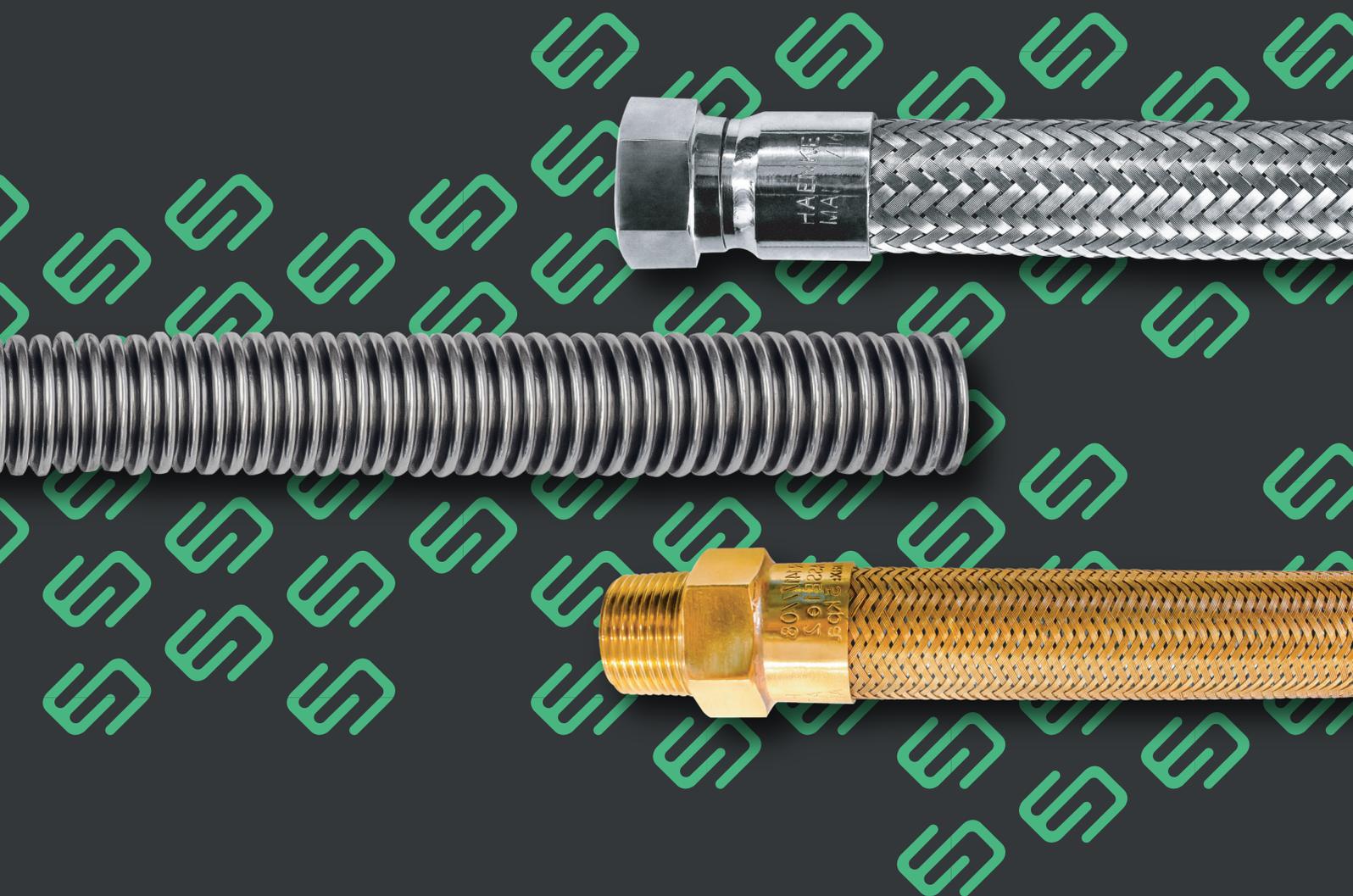




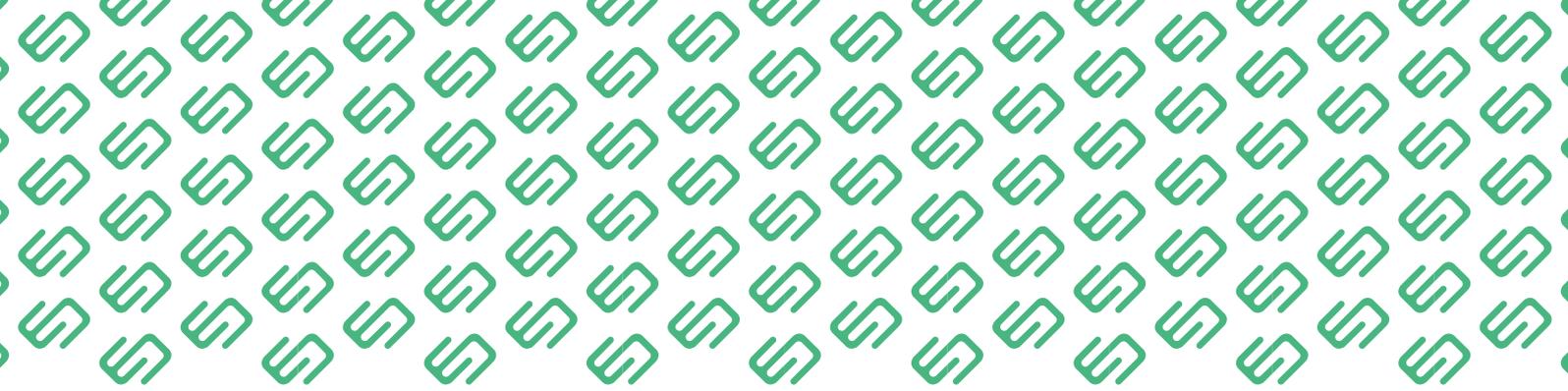
HAENKE®

FLEXIBLE METAL TUBES



IN-HOUSE
MANUFACTURING -
100% BRAZILIAN





About Us

Haenke is a 100% Brazilian company that manufactures Flexible Metal Tubes and Expansion Joints. With around 40 years in the market and high credibility with customers, it stands out for its quality, fair prices, and timely deliveries.

