



Global Pipe Manufacturer



CORRUGATED STAINLESS STEEL WATER DISTRIBUTION SYSTEM

DESIGN & INSTALLATION GUIDE



**ISO
9001**

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INSTALLATION OF FLEXIBLE TUBING

DISCLAIMER

All installations must comply with applicable standards, practices and codes set by local building authority. Manufacturer's suggested instructions do not supersede applicable local standards, practices or codes. Please contact the manufacturer or local building authority for any questions on installation. Only qualified, licensed professionals or qualified professionals under supervision of a licensed professional should install, modify or repair plumbing pipe and fixtures. Precautions must be taken to ensure that any exposed flexible piping is not damaged or abused during construction or assembly. Do not excessively bend or twist, dent or strike tubing. All systems should be stored in secure, dry location prior to installation. Only fittings provided by the manufacturer are to be used. Ends of tubing are to be temporarily capped and plugged prior to installation to prevent entrance of dirt or other debris. Contact with sharp objects or harmful substances are to be avoided. Contact with any chemicals containing chlorides or ammonia, such as solder or flux, bleach or masonry cleaner, must be followed by thorough rinse and wipe dry. CSST needs to be grounded or bonded in any area with a history of lightning strikes. Please follow the instructions in the guide and applicable local and national codes for proper grounding and bonding of the system.

CODE ACCEPTANCE

It is the responsibility of the installer to confirm that the local authority having jurisdiction has approved the use of CSST for water distribution. Corrugated Stainless Steel for water distribution has been approved and is in compliance with the major national plumbing codes followed by most states, but local adoption of these codes can be delayed in your area or not accepted. Please contact your local code officials for information. Easyflex assumes no responsibility for labor or material for installations made without prior determination of local code authority acceptance.

PRODUCT DESCRIPTION

The Water Line System is a flexible water distribution system for potable, hot-cold water in residential and commercial applications. The tubing can also be used for glycol based and distilled water distribution. Made from corrosion resistant 304 or (on special order) 316L annealed stainless steel, the water line features durability and flexibility enabling numerous bends and twisting of the tubing for installation, use and repair. The tubing features brass fittings with sealing gaskets that allow for simple installation and enhanced corrosion resistance and strength. In addition to the regular brass fittings of tees, reducers and sockets, is the Push-Fit fitting. This tool-free, push-on connection allows flexible tubing to be connected with rigid pipe like copper, galvanized steel or CPVC. The tubing features operating pressure of 147 psi and operating temperature of 212°F. The stainless steel tubing comes in rolls from 50' to over 150' and diameters from 1/2" to 2". The flexible tubing can be purchased with red or blue polyethylene coating, which makes installation and repair easier with color coding and adds additional protection to the tubing from harsh chemicals or environmental conditions.

The Use of EASYFLEX is not restricted by the style, size, age, type of construction, height, or physical layout of the building. It can withstand vibrations, movement, seismic forces, shearing and mechanical structural strain. Corrugated stainless pipe helps to prevent ruptures in the plumbing system by flexing and absorbing vibrations and stresses.

Product Ratings, Capabilities and Material Specifications

Material Specification

- Tube: 0.012 in. thick 304 Annealed Stainless Steel (ASTM A312/312M)
- Fittings: Nut & Body – Brass UNS C37700
- Isolating Ring – Nylon 66
- Sealing Ring – Dow Corning K760 Silicon
- Teeth ring – 304 Stainless Steel (ASTM A 240)
- 0.02 in. thick Polyethylene coating (ASTM D 3350)
- Push-Fit nut: Nylon 66

Minimum Bend Radius	3" (1/2", 3/4" & 1" Tube) & 5" (1-1/4" Tube)
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Features & Availability

- IAPMO/UPC IGC 233 and ANSI/NSF 61 tested and approved
- Manufacturer's recommended Max Working Pressure: 220psi (1/2"), 176psi (3/4"), 147psi (1"), 110 psi (1-1/4")
- Manufacturer's Max Temp & Pressure : 212°F, 147psi
- Burst Pressure: tubing 588 psi, fittings 1420 psi
- Diameters: 1/2", 3/4", 1", 1-1/4"
- Length: 50 ft, 100 ft, 150 ft / roll (Available in special lengths)
- Uncoated or Blue/Red PE (Polyethylene)
- Velocity Max: 13fps
- Elongation: 1.5" over 100'

Product Standards and Listings

EASYFLEX Water Line tube and fittings are produced to the requirements of IAPMO IGC 233-2006, ASTM A 240, ASME B1.20.1, ASTM D 3350, and ANSI/NSF 61 – 2005, section 4.

Standard	Title
ANSI/NSF Standard 61	Drinking Water System Components – Health Effects
ASTM A312/312M	Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
ASTM D 335	Specifications for Polyethylene Plastics Pipe and Fittings Materials
ASME B1.20.1	Pipe Threads, General Purpose
IAPMO IGC 233	1. Material 2. Performance 3. Marking and Identification

Applications

- Potable Water Distribution Systems (i.e. rough plumbing) New Construction, Repiping, Maintenance, and Repair
- Residential & Commercial Heating Appliance & Equipment Connections
- Commercial Heat Exchanger Coils
- Fan Coil Units
- Radiant Heating Systems

INSTALLATION

USER WARNING!

Please Read Disclaimer before installing.

Tools For Installation

1. Open End Wrench – For Assembly of Fittings
2. Adjustable Wrench – For manifold Body
3. Pipe Wrench – For attachments of tubing to fittings and manifold body.
4. Drill – For boring clearance holes through wood or metal framing. Recommended clearance hole size: 1/2" larger than tubing diameter.
5. Utility knife with sharp blade
6. Tubing Cutter
7. Pliers

General Installation

- EASYFLEX flexible water piping can be used to provide outdoor connections to appliances that are attached to, or in close proximity to the building.
- EASYFLEX flexible water piping can be routed in most locations where traditional water piping materials are installed: inside hollow wall cavities, along or through floor joists in basements, on top of the joists in attics, on roof tops or along soffits or in chases outside of buildings.
- For underground burial including in-slab or under-slab application, the coated water tubing can be laid directly. The fittings cannot be directly buried. Tubing and fittings must be encased in a PVC sleeve and/or PE jacket when run through concrete. The insulation material is to be at least 0.025" thick when there is direct contact with concrete and/or soil. Please also be sure to use appropriate bend support for tubes running upward from concrete slab or soil. [FIGURE 1]
- Flexible water tubing can be used in conjunction with any rigid pipe in either new construction or renovation and replacement piping installations. The conjunction can be made with push-fit fitting or manifold or tee.
- Use gradual or low degree bends to maximize water flow and reduce friction loss. Use bend support material when necessary.
- For out of wall installation that involve connection with supply stop and supply line to plumbing fixtures, please use support bracket made of plastic or copper or stainless steel. [FIGURE2]

