

SOLAR TUBING FOR SOLAR THERMAL SYSTEMS



The newest system of corrugated stainless steel tubing and accessories for solar thermal systems

### FLEXSURE

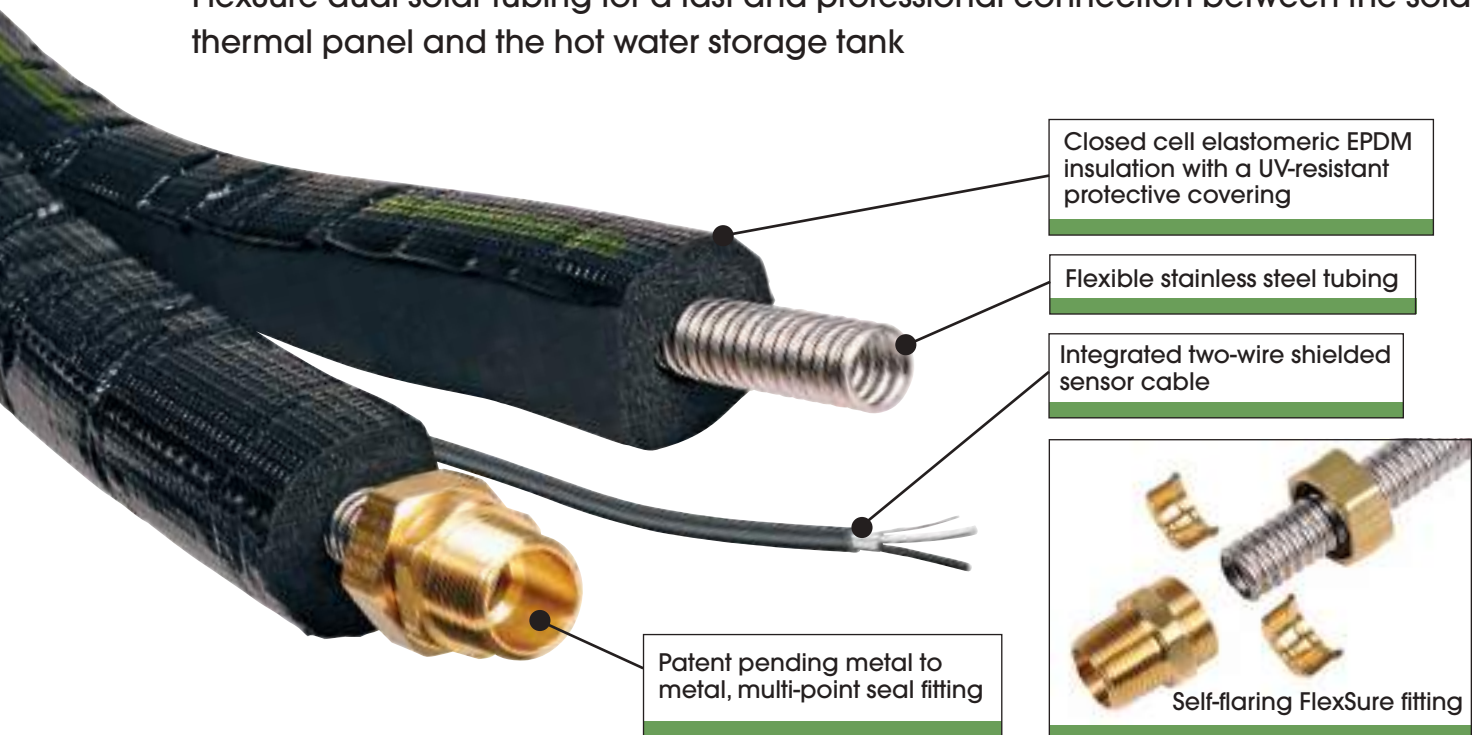
FlexSure is a division of Titeflex Corporation, a world power in fluid and tubular piping systems since 1916. Based in Portland, Tennessee, FlexSure brings the level of research and development that Titeflex is known for to the solar industry. The FlexSure system is a safe, time-saving and efficient method of connecting solar panels and a hot water storage tank. It utilizes corrugated, semi-rigid stainless steel tubing (CSST) with closed cell elastomeric EPDM insulation and a UV-resistant covering. We also offer a comprehensive system of fittings and accessories.

