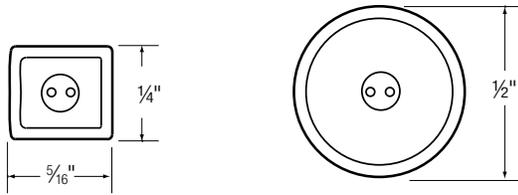




Profile Dimensions



**FTL-03
SEMI-RIGID**

**FTL-02
RIGID**

**FTL-05
ULTRAFLEX**

Please verify the contents of the packages!

Please read instructions entirely before starting installation

Be sure power is turned off before installing or modifying the system

Call Tivoli, LLC tech support with questions

Caution: Fastube™ 360° LED is designed to work with listed Class 2 12V DC transformers only. Use of any other power source will cause damage, shorten the life of the fixture and void the warranty.

Consult any and all applicable local and national codes for installation.

Do not conceal or extend exposed conductors through a building wall as per local electrical code.

Warning: With any luminaire for any application, basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injuries. This lighting system should only be installed by a certified professional.



Installation Instructions

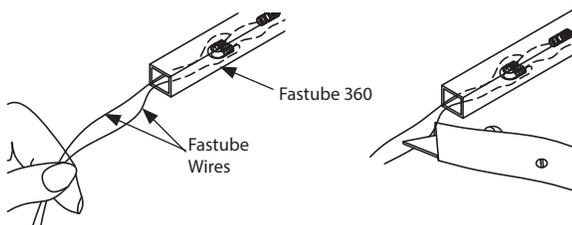
Fastube™ 360 is sold per foot so it may be ordered to fit in pre measured spaces. Fastube™ 360 also comes in two different profiles: Round flexible tube and Rectangular, semi-rigid polycarbonate tube. Both types of extrusions bend to a radius as small as 6". Both are wired in parallel. **Caution:** To avoid an electrical overload to your low voltage Fastube lighting system, do not exceed a 140 lamp run per 12V DC transformer capacity. Class II transformer required.

A Connector Kit is an integral part of the system and contains parts for up to 6 connections. (Kit includes: 9' length of 22ga. wire, 7 plugs with notch, 7 dead end plugs, 14 miniature crimp connectors, 4 1½" shrink tubes, 2 replacement lamps.)

The first part of these instructions will discuss preparing the tube and making connections. The second part covers Mounting Channels and Mounting Clips.

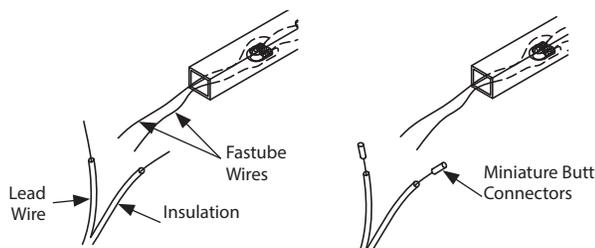
Step 1: Pull wires out of end of Fastube about 2 inches.

Step 2: Remove Clear insulation ½" from ends



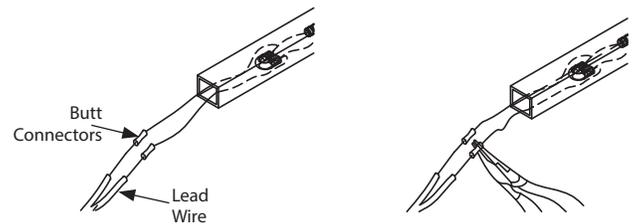
Step 3: Take the incoming lead wire and split it. Remove insulation ½" inch from ends.

Step 4: Insert lead wires into miniature butt connectors until they will go no further.

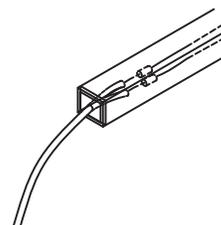


Step 5: Insert Fastube wires all the way into Butt Connectors.

Step 6: Crimp the Butt Connectors at both ends to insure a good electrical connection.



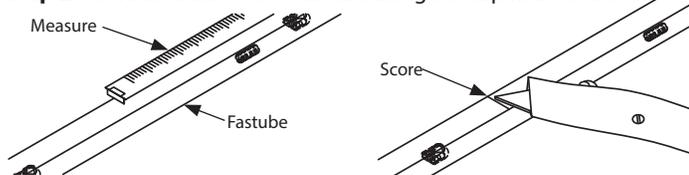
Step 7: Push wires back into Fastube until ½" of lead wire is inside tube. Apply silicone to the notched End Cap and insert into tube. Silicone sealant will ensure a moisture-tight seal.