FIGURE 1

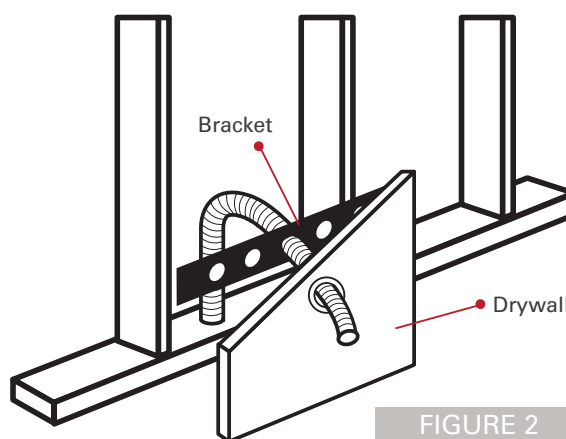
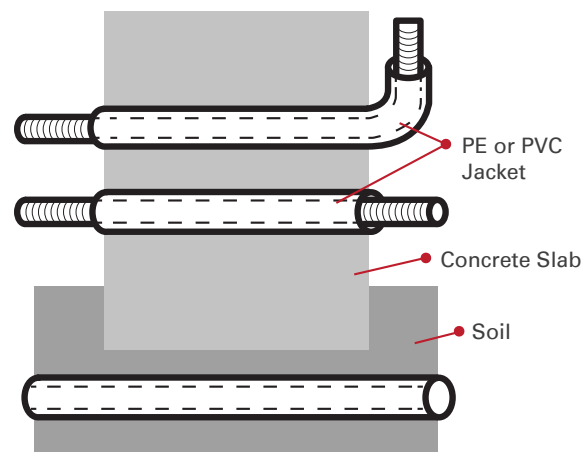


FIGURE 2

Bending The Tubing


- Bending flexible water piping is one feature which contributes to the speed of installation. Tubing can be bent to desired position subject to bend radius. Multiple tight bends can restrict the water flow and increase pressure drop. Care must be taken to avoid repeated sharp bending, stretching, kinking or twisting of tubing. Gradual bends are suggested whenever possible.

Horizontal/Inclined and Vertical Runs

- All horizontal / Inclined and Vertical runs shall be supported as specified in chart below.
- Tubing that runs parallel to the joists should be supported to the center of the vertical face at least 3" from the floor or ceiling.
- Tubing that runs perpendicular to the joists should be supported, preferably routed through drilled holes in the joists or inside an I-beam flange.

Support [FIGURE3]	Horizontal: 12' (recommended)
	Vertical: 18' (recommended)

- The tubing shall be supported in a workman like manner with piping straps, tubing clips, bands, brackets or hangers suitable for the size and weight of the tubing. Use saddles or talons made of plastic, copper, brass or stainless steel.

 Tubing edges are sharp. Take care when handling cut tubing.

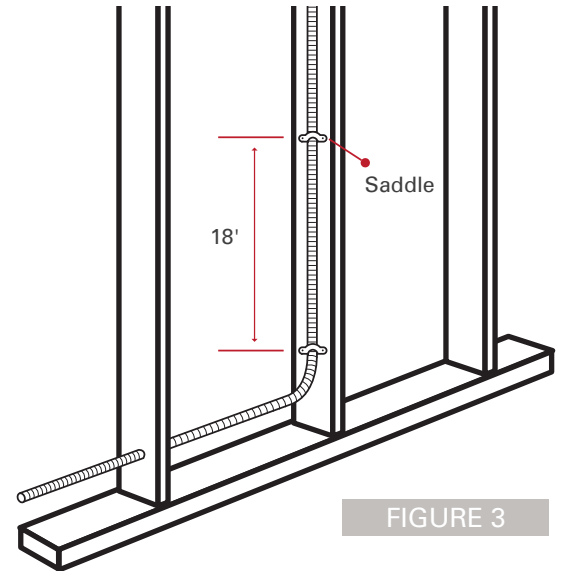
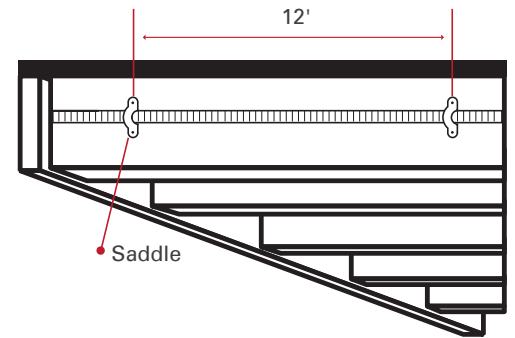
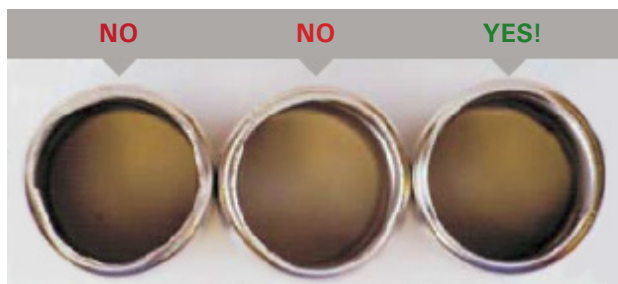


FIGURE 3


Cutting Tubing to Length

- Determine the proper length of the tubing. Use a standard tubing cutter equipped with a sharp (preferably hardened steel) cutting wheel. Whenever possible, cut a straight section of tubing that hasn't been bent. It is not necessary to remove polyethylene jacket prior to cutting. A pipe cutter can cut through the polyethylene tubing jacket. The cut must be centered in a convolution (valley) between two corrugations. Use full, circular cutting stroke continuing in the same directions as starting in. When the wheel has cut through jacket and is in contact with the stainless steel, it is important to slightly tighten the cutting wheel.



