<br>60<br>60<br>60         |
| $\frac{5}{8}$          | 16 | $\frac{5}{8}$    | 16.0 | 19.50       | TO<br>SS<br>PB<br>SS,RC/FP<br>SI<br>KYB | -<br>20.8<br>22.2<br>26.4<br>26.4<br>21.5 | 68<br>45<br>45<br>68<br>68<br>68         |
| $\frac{3}{4}$          | 20 | $\frac{3}{4}$    | 19.0 | 23.00       | TO<br>SS<br>PB<br>SS,RC/FP<br>SI<br>KYB | -<br>24.4<br>25.8<br>29.0<br>29.0<br>26.0 | 75<br>50<br>50<br>75<br>75<br>75         |
| $\frac{7}{8}$          | 22 | $\frac{7}{8}$    | 22   | 26.80       | TO<br>SS<br>PB<br>SS,RC/FP<br>SI<br>KYB | -<br>28.4<br>30.2<br>33.0<br>33.0<br>29.7 | 92.5<br>60<br>60<br>92.5<br>92.5<br>92.5 |
| 1                      | 25 | 1                | 25.4 | 31.00       | TO<br>SS<br>PB<br>SS,RC/FP<br>SI<br>KYB | -<br>32.3<br>34.7<br>36.9<br>36.9<br>33.4 | 110<br>70<br>70<br>110<br>110<br>110     |
| $1\frac{1}{4}$         | 32 | $1\frac{1}{4}$   | 32   | 37.30       | TO<br>SS<br>PB<br>SS,RC/FP<br>SI<br>KYB | -<br>38.4<br>40.1<br>43.2<br>43.2<br>39.7 | 140<br>100<br>100<br>140<br>140<br>140   |
| $1\frac{3}{8}$         | 35 | $1\frac{3}{8}$   | 34.9 | 40.50       | TO<br>SS<br>PB<br>SS,RC/FP<br>SI<br>KYB | -<br>41.8<br>44.2<br>46.4<br>46.4<br>42.9 | 160<br>120<br>120<br>160<br>160<br>160   |
| $1\frac{1}{2}$         | 40 | $1\frac{1}{2}$   | 38   | 45.00       | TO<br>SS<br>PB<br>SS,RC/FP<br>SI<br>KYB | -<br>46.8<br>48.8<br>54.6<br>54.6<br>47.7 | 180<br>140<br>140<br>180<br>180<br>180   |
| $1\frac{7}{8}$         | 48 | $1\frac{7}{8}$   | 47.6 | 54.60       | TO<br>SS<br>PB<br>SS,RC/FP<br>SI<br>KYB | -<br>56.4<br>58.4<br>64.2<br>64.2<br>57.3 | 280<br>190<br>190<br>280<br>280<br>280   |
| 2                      | 50 | 2                | 50.8 | 59.10       | TO<br>SS<br>PB<br>SS,RC/FP<br>SI<br>KYB | -<br>60.9<br>62.9<br>68.9<br>68.9<br>61.7 | 300<br>200<br>200<br>300<br>300<br>300   |



| MWP of Hose* | Minimum Burst Pressure | Maximum Continuous Hose Length | Weight per Unit Length |
|--------------|------------------------|--------------------------------|------------------------|
| Bar          | Bar                    | Mtrs                           | Kg/Mtr                 |
| 5            | 20                     | 20                             | .06                    |
| 80           | 320                    | 20                             | .14                    |
| 5            | 20                     | 20                             | .15                    |
| 70           | 280                    | 20                             | .29                    |
| 35           | 140                    | 20                             | .22                    |
| 70           | 280                    | 20                             | .39                    |
| 70           | 280                    | 10                             | .39                    |
| 10           | 40                     | 20                             | .19                    |
| 5            | 20                     | 20                             | .17                    |
| 65           | 260                    | 20                             | .35                    |
| 33           | 130                    | 20                             | .25                    |
| 65           | 260                    | 20                             | .47                    |
| 65           | 260                    | 10                             | .47                    |
| 10           | 40                     | 20                             | .20                    |
| 5            | 20                     | 20                             | .20                    |
| 60           | 240                    | 20                             | .40                    |
| 30           | 120                    | 20                             | .28                    |
| 60           | 240                    | 20                             | .55                    |
| 60           | 240                    | 10                             | .55                    |
| 10           | 40                     | 20                             | .24                    |
| 4            | 16                     | 20                             | .28                    |
| 55           | 220                    | 20                             | .52                    |
| 27.5         | 110                    | 20                             | .38                    |
| 55           | 220                    | 20                             | .74                    |
| 55           | 220                    | 5                              | .74                    |
| 10           | 40                     | 20                             | .33                    |
| 4            | 16                     | 20                             | .36                    |
| 50           | 200                    | 20                             | .63                    |
| 25           | 100                    | 20                             | .47                    |
| 50           | 200                    | 20                             | .92                    |
| 50           | 200                    | 5                              | .92                    |
| 10           | 30                     | 20                             | .41                    |
| 3            | 12                     | 20                             | .45                    |
| 45           | 180                    | 20                             | .85                    |
| 23           | 90                     | 20                             | .72                    |
| 45           | 180                    | 20                             | 1.15                   |
| 45           | 180                    | 5                              | 1.15                   |
| 6            | 24                     | 20                             | .53                    |
| 2            | 8                      | 18                             | .54                    |
| 40           | 160                    | 18                             | 1.00                   |
| 20           | 80                     | 18                             | .86                    |
| 40           | 160                    | 18                             | 1.38                   |
| 40           | 160                    | 5                              | 1.38                   |
| 6            | 20                     | 18                             | .68                    |
| 2            | 8                      | 17                             | .66                    |
| 40           | 160                    | 17                             | 1.10                   |
| 20           | 80                     | 17                             | .90                    |
| 40           | 160                    | 17                             | 1.55                   |
| 40           | 160                    | 5                              | 1.55                   |
| 6            | 20                     | 17                             | .78                    |
| 2            | 8                      | 13                             | .82                    |
| 35           | 140                    | 13                             | 1.38                   |
| 18           | 72                     | 13                             | 1.12                   |
| 35           | 140                    | 13                             | 1.94                   |
| 35           | 140                    | 5                              | 1.94                   |
| 6            | 16                     | 13                             | .97                    |
| 2            | 8                      | 10                             | 1.25                   |
| 30           | 120                    | 10                             | 1.90                   |
| 15           | 60                     | 10                             | 1.60                   |
| 30           | 120                    | 10                             | 2.56                   |
| 30           | 120                    | 5                              | 2.56                   |
| 6            | 12                     | 10                             | 1.42                   |