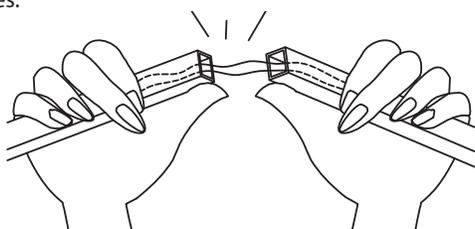
Installation Instructions: Cutting Tube to Size

Step 1: Measure Fastube to desired length. Mark tube where cut is to be made.

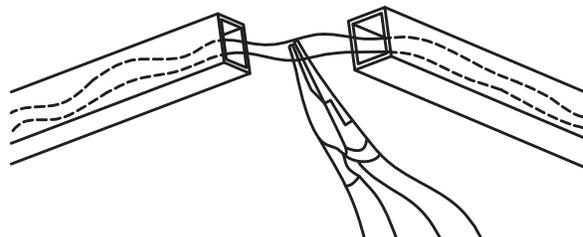
Step 2: Score all sides of the Fastube using a sharp knife or cutter.



Step 3: Snap tube by holding it between your thumbs and fingers and pushing out with your thumbs. Continue to "Connecting two Fastubes."



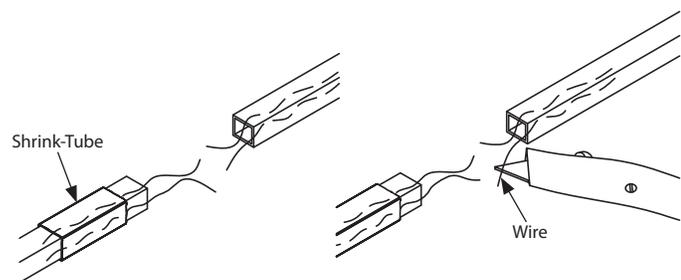
Step 4: Pull sets of wires from open tube ends and cut with wire cutters. Continue to "Connecting two Fastubes."



Installation Instructions: Connecting Two Fastubes

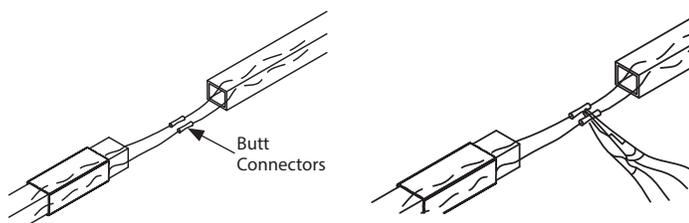
Step 1: Align Fastubes end to end. Slide Shrink-tubing onto one of the Fastube sections (to be used later). Pull set of wires out of each tube about 2 inches.

Step 2: Remove clear plastic insulation from the end of each wire.



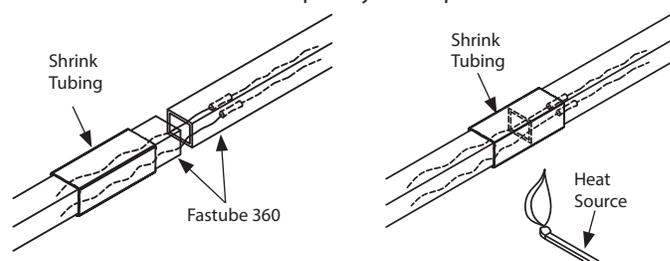
Step 3: Insert one set of wires all the way into miniature Butt Connectors and then insert the second set of wires into the other end.

Step 4: Crimp Butt Connectors to ensure a good connection. Note: Turn on power at this point to test and turn it back off again.

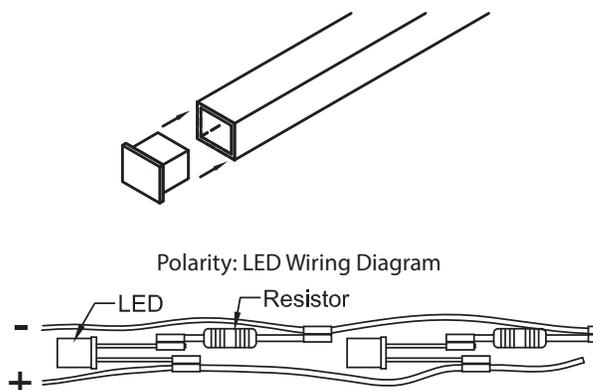


Step 5: Push connected wires back into tubes and bring them together in proper alignment end to end (see mitered instructions for other alignment variations)

Step 6: Slide large shrink-tube to cover both Fastubes. Apply heat until it shrinks tightly over tube ends. Caution: Do not heat tube. Keep away from open flame.