Do Not Assemble! BAD CUT Heavy Distortion Out of Round Excessive Burr	Do Not Assemble! BAD CUT Slightly Oval Heavy Burr	Okay to Assemble GOOD CUT Round, Clean with No Burr
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- A quarter turn is all that is necessary. You will hear the stainless steel "pop" or "crack" when you begin to cut through. Do not over tighten cutter. The tubing may flatten out if the cutter is tightened too much, and the cut edges will be deformed. Continue cutting until the tube is cut all the way around or only a small edge is attached. If necessary, bend and twist cut edge to separate tubing, then, ensure the twisted edge is not deformed or will obstruct flow. Remove burrs or rough edges with pliers if necessary.

 Precision cuts made on a previously bent or twisted length of tubing may cause distorted or out-of-round tubing. For best results, ensure that all final end cuts are only made on straight lengths of tubing.

Stripping Jacket

- Using a utility knife, strip the jacket back six (6) convolutions (valley) or 1" from the end of the tubing. Using a utility knife, slice the tubing around the tubing then make a single slice along the axis or long side of the tubing towards the nearest end. Peel the polyethylene away. Use caution when cutting the jacket and handling the tubing.



Installing Fittings

- Remove the nut and check the fittings internal components are in place (silicone ring, isolating ring and nuts). Replace nut so that it is just sitting on the threads. Insert the tube into the fitting until it meets the internal wall. Hold the fitting on the tubing and finger tighten the nut onto the fitting.



Attaching Fitting to another fitting or main line or fixed position fitting

- Use anaerobic joint sealing compound or PTFE tape or pipe dope on male end threads of connection. Connect male or female end of fitting to main line port or fixed position fitting. Tighten until resistance increases greatly or to fitting manufacturers torque instructions, if using other manufacturer's fittings. To attach flexible tubing to pipe fitting, follow instructions for attaching fitting found above.



Wrench Tightening

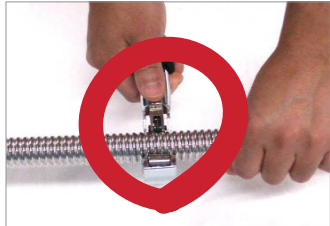
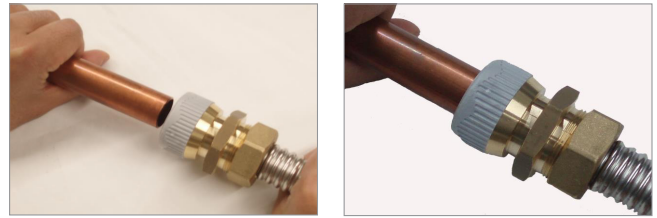
- **Field instructions:** using appropriate wrenches, secure the nut until the resistance of the wrenching force increases greatly or nut will not turn after 1.5 turns. Caution: Do not use any thread sealants for both side threads for this connection.
- **Final Torque:** Tighten nut and fitting to the torque values shown in table 3. If the tubing begins to buckle or deform, you have tightened too much. If damaged, cut off section of damaged tubing and re-attach fitting using method in instructions

Size and Torque (Manufacturer recommended)

Tube Size (inch)	Torque Value (ft-lb)
1/2	40 ~ 44
3/4	44 ~ 48
1	72 ~ 76
1 1/4	120 ~ 140

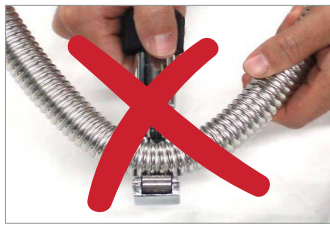
Push-Fit Assembly

- If necessary, using cutting tool, cut end of copper pipe to desired length. Push rigid pipe end into Push-Fit connection until pipe meets walls of fitting. Insure that rigid pipe is inserted completely into fitting. Insure copper pipe is pushed all the way in and will not pull out with force applied.



Trouble Shooting of Fittings Connections

- The tube cutting is the critical step in the assembly procedure. Always cut in a straight section of piping, rather than an area you have bent. Use roller pressure lightly applied on every revolution to cut tube evenly around its surface. Make sure that cut part must be centered between two corrugations.
- If the cutting connection cannot be made to seal upon applying torque per the instructions, continue to tighten an additional turn. If leakage continues, do not continue to apply torque. Disassemble the fitting and inspect the sealing surface. The most likely cause of leakage is foreign material on the sealing surfaces. Wipe both fitting and tubing with a clean cloth. Inspect the sealing ring, pressure ring and tube end. If any deformation is noted, re-cut the tubing and reassemble the fitting.



Tubing Location

Tubing can be located several places within the building.

- Beneath through, and alongside floor joists – Consideration should be given to future construction possibilities. On the top of ceiling joists in attic spaces – considered choice location in areas where slab-on-grade construction is prevalent.
- Inside wall cavities – Preferred for vertical sections of piping rather than horizontal sections. Protect tubing from damage caused by screws and nails by using protective plates.
- Installation clearance holes for routing the piping through studs, joists, plates, etc. shall have a diameter 1/2" larger than the outside diameter of the piping.