**Maximum Operating Temperatures (internal fluid):** SS Braid -70°C to +260°C, PB Braid -30°C to +100°C.

SS, RC and SS, FP -40°C to +140°C, SS,SI -40°C to +180°C, KYB -40°C to +120°C.

(For external temperature limits, reduce maximum temperatures by 20°C).

**Pressure Variation with Temperature:**  
SS Braid as per Graph on previous page; PB pressure as above from -30°C to +90°C; RC, FP and SI grades as per Graph on previous page, BUT only within the temperature range for the particular grade of rubber.

**\*MWP:** the Maximum Working Pressure of a hose assembly is limited to the lowest of the MWPs of either of the two end fittings, as given for each end fitting design on pages 15-22, or of the hose itself as given above.

**Testing:** each hose assembly is pressure tested to 1.5 times the MWP as defined above.

**Identification:** each hose assembly is supplied with an identification ring which includes the hose description, working and test pressures, date of manufacture, and a unique serial number for traceability purposes.

**Certification:** Pressure test certificates, and Certificates of Conformity can be supplied. 3.1.B material certificates to EN10204 can also be supplied if requested with order. 'CE' marking in accordance with European Directive 97/23/EC will be applied.



## Bioflex Hose Liners.



### BIOFLEX GP

#### Purpose

Bioflex GP is the 'General Purpose' grade, for use in all applications where fluids or gases being conveyed are not highly electrically resistant.

#### Design

Bioflex GP is a virgin PTFE liner, manufactured from FDA approved hose grade PTFE material to 21 CFR 177.1550.



### BIOFLEX AS

#### Purpose

Bioflex AS is suitable for use in applications where electrically resistive fluids, such as fuels, solvents or freons or pure, dry gases such as halogens or steam are being conveyed. The use of Bioflex AS prevents a damaging electrostatic charge build-up inside the hose.

#### Design

Bioflex AS is an anti-static PTFE liner manufactured from FDA approved PTFE, and Carbon Black material to FDA requirement 21 CFR 178.3297.



#### Specifications

Bioflex AS meets the anti-static hose requirements of BS2050:1978. The resistance is measured between the (wetted) inside surface of the hose liner and an end fitting, and this resistance must not exceed  $10^7$  ohms. When using an AS hose, one end fitting must always be connected to earth.

### ELECTRICAL CONTINUITY EC (between end fittings)

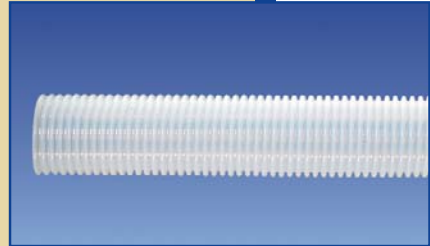
Always specify EC grade if it is required. Resistances between end fittings are: For Bioflex SS <10 ohms; and for Bioflex PB <20 ohms.

Conductivity between the fittings is achieved either directly through the SS braid, or on PB Braided Hoses, through 2 x spirally wound plaited monel wire strips, which criss-cross under the braid.

## Bioflex Hose Braids.

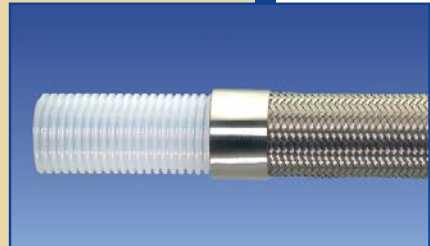
### TO - TUBE ONLY (NO BRAID)

TO grade hose (available in both GP and AS) is a lightweight hose, used in applications where working pressures are low and where there is no need for the physical protection offered by an external braid.



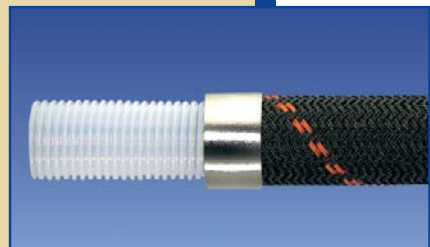
### SS - STAINLESS STEEL

Stainless Steel braided hose is used in applications involving high temperatures and working pressures. High tensile grade 304 stainless steel wire is used, to give maximum pressure resistance and external protection to the hose.



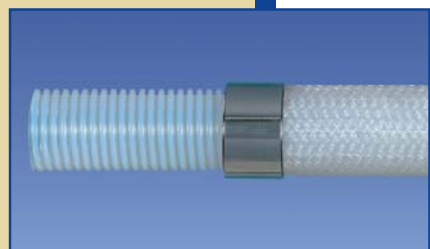
### PB - POLYPROPYLENE BRAID

Polypropylene braided hose is often preferred in applications involving frequent handling and movement of the hose, and where temperatures are within the range -30°C and +100°C. PB braid is lighter in weight, and any broken strands will not cut the operator's hands. In addition, PB braid is not prone to chloride stress corrosion.



