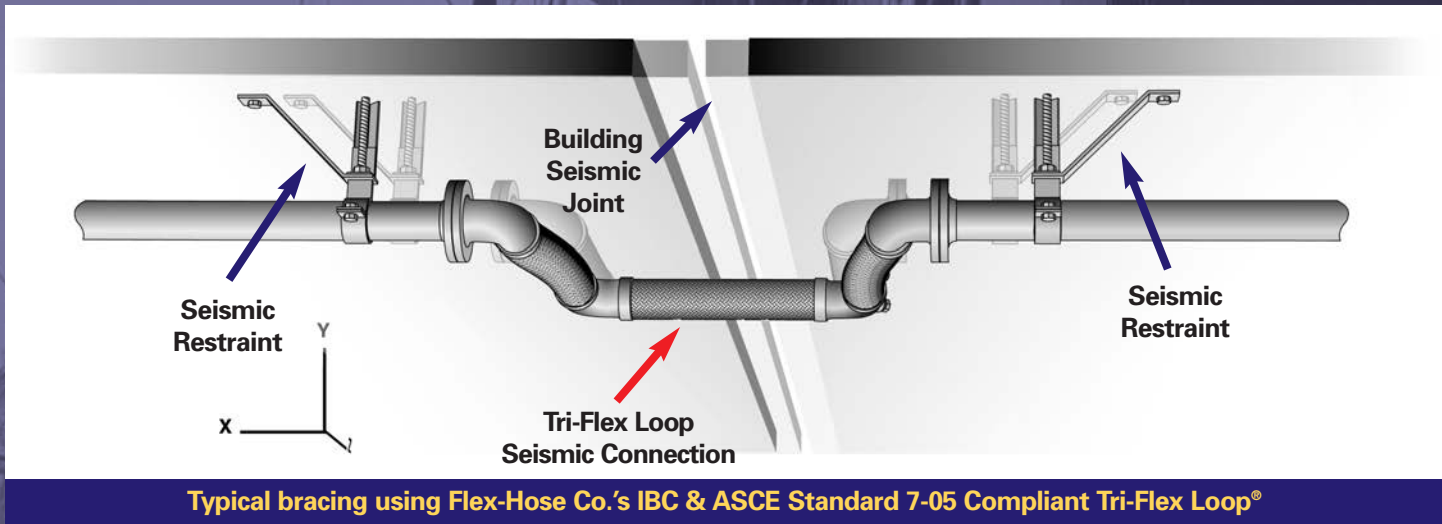


Protect your building from critical
SEISMIC MOVEMENT
with the **Tri-Flex Loop**®



Isolating Building Joints
Tri-Flex Loop meets the stringent requirements
of the International Building Code and ASCE Standards
for seismic applications.



Find out how the IBC & ASCE seismic regulations will impact your next building.

www.flexhose.com • Toll Free 1.877.TRI-FLEX

Isolate Building

The Tri-Flex Loop[®] Seismic Connection System meet the requirements of Chapter 17.1.2 of ASCE Standard 7-05 code for total displacement.

From coast to coast, the 2009 International Building Code (IBC) & ASCE Standard 7-05 are requiring architects, engineers and building owners to adapt to new building requirements related to seismic regulations. Flex-Hose Company's Patented Tri-Flex Loop design meets the displacement requirements as defined by Chapter 17.1.2 of the ASCE 7-05 code. It's three flexible sections allow it to compensate movement in six degrees of freedom (three coordinates axes, plus rotation about those axes simultaneously from random seismic shifts).

**2009 International Building Code (IBC)
Section 1613-Earthquake Loads 1613.1 Scope.**
Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7, excluding Chapter 14 and Appendix 11A. The seismic design category for a structure is permitted to be determined in accordance with Section 1613 or ASCE.



ASCE Standard 7-05

Chapter 17 - Seismic Design Requirements for Seismically Isolated Structures

17.1.2 Displacement

Design Displacement. The design earthquake lateral displacement, excluding additional displacement due to actual and accidental torsion, required for design of the isolation system.