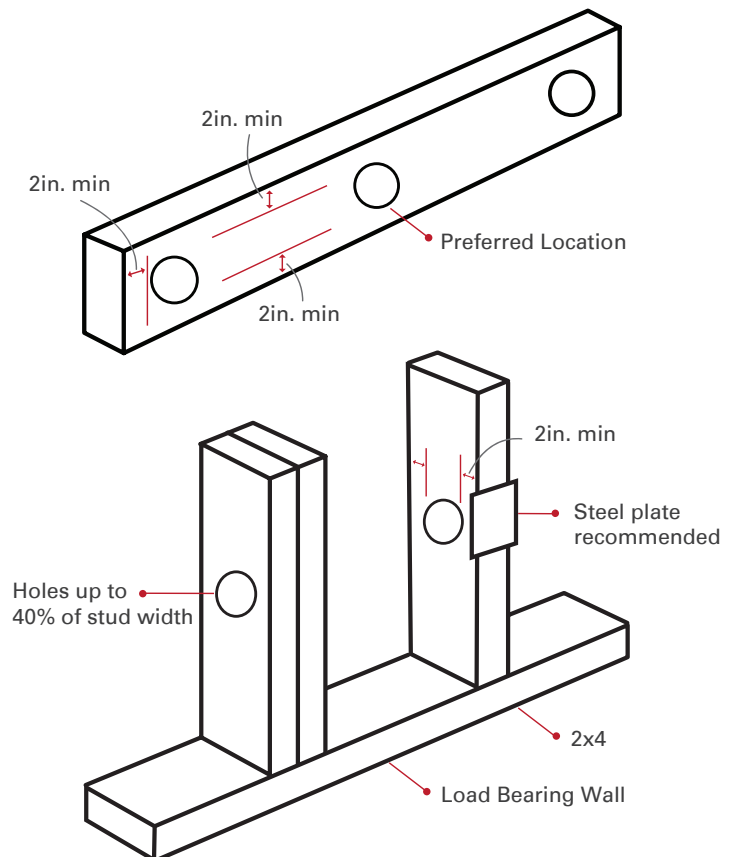


FIGURE 4

Branching

- Avoid branching if not necessary. This minimizes the number of joints in the system. Utilize only manufacturer supplied fittings and support tubing and fittings as described in previous instructions.
- Where holes are to be bored in load bearing vertical members of the wall framing, the size of such holes shall not be larger than 40% of the width of the member. Holes up to 60% of the member's width are permitted if the members are doubled. No more than two successive double bored members are permitted
- Use a pipe grommet to secure the tubing through a bored hole.

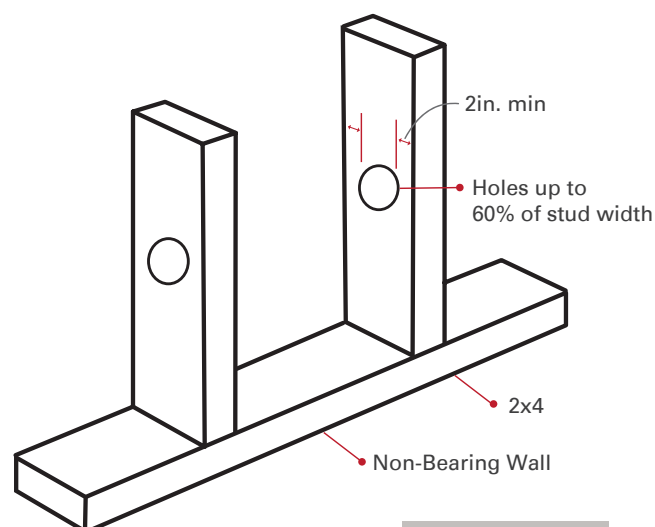


FIGURE 5

Steel or Striker plate protection

- The use of steel plates or striker plates is advised, but not required by the manufacturer, especially in new construction. When the tubing does not have a 2" space between framing or drywall, or cannot move freely between brackets, and the risk of penetration by screws or nails is possible, the use of protective steel plates is advised.

Water Line Mounted Through Metal Framing

- The installation instructions for metal framed structures are same as wood framed structure with the following exception.

When flexible water tubing passes through metal members it shall be protected by one of the following methods:

1. Busing securely fastened in the opening of the metal member.
2. Grommets securely fastened in the opening of the metal member.

The installer shall insure that no physical contact occurs between the metal member and the flexible water tubing.

Metal Studs

- For installations involving horizontal runs through galvanized steel studs, the use of plastic grommets supplied by the stud manufacturer is recommended. The use of these grommets will reduce the likelihood of damage to the tubing non-metallic jacket.

Underground Installations

General Provisions

- **Inspection:** Before installation, flexible water tubing should be thoroughly inspected for cuts, scratches, gouges or split ends which might have occurred to the products during shipping and handling. Do not use damaged sections. Damaged sections found must be cut-out and discarded.
- Where local codes conflict with this manual, local codes take precedence.
- Coated water piping can be buried directly in the ground, but not directly embedded in concrete without a sleeve (e.g. patio slabs, foundations and walkways). The fittings can be buried directly in the ground without sleeves or taping. When burial is required, insure trench and backfill do not contain corrosive elements. EASYFLEX flexible water piping can be routed inside nonmetallic (e.g. PVC or PE) conduit, which conforms to standards to prevent freezing in exterior installations.
- Water service pipe and the building sewer or drainage pipe shall be separated by a minimum of 5 feet of undisturbed or compacted earth. Exceptions to this standard are applied as per compliance with local codes.
- Potable water service and distribution pipe shall not be located in, under or above cesspools, septic tanks, septic tank drainage fields or seepage pits.
- When installed along the side of a structure in an exposed condition. The flexible water piping must be protected inside a conduit or installed in a location which will not subjected it to crushing or puncture damage.



EASYFLEX flexible water tubing must only be installed by qualified licensed professionals or under supervision of a licensed professional. All installations must comply with local code requirements and the instructions contained in the EASYFLEX Installation Guide

- **Trench Preparation:** Trench bottom shall be solid with no hollows, lumps, rocks, or other materials that could damaged the tubing. All piping shall be installed at least **12" inches below the average frost depth**. In case of loose, rocky soil, the trench should be excavated **at least 6"** deeper than the desired pipe depth and filled with suitable soils. Regardless of soil condition, the backfill should be free of rocks, glass, or other sharp objects. The tube and fitting are to be insulated with PE jacket and PVC sleeve, and the insulation material is to be at least 0.025" thick when there is direct contact with concrete and/or soil.
- **Laying the tubing:** Tubing should be laid with sufficient slack (snaking) to accommodate any contraction or elongation prior to backfilling. Minimum bending radius requirements for flexible water tubing shall be followed. In poor soil conditions, it's necessary to excavate deeper and use good clean fill or granular fill to smooth the trench bottom.
- **Backfilling:** Do not use clay, silt, or rocky backfill. Remove the construction materials or foreign objects from trench prior to backfilling. The tubing and fittings should be surrounded with good clean fill, or sand. Compact the initial backfill around the tubing to provide adequate tubing support and prevent settlement. It is particularly important to adequately compact the soil around the tap connection.