Aiming at improvement, it makes constant investments in the manufacturing area, acquiring machinery and equipment that enable it to improve product quality, which is ensured by the Quality Management System based on the ISO 9001:2015 standard.

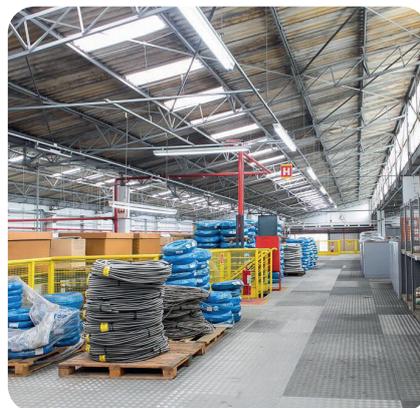
Warranty Policy

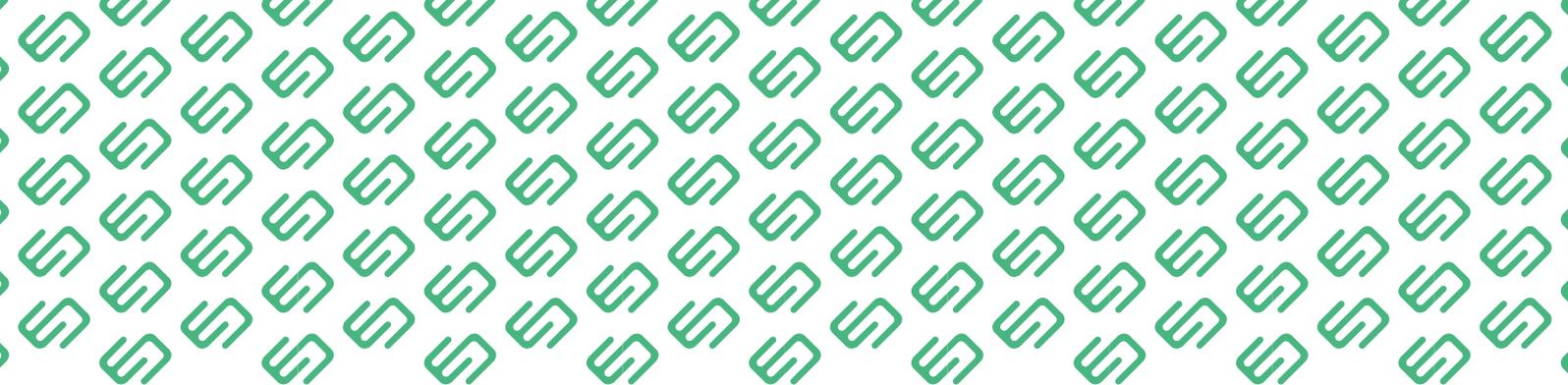
Haenke Flexible Metal Tubes are guaranteed for 12 (twelve) months from the date of installation, or 18 (eighteen) months from the date of issue of the invoice (whichever comes first).

This warranty exclusively covers manufacturing defects and does not extend to situations arising from failure to follow the installation instructions, incorrect handling during use, or inadequate storage and preservation of the product.

Flexible metal pipes for natural gas transmission are manufactured from metal alloys, which are non-perishable materials. Standard NBR 14177 does not specify their validity.

Haenke reserves the right to change any item in its products without prior notice. For further information, please consult the technical department.

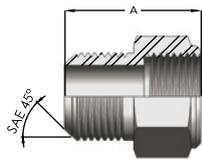




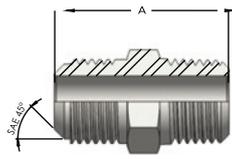
Summary

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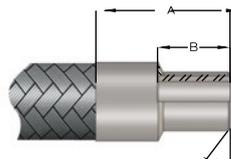
TERMINALS FOR WELDING AND BRAZING ON FLEXIBLE METAL TUBING



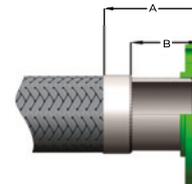
AFS - Male/Female Adapter in Stainless Steel
 AFC - Male/Female Carbon Steel Adapter
 AFB - Male/Female Brass Adapter



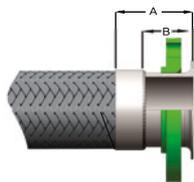
MAS - Male/Male Adapter in Stainless Steel
 MAC - Male/Male Adapter in Carbon Steel
 MBA - Male/Male Brass Adapter



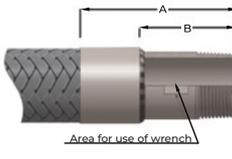
SWFT - Stainless Steel Welded Bevelled Flat Tip
 CWFT - Carbon Steel Welded Bevelled Flat Tip