### FLEXSURE SOLAR

FlexSure is the newest system of corrugated stainless steel tubing (CSST) and accessories for solar thermal systems and beyond. Manufactured by the Titeflex Corporation in the USA, FlexSure features flexible 316L stainless steel tubing as well as a full range of accessories including a series of patent pending fittings featuring a dependable, multipoint seal. Choose FlexSure tubing for a fast and professional connection.

## FLEXSURE SOLAR TUBING

FlexSure dual solar tubing for a fast and professional connection between the solar thermal panel and the hot water storage tank



#### • FEATURES OF FLEXSURE SOLAR TUBING

- Flexible stainless steel tubing (316L)
- Closed cell elastomeric EPDM insulation
- Integrated two-wire shielded sensor cable
- UV-resistant protective cover
- Easy to separate
- Metal to metal, multi-point seal fitting
- Complete range of solar fittings
- Made in the USA

#### • BENEFITS OF FLEXSURE SOLAR TUBING

- Continuous runs allow for bending around corners and obstacles
- Pre-insulated tubing saves time and money
- Minimum energy loss through tubing because of high R-value insulation
- Tough cover stands up to installation conditions
- Self-flaring, reusable fitting: No special tools required

# FLEXSURE DUAL SOLAR TUBING

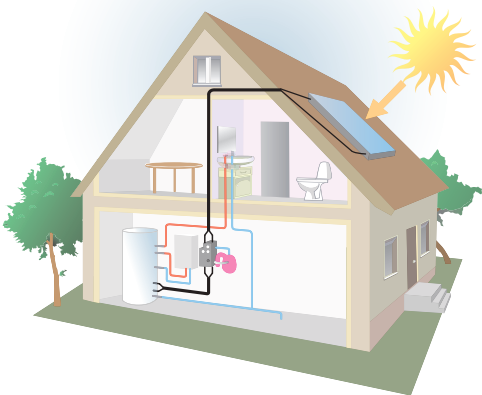
Two flexible stainless steel tubes and sensor wire pre-insulated with elastomeric EPDM insulation with a UV-resistant covering  
Tubing system to connect supply and return lines between solar panels and hot water storage tank

## FEATURES OF FLEXSURE DUAL SOLAR TUBING

- Pre-insulated dual tubes
- 316L corrugated stainless steel tubing
- Integrated shielded sensor wire
- Identification marks to distinguish supply and return lines
- Easy to bend
- Two standard lengths: 50 ft. and 75 ft., custom lengths available upon request
- Operating temperature range from -60° F to 300° F
- Available in three diameters and two insulation thicknesses



R-VALUES		
	5/8" INSULATION	1" INSULATION
5/8" CSST	3.7	6.3
3/4" CSST	3.6	6.0
1" CSST	3.5	5.5



# FLEXSURE SINGLE SOLAR TUBING

Flexible stainless steel tube pre-insulated with elastomeric EPDM insulation with UV-resistant covering  
Recommended for connecting solar panels

## FEATURES OF FLEXSURE SINGLE SOLAR TUBING

- Pre-insulated tubing saves you time and money
- 316L corrugated stainless steel tubing
- Two standard lengths: 50 ft. and 100 ft., custom lengths available upon request
- Operating temperature range from -60° F to 300° F
- Available in four diameters and two insulation thicknesses