Electrical Grounding/Bonding

General Provisions

- The EASYFLEX flexible water piping and/ or the components must not be used as a grounding electrode of any part of an electrical system.
- ***Grounding Tubing** Proper bonding and grounding may reduce the **risk of damage in a lightning strike**. A lightning strike can cause the system to become energized, and if not bonded, the differences in potential can cause the charge to arc to another system. This arcing can cause damage to the system. The CSST shall be bonded in accordance with NFPA 54, section 7.13.2-4, using a bonding clamp approved for steel pipe by UL 467/CSA C22.2, to provide an adequate bonding connection which is continuous. A bonding connector shall be installed downstream of the meter, but before any fittings, to steel pipe, termination or brass nut of the fitting and **not to the tubing**, in accordance with NEC section 250.70, and shall be permanently connected to the grounding electrode system. The bonding conductor shall be a 6 AWG copper wire, connected to either the electrical service enclosure, the grounded conductor at the electrical service, or to one or more of the grounding electrodes used.
- Make grounding wire runs short whenever possible to maximize effect.
- Reducing the number of sharp bends in the system may also reducing arcing potential
- A licensed electrician should make the grounding connection whenever possible.

Manifold Installations

- Manifolds are installed where multiple tubing runs re made from a common location in a parallel arrangement. Depending on the location and available space, different mounting arrangements are permitted. A manifold assembly may be mounted on the surface of an interior wall, between open floor joints, in attic spaces, or within a partition wall inside ventilated enclosures the manifold assembly shall be installed in an accessible location where it can be inspected, maintained and serviced if repair or replacement is required.

Horizontal Manifold Installation

- Position the manifolds in the desired location and nail and screw the mounting bracket to the studs. Make sure all valve handles have room for operation.

Vertical Manifold Installation

- Manifolds may be coupled end to end and installed vertically along a stud. Position the manifold in the desired location and fasten it to the studs.

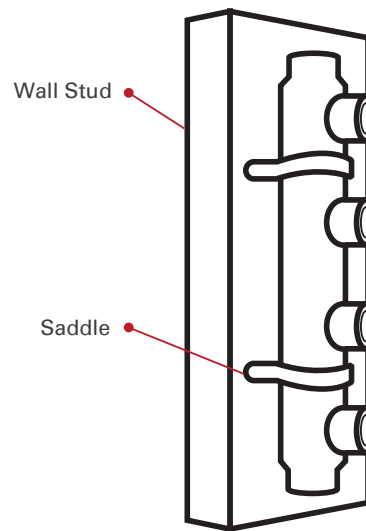
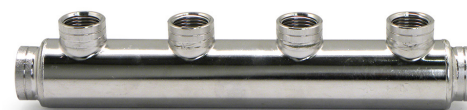


FIGURE 6

Note: A vertical manifold installation usually requires bending the flexible water tubing immediately off the manifold. Extra care must be taken to assure that tube is not bent in a radius smaller than the minimum permitted for flexible water pipe. Also make sure that bending stress is not applied to the fitting that connects the tube to the manifold.

Selecting the Manifold Size

- EASYFLEX manifolds are designed for easy connection to 1/2", 3/4", 1" flexible water line. When selecting the tube size, the following factors should be considered:
 1. Local code requirements
 2. Water demand of the fixture
 3. Distance from the manifold to the fixture
 4. Elevation change from manifold to the fixture
 5. Water pressure available to the manifold

Repair and Replacement

- Damaged tubing runs shall be repaired in accordance with this design guide and installation instruction manual. The repair can result in a line splice which may be located in a concealed location. If the tubing is damaged refer to the following subsections to determine the severity of damaged and, if necessary, the method of repair.
- Classification of Repairs
- No repairs or replacement of the tubing is necessary if the tubing corrugations are only slightly dented.
- EASYFLEX flexible water piping must be repaired or replaced under the following circumstances.
 - The tubing has been significantly damaged
 - The tubing has been punctured.
 - The tubing has been bent sharply and a crease or kink appears

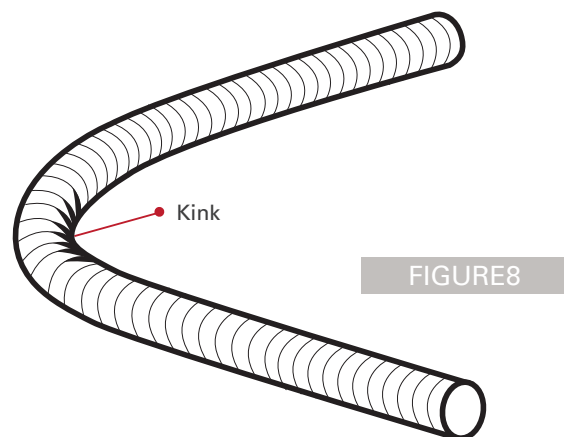
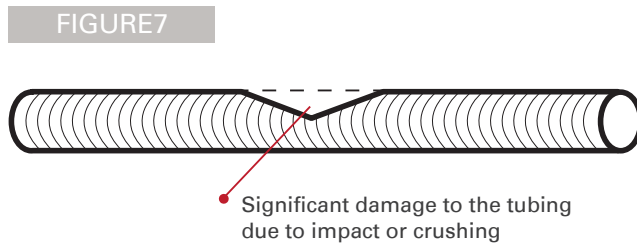
Method of Repair

The installer shall determine the most reliable and economical method of repair using one of the following methods:

- Replace the entire tubing run: In most cases when the tubing run is short and easily accessible, it can be replaced faster and more economically than repairing the damaged section. This is the preferred method because extra fittings are not required.
- Repair the damaged section: The damaged tubing can be repaired by each of two methods described below:
 1. Remove the section of tubing which is damaged and reconnect the new ends with a single mechanical coupling.
 2. Remove the section of tubing which is damaged and splice in a new section of tubing with two mechanical couplings. Use this repair method if the extent of the damage covers more than a small area, and there is not enough slack in the existing tubing run to make-up the damaged length.

Testing Installation

After all connections in the line have been made and tightened, test water line by running water or air through the line at the same pressure for intended use. If leaks are found, see trouble shooting instructions.