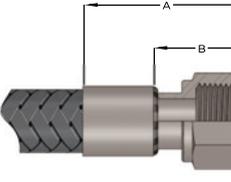
WFFS - Welded Fixed Flange in Stainless Steel
 WFFC - Welded Fixed Flange in Carbon Steel



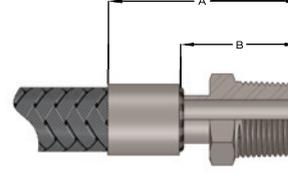
SMF - Stainless Steel Movable Flange
 CMF - Carbon Steel Movable Flange



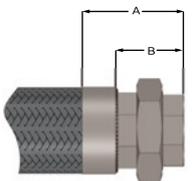
WTTT - Welded Threaded Tip in Carbon Steel



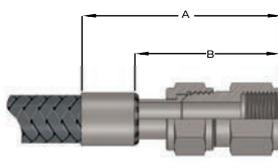
SWFFT - Stainless Steel Welded Fixed Female Terminal
 CWFFT - Carbon Steel Welded Fixed Female Terminal
 BWFFT - Brass Welded Fixed Female Terminal



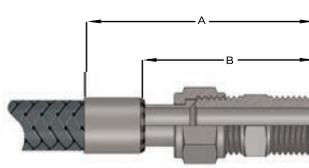
SWFMT - Stainless Steel Welded Fixed Male Terminal
 CWFMT - Carbon Steel Welded Fixed Male Terminal
 BWFMT - Brass Welded Fixed Male Terminal



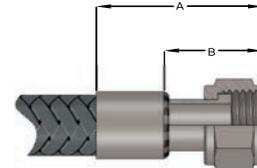
SU - Stainless Steel Female Union
 CU - Carbon Steel Female Union



SFST+FSA - Swivel Female Terminal plus Male/Female Stainless Steel Adapter
 CFST+FCA - Swivel Female Terminal plus Male/Female Carbon Steel Adapter
 BFST+FBA - Swivel Female Terminal plus Male/Female Brass Adapter



SFST+MSA - Swivel Female Terminal plus Male/Male Stainless Steel Adapter
 CFST+MCA - Swivel Female Terminal plus Male/Male Carbon Steel Adapter
 BFST+MBA - Swivel Female Terminal plus Male/Male Brass Adapter



SFST - Stainless Steel Female Swivel Terminal
 CFST - Carbon Steel Female Swivel Terminal
 BFST - Brass Female Swivel Terminal

FLEXIBLE METAL TUBES IN STAINLESS STEEL - AISI-304/321 OR AISI-316L

Manufactured in Austenitic Stainless Steel AISI-304/321 or AISI-316L, externally coated with one or two braided layers of AISI-304 or AISI-316L Stainless Steel wire.

APPLICATION: For transporting Liquids, Vapors, Corrosive Gases, Fuels, and Lubricants for Industry in general, Liquid Oxygen, Nitrogen, LPG, Natural Gas, Naphtha, Ammonia, Food Products, Chemicals, Pharmaceuticals, Vacuum, etc.

WORKING TEMPERATURE: from -196°C to +600°C

1/4" to 12"



CLOSED PITCH



NORMAL PITCH

FTSS = Flexible Tube in Stainless Steel normal pitch without braided cover.
FTSS1 = Flexible Tube in Stainless Steel with normal pitch and 1 braided layer.
FTSS2 = Flexible Tube in Stainless Steel with 2 braided layers.

FLEXIBLE METAL TUBES IN TOMBACK 85/15 (ASTM-B.135-UNS 23000)

Manufactured from Tomback 85/15 (ASTM-B. 135-UNS 23000), externally coated with one or two layers of braided Tomback 85/15 (ASTM-B. 134-UNS 23000) wire.

Designed for various static and dynamic applications, provided that its radius of curvature is observed.

APPLICATION: Widely used in the transfer of liquids, vapors, gases, and air.

WORKING TEMPERATURE: from -60°C to +250°C.

1/4" to 2"



CLOSED PITCH



NORMAL PITCH

FTX = Flexible Tube in Tomback without braided cover.
FTX1 = Flexible Tube in Tomback with 1 braided cover.
FTX2 = Flexible Tube made in Tomback with 2 braided layers.

FLEXIBLE METAL CONDUIT FOR EXPLOSIVE ATMOSPHERES ELETROPROV-STAINLESS STEEL/ELETROPROV-BRASS

APPLICATION:

The Flexible Metal Conduit with a nominal diameter of 1/2" to 4" manufactured by Haenke is suitable for electrical installations in environments with explosive atmospheres of flammable vapors and gases of Group IIA and IIB + H² (Brass) and gases of groups IIA, IIB, and IIC (Stainless Steel).

Also used to protect electrical wires and cables from weather and environmental conditions (IP-66) in installations and assemblies of machines and equipment, ideal for compensating for misalignment, allowing movement, and dampening equipment vibrations without affecting the line or installed unit.

Designed, manufactured, and tested to meet the requirements of ABNT NBR IEC 60079-0 - Explosive atmospheres; Part 0: Equipment

- General requirements and INMETRO Ordinance No. 179 of May 18, 2010. The total length may vary by up to 1.5% more or 1% less.