Total Design Displacement

The design earthquake lateral displacement, including additional displacement due to actual and accidental torsion, required for design of the isolation system.

Total Maximum Displacement

The maximum considered earthquake lateral displacement, including additional displacement due to actual and accidental torsion, required for verification of the stability of the isolation system or elements thereof, design of building separation, and vertical load testing of isolator unit prototype.

ASCE 7-05 Chapter 11

11.1.2 Scope. Every structure, and portion thereof, including nonstructural components, shall be designed and constructed to resist the effects of earthquake motions as prescribed by the seismic requirements of this standard. Certain non-building structures, as described in Chapter 15, are also within the scope and shall be designed and constructed in accordance with the requirements of Chapter 15. Requirements concerning alterations, additions, and change of use are set forth in Appendix 11B. Existing structures and alterations to existing structures need only comply with the seismic requirements of this standard where required by Appendix 11B.

17.2.6.2 Components Crossing the Isolation Interface. Elements of seismically isolated structures and nonstructural components, or portions thereof, that cross the isolation interface shall be designed to withstand the total maximum displacement.

CYCLE TESTED FOR
20,000
cycles

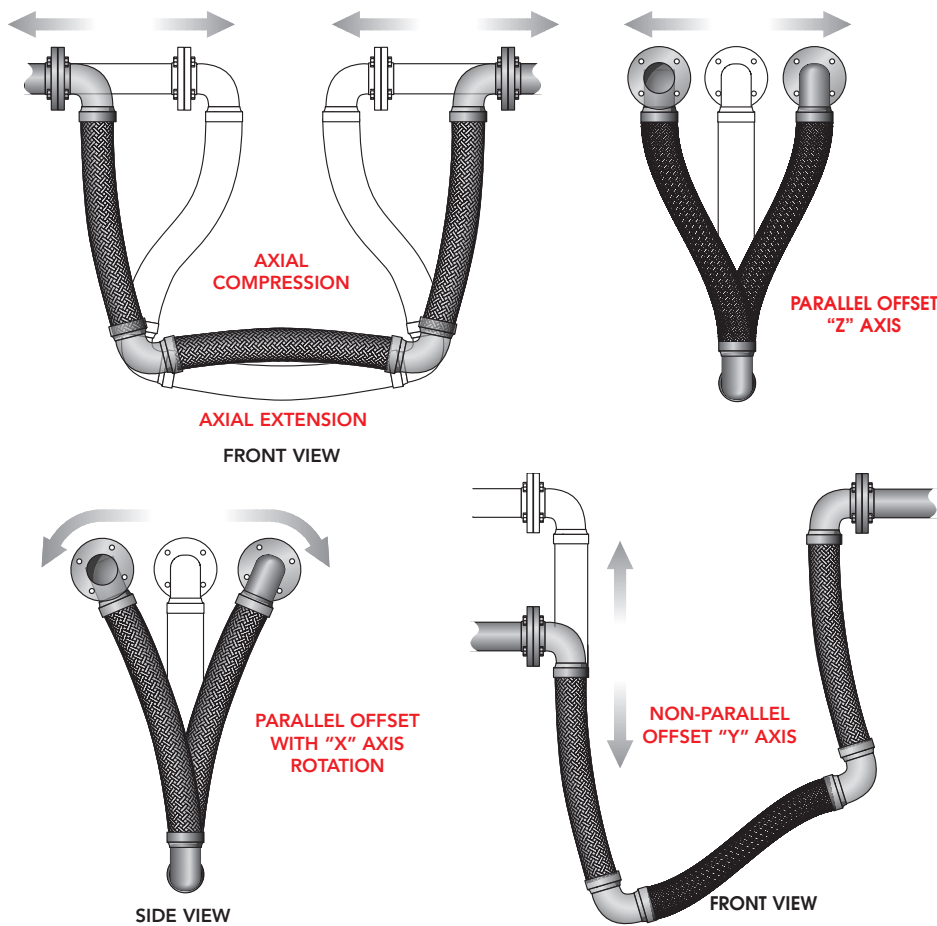
Tri-Flex Loop[®] meets the most stringent requirements of

Joint

Protect your building from critical seismic movement.

