

Aflex Hose Usage Data Sheet

To be applied *in addition* to the relevant Hose Brochure, which specifies other usage limitations in greater detail. Available from Aflex Hose USA, LLC.

Hose Installation & Design Requirements

Hose Assemblies are usually connected at both ends in service. They may then either remain in a fixed, or static configuration or in a flexing, or dynamic configuration.

Whether static or dynamic, Rule 1 concerning the configuration of the hose is that **The bend radius of the hose must never be less than the Minimum Bend Radius (MBR) for the hose** as listed in the relevant hose brochure, this is to prevent the hose from kinking.

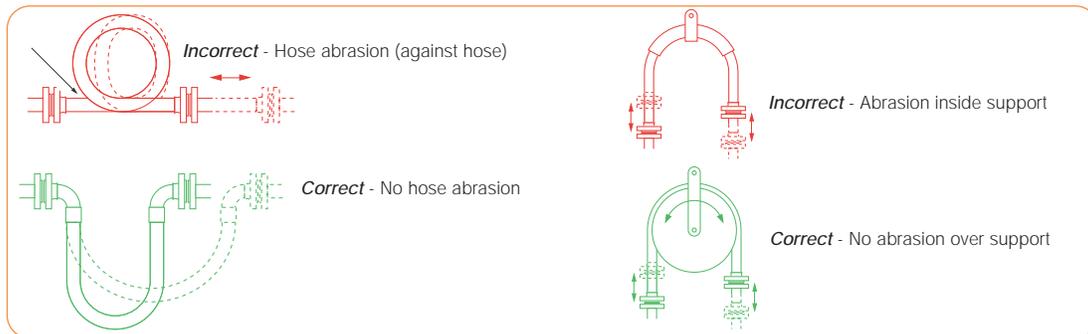
The most common situation when this is likely to occur is when the hose is flexed at the end fitting, with stress being applied to the hose at an angle to the axis of the end fitting. Typically, this happens either because the length of the hose is too short, or because the weight of the hose plus contents creates a stress at an angle to the end fitting.

Rule 2, therefore, is to **Design the configuration to ensure that any flexing in the hose takes place away from the end fittings.**

Rule 3 is that **Flexed Hose configurations which are not suspended vertically downward, but are to one side or upward, should be supported to prevent the hose from falling under its own weight**, which may kink or otherwise damage the hose.

Rule 4 is that **The hose configuration should always be designed, and supported where necessary, to avoid any possibility of external abrasion.**

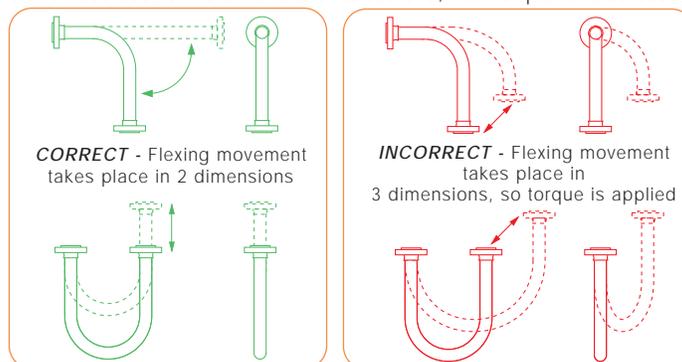
In some cases, the length, configuration and angle of the hose can be designed to avoid abrasion. In others, static or moving support frames or support wheels are required.



Rule 5 is that **The hose must not be subjected to torque, either during connection, or as a result of the flexing cycle.**

Torque (twist) in the hose can be applied during connection if the hose is accidentally twisted, or if the second end being connected is a screwed connection, and the hose is subjected to torque during final tightening.

In a flexing application, if any flexing cycle of the hose occurs in 3 dimensions instead of 2, then torque will also occur:



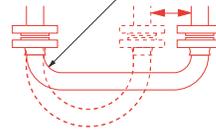
Rule 6 is that **The hose must not be subjected to any excessive form of external abuse, whether mechanical, thermal, chemical or electrical.** Examples are excessive abrasion, crushing, pulling against a corner, cutting, impacting, contact with weld spatter, contact with a high temperature surfaces or flame, contact with any chemical corrosive to external hose components. Also, hose assemblies should not be subjected to high voltages, for example when an electric arc weld is struck with a hose assembly in the circuit.