CONSTRUCTION:

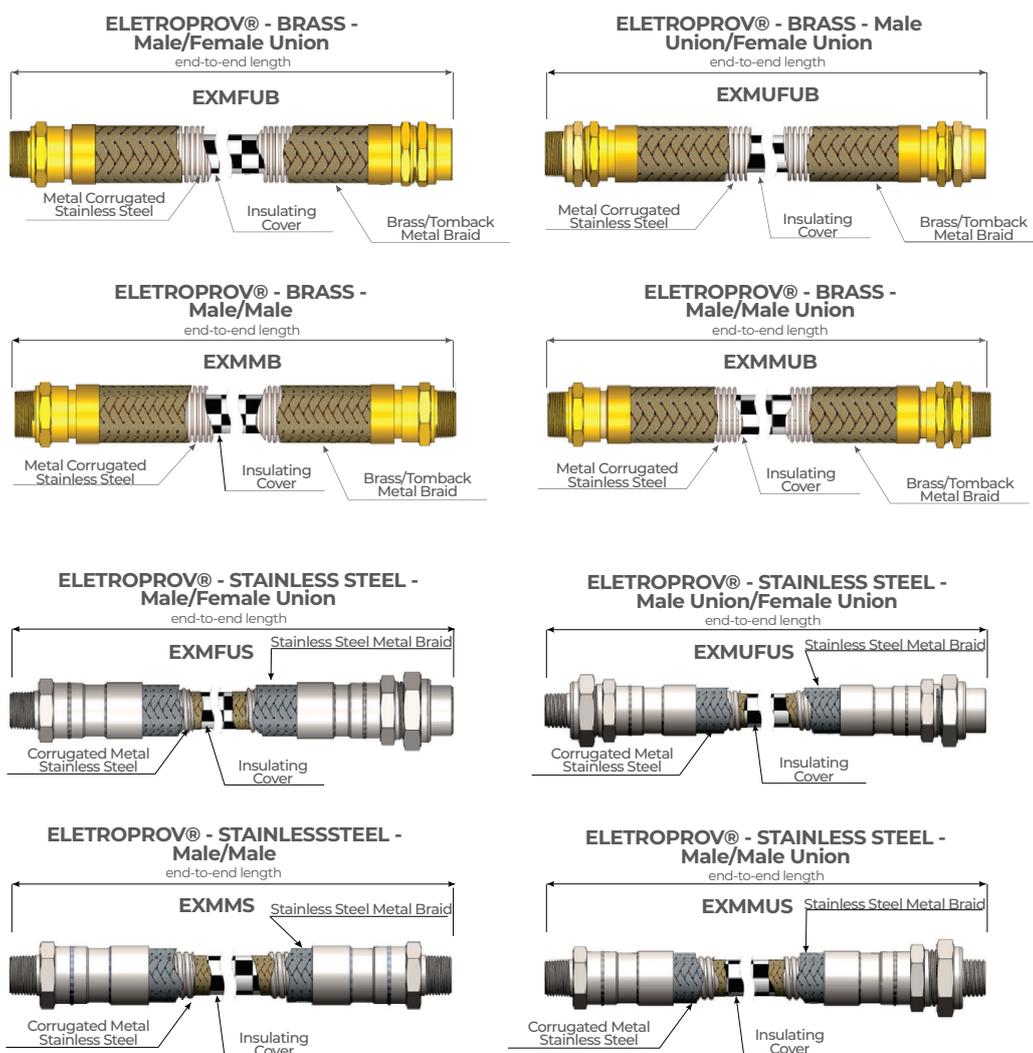
The brass version is manufactured with a 300 series stainless steel alloy corrugated pipe and is externally coated with a copper/Tombac braided mesh, while the stainless steel version is manufactured with a 300 series stainless steel corrugated pipe and is externally coated with a braided mesh of the same material. Both are internally coated with a braided synthetic fiber insulation cover to provide additional insulation for the electrical cables, thereby preventing possible electric arcs and increasing thermal insulation in the event of electrical system failures.

Supplied in nominal diameters of 1/2", 3/4", 1", 1.1/4", 1.1/2", 2", 2.1/2", 3", and 4", assembled with terminals made of brass or 300-grade stainless steel, in the following models:

- ▶ Male / Male - EXMMB ou EXMMS
- ▶ Male / Female Union - EXMFUB ou EXMFUS
- ▶ Male / Male Union - EXMMUB ou EXMMUS
- ▶ Male Union / Male Union - EXMUB ou EXMUS
- ▶ Female Union / Female Union - EXFUB ou EXFUS
- ▶ Male Union / Female Union - EXMUFUB ou EXMUFUS

Threads according to standards:

- ▶ NBR 12912 (NPT) and/or NBR NM-ISO 7-1 (BSPT)



WEATHERPROOF FLEXIBLE METAL CONDUIT (ELETROINOX- REUSABLE: IP-66)

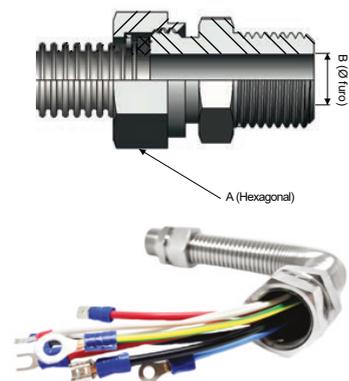
This conduit is manufactured with flexible (corrugated) metal tubing in 300 series stainless steel (AISI-304, AISI-321, and AISI-316L), normal pitch, ring corrugation, and without external coating.

Its terminals and conduit are designed to ensure IP-66 protection, in accordance with ABNT NBR IEC 60529, and to be field-mounted, ensuring watertightness and preventing accidental disassembly, provided that the Assembly Instructions are followed.

This assembly is simple and does not require special tools, as the system is composed of a metal mounting ring and a sealing ring which, once connected to the conduit, give the structure a permanent and secure shape.