2009 IBC & ASCE Standard Code Compliance - Seismic Design Requirements

Compliant Tri-Flex Loop® Patented Technology
Meets the stringent requirements of the ASCE standards for displacement requirements



Tri-Flex Loop Specifications:

The Tri-Flex Loop patented design meets the displacement requirements as defined Chapter 17 of ASCE Standard 7-05. Its three flexible sections allow it to compensate movement in six degrees of freedom (three coordinates axes, plus rotation about those axes simultaneously from random seismic movements and displacements).



PASSED ✓



Passing the Test!

The New York State Center for Advanced Technology (CAT) at Rensselaer Polytechnic Institute, Troy, NY
Tri-Flex Loop Flexible Coupling for Seismic Applications Testing
Project No. A70614, October 1998

The focus of the Flexible Coupling Evaluation is to study the motion capabilities of the Flex-Hose Tri-Flex Loop. The product is designed to withstand large and irregular movements such as might be caused by seismic activities. Testing was conducted by (1) analytically using finite element modeling and computer simulation and (2) using physical testing.

The experimental results, in which the Flex-Hose Tri-Flex Loop exhibited significantly superior ability to withstand repeated cyclic loading in three dimensions. Based on the testing conducted on the Tri-Flex Loop, it is likely that the Flex-Hose Tri-Flex Loop will withstand limited application of displacements in excess of those published by the manufacturer without failure.

The New York State Center for Advanced Technology (CAT) concluded the Flex-Hose Tri-Flex Loop is found to be more likely to survive a seismic event where large, three dimensional relative displacements of the ends of the coupling are involved.

Tri-Flex Loop's superior capabilities were proven in computer-controlled, rigorous robotic testing at the New York State Center for Advanced Technology (CAT) at Rensselaer Polytechnic Institute and are available on a video.

For your complimentary copy of the testing CD call us toll free 1-877-TRI-FLEX.

of ASCE Standards and the International Building Code.

Isolate Building

Tri-Flex Loop[®] Factory Cable Hanger Support Systems
meet the requirements of the ASCE Standard 7-05 Chapter 13.6.5,
13.6.5.1, 13.6.8 for piping systems and component supports.

From coast to coast, the 2009 International Building Code (IBC) and ASCE Standard 7-05 require architects, engineers and building owners to adapt to new building codes and standards related to seismic regulations. These code standards also apply to the components utilized to support flexible loops at building separations. The Tri-Flex Loop UL Listed Cable Support Hanger System is simple and reliable and is in compliance with ASCE Standard 7-05, Chapter 13.6.5, 13.6.5.1 and 13.6.8.

Flex-Hose Company's Tri-Flex Loop is capable of accommodating seismic displacements for vertical piping between floors in buildings, and where piping passes through or bridges building seismic joints or building expansion joints.



LISTED
Tri-Flex Loop[®]
for combustible
gases and
flammable liquids
33NB



CSA standard B51
certified. Inspected
and tested by the
Technical Standards
and Safety Authority
of Canada.



APPROVED
For Fire Protection Systems

ASCE Standard 7-05

● Chapter 13 - Structural Design Requirements for Non-Structural Components

13.6.5 Component Supports. Mechanical and electrical component supports (including those with $I_p = 1.0$) and the means by which they are attached to the component shall be designed for the forces and displacements determined in Sections 13.3.1 and 13.3.2. Such supports include structural members, braces, frames, skirts, legs, saddles, pedestals, cables, guys, stays, snubbers, and tethers, as well as elements forged or cast as a part of the mechanical or electrical component.