### KYB - KYNAR (PVDF) BRAID

Kynar Braid is only used where severe chemical corrosion conditions exist around the outside of the hose. This can happen when Chlorine or Fluorine are being transferred. Diffusion of these gases through the PTFE liner can lead to atmospherically wetted chlorine attacking the braid material, in which case the Kynar Braid would be resistant.



## Bioflex External Protection.

### RC - RUBBER COVERED

#### Purpose

For the most rugged applications where the hose may be subjected to rough treatment and severe external abrasion. Also for hygienic applications, where the external smoothness and cleanability of the hose is of prime importance.

#### Design

An SS braided hose assembly has a smooth finish, blue EPDM external rubber cover vulcanised directly onto the braid. Black anti-static EPDM is available as an option. EPDM has excellent chemical resistance, and is temperature resistant up to 120°C (external) 140°C (internal). Alternative colours of rubber, and strips with alternative text titles are available.



### FP - FIREPROOF RUBBER COVERED

#### Purpose

As for RC hose, but where the hose is also required to resist failure in the event of fire, in accordance with Specification BS5173 Section 103.13 (Fireproof). This specification calls for an 1100°C flame to be applied to the hose at minimum bend radius, maximum operating pressure (water), and one end fitting under vibration. The hose must withstand at least 15 minutes without leakage.

#### Design

As for RC hose, but the red EPDM rubber is specially compounded to be fire resistant. Black, anti-static EPDM Fireproof rubber is also available as an option.



### KR - KINK RESISTANT

#### Purpose

For applications where there is a risk that the hose might be severely flexed, and possibly kinked as a result.

#### Design

KR is only available on hoses which also have a SS wire braid and a rubber cover (RC, FP or SI). An SS reinforcement wire is helically wound on to the SS wire braid, then the rubber cover is applied on top of the helical wire.

#### Limitations

Only available for sizes  $\frac{3}{4}$ " and above.





## Bioflex External Protection.

### SI - SILICONE RUBBER COVERED

#### Purpose

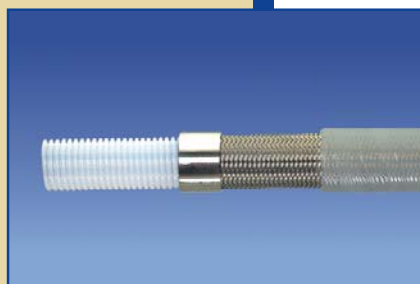
As for RC hose, but where the hose may be required to withstand temperatures up to 180°C. SI grade hose is semi-transparent, allowing visual monitoring of the braid.

#### Design

An SS braided hose assembly has an external smooth finish silicone rubber cover vulcanised directly onto the braid.

#### Limitations

Up to 3/4" Bore available in lengths up to 10 metres. 1" and above normally only available in up to 5 metre lengths.



### SR - SCUFF RINGS

#### Purpose

For medium duty applications where the hose requires some protection against abrasion when dragged over the ground, but where a full rubber cover would be too heavy and cumbersome.

#### Design

Specially moulded abrasion resistant rubber scuff rings are placed every half metre along the hose.

#### Limitations

Available for hose sizes 1" (25mm) and above only. The operating temperature should not exceed 140°C (internal).



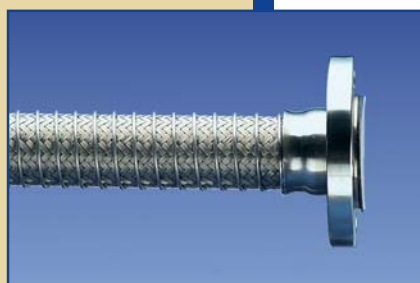
### PC - PROTECTION COIL

#### Purpose

For applications where the hose requires protection against abrasion when dragged over the ground, but where any rubber reinforcement is not permissible due to temperature, chemicals etc.

#### Design

A stainless steel wire helix is wound onto the braid, and welded to the ferrules at each end.



## Bioflex Standard Flange Fittings.

### Description

Swivel flange fitting, integral PTFE lined and flared.

### Specifications

Flanges to ASA 150 (ASME B16.5 Class 150), DIN PN10, or BS10 Table E. Other flange ratings to these specifications are also available, and other types of flanges can be supplied.

### Materials

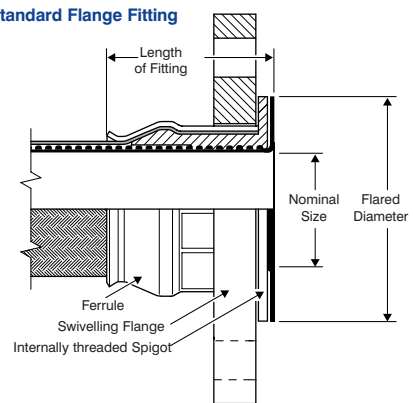
Spigot, flange and ferrule are normally supplied either in MS (all components in mild steel, zinc plated) or SS (AISI 316 Spigot, AISI 304 Flange and Ferrule). Alternative options include grade 316 SS flanges, polypropylene flanges mounted on SS spigots, nickel plated MS flanges, and other materials.

### Maximum Working Pressures

These are defined by the flange specification. For standard PN10 and PN40 etc. the Maximum Working Pressures are 10 Bar and 40 Bar respectively. For ASA 150 the Maximum Working Pressure is 230 psi or 16 Bar. Test Pressures are 1.5 times the MWP. (Exceptions: when the hose MWP is less than the fitting MWP).