Step 7: Apply silicone sealant to a solid End Cap and insert into the trail end of the Fastube and insert a notched End Cap into the Lead end of the tube to accommodate the wires. Silicone sealant applied to the End Caps before installation will ensure a moisture-tight seal.



Installation Instructions: Wire Sizing

Care must be taken in sizing the wire from the transformer to the light fixture. The following chart provides a guide to determine the minimum wire size based on the wattage of the circuit and distance to the transformer. Locating the transformer as close to the luminaire as possible is recommended.

6% voltage drop and an operating temperature of 65° C is used in these calculations. Solid copper wire is recommended when using this chart. These are only estimates.

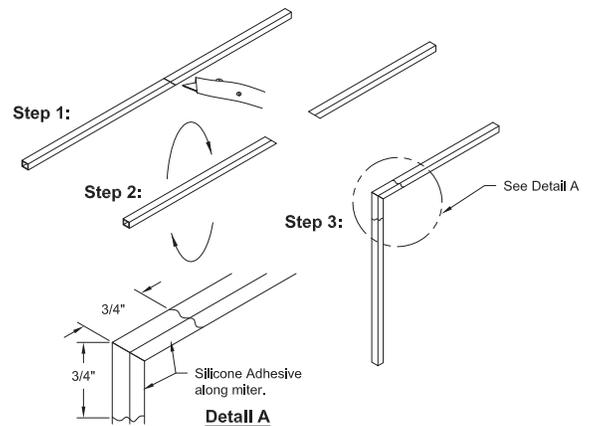
Wire Gauge	Max Feet Per Run, 12 Volt System								
	System Wattage								
	20W	25W	30W	35W	40W	45W	50W	55W	60W
18	61	49	41	35	30	27	24	22	20
16	97	78	65	55	48	43	39	35	32
14	155	124	103	88	77	69	62	56	52
12	247	197	164	140	123	109	98	89	82
10	387	310	260	222	194	173	155	142	130
8	623	495	416	354	310	276	250	226	207

Installation Instructions: Miter Cutting Fastube

Step 1: Using knife or sharp object, score tube where miter occurs. Bend tubing at score marks until tube breaks on one side. Then bend and break other side. Do not damage LEDs or wires in the process. For angles less than 90°, simply adjust the cut.

Step 2: Flip over one of the tubes, bringing it to its mitered position.

Step 3: Using silicone adhesive at miters, fill approximately 3/4" to moisture proof.



Installation Instructions: Installing Fastube™ 360 in floors

Installation in existing floor

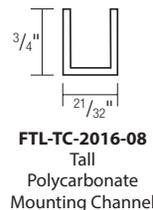
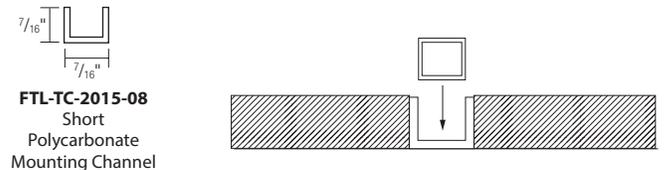
Floor must have a groove cut into the floor wide enough to fit the mounting channel.

Step 1: Fastube™ 360 must be installed just slightly below floor level, 1/32" or less.

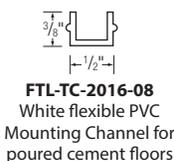
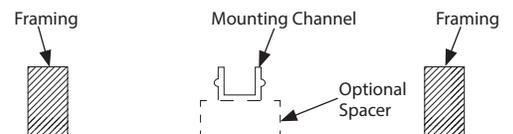
Step 2: Be sure the groove is clean before starting the installation process. Lay a bead of clear silicone adhesive compound in groove before inserting tube. Press tube into groove with heel of hand or soft soled shoe.

Step 3: Use denatured alcohol to clean up excess silicone.