- **13.6.5.1 Design Basis.** If standard supports, for example, ASME B31, NFPA 13, or MSS SP-58, or proprietary supports are used, they shall be designed by either load rating (i.e., testing) or for the calculated seismic forces. In addition, the stiffness of the support, where appropriate, shall be designed such that the seismic load path for the component performs its intended function.

- **13.6.8 Piping Systems.** Piping systems shall satisfy the requirements of this section except that elevator system piping shall satisfy the requirements of Section 13.6.10. Except for piping designed and constructed in accordance with NFPA 13, seismic supports shall not be required for other piping systems where one of the following conditions is met: 1. Piping is supported by rod hangers; hangers in the pipe run are 12 in. (305 mm) or less in length from the top of the pipe to the supporting structure; hangers are detailed to avoid bending of the hangers and their attachments; and provisions are made for piping to accommodate expected deflections.

CYCLE TESTED FOR
20,000
cycles

Tri-Flex Loop[®] meets the most stringent requirements of

Joints

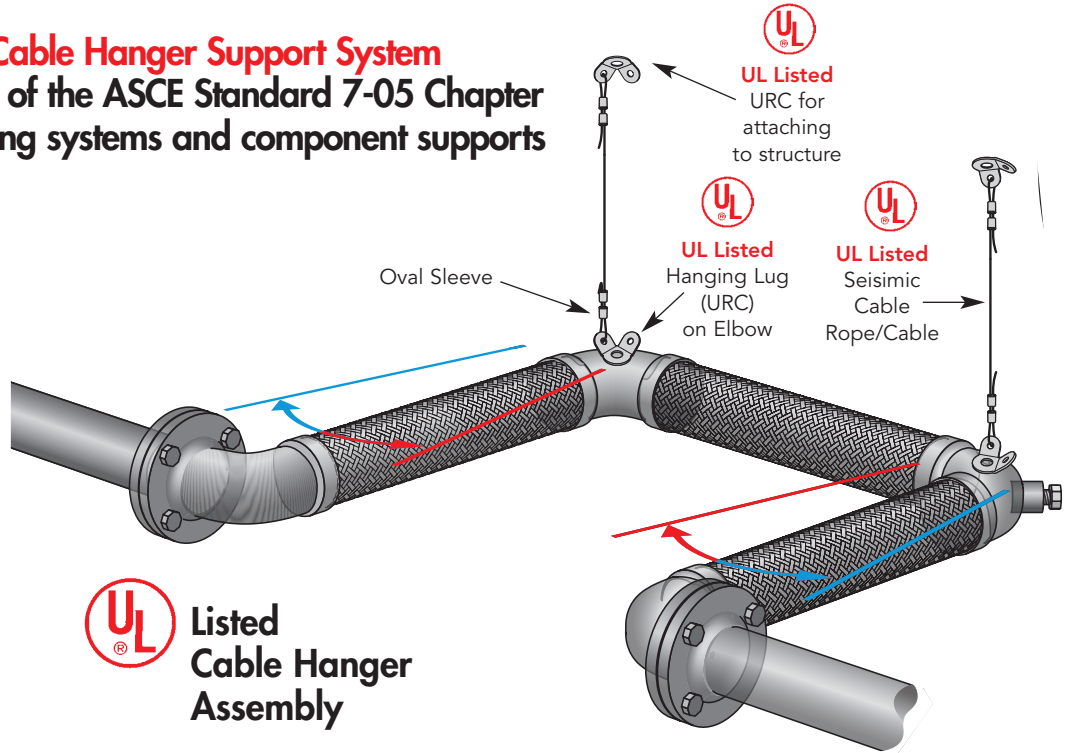
Protect your building from critical seismic movement.