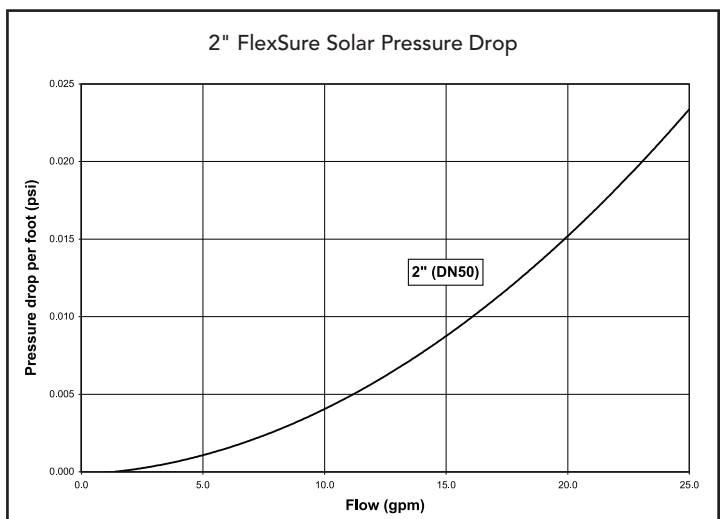
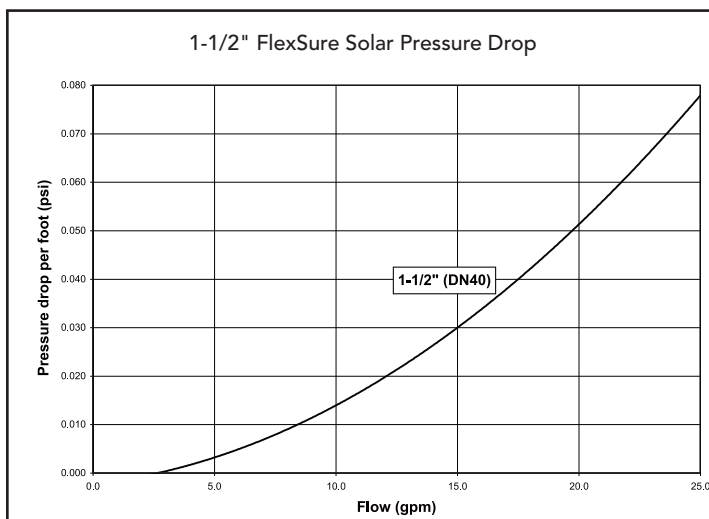
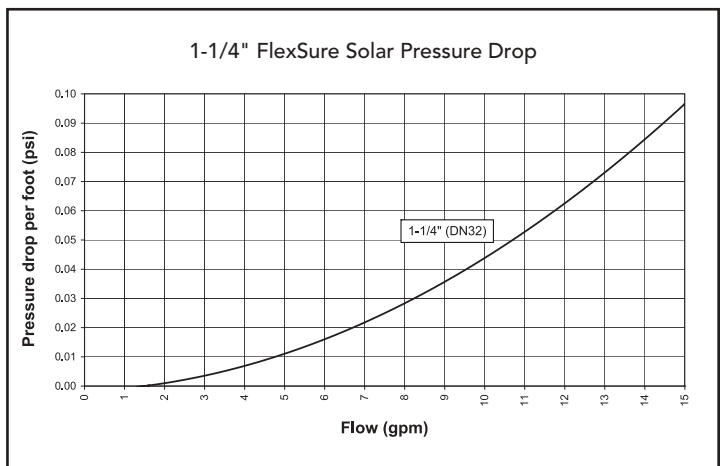
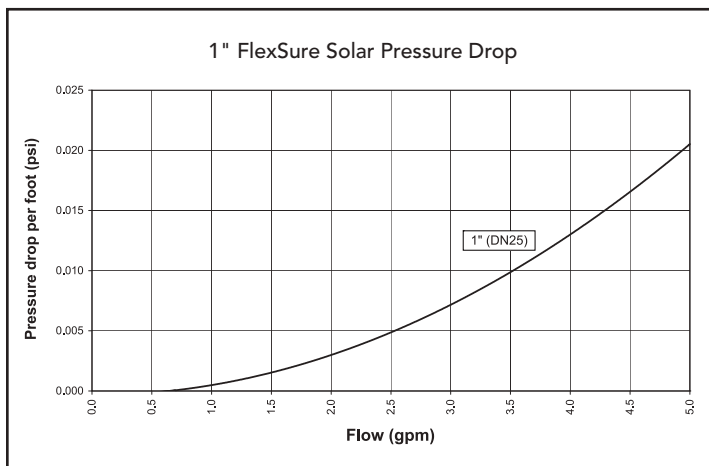
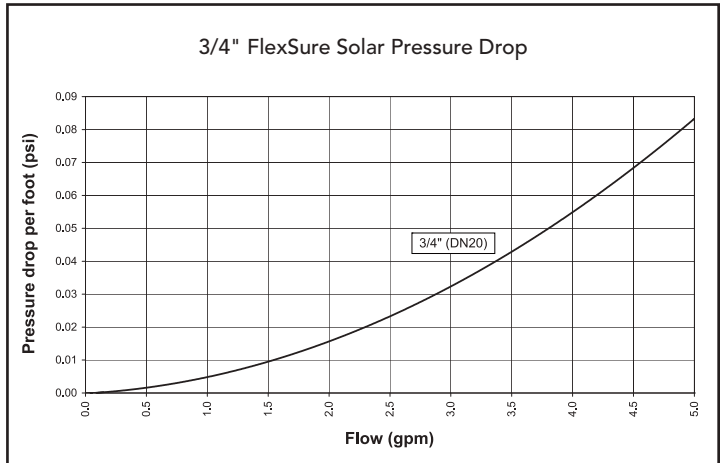
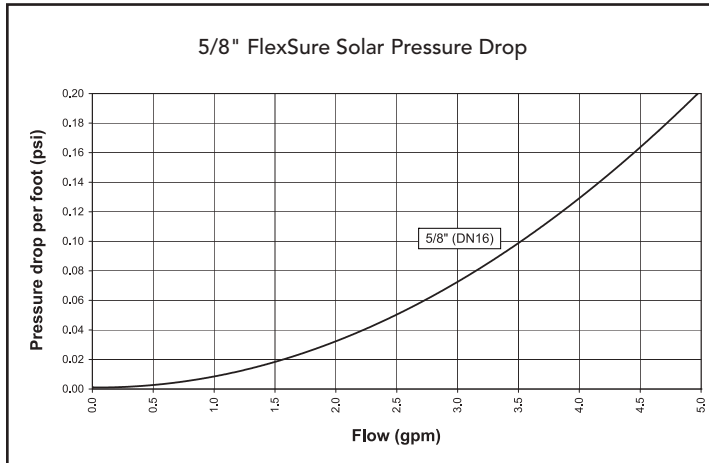


