

# HOSE END FITTINGS

Manufactured by Aflex Hose Ltd

LOOSE END FITTINGS, FERRULES and ADAPTORS  
- For Self-Assembly by Customers

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## AFLEX HOSE END FITTINGS MANUFACTURE

Aflex Hose was established as a PTFE hose manufacturing company in 1973 and, since then, has led the world in inventing and developing all the major innovations in PTFE hose design for use in process fluids transfer applications. Pharmaceutical, Biotech and Chemical manufacturing plants worldwide recognise the Aflex PTFE hose product range to be the best available, and have adopted them as 'site standard' over many years.

Aflex Hose PTFE Lined hose is also widely used in Automotive and Motorsport applications.



Technically trained Aflex Hose sales staff are available to respond quickly and effectively to every kind of enquiry, and to advise the optimum hose solution for any application.

### HISTORY

Until 1998, Aflex Hose sourced all their PTFE Hose end fitting components from external suppliers.

Sometimes, however, there were disadvantages, including poor quality, late deliveries and difficulties obtaining small quantities of non-standard designs.

Aflex Hose therefore decided to manufacture their own fittings themselves, and set-up their own machine shop for this purpose.

### TOTAL MANUFACTURE

Having confirmed the advantages of manufacturing end fittings in-house, Aflex Hose recently commenced a major investment program, re-equipping their machine shop with fully automated, state-of-the-art CNC Lathes.

Improvements have resulted in all areas - better quality, higher productivity, improved surface finishes and on time deliveries.

The end fitting manufacturing operation has been further improved by the purchase of an in-house polishing and electropolishing plant, as well as a nut-crimping facility.

The hose products from Aflex have always been manufactured in-house but now this principle has been extended to include end fittings.

As a result, the highest possible levels of control over quality, delivery and design flexibility have now been achieved for the complete range of hose and fitting products supplied by Aflex Hose USA, LLC.

Aflex are able to supply loose, standard end fittings, ferrules and adaptors to customers who are able to assemble themselves.

Now, Aflex are also able to supply customer specified end fitting designs to order, in a wide variety of sizes, materials and surface finishes.



Surfscan, measuring internal surface finish

## MACHINED FITTINGS - Materials, Finishes and Size Range

Aflex Hose are able to supply a standard range of end fittings, supplied loose, as described on pages 5 & 6, but are also able to supply customer specified end fittings in the size range, materials and finishes as described below.

### SIZE RANGE

Major Diameter from 10mm ( $\frac{3}{8}$ " ) to 190mm ( $7\frac{1}{2}$ " )

Bore Diameter from 6mm ( $\frac{1}{4}$ " ) to 150mm (6" )

### MATERIALS

#### Grades of Stainless Steel:

Aflex Grade Reference	BS - British Standard	AISI - American Standard	EN - European Norm Standard	Standard Stock (S)
316 SS	316 S31	316	1.4401	-
316 L SS	316 S11	316 L	1.4404	S
316 C SS	316 C16	CF8M	1.4408	-
1.4435 SS	316 S13	316L	1.4435	S
1.4571 SS	320 S31	316 TI	1.4571	S
304 SS	304 S31	304	1.4301	-
304 L SS	304 S11	304L	1.4307	S
303 SS	303 S31	303	1.4305	S
321 SS	321 S31	321	1.4541	-

#### Other Materials (available to special order)

Carbon Steel (zinc plated) Hastelloy C276, Titanium, Duplex, Monel 400, Inconel, Brass, Bronze and other metals.

Polypropylene, PTFE, PVDF, PEEK, Acetal Resin and other plastics.

### SURFACE FINISHES (NORMALLY APPLICABLE TO STAINLESS STEEL COMPONENTS)

Standard external machined finishes are  $<0.8\mu$  mtr Ra =  $<32\mu$  inRa

	Standard		Best	
	$\mu$ mtr Ra	$\mu$ in Ra	$\mu$ mtr Ra	$\mu$ in Ra
Machined Bore Finishes	$<0.8$	$<32$	$<0.2$	$<8$
Electropolished Bore Finishes	$<0.375$	$<15$	$<0.18$	$<7$

### BATCH TRACEABILITY and MATERIAL CERTIFICATION

- Full batch traceability available for all components.
- Material Certification available in accordance with EN 10204.
- Certificates of Conformity to BS EN ISO/IEC 17050.