ASCE Standard 7-05 Compliance - Component Support Requirements

Compliant Tri-Flex Loop® Cable Hanger Support System
Meets the stringent requirements of the ASCE Standard 7-05 Chapter 13.6.5, 13.6.5.1, 13.6.8 for piping systems and component supports

Tri-Flex Loop Factory Cable Hanger

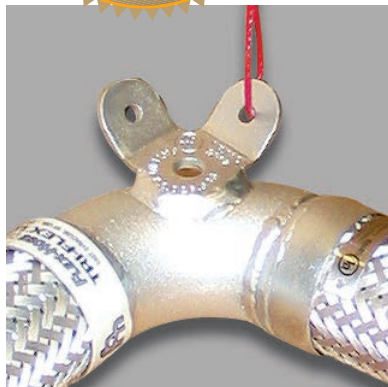
Assembly Kits meet the requirements of the ASCE 7-05 Chapters 13.6.5, 13.6.5.1 and 13.6.8 for component supports in that they are designed for load rating and third party tested. The UL Listed Seismic Wire Rope/Cable used in our hanger assemblies conforms to the requirement of ASCE (American Society of Civil Engineers) guidelines for structural application of wire rope in that the cable is pre-stretched and permanent end fittings maintain the breakstrength of the cable with a safety factor of two.



UL Listed Cable Hanger Assembly

Color Coded • Pre-stretched • Breakstrength Certified

Simple and Reliable



Use **RED CABLE** kit for installing all Tri-Flex Loops up to 8" in diameter.

Use **BLUE CABLE** kit for installing all Tri-Flex Loops of 10" or larger in diameter.



Contents of kits:

- 2 URC (universal restraint) clips for attaching to structure
- 4 zinc-plated copper oval sleeves
- 2 red or blue cables, 13 ft. long

of ASCE Standards and the International Building Code.

Tri-Flex Loop[®]

The Tri-Flex Loop's superior capabilities for withstanding large and irregular movements caused by seismic activities in a piping system were tested and confirmed by independent, third party testing at The New York State Center for Advanced Technology (CAT) at Rensselaer Polytechnic Institute.

UL listed and labeled Tri-Flex Loop products are tested, listed labeled and regularly inspected by Underwriters Laboratories to ensure they meet or exceed industry performance standards.

Tri-Flex Loop is a reliable means of absorbing movement resulting from random seismic shifts and displacement in a piping system.

The Tri-Flex Loop meets the most stringent requirements of the ASCE and the International Building Code!



LISTED
Tri-Flex Loop[®]
for combustible gases
and flammable liquids
33NB



CSA standard B51
certified. Inspected
and tested by the
Technical Standards
and Safety Authority
of Canada.



APPROVED
For Fire Protection Systems

U.S. Patent
No. 5,803,506



Seismic Loop Sizing Program It's FREE!



PROGRAM FEATURES

- Building seismic joints
- Automatically selects **UL[®] Listed** hanger assemblies
- Calculates nesting of expansion seismic loops
- Calculates spring rates of expansion seismic loops
- Creates detailed schedule or submittals
- Allows saving of projects, opening new projects, and editing of projects
- Industry terminology
- Application examples
- Specifications

AND BEST OF ALL IT SAVES DESIGN TIME!
Compatible with all Auto CAD programs allowing input directly into your piping drawings!



CYCLE TESTED FOR
20,000
cycles

Tri-Flex Loop[®] meets the most stringent requirements of

The complete seismic system solution.



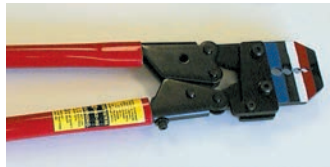
Save Labor Costs with these Tri-Flex Loop Accessories!

Tri-Flex Loop® Hanger Assembly Kit and Accessories

The UL Listed Seismic Wire Rope/Cable™ used in our hanger assemblies conform to the requirements of the ASCE (American Society of Civil Engineers) guidelines for structured applications of wire rope, in that the cable is pre-stretched and the permanent end fittings maintain the breakstrength of the cable with a safety factor of two.



