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# **RECOMMENDED ENGINEERING SPECIFICATION FOR THE ASSUREFLEX® TRI-FLEX LOOP®**

# **EXPANSION LOOPS AND SEISMIC LOOPS FOR FIRE PROTECTION**

## PART 1 GENERAL

1.01 SECTION INCLUDES

A. AssureFlex® Tri-Flex Loop, model FPTFL2 (+/-2") axial, TFL4 (+/-4") axial and FPTFL8 (+/-8") axial which provides a flexible pipe loop that will absorb and compensate multi-plane movements (X, Y, and Z), plus rotation about those axes simultaneously as well as reduce piping stress.

Models FPTFL2/4/8M (male NPT ends)

Models FPTFL2/4/8F (150# plate steel flanges)

Models FPTFL2/4/8G (groove pipe ends)

Models FPTFL2/4/8W (beveled weld ends)

1.02 MANUFACTURES

A. AssureFlex® Tri-Flex Loop shall be manufactured by Flex Hose Co., FHC-International or pre-approved equal.

PART 2 PRODUCTS

2.01 TRI-FLEX LOOP

## Construction to be 3 equal length sections of annular corrugated 321 / 304L stainless steel close-pitch hose (made in USA) with stainless over-braid (made in USA) that will absorb or compensate for pipe movements in all 6 degrees of freedom (3 coordinate axes, plus rotation about those axes) simultaneously.

1. The corrugated metal hose, braid(s), and a stainless steel ring-ferrule/band (material gauge not less than .048") must be integrally seal welded using a 100% circumferential, full penetration TIG welds. End fittings shall be selected per application. Fittings must be attached using a 100% circumferential TIG weld.
2. Braided stainless steel Tri-Flex Loops must be suitable for operating temperatures up to 850 degrees F (455 degrees C). Braided
3. Tri-Flex Loop must be designed for pressure testing to 1.5 times their maximum rated working pressure and a minimum 4:1 (burst to working) safety factor.
4. Each braided Tri-Flex Loop shall be individually leak tested by the manufacturer using air-under-water and/or hydrostatic pressure to 1.5 times rated working pressure prior to shipment.
5. Tri-Flex Loops shall be prepared for shipment using a cut-to-length metal shipping bar, tacked securely between the elbows of the two parallel legs, to maintain the manufactured length during shipping. Shipping bar must be removed prior to system start-up.
6. The Flex-Hose Co. Tri-Flex hanger assembly kit shall be used to support and hang the Tri-Flex Loop. The UL Listed Seismic Wire/Cable assemblies conform to the requirements of the ASCE (American Society of Civil Engineers) guidelines for structural applications of wire rope, in that the cable is pre-stretched and the permanent end fittings maintain the break strength of the cable with a safety factor of two.
7. The pre-manufactured flexible loop shall be installed and guided following the manufacturer's published installation instructions.
   1. The Flex-Hose Co. Tri-Flex Loop requires no pipe guides.
   2. Manufactured loops that require pipe alignment guides shall use "Spider" type with outer housing ring affixed to building structure with rigid elements. Units shall be fabricated from carbon steel. Pipe hangers and/or roller supports shall not be considered acceptable for use as guides.
8. The pre-manufactured flexible loop design shall be tested by an independent third party to confirm simultaneous movement in X, Y, and Z planes plus rotation about those axes. Third party testing will document and confirm motion capabilities of the device. Device testing to include large and irregular movements similar to movement that may be caused by seismic movement analytically using finite element modeling and computer simulation as well as physical testing of the device. Independent third party testing data and documentation are to be furnished upon the engineers request during pre-qualification process or at the time of submission.
9. The pre-manufactured flexible loop shall meet the requirements of the 2022 International Building Code (IBC) and the American Society of Civil Engineers code requirements for Total Maximum Displacement and accidental torsion as directed in IBC Chapter 16 and ASCE 7-22, Chapter 13.
10. Tri-Flex Loop shall be third party listed by UL (Underwriters Laboratories) for use in fire protection systems in both the United States and Canada
11. All standard models that are UL listed must be rated for 300 PSI ½”-3” and 175 PSI for sizes 4”-12” nominal hose inside diameter.
12. High Pressure models UL listed for 300 PSI 4”-6” nominal hose inside diameters to be used for where pressure indicates.
13. For the Canadian market they must be standard B51 certified, inspected and tested by the Technical Standards and Safety Authority of Canada
    1. WARRANTY

Tri-Flex Loop must have a 5-year full replacement warranty when installed in accordance with all specifications and installation instructions as described in the Flex-Hose Tri-Flex Loop Installation and Maintenance Instructions.