It is recommended for protecting electrical wires and cables in machine and equipment installations that are subject to weather and harsh conditions (IP-66), in the food industry (subject to periodic washing), installed on the seafront, underground applications, and others.

Eletroinox-Reusable IP-66: It can be supplied in rolls according to customer requirements.



WEATHERPROOF FLEXIBLE METAL CONDUIT ELETROINOX-PRESSED (IP-66)

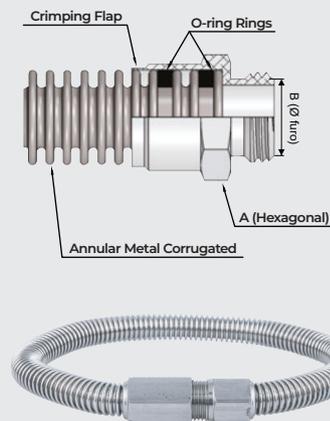
This conduit model is manufactured with flexible (corrugated) metal tubing in 300 series stainless steel (AISI-304, AISI-321, and AISI-316L), normal pitch, ring corrugation, and without external coating.

The terminals and the conduits were designed to guarantee an IP-66 protection rating, in accordance with the ABNT NBR IEC 60529 standard, while also ensuring watertightness and preventing accidental disassembly.

The terminals, male rotary and female rotary: are mounted on the conduit with O-ring seals (see figure opposite) and manufactured in AISI-304, AISI-316 stainless steel, aluminum, or CLA brass with BSP (ABNT NBR 8133), NPT (ABNT NBR 12912), metric (ABNT NBR ISO 724), PG, and other types of threads.

The assembly work requires special tools, so we recommend that it be done at our factory or that the customer purchase the tools, so that once completed, the assembly is watertight and the terminals remain rotatable.

They are recommended for protecting electrical wires and cables in machine and equipment installations that are subject to weather and harsh conditions (IP-66), in the food industry (subject to periodic washing), installed on the seafront, underground applications, and others.



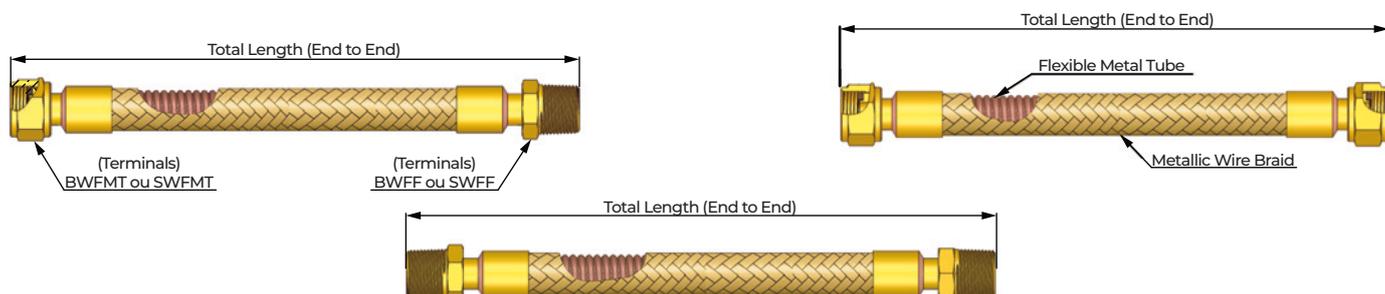
FLEXIBLE METAL CONDUIT WELDED TO WEATHERPROOF

APPLICATION:

The Weatherproof Flexible Metal Conduit is recommended for protecting electrical cables in installations and assemblies of machines and equipment (e.g., instrumentation) that are exposed to the exposure to the weather. As it does not have internal insulation coating and other construction features, it should not be used in electrical installations in environments with explosive atmospheres. The length of the Weatherproof Flexible Metal Conduit is determined according to the requirements of the installations and assemblies, with a manufacturing length tolerance of plus (+) 1.5% and minus (-) 1%.

CONSTRUCTION:

The Weatherproof Flexible Metal Conduits have been manufactured with Flexible Metal Tubing that is corrugated and externally coated with a Metal Wire Braid.



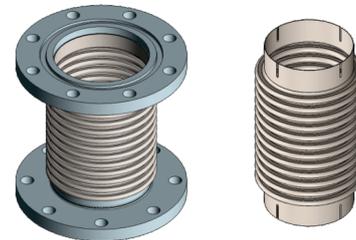
VIBRATION DAMPER FOR GENERATOR SET

The Vibration Damper for Generator Sets, also known as the "Elastic Segment," is manufactured with flexible (corrugated) metal tubing made of **300 series** stainless steel alloy.

Designed to be installed between the engine exhaust manifold and the rigid piping of the generator set exhaust system, thereby eliminating any stress on the rigid piping of the exhaust system, especially when the engine is turbocharged.

Its function is to absorb vibrations transmitted from the engine to the exhaust system and thermal expansion movements.

- ▶ Minimizes stress from rigid piping on the engine or turbine manifold;
- ▶ Absorbs movements and vibrations transmitted from the engine to the exhaust system;
- ▶ It increases the durability of the engine and the exhaust system components and their supporting parts.
- ▶ Compensates for movements and variations caused by thermal expansion;
- ▶ Promotes tightness between the turbine, manifold, and exhaust system.



Manufactured in diameters from 1.1/2" to 12", with the following terminals: welding tip, fitting tip, flanges, or others, according to the customer's design.