R-VALUES		
	3/4" INSULATION	1" INSULATION
5/8" CSST	5.0	7.2
3/4" CSST	4.8	6.9
1" CSST	4.4	6.3
1-1/4" CSST	4.2	6.0

## FLEXSURE CSST

Reference the pressure drop chart to determine the correct FlexSure tubing size to handle the flow requirements of the installation. (5/8", 3/4", 1", and 1-1/4" test were conducted at 70°F and 1atm. 1-1/2" and 2" tests were conducted at 80°F and 1atm)

### 40/60 PROPYLENE GLYCOL/WATER MIX





# FLEXSURE SOLAR TECHNICAL SPECIFICATIONS

## • INSULATION

- Closed cell elastomeric EPDM
- Water vapor permeability: 0.03 perm. max, ASTM E96
- Water absorption (weight %): 0.2% max, ASTM C209
- Flame and smoke: ASTM E84 25/50 pass
- UV-resistant
- Temperature range: -60° F to 300° F
- Thermal conductivity (k value) at 75° F: 0.245 Btu•in/h•ft<sup>2</sup>•° F ASTM C518/C177
- No PVC, CFCs, HCFCs, HFCs, Halogen-free

## • WIRE

- Shielded two-wire sensor (control) wire
- 18 ga.
- Rated voltage: 300V

## • PROTECTIVE COVERING

- UV-resistant polyolefin

FlexSure CSST/SS 316L: ASTM A240/A240M

	5/8"(DN16)	3/4"(DN20)	1"(DN25)	1-1/4"(DN32)	1-1/2"(DN40)	2"(DN50)
MAX. OPERATING PRESSURE	150 PSI	150 PSI	150 PSI	150 PSI	140 PSI	60 PSI
SS WALL THICKNESS (in.)	0.009"	0.009"	0.009"	0.010"	0.011"	0.011"
ID (in.)	0.632"	0.752"	1.037"	1.250"	1.478"	1.978"
OD (in.)	0.785"	0.920"	1.255"	1.495"	1.745"	2.320"
VOLUME (gallons/ft.)	0.019	0.028	0.053	0.075	0.109	0.183
MIN. BEND RADIUS (in.), NO INSULATION	1"	1"	3"	3"	3"	4"

## FLEXSURE ACCESSORIES

### SELF-FLARING FLEXSURE FITTINGS



SWEAT



FEMALE



MALE



COUPLING



STUB



90°

- Metal to metal seal/No gaskets or O-rings
- Multiple-point seal
- Brass fittings are reusable

- Self-flaring/No special tools required
- Patent pending design

### FLEXSURE DUAL BRACKETS



HINGED WITH CENTER POST



FLUSH MOUNT

- One hand application
- Galvanized steel
- Post attachment
- Surface mount
- Galvanized steel

### FLEXSURE TUBING CUTTER



- Fitted with cutting wheel designed to cut stainless steel tubing
- Creates clean cuts for optimal flaring of tubing
- Metallic body
- Replacement cutter wheels available

### FLEXSURE EPDM RUBBER TAPE FOR INSULATION SEAMS



- Self-adhering black EPDM rubber tape
- UV-resistant
- 2" x 0.020" x 82 ft. roll
- -60° F to 300° F