PART NUMBERS

EFW-034-050/BL/SF

PRODUCT CATEGORY	DIAMETER	LENGTH / JACKET / CONN. TYPE

CORRUGATED STAINLESS STEEL TUBE

Description	Part No.	Size
1/2" (ID) 3/4" (OD)	EW-012-050	1/2" x 50 ft
	EW-012-100	1/2" x 100 ft
	EW-012-150	1/2" x 150 ft
3/4" (ID) 1" (OD)	EW-034-050	3/4" x 50 ft
	EW-034-075	3/4" x 75 ft
	EW-034-100	3/4" x 100 ft
	EW-034-150	3/4" x 150 ft
1" (ID) 1 1/4" (OD)	EW-010-050	1" x 50 ft
	EW-010-075	1" x 75 ft
	EW-010-100	1" x 100 ft
	EW-010-150	1" x 150 ft
1 1/4" (ID) 1 1/2" (OD)	EW-114-050	1 1/4" x 50 ft
	EW-114-100	1 1/4" x 100 ft
With PE Jacket 1/2" (ID) 3/4" (OD) (Blue or Red)	EW-012-050BL	1/2" x 50 ft
	EW-012-100BL	1/2" x 100 ft
	EW-012-150BL	1/2" x 150 ft
	EW-012-050RD	1/2" x 50 ft
	EW-012-100RD	1/2" x 100 ft
	EW-012-150RD	1/2" x 150 ft

CORRUGATED STAINLESS STEEL TUBE

Description	Part No.	Size
With PE Jacket 1" (ID) 1 1/4" (OD) (Blue or Red)	EW-010-050BL	1" x 50 ft
	EW-010-100BL	1" x 100 ft
	EW-010-150BL	1" x 150 ft
	EW-010-050RD	1" x 50 ft
	EW-010-100RD	1" x 100 ft
	EW-010-150RD	1" x 150 ft
	EW-034-150	3/4" x 150 ft
With PE Jacket 1 1/4" (ID) 1 1/2" (OD) (Blue or Red)	EW-114-050BL	1" x 50 ft
	EW-114-100BL	1" x 100 ft
	EW-114-050RD	1" x 50 ft
	EW-114-100RD	1" x 100 ft

BRASS FITTINGS

Description	Part No.	Size
Straight Male (MIP) Threaded Connector	EFW-012-ST	1/2"
	EFW-034-ST	3/4"
	EFW-010-ST	1"
	EFW-114-ST	1 1/4"
Straight Female (FIP) Threaded Connector	EFW-012-SF	1/2"
	EFW-034-SF	3/4"
	EFW-010-SF	1"
	EFW-114-SF	1 1/4"
Copper Sweat Adapter	EFW-012-SW	1/2"
	EFW-034-SW	3/4"
	EFW-010-SW	1"
	EFW-114-SW	1 1/4"

BRASS FITTINGS

Description	Part No.	Size
Coupling (Union)	EFW-012-CP	1/2"
	EFW-034-CP	3/4"
	EFW-010-CP	1"
	EFW-114-CP	1 1/4"
Elbow Female (FIP)	EFW-012-EL	1/2"
	EFW-034-EL	3/4"
	EFW-010-EL	1"
Tee	EFW-012-T	1/2"
	EFW-034-T	3/4"
	EFW-010-T	1"
Female Tee	EFW-012-FT	1/2" Female
	EFW-034-FT	3/4" Female
	EFW-010-FT	1" Female
Tee reducer 1 x 2 x 3 (Tee)	EFW-RT-034-RT-012	3/4" x 3/4" x 1/2"
	EFW-RT-010-RT-012	1" x 1" x 1/2"
	EFW-RT-010-RT-034	1" x 1" x 3/4"
Reducing Female Tee 1 (run) x 2 (Tee)	EFW-034-FRT-012	3/4" x 1/2" F Tee
	EFW-010-FRT-034	1" x 3/4" F Tee
Reducing Coupling	EFW-012-RCP-034	3/4" x 1/2"
	EFW-012-RCP-010	1" x 1/2"
	EFW-034-RCP-010	1" x 3/4"
Push-Fit Coupling Flex x Push-fit	EFW-012-EC-CP	1/2" EW x 1/2"
	EFW-034-EC-CP	3/4" EW x 3/4"
	EFW-010-EC-CP	1" EW x 1"
High Temperature Gaskets (Blue)	EW-HG-012	1/2"
	EW-HG-034	3/4"
	EW-HG-010	1"
	EW-HG-114	1 1/4"
Water Brackets Saddles	EW-WB-012	1/2"
	EW-WB-034	3/4"
	EW-WB-010	1"

FRICITION LOSS

Friction loss of tubing calculated in pounds per square inch (PSI) of pressure lost per foot of tubing with a friction constant = 70 and no bends. Sharp bends are calculated the same as for fittings and gradual bends calculated the same as straight pipe.

GPM	NOMINAL SIZE (ID)			
	1/2"	3/4"	1"	1-1/4"
1	.020	.003	.001	.000
2	.073	.010	.003	.001
3	.154	.020	.007	.003
4	.262	.035	.012	.005
5	.396	.053	.019	.007
6	.555	.074	.026	.010
7	.738	.098	.035	.013
8	.946	.125	.045	.017
9	1.176	.156	.056	.021
10	1.43	.190	.068	.025
15	3.029	.402	.143	.054
20	5.161	.685	.244	.091
25	7.801	1.035	.369	.138
50	28.163	3.737	1.330	.499
75	59.676	7.918	2.819	1.057
100	101.668	13.490	4.802	1.801

NOTE:

1. Table is based on the *Hazen-Williams formula.
2. Fluid velocities in excess of 5-8 ft/sec are not recommended.
3. Friction loss values shown are for the flow rates that do not exceed a velocity of 8 ft/sec.

$$*P = \frac{4.52Q^{1.85}}{C^{1.85}d^{4.87}}$$

Where: P = friction loss, psi per linear foot

Q = flow, gpm

D = average, I.D., in inches

C = constant, 90

PIPE SIZING

Pipe shall be sized in reference to the supplied table included in this installation guide and or in compliance with local codes and standards. The water distribution system shall be designed, and pipe sizes shall be selected such that under conditions of peak demand, the capacities at the fixture supply pipe outlets shall not be less than required for the combined fixture demand.

For specific information on fixture demand, see local building code.