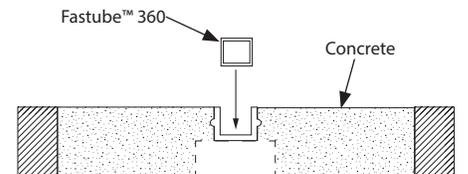
Step 4: For routine cleaning, mop with a damp mop. Keep tubing as dry as possible.



FTL-TC-2016-08
Tall
Polycarbonate
Mounting Channel



FTL-TC-2016-08
White flexible PVC
Mounting Channel for
poured cement floors



Installation in a poured floor

Fastube™ Mounting Channel must be put into position before the concrete is poured.

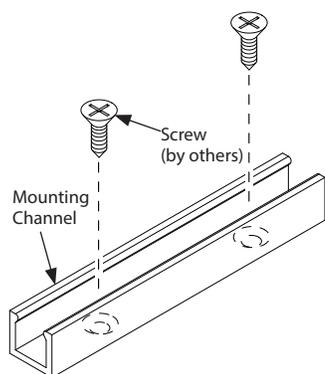
Step 1: Place mounting channel in position on floor. Consider final height of floor after it is poured to be sure the channel is positioned at the proper height.

Step 2: Pour and finish the floor keeping the mounting channel clear and clean.

Step 3: Press tube into groove with heel of hand or soft soled shoe.

Step 4: For routine cleaning, mop with a damp mop. Keep tubing as dry as possible.

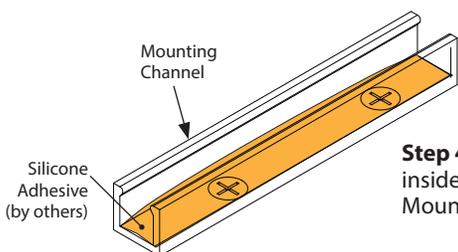
Installation Instructions: Using Mounting Channel



Step 1: Measure area where system is to be installed.

Step 2: Lay Mounting Channel along desired path and mark locations on tube and on mounting surface for screw holes. Screws should be placed every 9 to 12 inches.

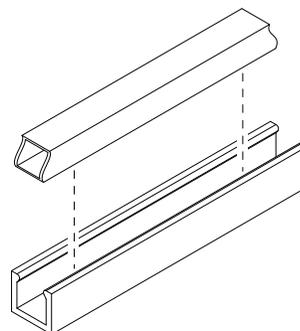
Step 3: Drill screw holes at marked locations and attach mounting channel to surface. Mounting Screws should not be tightened excessively to permit alignment of long runs of tubing.



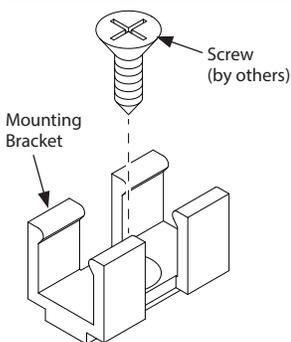
Step 4: Apply silicon to the inside bottom surface of the Mounting Channel.

Step 5: Fastube™ 360 may be cut in the field to fit installation. Insert solid End Cap into dead end of tube and notched End Cap into lead end of tube to accommodate the wire. (See previous Fastube preparation instructions.)

Step 6: Snap Fastube™ into Mounting Channel.



Installation Instructions: Using Mounting Brackets



Step 1: Measure area where system is to be installed.

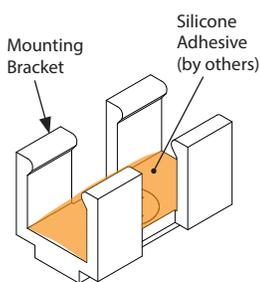
Step 2: Lay lighting system along desired path and position mounting brackets every 12 inches and mark locations for screw holes.

Step 3: Drill screw holes at marked locations.

Rectangular Tube

Step 4: Attach mounting brackets (FTL-03 BMC) to surface. Mounting screws should not be tightened excessively to permit alignment of long runs of tubing.

Step 5: Apply silicon to the inside bottom surface of the Mounting Bracket.



Circular Tube

Step 4: Insert Round Tube into mounting brackets (MC-1-1/2).

Step 5: Align brackets with mounting holes and attach to surface. Mounting screws should not be tightened excessively to permit alignment of long runs of tubing.

Step 6: The Light Tubes may be cut in the field to fit installation. Insert solid End Cap into dead end of tube and notched End Cap into lead end of tube to accommodate the wire.

Step 7: Snap Fastube™ into Mounting Bracket and snap Retaining Clip over Fastube.