## STANDARD END FITTINGS (for AFLEX PTFE Hose Only) For Process Fluid Applications

- Materials**
- Internally wetted components in 316 L S/S.
  - External, non-wetted components in 304 L S/S.
  - USA Fittings are in accordance with ASME BPE requirements.
  - European Fittings are in accordance with European Norms, EN ISO Specification requirements.



Please consult with Aflex Hose for further details.

## STANDARD END FITTINGS (for AFLEX PTFE Hose Only) For Automotive and General Purpose Applications

- Materials** - Internally wetted components in 316 L S/S  
- External, non-wetted components in 304 L S/S  
OR all in zinc plated carbon steel  
- In accordance with SAE, ANSI or BS specification and thread requirements, as appropriate.



FERRULES & CLAMPS TO SUIT - PAGE 5

Please consult with Aflex Hose Ltd for further details.

# CONDITIONS OF SALE

## General

(1) Aflex Hose Products have not been designed or tested for use in **Aerospace, Medical Implantation or Radioactive applications**, and such use is therefore strictly prohibited unless written approval from Aflex Hose USA, LLC has been given.

(2) Aflex Hose USA, LLC will not accept liability for any failures of the Aflex Hose Products which are caused by Customers failing to perform their Responsibilities as specified in these Conditions of Sale.

(3) It is the Customer's strict Responsibility to review all of the usage limitations given for the Aflex Hose Product which is intended for use in a particular application, to ensure that the application conditions are in compliance with those usage limitations. The usage limitations are specified both on this page and in the relevant Full Product Brochure on the Aflex Hose website. Customers must always consult the latest, up to date hose product information at the time of ordering, which is only available and downloadable from the Aflex Hose website, or on request from Aflex Hose USA, LLC.

(4) If a Customer sells or passes on any Aflex Hose Products to others, then it is the Customer's Responsibility to ensure that the final end user of the Aflex Hose Product is supplied with this document and the Aflex Hose website address, together with notification of the requirement to review the usage limitations.

(5) The Customer must accept, however, that the usage limitations specified elsewhere in the Hose Product Information on the Aflex Hose Website and on this page are intended as a guide only, since every possible factor in every type of application cannot possibly be anticipated and fully covered. It is therefore the Customer's Responsibility to ensure the design suitability and safety of the Aflex Hose Products in their intended applications, giving particular consideration to the chemical and electrostatic compatibility of the fluids or gases passing through, the possibility of diffusion of fluid or gases through the PTFE hose lining, the possibility of external corrosive conditions, the types and likelihood of excessive mechanical abuse, such as abrasion (internal or external), crushing, excessive flexing or vibrations etc, and any excessive temperature and/or pressure "pulsing" conditions, or any other condition, which may cause premature hose failure. It is also the Customer's Responsibility to consider, and take account of the degree of risk involved in any hose failure, including the provision of adequate protection in the event of any risk to employees or the general public. In applications where any type of hose failure would lead to financial losses if the hose is not replaced immediately, it is the Customer's Responsibility to order and hold in stock spare hose(s) accordingly. It is also the Customer's Responsibility to advise Aflex Hose in writing at the time of placing the enquiry and on any purchase order if there are any special requirements for the hose, including special cleaning, or drying, or extra testing requirements which are in addition to normal industrial standards.

(6) If the Customer has any doubts concerning these or any other usage limitation or safety parameters, it is the Customer's Responsibility to consult Aflex Hose USA, LLC and to request a written response to any queries.

## Hose Service Life

(7) It is not possible to guarantee a minimum service life for any of the Aflex Hose Products which can be applicable for every type of application.

(For example, Aflex PTFE lined hose has been used in one application where it was cycled with hot steam, then cold water, also flexed every 17 seconds 24 hours per day, and the customer was very satisfied with a service life of 3 weeks before failure. In other light duty applications carrying pharmaceutical products, however, many Aflex "Corroflon" hoses are still performing satisfactorily after 20 years in service).

(8) Service life predictions or guarantees can only be given in cases where all the relevant information concerning the application is given in writing to Aflex Hose, and Aflex Hose subsequently replies in writing prior to the order being placed.