FLEXIBLE METAL TUBE FOR LOADING AND UNLOADING SHIPS AND TRUCKS (In ports and product transfer areas)

APPLICATION:

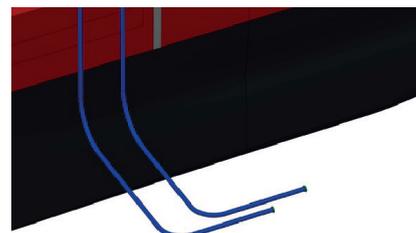
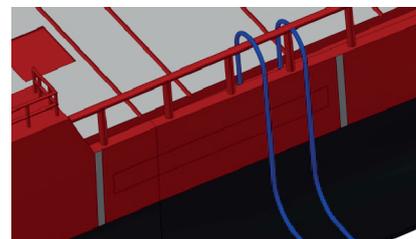
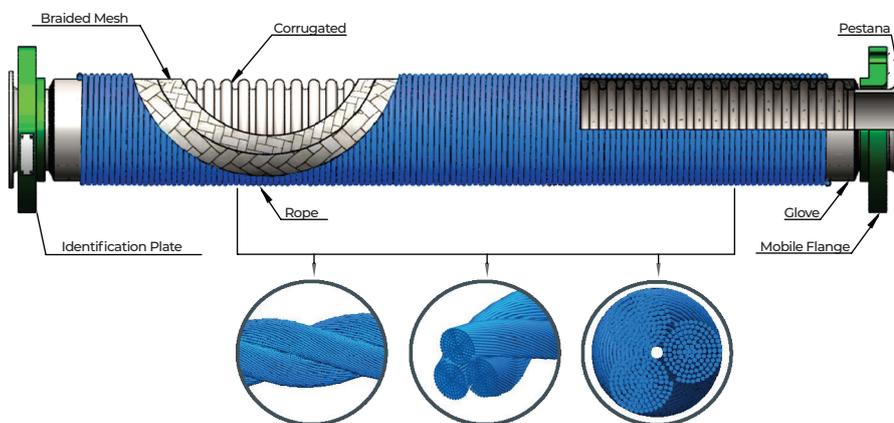
Fuel loading and unloading procedures are extremely important to ensure the safety of your establishment. Although they require extra attention, these processes (when done correctly) serve to prevent contamination and the risk of accidents.

These procedures require calm and must always be carried out in compliance with safety standards. Initially, the usual precautions are taken, with the area being cleared for the correct positioning of the tanker truck, the space being cordoned off with protective cones and safety warnings, and a fire extinguisher for flammable liquids being placed nearby.

In order to ensure this safety, Haenke has developed flexible metal hoses for loading and unloading ships and trucks, whose main features are safety, agility, and flexibility.

Flexible metal pipe with a nominal diameter of 3" to 12", suitable for transporting liquids, gases, and vapors. Designed, manufactured, and tested to the most rigorous international standards and norms.

We emphasize that, based on our production process controls, the total length may vary by up to 1.5% longer and 1% shorter, a variation that can be considered negligible given the length and flexibility of the tube.



SPECIAL LINE OF FLEXIBLE METAL TUBES

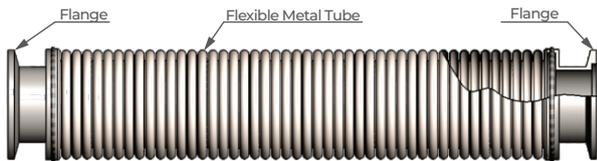
Materials: Stainless Steel, Brass, or Carbon Steel

Haenke offers Flexible Metal Tubes in other assembly options.

They can be assembled with material, length, and terminals according to the installation requirements. Other models can be manufactured upon request or design.

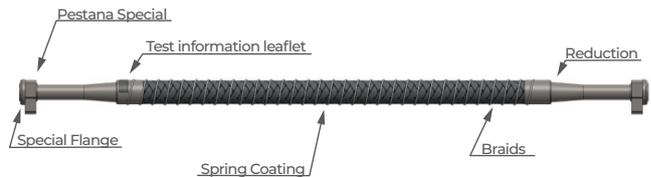
Flexible Metal Tube for Vacuum Application

The Flexible Metal Tubes do not change their shape or crack like rubber or plastic hoses and do not collapse under a vacuum. They allow the installation of pumps, rigid pipes, and valves with fewer connecting parts, further reducing the possibility of leaks in the vacuum system. Manufactured in AISI-321, AISI-304, or AISI-316L stainless steel for high performance, they are supplied in the length specified by the customer, with welded ISO-KF, ISO-K, ISO-F, CF, and special flange connections, meeting the most diverse installation requirements.



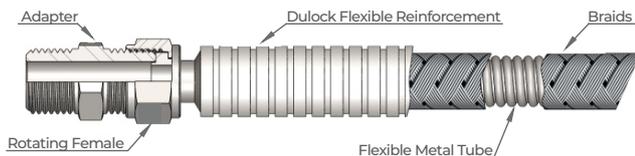
Flexible Metal Tube for Gas Transfer

Due to high demand, many companies choose to use bulk gases, eliminating the need for cylinders. In order to maintain an uninterrupted supply and ensure greater safety. With this in mind, Haenke has developed a flexible metal tube for transferring bulk gases, whereby the operator transfers the product in its liquid phase from the truck to the tank located at the customer's premises, ensuring total safety and agility in the process.