Standard Flange Fitting



| Nominal Size<br>Flange & Hose |    | Fitting<br>Length |    | Flared Diameter |    |          |     | Recommended<br>Bolt Tightening<br>Torques |         | Weight/<br>Fitting |
|-------------------------------|----|-------------------|----|-----------------|----|----------|-----|---|---------|--------------------|
|                               |    |                   |    | ASA 150         |    | DIN PN10 |     |   |         |                    |
| in                            | mm | in                | mm | in              | mm | in       | mm  | ft.lbs                                    | mtr.kgs | kg                 |
| 1/2                           | 15 | 1 5/8             | 42 | 1               | 32 | 1 3/8*   | 32* | 8   | 1.10    | 0.54               |
| 3/4                           | 20 | 2 1/4             | 57 | 1 1/2           | 43 | 2*       | 43* | 8   | 1.10    | 0.88               |
| 1                             | 25 | 2 5/8             | 60 | 2               | 50 | 2 5/8    | 64* | 10  | 1.40    | 0.96               |
| 1 1/4                         | 32 | 2 5/8             | 60 | 2 1/2           | 63 | 3        | 78  | 12  | 1.70    | 1.36               |
| 1 1/2                         | 40 | 2 7/8             | 63 | 2 7/8           | 73 | 3 1/2    | 88  | 15  | 2.10    | 1.75               |
| 2                             | 50 | 2 5/8             | 66 | 3 5/8           | 92 | 4        | 102 | 25  | 3.50    | 2.70               |

\*These are not the correct flared diameters for DIN PN10, but they are the maximum diameter to which the PTFE can be flared out.

### Larger Flange Options

2 1/2" and 3" ASA150 flanges, and 2 1/2" DIN PN10 flanges can also be fitting to 2" Bioflex Hose, including a 15° internal taper to 'step up' the bore.



## Bioflex DIN 11851 Fittings.

### Description

DIN 11851 male and female fittings, integral PTFE lined (or unlined). The PTFE sealing face is hot moulded into the correct shape, designed to achieve the optimum pressure seal.

### Specification

Generally to German DIN 11851 specifications.

### Materials

Spigots in AISI 316 SS nuts and ferrules in AISI 304 SS

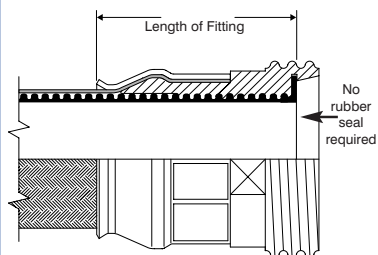
*NB : The PTFE lined male fitting is designed to be used without a rubber seal.*

### Maximum Working Pressures (MWP)

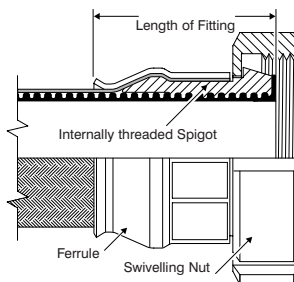
SS Braided,  $\frac{3}{4}$ " to  $1\frac{1}{4}$ " MWP = 40 Bar.  $1\frac{1}{2}$ " and 2" MWP = 25 Bar

PB Braided, MWP as for hose. Test Pressure = 1.5 x MWP

DIN 11851 Male Fitting



DIN 11851 Female Fitting



| Nominal Size   |    | Length (Male)  |    | Length (Female) |    | Weight of Fitting |              |
|----------------|----|----------------|----|-----------------|----|-------------------|--------------|
| in             | mm | in             | mm | in              | mm | Male<br>kg        | Female<br>kg |
| $\frac{1}{2}$  | 15 | $1\frac{7}{8}$ | 49 | $1\frac{5}{8}$  | 42 | 0.13              | 0.16         |
| $\frac{3}{4}$  | 20 | $2\frac{3}{8}$ | 60 | $2\frac{3}{8}$  | 60 | 0.18              | 0.22         |
| 1              | 25 | $2\frac{3}{8}$ | 60 | $2\frac{5}{8}$  | 67 | 0.22              | 0.36         |
| $1\frac{1}{4}$ | 32 | $2\frac{1}{2}$ | 65 | $2\frac{3}{4}$  | 70 | 0.27              | 0.47         |
| $1\frac{1}{2}$ | 40 | $2\frac{5}{8}$ | 67 | $2\frac{7}{8}$  | 73 | 0.33              | 0.55         |
| 2              | 50 | $2\frac{5}{8}$ | 67 | $2\frac{7}{8}$  | 73 | 0.58              | 0.93         |

## Bioflex Standard Cam Action Fittings.

### Description

Cam Action quick release coupler (female) fitting, integral PTFE lined.

### Specifications

Generally to Mil-C-27487 and DIN2828. (Fully interchangeable with other makes of Cam Action type quick-release fittings to these specifications).

### Materials

Cam Action spigot in AISI 316 SS, ferrule in AISI 304 SS, standard gasket in buna N nitrile rubber, with alternatives available.

### Limitations

Usable at temperatures up to 100°C, but higher temperature use is possible, dependent upon the gasket materials.

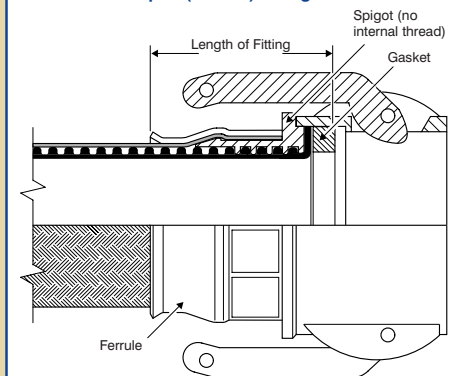
PTFE Lined Cam Action Adaptor (Male) Fittings are also available. Specification, materials and size range as for Female (Coupler) Fittings.

### Maximum Working Pressures

All sizes 10 Bar (Test Pressure = 15 Bar).