Rule 7 is that **The Minimum and Maximum Working Temperatures and Maximum Working Pressures must be determined from the relevant Hose Brochure for the relevant hose and end fitting specifications.** It must be noted in particular that the Maximum Temperature and Maximum Pressure are interdependent, also that they depend not only on the braid, but also on any cover material, and the types of end fittings.

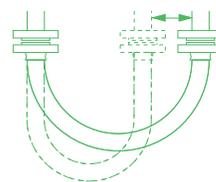
(Dynamic) Configuration

INCORRECT - Hose too short

Less than MBR



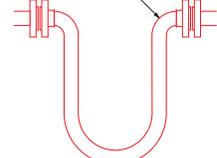
CORRECT - No flex at end fittings



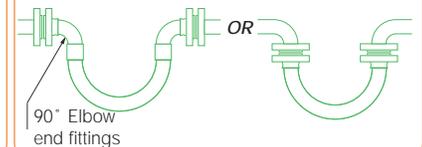
(Static) Configuration

INCORRECT - Weight of hose is at 90° to Axis of End Fittings

Less than MBR



CORRECT - No flex at end fittings



Conditions of Sale

General

Aflex PTFE hose products have not been designed or tested to be suitable for use in any **Aerospace, Medical Implantation or Radioactive applications** and such use is therefore strictly prohibited unless written approval from Aflex Hose USA, LLC has been given.

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.

It is the customer's strict Responsibility to review all of the usage limitations given for the hose which he intends to use in an application, to ensure that the application conditions are in compliance with those usage limitations. The usage limitations are specified both on this page, in the **Full Brochures** for the relevant products on the Aflex Hose website. Customers must always consult the latest, up to date information, which is only available and downloadable from the Aflex website.

It must be accepted, however, that the usage limitations specified elsewhere in the Hose Product Information and on this page are intended as a guide only, since every possible factor in every type of application cannot possibly be covered. It is therefore the Customer's Responsibility to ensure the design suitability and safety of the 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, all of 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 if there are any special requirements for the hose, including cleaning, or drying, or extra testing requirements which are in addition to normal industrial standards.

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, to request a written response to any queries.

It is the Responsibility of the Customer to ensure that if the product is sold on, or passed on, however many times, that all the necessary information including this page and the Aflex Hose website address are also passed on to the final user, together with a specific requirement that the final user must review the usage limitations in terms of his own application.

Hose Service Life

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, 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 Corroflon hoses are still performing satisfactorily after 20 years in service).

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.

If such a written undertaking is not sought and given, then Aflex Hose cannot be held liable for any hose product failure which the customer considers to be premature, excepting failures which are due to faulty materials or manufacturing defects.

24 Month Warranty

Aflex Hose USA, LLC warrants its products to be free from faulty materials or manufacturing defects from the date of the initial sale, for 24 months.

N.B. All ETH Hoses are only warranted for 12 months.

Product Failure

In the event of a product failure, Aflex Hose requests that the product 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.

If faulty materials or a manufacturing defect in the hose was responsible for the failure to perform then, the maximum liability to be accepted by Aflex Hose would 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 products or downtime costs.

Untested Hose for Self Assembly by Customers

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.

Self Assembly Customers must then accept the responsibility to carry out pressure testing of 100% of such assemblies to 1¹/₂ times the Maximum Working Pressure (MWP) if the hose as listed in the Full Product Brochure before supply for end use, to validate both the hose and the end fitting attachment.

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 recommended that after the Hydrostatic Pressure Test, the hose should be tested at the MWP with air under water for a minimum test period of 5 minutes.

Unless the customer requests, and Aflex Hose confirm that their loose hose is pressure tested before supply, such testing is not normally applied by Aflex Hose, because this testing requirement is satisfied by the Self Assembly Customer during his own testing of the finished Hose Assembly.

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 determining and requesting or applying any special tests which may be identified as necessary to ensure suitability for the intended use.

Aflex Hose will only accept liability for its hose products which are assembled by Aflex Approved Self-Assembly Companies 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

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 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

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, strikes, natural disasters or performance failures by Carriers, sub-contractors or other third parties outside the control of Aflex Hose USA, LLC.

Legal System

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

AFLEX HOSE USA, LLC

The World's Leading Manufacturer of PTFE Flexible Hose.

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