### FLEXSURE SILICONE RUBBER TAPE FOR COVERING EXPOSED STEEL



- Self-fusing black silicone rubber
- UV-resistant
- 1" x 0.015" x 36 ft. roll
- -65° F to 500° F

# FLEXSURE PART LIST

PART NUMBER	DESCRIPTION	STANDARD LENGTHS	PACK WEIGHT (LBS./FT.)
FLEXSURE DUAL SOLAR TUBING:*			
5/8" Insulation Thickness			
DPST-IB1-DN16-(Length)	5/8" (DN 16) CSST	50 ft., 75 ft.	0.46
DPST-IB1-DN20-(Length)	3/4" (DN 20) CSST	50 ft., 75 ft.	0.50
DPST-IB1-DN25-(Length)	1" (DN 25) CSST	50 ft., 75 ft.	0.68
1" Insulation Thickness			
DPST-IB2-DN16-(Length)	5/8" (DN 16) CSST	50 ft., 75 ft.	0.60
DPST-IB2-DN20-(Length)	3/4" (DN 20) CSST	50 ft., 75 ft.	0.64
DPST-IB2-DN25-(Length)	1" (DN 25) CSST	50 ft., 75 ft.	0.83
FLEXSURE SINGLE SOLAR TUBING:*			
3/4" Insulation Thickness			
PST-IB1-DN16-(Length)	5/8" (DN 16) CSST	50 ft., 100 ft.	0.30
PST-IB1-DN20-(Length)	3/4" (DN 20) CSST	50 ft., 100 ft.	0.32
PST-IB1-DN25-(Length)	1" (DN 25) CSST	50 ft., 100 ft.	0.39
PST-IB1-DN32-(Length)	1-1/4" (DN 32) CSST	50 ft., 100 ft.	0.51
1" Insulation Thickness			
PST-IB2-DN16-(Length)	5/8" (DN 16) CSST	50 ft., 100 ft.	0.35
PST-IB2-DN20-(Length)	3/4" (DN 20) CSST	50 ft., 100 ft.	0.37
PST-IB2-DN25-(Length)	1" (DN 25) CSST	50 ft., 100 ft.	0.51
PST-IB2-DN32-(Length)	1-1/4" (DN 32) CSST	50 ft., 100 ft.	0.65
BARE CORRUGATED STAINLESS STEEL TUBING (316L):*			
CSST-BB-DN16-(Length)	5/8" (DN 16) Bare CSST	250 ft.	0.12
CSST-BB-DN20-(Length)	3/4" (DN 20) Bare CSST	250 ft.	0.14
CSST-BB-DN25-(Length)	1" (DN 25) Bare CSST	150 ft.	0.19
CSST-BB-DN32-(Length)	1-1/4" (DN 32) Bare CSST	150 ft.	0.26
CSST-BB-DN40-(Length)	1-1/2" (DN40) Bare CSST	150 ft.	0.40
CSST-BB-DN50-(Length)	2" (DN50) Bare CSST	150 ft.	0.60
PART NUMBER	DESCRIPTION	PACK QUANTITY	PACK WEIGHT (LBS.)
FITTINGS:			
Sweat Fittings			
FLX-SB-DN16-3/4-10	5/8" (DN 16) x 3/4" Copper	10/box	4.0
FLX-SB-DN20-3/4-10	3/4" (DN 20) x 3/4" Copper	10/box	4.6
FLX-SB-DN20-1-10	3/4" (DN 20) x 1" Copper	10/box	4.8
FLX-SB-DN25-1-10	1" (DN 25) x 1" Copper	10/box	6.3
Stub Fittings			
FLX-UB-DN16-1/2-10	5/8" (DN 16) x 1/2" Copper Stub	10/box	3.6
FLX-UB-DN20-1/2-10	3/4" (DN 20) x 1/2" Copper Stub	10/box	4.4
FLX-UB-DN20-3/4-10	3/4" (DN 20) x 3/4" Copper Stub	10/box	5.2
FLX-UB-DN20-22-10	3/4" (DN 20) x 22mm Copper Stub	10/box	5.4
FLX-UB-DN25-3/4-10	1" (DN 25) x 3/4" Copper Stub	10/box	6.4
FLX-UB-DN25-1-10	1" (DN 25) x 1" Copper Stub	10/box	6.9
Female Fittings			
FLX-FB-DN16-3/4N-10	5/8" (DN 16) x 3/4" Female NPT	10/box	4.0
FLX-FB-DN20-1/2N-10	3/4" (DN 20) x 1/2" Female NPT	10/box	4.5
FLX-FB-DN20-3/4N-10	3/4" (DN 20) x 3/4" Female NPT	10/box	4.6
FLX-FB-DN25-1N-10	1" (DN 25) x 1" Female NPT	10/box	6.3
Male Fittings			
FLX-MB-DN16-3/4N-10	5/8" (DN 16) x 3/4" Male NPT	10/box	3.8
FLX-MB-DN20-1/2N-10	3/4" (DN 20) x 1/2" Male NPT	10/box	4.2
FLX-MB-DN20-3/4N-10	3/4" (DN 20) x 3/4" Male NPT	10/box	4.3
FLX-MB-DN25-3/4N-10	1" (DN 25) x 3/4" Male NPT	10/box	6.4
FLX-MB-DN25-1N-10	1" (DN 25) x 1" Male NPT	10/box	6.5
FLX-MB-DN32-5/4N-10	1-1/4" (DN 32) x 1-1/4" Male NPT	10/box	9.0
FLX-MB-DN40-6/4N-10	1-1/2" (DN40) x 1-1/2" Male NPT	4/box	5.7
FLX-MB-DN50-2N-10	2" (DN50) x 2" Male NPT	4/box	9.4
Couplings			
FLX-CB-DN16-10	5/8" (DN 16) Coupling	10/box	4.3
FLX-CB-DN20-10	3/4" (DN 20) Coupling	10/box	7.0
FLX-CB-DN25-10	1" (DN 25) Coupling	10/box	10.8
FLX-CB-DN32-10	1-1/4" (DN 32) Coupling	10/box	13.6
FLX-CB-DN40	1-1/2" (DN40) Coupling	4/box	8.9
FLX-CB-DN50	2" (DN50) Coupling	4/box	15.6
90° Elbows			
FLX-LB-DN20-3/4N-10	3/4" (DN 20) x 3/4" Female NPT 90° Elbow	10/box	7.2
FLX-LB-DN25-1N-10	1" (DN 25) x 1" Female NPT 90° Elbow	10/box	13.9