Cam Action Coupler (Female) Fitting

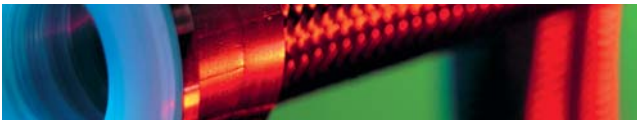


### ALTERNATIVE GASKETS

FEP-encapsulated Silicone Rubber Gasket. (Rubber fully encapsulated inside an FEP outer). Usable at temperatures up to 160°C. Other types of gaskets are also available, including EPDM or Viton Rubber or PTFE envelope gaskets.

| Nominal Size |    | Length |    | Weight |
|--------------|----|--------|----|--------|
| in           | mm | in     | mm | kg     |
| 3/4          | 20 | 2 1/4  | 57 | 0.35   |
| 1            | 25 | 2 1/2  | 63 | 0.45   |
| 1 1/2        | 40 | 2 3/4  | 70 | 0.84   |
| 2            | 50 | 2 3/4  | 70 | 1.10   |





# **Bioflex Autolock Cam Action Fittings.**

## **Description**

Locking Arm Cam Action Quick Release Fitting. The lock is released by pulling a wire ring horizontally away from the fitting, then using the ring to pull the arm open.

## **Construction & Materials**

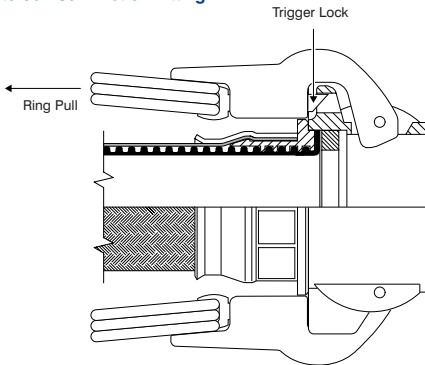
As for the Cam Action Coupler on the opposite page. The fitting is the same length, but has ring operated trigger locks on both arms.

## **Maximum Working Pressures**

All sizes 10 Bar (Test Pressure = 15 Bar).

| Nominal Size |    | Length |    | Weight |
|--------------|----|--------|----|--------|
| in           | mm | in     | mm | kg     |
| 1            | 25 | 2 1/2  | 63 | 0.59   |
| 1 1/2        | 40 | 2 3/4  | 70 | 1.15   |
| 2            | 50 | 2 3/4  | 70 | 1.40   |

**Autolock Cam Action Fitting**



## **CAM ACTION ADAPTOR TO FLANGE CONNECTOR**

### **Description & Purpose**

SS Cam Action Adaptor (male) to Flange Connector, PTFE lined right through the connector.

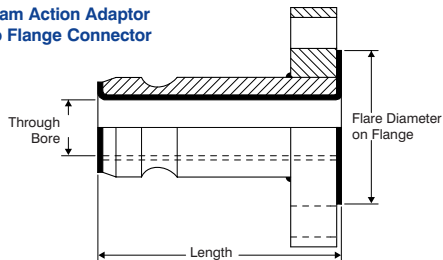
### **Construction & Materials**

The 316 SS Cam Action Adaptor and Flange components are welded together, and include a thick wall PTFE liner, either GP or AS grade, flared at both ends.



| Cam Action Adaptor Size |    | Flange Size & Specification | Flare Dia. on Flange |     | Length |     | Through Bore |    |
|-------------------------|----|-----------------------------|----------------------|-----|--------|-----|--------------|----|
| in                      | mm |                             | in                   | mm  | in     | mm  | in           | mm |
| 1                       | 25 | 1" ASA 150                  | 2.00                 | 50  | 4 1/8  | 105 | 0.84         | 21 |
| 1                       | 25 | DN25/PN16                   | 2.58                 | 64  | 4 1/8  | 105 | 0.84         | 21 |
| 1 1/2                   | 40 | 1 1/2" ASA 150              | 2.87                 | 73  | 4 3/8  | 118 | 1.35         | 34 |
| 1 1/2                   | 40 | DN40/PN16                   | 3.47                 | 88  | 4 3/8  | 118 | 1.35         | 34 |
| 2                       | 50 | 2" ASA 150                  | 3.63                 | 92  | 4 3/8  | 118 | 1.69         | 43 |
| 2                       | 50 | DN50/PN16                   | 4.00                 | 102 | 4 3/8  | 118 | 1.69         | 43 |

**Cam Action Adaptor to Flange Connector**





## Bioflex Triclover Fittings.

### Description

Triclover fitting (also known as Triclamp or Clamp Pipe fittings) integral PTFE lined and hot formed. Design patented in Europe.

### Specifications

Generally in accordance with BS4825: Pt 3, ISO 2852 or DIN 32676.

### Materials

Spigots AISI 316 SS. Ferrules AISI 304 SS.

### Size of Triclover Fittings

BS4825 and DIN32676 are the popular, listed specifications. Both specify the same range of flange diameters and groove dimensions, but specify different nominal sizes for the attached pipes.

It is therefore important that when ordering, both the hose size *and* the Triclover flange diameter must be stated.

The lists show that in some cases, the end fitting outlet diameters are 'stepped up' in order to match the inside diameter of the pipe to which the fitting is to be connected.

Other hose sizes and outlet diameters to those shown in the lists are also available, to special order.

Customers are advised to check carefully that the hose bore size, flange diameter, and outlet diameter specified are in accordance with their requirements.

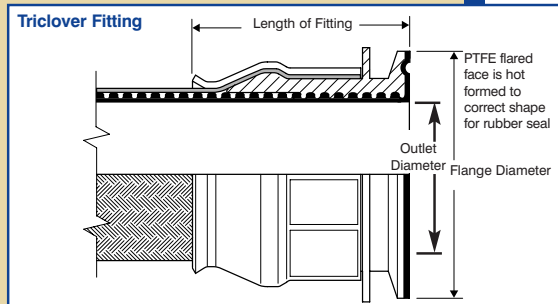
### Maximum Working Pressures

All sizes 16 Bar. (Test Pressure = 24 Bar).