PIPE SIZING CHART

Developed Length in Feet

Pressure Range: 30-45 psi									
Diameter Size (in)	40	60	80	100	150	200	250	300	400
1/2	6	5	4	3	2	1	1	1	1
3/4	16	16	13	11	8	5	5	4	4
1	28	24	22	21	16	14	12	11	10
1-1/4	35	33	30	27	23	22	21	18	17

Pressure Range: 46-60 psi									
Diameter Size (in)	40	60	80	100	150	200	250	300	400
1/2	7	7	6	5	4	3	2	2	1
3/4	20	20	19	16	13	10	8	7	6
1	38	37	35	32	27	22	20	18	16
1-1/4	38	38	38	38	38	38	33	31	26

Pressure Range: over 60 psi									
Diameter Size (in)	40	60	80	100	150	200	250	300	400
1/2	7	7	7	6	5	4	3	3	2
3/4	19	19	19	19	16	12	10	9	7
1	38	38	38	38	34	29	26	23	20
1-1/4	38	38	38	38	38	38	38	38	33

Values in Water Supply fixture Units (WSFU)

Source: IAPMO IGC-233-2009

TESTING

All tubing and fittings comply with IAPMO IGC 233 and ANSI/NSF 61

- Hydrostatic Test - Filled with water and internal pressure increased to 220 ± 7 psi, at a temperature of $68^{\circ} \text{F} \pm 5^{\circ} \text{F}$ for a period of 5 minutes.
- Hydrostatic Burst Test at 68°F - Filled with water, and the internal pressure increased to 588 ± 7 psi, at a temperature of $68^{\circ} \text{F} \pm 5^{\circ} \text{F}$ for a period of 5 minutes.
- Bending Test – Bending motion being applied uniformly at the rate of 5-6 cycles per minute.
- Hydraulic Shock Test – Subjected to a hydraulic shock for 2,000 cycles at $68^{\circ} \text{F} \pm 5^{\circ}$.
- Vibration Test – Filled with water. The amplitude of vibration was 0.2 in, and the frequency was 25 Hz for 3 hours.
- Flattening Test – Pressed to $2/3$ D height of the outer diameter until the tube was flat.
- Impact Test – An impact force was applied of 9.76 to 15.19 lb-ft to varied sizes of fittings using a hammer.
- Pressure Test – Pressure Rating at 212°F of 147 psi
- Toxicity Test – Water outflow was tested in hot and cold conditions with a ph range of 5 – 10.
- High Temperature Exposure – Tested in fluid exposure of 230°F at 177 psi for 240 hours

WARRANTY

EASYFLEX LIMITED WARRANTY EASYFLEX FLEXIBLE TUBING FOR WATER, FITTINGS AND MANIFOLDS

Subject to the conditions and limitations in this Limited Warranty, EASYFLEX warrants to the real owner as installed by licensed plumbers, who purchase and properly install in a hot and cold potable water distribution system its Water Line System corrugated stainless steel tubing (CSST), fittings and manifold plumbing system, sold by EASYFLEX, under normal conditions of use, will be free from failure caused by manufacturing defect, from the time of installation:

- (I) Corrugated stainless steel tubing for a period of fifty (50) years.
- (II) Brass fittings and stainless steel manifolds for a period of twenty five (25) years.

Under this warranty, you only have a right to reimbursement if the failure or leak resulted from a manufacturing defect in the products covered by this warranty and occurred during the warranty period. You do not have a remedy or right of reimbursement under this warranty and this warranty does not apply if the failure or any resulting damage is caused by (1) components in the plumbing system other than those manufactured or sold by EASYFLEX; (2) not designing, installing, inspecting or testing the system in accordance with EASYFLEX'S installation instructions at the time of the installation, applicable code requirements, and good plumbing practices; (3) improper handling and protection of the product prior to or during installation, inadequate freeze protection, exposure to water pressures or temperatures in excess of the limitations on the pipe or tubing, or application of unauthorized solvents or chemicals.; (4) acts of nature such as earthquakes, fire, flood, or landslide; (5) damage caused by lightning without proper grounding as per NFPA 780, NEC 2005 article 250.70 and clamps complying with UL 467 standards; (6) remain in its originally installed location; (7) show no evidence of tampering, mishandling, neglect, accidental damage, modification or repair without the approval of EASYFLEX; (8) exposure to abnormal environmental conditions relative to the norm for the installation site and outside manufacturer specified pressure and temperature range; including chemical and biological substance exposure; (9) freezing during or after the installation or inadequate freeze protection; (10) exposure to operating use and or conditions outside those specified by manufacturer.

In the event of a leak or other failure in the system, it is the responsibility of the property owner to obtain and pay for the repairs. Only if the warranty applies will EASYFLEX be responsible for reimbursement under this warranty. The part or parts which you claim failed should be kept and EASYFLEX contacted by writing to the address below or telephoning 714.258.2600 within thirty (30) days after the leak or other failure and identifying yourself as having a warranty claim. You should be prepared to ship, at your expense, the product which you claim failed due to a manufacturing defect, document the date of installation, and the amount of any claimed bills which you wish reimbursed. Within a reasonable time after notification, EASYFLEX will investigate the reasons for the failure, which includes the right to inspect the product at EASYFLEX and reasonable access to the site of the damage in order to determine whether the warranty applies. EASYFLEX will notify you in writing of the results of its review.

In the event that EASYFLEX determines that the failure or leak and any resulting damages were the result of a manufacturing defect in the products covered by this warranty, EASYFLEX will reimburse the property owner for reasonable repair or replacement charges to include labor, repair or replacement, drywall and painting or plastering costs, as well as damages to personal property resulting from the failure or leak. EASYFLEX SHALL NOT BE LIABLE FOR CONSEQUENTIAL ECONOMIC LOSS DAMAGES UNDER ANY LEGAL THEORY AND WHETHER ASSERTED BY DIRECT ACTION, FOR CONTRIBUTION OR INDEMNITY OR OTHERWISE. THE ABOVE LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Other than this limited warranty, EASYFLEX does not authorize any person or firm to create for it any other obligation or liability in connection with its products. Licensed plumbers are authorized to provide this warranty in connection with any warranty extended by them to builders or owners of site built construction.

Some states do not allow the exclusion or limitation of incidental or consequential damages in certain types of transactions, so the above exclusion or limitations may not apply to you. This limited warranty gives you specific legal right and you also may have other rights which vary from state to state.