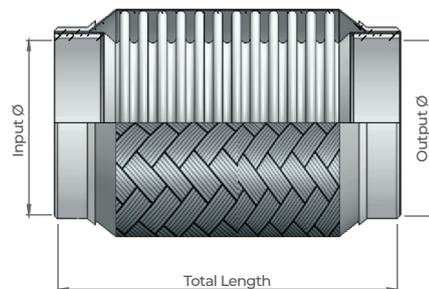
Flexible Metal Pipe with Full or Partial Reinforcement of Flexible Conduit - DULOK

Haenke Flexible Metal Tube in Stainless Steel or Copper Alloy with full or partial reinforcement for protection against splashes and abrasions, facilitating external cleaning, as well as limiting the bending radius.



Vibration Damper for Automotive Exhaust - AVA/AVB

The Automotive Vibration Damper, also known as "Steel Mesh," is manufactured with flexible (corrugated) metal tubing made of 300 series stainless steel alloy, externally coated with a braided cover made of the same material, and can be internally coated with a braided cover similar to the external one.



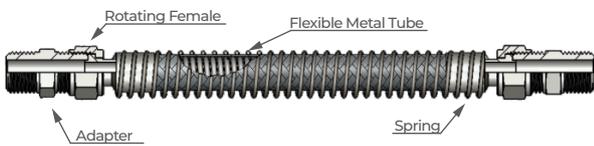
We have a specialized engineering department dedicated to special projects tailored to customer needs. For more information or assistance, please contact us.

SPECIAL LINE OF FLEXIBLE METAL TUBES

Materials: Stainless Steel, Brass, or Carbon Steel

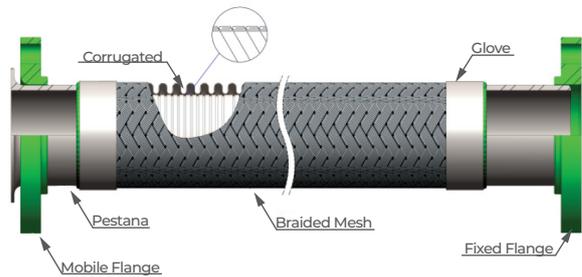
Flexible Metal Tube with Full or Partial Spring Reinforcement

Haenke Flexible Metal Tube in Stainless Steel or Copper Alloy with full or partial reinforcement of Galvanized Carbon Steel or Stainless Steel spring, to protect against dragging during handling and limit the bending radius of the flexible tube near the terminals.



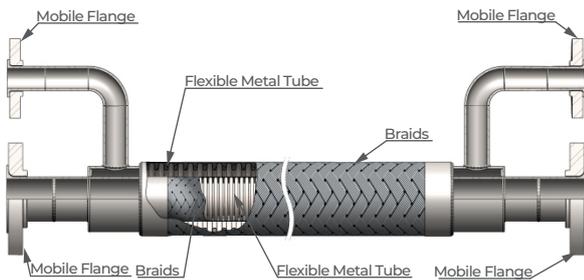
Flexible Metal Pipe with Dulock Interior

Haenke Flexible Metal Pipe, made of stainless steel coated internally with flexible pipe manufactured with stapled metal tape, with external coating of 1 or 2 braided metal wires, which can be manufactured entirely in stainless steel or tombac. This assembly configuration is suitable for high-speed drainage.



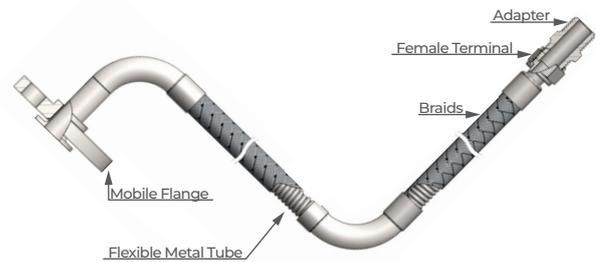
Flexible Metal Tube Jacketed

The Haenke Flexible Metal Tube is jacketed and can be made entirely of Stainless Steel, with a chamber for heating/cooling or for maintaining the temperature of the fluid being conveyed.



Flexible Metal Tube Mounted at 90°

The Haenke Flexible Metal Hose in Stainless Steel or Special Copper/Tombac Alloy for mounting at 90° in installations which require the absorption of vertical and horizontal vibratory movements at low or high frequencies, associated with low or high amplitudes, in compressors and machine installations.

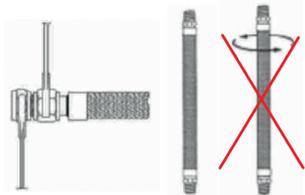


INSTALLATION RECOMMENDATIONS

FLEXIBLE METAL TUBES

Never bend the pipe beyond the minimum recommended bending radius. Do not twist the pipes, as they do not absorb radial movements. Refer to the installation examples below.

Install the hoses without twisting them. To prevent the hose from rotating, use two wrenches.



Protect the outside of the pipe to be welded with damp burlap, a wet cloth, or insulating paste.



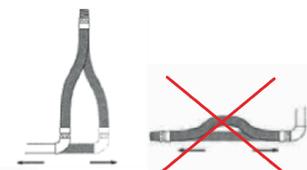
In case of condensation on the outside of the tube, it should be covered with rubber or special foam to absorb all moisture.



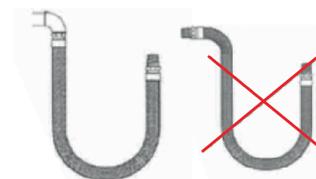
Do not expose the tube directly to flame.



Lateral installation to absorb expansion up to 100mm.