(9) If such a written undertaking is not sought and given, then Aflex Hose cannot be held liable for any Aflex Hose Product failure which the Customer considers to be premature, excepting failures which are due to faulty materials or manufacturing defects which occur within 24 months of supply.

## 24 Month Warranty

(10) Aflex Hose USA, LLC warrants its Aflex Hose Products to be free from faulty materials or manufacturing defects from the date of the initial sale, for 24 months. An exception is that all Hose Assemblies which are "ETH" (Electrical Trace Heated) Grade are only warranted for 12 months.

## Product Failure

(11) In the event of a product failure, Aflex Hose requires that the Aflex Hose Products should not be cut up or tampered with, but should be de-contaminated and returned to Aflex Hose, plus a decontamination certificate, for examination and analysis of the fault. The Customer should also provide full details in writing of the application conditions under which the hose failed, including Pressure, Vacuum, Temperature, Flexing and any cycling of any of these, also the fluid and gases passing through the hose, and the total time that the hose has been in service. The Customer may send his own witness to the examination if required. Aflex Hose will provide a full Non Conformance Report for the Customer.

(12) If faulty materials or a manufacturing defect in the hose was responsible for the hose failure, then the maximum liability which will be accepted by Aflex Hose will include the invoice value of the failed hose itself, or the invoice value of the whole customer order if appropriate, also any reasonable costs for removal and replacement of the hose, and costs for packing and despatching the failed hose back to Aflex Hose. Aflex Hose USA, LLC will not accept liability for any other consequential or financial losses, including, but not limited to loss of profits, loss of process products, damage to equipment, or downtime costs.

## Untested Hose for Self Assembly by Customers

(13) Aflex Hose sometimes supplies "loose" hose, without end fittings attached to Self Assembly Customers, who will then cut the hose to length and attach end fittings to make up Hose Assemblies for their own use, or for sale to their own customers.

(14) Unless the Customer requests, and Aflex Hose confirm that the 'loose' hose is pressure tested before supply, such testing is not normally applied by Aflex Hose, because this testing requirement is otherwise satisfied by the Self Assembly Customer during his own testing of the finished Hose Assemblies made up using the 'loose' hose.

Self Assembly Customers must then accept the responsibility to carry out hydrostatic pressure testing of 100% of such assemblies to 1½ times the Maximum Working Pressure (MWP) of the hose assembly as specified in the relevant Full Product Brochure before supply for end use, to validate both the hose and the end fitting attachment.

(15) When pressure testing hoses with a plastic or rubber outer cover, the cover will mask any signs of leakage for a time. It is therefore, required that after the hydrostatic pressure test, each covered hose assembly should also be tested with an internal helium gas pressure of 30 Bar (450 psi) for hose sizes up to 1" and 15 Bar (225 psi) for hose sizes above 1", with the hose assembly immersed in water to enable leak detection by gas bubbles, for a minimum test period of 5 minutes.

(16) The Self Assembly Customer must also accept responsibility for determining and approving the Design Suitability of the hose assemblies for their intended use before supply. This includes proceeding in accordance with (3) and (4) above.

(17) Aflex Hose will only accept liability for its Aflex Hose Products which are assembled by approved Self Assembly Customers if all the hose and fitting components were supplied by Aflex Hose or approved for use by Aflex Hose, and they were assembled and tested in accordance with Aflex Hose's current Manufacturing and Testing Instructions, available to approved Self Assemblers in an I-Bay on the Aflex Hose website.

## Untested Hose Assemblies

(18) Aflex Hose is sometimes requested by Customers to attach non-standard end fittings to hose assemblies which they supply, and in some cases it is not possible to connect these fittings to the Aflex Hose pressure test system. In such cases a Concession not to test is obtained from the Customer, and a label is attached to the hose assembly, warning that it requires pressure testing before use.

## Force Majeure

(19) Aflex Hose USA, LLC shall not be liable for any delay or default in performing in accordance with any Customers' order if the delay or default is caused by conditions beyond its control, including, but not limited to wars, insurrections, protests, strikes, natural disasters or performance failures by Carriers, sub-contractors or other third parties outside the control of Aflex Hose USA, LLC.

## Legal System

(20) This agreement and any sales thereunder shall be governed by the laws of the Commonwealth of Pennsylvania, without regard to conflicts of laws rules.



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