### Non-lined Triclover Fittings

Non-lined Triclover Fittings are also available, manufactured in the same materials to the same specifications as the lined Triclover Fittings.

Available with polished or electropolished inside diameters. 'Step Up/Down' option available.



### Standard Range -BS 4825 Pt 3 Range

| Actual Hose Bore Size |      | Nominal Pipe Size |      | Actual Pipe Inside Dia. |      | Hose Fitting Outlet Dia. |       | Flange Dia. |      | Length of Fitting |    |
|-----------------------|------|-------------------|------|-------------------------|------|--------------------------|-------|-------------|------|-------------------|----|
| in                    | mm   | in                | mm   | in                      | mm   | in                       | mm    | in          | mm   | in                | mm |
| 3/8                   | 9.5  | 1/2               | 12.7 | 3/8                     | 9.5  | 3/8                      | 9.5   | 1           | 25.4 | 2                 | 50 |
| 7/8                   | 22.2 | 1                 | 25.4 | 7/8                     | 22.2 | 7/8                      | 22.2  | 2           | 50.5 | 2 3/8             | 60 |
| 1 3/8                 | 34.9 | 1 1/2             | 38.1 | 1 3/8                   | 34.9 | 1 3/8                    | 34.9  | 2           | 50.5 | 2 3/8             | 66 |
| 1 7/8                 | 47.6 | 2                 | 50.8 | 1 7/8                   | 47.6 | 1 7/8                    | 47.6  | 2 1/2       | 64.0 | 2 3/8             | 66 |
| 2                     | 50.8 | 2 1/2             | 63.4 | 2 3/8                   | 60.3 | 2 3/8                    | 60.3* | 3.05        | 77.5 | 2 3/8             | 66 |
| 2                     | 50.8 | 3                 | 76.1 | 2 7/8                   | 73.0 | 2 7/8                    | 73.0* | 3.58        | 91.0 | 2 3/8             | 66 |

### Special Range - DIN 32676 Range

| Actual Hose Bore Size |      | Nominal Pipe Size | Actual Pipe Inside Dia. | Hose Fitting Outlet Dia. | Flange Dia. | Length of Fitting |
|-----------------------|------|-------------------|-------------------------|--------------------------|-------------|-------------------|
| in                    | mm   | mm                | mm                      | mm                       | mm          | mm                |
| 3/8                   | 10   | DN10              | 10.0                    | 10.0                     | 34.0        | 45                |
| 5/8                   | 16.0 | DN15              | 16.0                    | 16.0                     | 34.0        | 50                |
| 3/4                   | 19.0 | DN20              | 20.0                    | 19.0                     | 34.0        | 55                |
| 1                     | 25.4 | DN25              | 26.0                    | 26.0                     | 50.5        | 60                |
| 1 1/4                 | 32.0 | DN32              | 32.0                    | 32.0                     | 50.5        | 63                |
| 1 3/8                 | 34.9 | DN40              | 38.0                    | 34.9                     | 50.5        | 66                |
| 1 7/8                 | 47.6 | DN50              | 50.0                    | 47.6                     | 64.0        | 66                |
| 2                     | 50.8 | DN65              | 66.0                    | 66.0*                    | 91.0        | 70                |

\* = Outlet diameters 'stepped up'.

\*\*3/8" Hose size fittings - the flared PTFE face does not extend to cover the groove.

## Bioflex SMS & RJT Fittings.

### SMS FEMALE FITTING

#### Description

SMS female fitting, integral PTFE lined.

#### Specification

Generally to Swedish SMS 1148 specification.

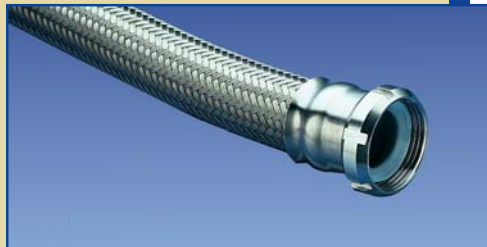
#### Materials

Spigot AISI 316, Ferrule & Nut 304.

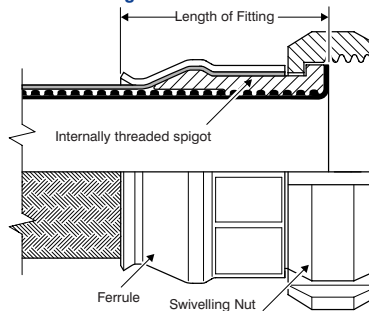
#### Maximum Working Pressures

All sizes 10 Bar. (Test Pressure = 15 Bar).

| Nominal Size                  |    | Length                        |    | Weight |
|-------------------------------|----|-------------------------------|----|--------|
| in                            | mm | in                            | mm | kg     |
| 1                             | 25 | 2 <sup>1</sup> / <sub>2</sub> | 63 | 0.25   |
| 1 <sup>1</sup> / <sub>4</sub> | 32 | 2 <sup>5</sup> / <sub>8</sub> | 67 | 0.36   |
| 1 <sup>1</sup> / <sub>2</sub> | 40 | 2 <sup>3</sup> / <sub>4</sub> | 70 | 0.46   |
| 2                             | 50 | 2 <sup>3</sup> / <sub>4</sub> | 70 | 0.64   |



SMS Female Fitting



### RJT FEMALE FITTING

#### Description

RJT female fitting, integral PTFE lined.

#### Specification

Generally to BS4825: Pt 5.

#### Materials

Spigot AISI 316, Ferrule & Nut 304.

#### Alternative Specification

There is a variant of the RJT fitting known as the ILC fitting, which uses the RJT nut.