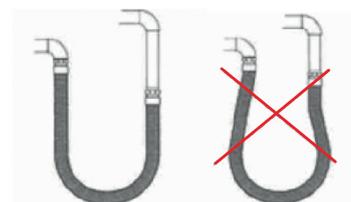
Avoid sharp bends near the fittings.



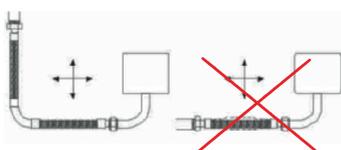
The direction of movement and the tube bend must be in the same plane.



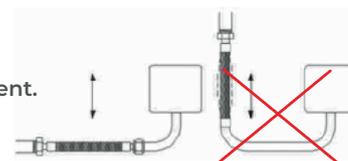
Respect the minimum bending radius. (see table on pages 3 to 5)



To absorb vibrations in more than one direction, install hoses at 90°. Always install at a right angle to the direction of movement or vibrations.



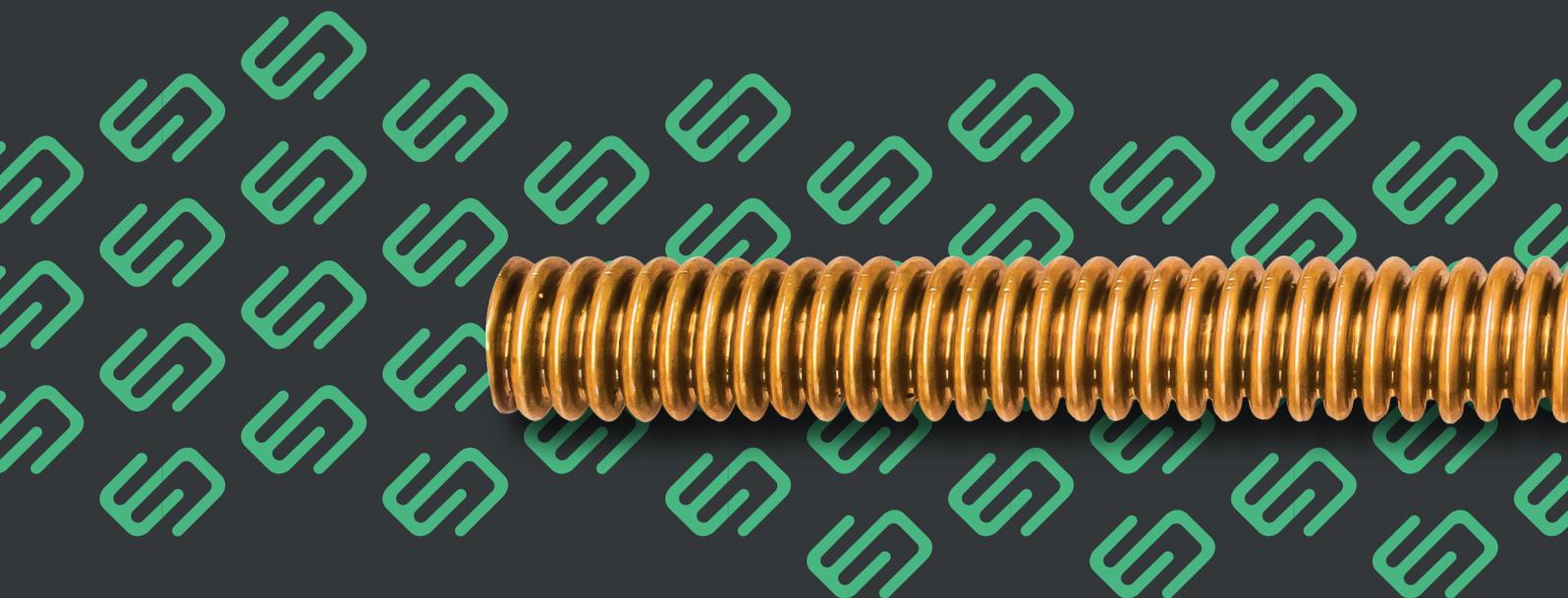
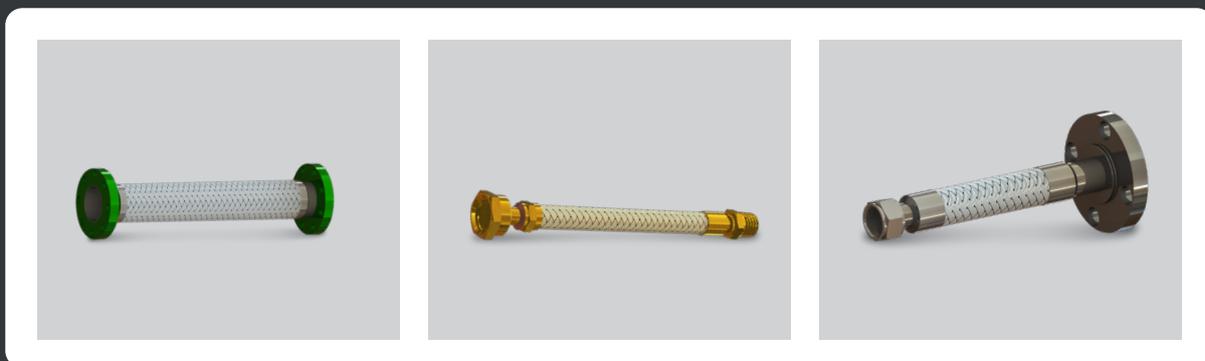
Install the hose at a right angle to the direction of movement.



Flexible couplings do not absorb axial vibrations.



HAENKE®



HAENKE TUBOS FLEXÍVEIS LTDA

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