EASYFLEX TERMS AND CONDITIONS

PRICES, PAYMENT AND LATE CHARGES

Prices are F.O.B Garden Grove, CA. Our terms are 1% discount applied with payment within 10 days of receipt of goods and full payment of purchase price and other charges is due within thirty (30) days after invoice date. In special circumstances, different terms may be negotiated at the discretion of EASYFLEX. Prices are subject to change without notice. If full payment is not received by the applicable due date, Buyer agrees to pay EASYFLEX attorney's fees and all other cost of collection incurred by EASYFLEX, and a monthly late charge equal to one and one-half percent (1.5) of all outstanding amounts. Buyer understands that EASYFLEX may refuse to sell any products to Buyer until overdue accounts are paid in full. Buyer shall be responsible for the payment of all taxes, duties, customs and other fees of any nature imposed to this transaction.

CREDIT APPROVAL

All orders are subject to approval of Buyer's credit. If Buyer's credit is not approved by EASYFLEX prior to shipment of the Products, EASYFLEX may require, in its sole discretion, different terms of payment from those specified in this document, including, but not limited to, requiring first three orders to be C.O.D or full payment before shipment, requiring Buyer to pay EASYFLEX C.O.D, or to return the products to EASYFLEX at Buyer's expense.

ORDERS

All orders are subject to acceptance by EASYFLEX, Inc and cannot be canceled once accepted. No Orders can be amended except with EASYFLEX, Inc's written approval, and upon terms except EASYFLEX, Inc against any losses including loss of profit on additional costs resulting there from. Minimum order must be greater than shipping charge for all fittings and other parts or \$100 for roll(s) of tubing and complete sets of fire sprinkler drops.

DELIVERY

EASYFLEX shall ship the Products to the location designated by buyer via commercial carrier or private delivery at the date provide by buyer in purchase order or earliest available shipment date, by most economical means. Shipping dates are estimates only. EASYFLEX will notify buyer of changes or delays in shipping when information becomes available. Changes in the shipping schedule by Buyer, may at EASYFLEX's discretion, result in an increase in the freight costs.

RETURNS AND CLAIMS

All claims for Products damaged and or lost during shipping must be made within seven (7) days after receipt to EASYFLEX or, if a common carrier is used, made to the common carrier within their specified claims period. Buyer will report to EASYFLEX exactly how the Products were damaged and request a Return Authorization Number to return the damaged Products to EASYFLEX. After EASYFLEX has inspected the damaged Products, EASYFLEX may replace the damaged Products at no cost to the Buyer, or issue a credit memo to the Buyer's account, or may disallow Buyer's claim, or may refer claim to the common carrier, if used. When the product is damaged in shipment, the buyer is responsible for recovering any and all damages from the common carrier.

No returns will be accepted without our Return Authorization Number and there will be a 15% restocking fee. Buyer must tell EASYFLEX the specific reason(s) why they want to return the item. EASYFLEX may, at its discretion, not accept non-damaged Products for credit to the Buyer's Account. All non-damaged Products must be resalable. After EASYFLEX confirms that the non-damaged Products are resalable, EASYFLEX will credit the Buyer's Account.

NON-CONFORMING PRODUCTS

Buyer shall notify EASYFLEX in writing within seven (7) days after delivery of any deficiencies or shortages; otherwise all such claims shall be deemed waived by Buyer. The use or resale by Buyer of any Products claimed to be non-conforming or deficient shall constitute acceptance of such items by Buyer. Buyer shall have no right to withhold payment of the purchase price or to adjust the amount of the purchase price because of such claim, the sole remedy of the Buyer shall be the replacement or repair by EASYFLEX, at EASYFLEX's option, of non-conforming or deficient items in accordance with the Disclaimer and Limited Warranty below.

DISCLAIMER AND LIMITED WARRANTY

All Products sold by EASYFLEX are warranted to be free from defects in material and workmanship to the extent, in the manner and during the period provided in the applicable express Warranty
EASYFLEX Page 22 www.easyflexusa.com
extended to EASYFLEX by the manufacture of such Products and to the extent EASYFLEX is able to enforce such Manufacturer's Warranty

CONFIDENTIALITY

Buyer and its directors, officers, employees and agents shall not disclose to any third party any information pertaining to the goods provided or services performed hereunder, or pertaining to EASYFLEX'S business or operations which Buyer obtains or has access to in connection herewith, without the prior written consent of EASYFLEX.

NO WAIVER OF DEFAULTS

No failure by EASYFLEX to enforce at any time any of the terms or conditions of this agreement shall constitute a waiver thereof or in any way impair EASYFLEX's right at any time to avail itself of such remedies as it may have to enforce such terms or conditions. No waiver by EASYFLEX hereunder will be effective unless in writing and signed by EASYFLEX.

SEVERABILITY


Any provision of this agreement that is unenforceable in any jurisdiction shall be ineffective to the extent of such unenforceability (but shall be enforced to the maximum extent permissible) without invalidating the remaining provisions hereof.

GOVERNING LAW

This agreement shall be governed by the laws of the state from which EASYFLEX corporate office resides (Garden Grove, California), without giving effect to its principles of conflicts of law.

FORCE MAJEURE

EASYFLEX shall not be liable to Buyer for any breach hereunder, including the failure to deliver or delays in delivery for causes beyond the control of EASYFLEX or EASYFLEX's suppliers or subcontractors, including, but not limited to, unavailability or excessive cost of material, strikes, labor slowdowns and stoppages, labor shortages, lockouts, fires, floods, earthquakes, storms, drought, adverse weather, riots, thefts, accidents, embargoes, war (whether or not declared) or other outbreak of hostilities, civil strife, acts of government, act of God, acts of the public enemy, machinery breakdowns, delay or unavailability of carriers of suppliers, shortages of labor, and government acts or regulation, order or injunctions, or other reasons, whether similar or dissimilar to the forgoing (together a "Force Majeure Event"). In addition, in the event of a Force Majeure Event (i) the time for EASYFLEX's performance shall be reasonably extended (ii) EASYFLEX and Buyer shall take reasonable steps to adjust all affected dates in the agreement and (iii) an adjustment in the purchase price may be made for the resulting additional costs to EASYFLEX upon proof provided to Buyer.

 **WARNING**: THIS PRODUCT CAN EXPOSE YOU TO CHEMICALS INCLUDING LEAD, WHICH IS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM. For more information go to www.p65Warnings.ca.gov

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