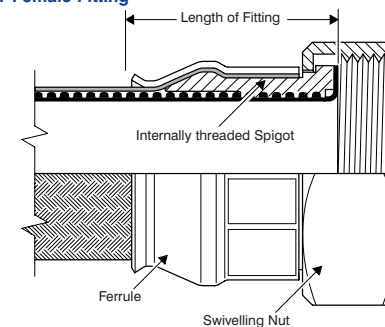
#### Maximum Working Pressures

All sizes 10 Bar. (Test Pressure = 15 Bar).

| Nominal Size                  |    | Length                        |    | Weight |
|-------------------------------|----|-------------------------------|----|--------|
| in                            | mm | in                            | mm | kg     |
| 1                             | 25 | 2 <sup>1</sup> / <sub>2</sub> | 63 | 0.25   |
| 1 <sup>1</sup> / <sub>4</sub> | 32 | 2 <sup>5</sup> / <sub>8</sub> | 67 | 0.36   |
| 1 <sup>1</sup> / <sub>2</sub> | 40 | 2 <sup>3</sup> / <sub>4</sub> | 70 | 0.46   |
| 2                             | 50 | 2 <sup>3</sup> / <sub>4</sub> | 70 | 0.64   |



RJT Female Fitting



## Bioflex Non-Lined End Fittings.

### FIXED MALE FITTING

#### Description

Fixed male fitting, BSP taper thread non-lined.

#### Specifications

Threads to BS21.

#### Materials

All components are either zinc plated mild steel, AISI 316 SS or polypropylene with an AISI 304 SS Ferrule.

#### Alternatives

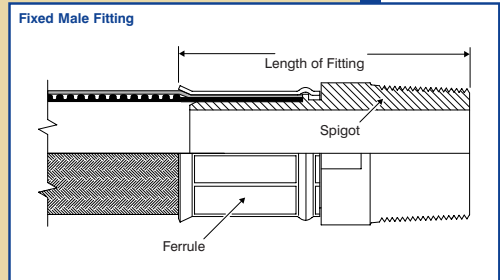
NPT, metric or parallel screwthreads with flat face or 60° internal cone.

#### Maximum Working Pressures

As given for the hose. (Test Pressures = MWP x 1.5).

#### Limitations

Polypropylene Fixed Male Fittings are only usable between -10°C and +50°C, and the Maximum Working Pressure is 50% less.



| Nominal Size |    | Length |     | Weight |
|--------------|----|--------|-----|--------|
| in           | mm | in     | mm  | kg     |
| 1/2          | 15 | 2 5/8  | 67  | 0.10   |
| 3/4          | 20 | 3 1/2  | 89  | 0.16   |
| 1            | 25 | 3 7/8  | 98  | 0.26   |
| 1 1/4        | 32 | 4 3/8  | 110 | 0.40   |
| 1 1/2        | 40 | 5 1/8  | 130 | 0.58   |
| 2            | 50 | 5 1/2  | 140 | 0.95   |

### FEMALE UNION FITTING

#### Description

60° cone seat female union fitting, BSP parallel thread non-lined.

#### Specifications

Generally to BS5200 and ISO 1179.

#### Materials

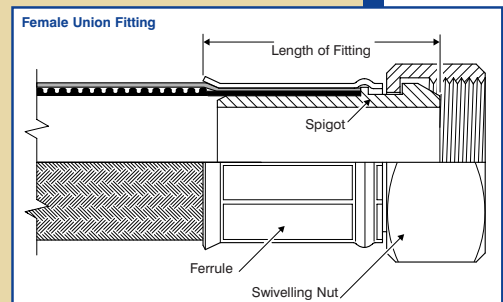
All components are either zinc plated mild steel or AISI 316 SS with an AISI 304 Ferrule.

#### Alternatives

These fittings may be supplied with a flat seat or with a metric or NPSM thread. Lug Nut female union (and male) fittings are also available in gun metal or stainless steel.

#### Maximum Working Pressures

As given for the hose. (Test Pressures = MWP x 1.5).



| Nominal Size |    | Length |     | Weight |
|--------------|----|--------|-----|--------|
| in           | mm | in     | mm  | kg     |
| 1/2          | 15 | 2 1/2  | 63  | 0.08   |
| 3/4          | 20 | 3 1/2  | 89  | 0.18   |
| 1            | 25 | 3 1/2  | 89  | 0.27   |
| 1 1/4        | 32 | 3 1/2  | 89  | 0.50   |
| 1 1/2        | 40 | 3 7/8  | 98  | 0.58   |
| 2            | 50 | 4      | 100 | 0.92   |





# Bioflex Dip Pipes.

## DIP PIPES

### Description

Fixed Dip Pipes are rigid tubes, either straight or 90° elbow, which are directly crimped to the end of Bioflex hoses. They are designed for insertion into drums, tanks and reaction vessels in order to suction drain (or inject) process fluids transferred through the hose.

### Materials

Standard dip pipes are in anti-static (AS) PTFE. Also available in 316 SS, polypropylene, virgin PTFE (GP) and other materials.

### How to Order

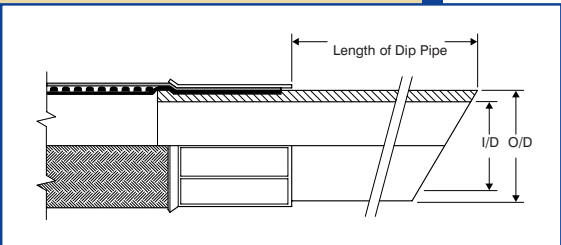
Specify the size and material of the dip pipe, whether it is straight or 90° elbow. Give the length of the straight leg of the dip pipe and the length of the flexible section of hose separately.

### Maximum Working Pressures

Dip Pipes are only tested to 4 Bar Pressure, and are not suitable for use at pressures higher than 3 Bar. They are usable at negative pressure up to full vacuum.