Color coded, factory cable cutter & crimper to meet cable specifications



Color coded for Tri-Flex Loop installations of 10" and larger in diameter



Color coded for Tri-Flex Loop installations of up to 8" diameter



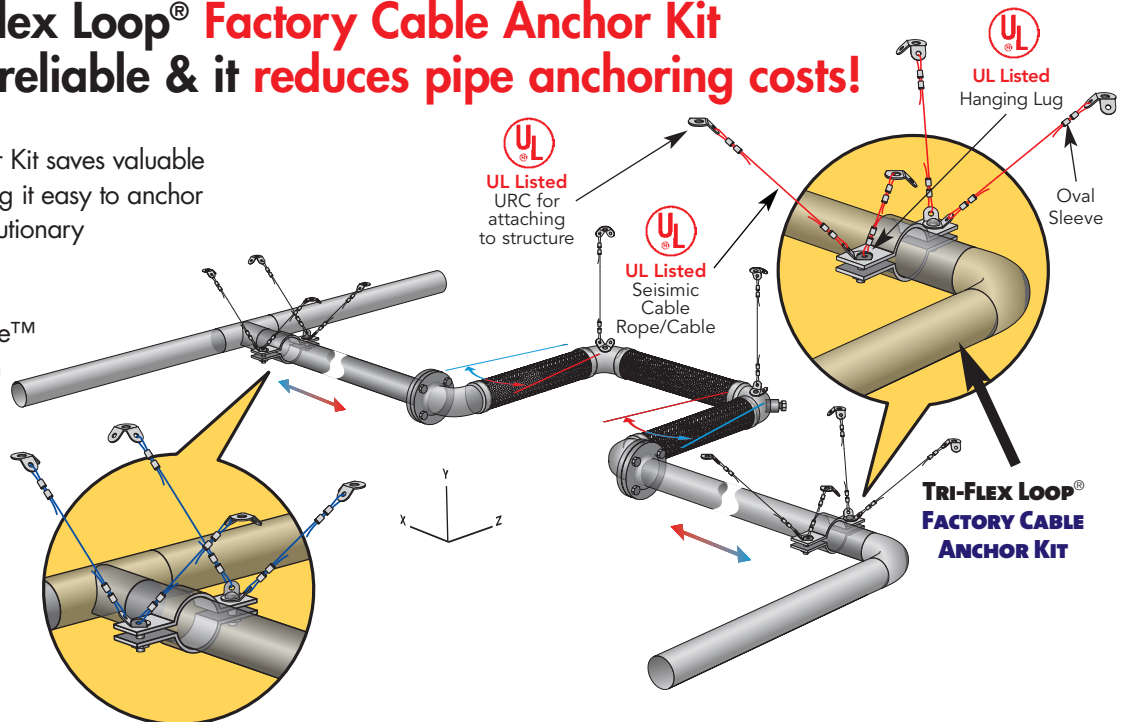
Listed • Color Coded • Pre-stretched • Breakstrength Certified

Save Labor Costs with these Tri-Flex Loop Accessories!

Tri-Flex Loop® Factory Cable Anchor Kit It's simple, reliable & it reduces pipe anchoring costs!

The Tri-Flex Loop Factory Cable Anchor Kit saves valuable time on Tri-Flex Loop installation, making it easy to anchor the piping system when using the revolutionary Tri-Flex Loop.

The UL Listed Seismic Wire Rope/Cable™ used in our hanger 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 breakstrength of the cable with a safety factor of two.



Listed • Factory Assembled • Simply install over pipe & fasten to above structure
• Color Coded • Pre-stretched • Breakstrength Certified

* UL9P92 Loos & Co.

of ASCE Standards and the International Building Code.

Tri-Flex Loop[®] A World of Difference...

IN CRITICAL PIPING CONNECTIONS SINCE 1968

1 TON (2000 LB) CAPACITY



fh **FLEX-HOSE** CO. INC.



TFL/SM-11/12

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for combustible gases and
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