### Lengths

Dip Pipes can be supplied in any length to individual requirements.



| Nominal Hose Bore Size |    | Approximate Dip Pipe Dimensions |    |                 |    |
|------------------------|----|---------------------------------|----|-----------------|----|
|                        |    | Outside Diameter                |    | Inside Diameter |    |
| in                     | mm | in                              | mm | in              | mm |
| 1/2                    | 15 | .63                             | 16 | .31             | 8  |
| 3/4                    | 20 | .87                             | 22 | .51             | 13 |
| 1                      | 25 | 1.14                            | 29 | .83             | 21 |
| 1 1/2                  | 40 | 1.54                            | 39 | 1.00            | 27 |
| 2                      | 50 | 2.17                            | 55 | 1.58            | 40 |



## Bioflex Steam Heated Hose Assemblies.



### CH HOSE ASSEMBLIES

#### Purpose

For use in applications where the temperature of the process fluid must be maintained as it passes through the hose. This is usually required to prevent solidification or an increase in fluid viscosity. Steam heating is preferred to electrical heating in some applications for reasons of availability or safety, but is less controllable.

#### Description

The heating element comprises a small diameter PTFE heating hose, 6mm or 9.5mm bore size, with a single SS wire braid. This is spirally wrapped around the hose, with inlet and outlet ports attached, either both at one end or at opposite ends of the hose assembly. In the case of hose assemblies longer than 3 metres, it is usual to have several heating hoses with inlet ports at opposite ends and along the hose. This reduces the effects of temperature loss over the length of the Hose Assembly. The thermal insulation is usually closed-cell silicone foam rubber. The outer cover is a SS wire braid with a rubber cover if necessary.

#### Design

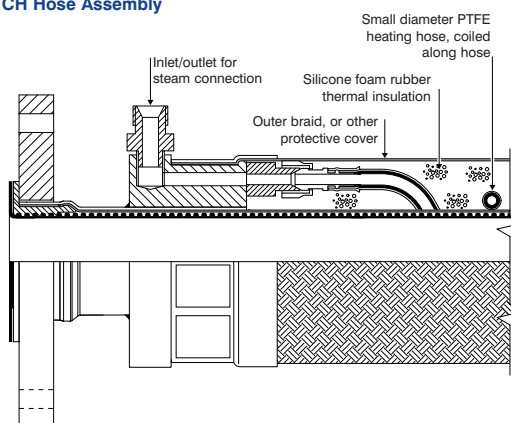
Each hose is custom designed and built to suit the requirements of the particular application. The following information is therefore required:

- Fluid in Hose Assembly
- Maintained Temperature of Fluid in Hose
- Temperature of Steam or Fluid in the Heating Hose
- Min/Max Ambient Temperature
- Pressure/Vacuum Applied to Fluid
- External Conditions of Abrasion etc

#### Specifications

As for Bioflex GP, SS on pages 9 and 10, except that the minimum bend radius is doubled, and the outside diameter and weight are significantly increased in line with the particular design.

CH Hose Assembly



## Bioflex Electrically Trace Heated Hose Assemblies.



### ETH HOSE ASSEMBLIES

#### Purpose

For use in applications where the temperature of the process fluid must be maintained as it passes through the hose. In some applications, an additional 'melt out' facility may also be required.

#### Description

The heating element comprises either a resistance or self-regulating element spirally wrapped around the hose assembly. Resistance element heated hoses usually also require a temperature sensor to be built in to the construction. The power leads and (if applicable) temperature sensor leads emerge from the hose assembly at one end, through glands and conduits. The thermal insulation is foam rubber, silicone foam rubber for temperatures above 80°C. The outer cover may be a polypropylene yarn or SS wire braid with a rubber cover if necessary, or a ribbed PVC waterproof sleeve.

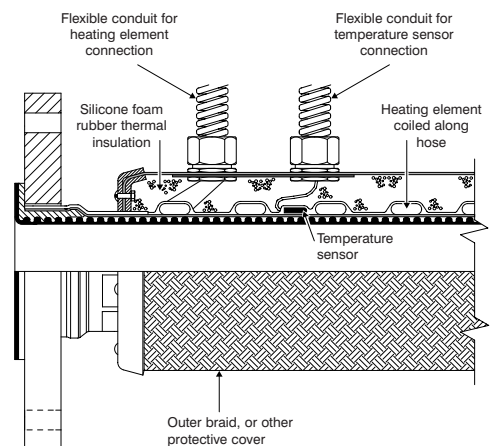
#### Design

Each hose is custom designed and built. Application details must be supplied by filling in an "ETH Hose Questionnaire", available from Aflex Hose. Generally, for Hazardous Areas, particularly "ZONE 1", the Self Regulating type of heating element is employed, with or without a temperature sensor and control, and flameproof glands and conduit are also required. The watts per metre of the heating element, the pitch of the spiral on the hose, and the thickness of the thermal insulation are all calculated in accordance with established formulae to give the required maintained temperature.

#### Specifications

As for Bioflex GP, SS on pages 9 and 10, except that the Minimum Bend Radius is doubled and the outside diameter and weight are significantly increased in line with the particular design. Maximum ETH Hose Assembly Lengths are as Bioflex GP, SS.

ETH Hose Assembly





**AFLEX** HOSE LTD

**Use  
in Application**

Usage limitations are specified herein, but other factors may be present in any given application including mechanical abuse, abrasion, safety risks to staff, etc which may affect the suitability and service life of the product. Unless all these details are given to Aflex Hose Ltd in advance so that the best possible product for the application can be recommended Aflex Hose Ltd cannot accept any responsibility for unsatisfactory performance.

**Product Development**

Because Bioflex is a new product, still undergoing development and modification, the information in this brochure is subject to change without notice, except in the unlikely event that technical specifications have to be downgraded, in which case advice will be given immediately.

**The World's Leading Manufacturer of PTFE Flexible Hose.**

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*Aflex Hose Distributors exist in most countries. For further details, please contact Aflex Hose on the number above*



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