\* When placing orders, replace (Length) with desired length in feet. Maximum length of 200 ft. for insulated tubing, 5,000 ft. for non-insulated tubing.

## PART LIST CONTINUED

PART NUMBER	DESCRIPTION	PACK QUANTITY	PACK WEIGHT (LBS.)
FLEXSURE DUAL BRACKETS:			
Dual Brackets - Hinged with Center Post			
ACC-BS1-DN16-4	Fits 5/8" (DN 16) with 5/8" Insulation	4/bag	1.1
ACC-BS1-DN20-4	Fits 3/4" (DN 20) with 5/8" Insulation	4/bag	1.1
ACC-BS1-DN25-4	Fits 1" (DN 25) with 5/8" Insulation	4/bag	1.3
ACC-BS2-DN16-4	Fits 5/8" (DN 16) with 1" Insulation	4/bag	1.3
ACC-BS2-DN20-4	Fits 3/4" (DN 20) with 1" Insulation	4/bag	1.3
ACC-BS2-DN25-4	Fits 1" (DN 25) with 1" Insulation	4/bag	1.4
Dual Brackets - Flush Mounting			
ACC-BS3-DN16-4	Fits 5/8" (DN 16) with 5/8" Insulation	4/bag	0.5
ACC-BS3-DN20-4	Fits 3/4" (DN 20) with 5/8" Insulation	4/bag	0.6
ACC-BS3-DN25-4	Fits 1" (DN 25) with 5/8" Insulation	4/bag	0.6
ACC-BS4-DN16-4	Fits 5/8" (DN 16) with 1" Insulation	4/bag	0.6
ACC-BS4-DN20-4	Fits 3/4" (DN 20) with 1" Insulation	4/bag	0.7
ACC-BS4-DN25-4	Fits 1" (DN 25) with 1" Insulation	4/bag	0.7
TAPE			
TAPE-SOL1-12	Self-adhering EPDM Rubber Tape (2" x 0.02" x 82 ft. roll)	12/box	33.5
SIL-TAPE-B-5	Self-fusing Silicone Rubber Tape (1" x 0.015" x 36 ft. roll)	5/box	1.7
PIPE CUTTER			
FSCUTTER-SM	CSST Cutter (5/8"-1")	1 piece	1.5
FSCUTTER-LG	CSST Cutter (up to 2")	1 piece	3.1
FSBLADE-SM-5	Replacement Blades for FSCUTTER-SM	5/bag	0.3
FSBLADE-LG-5	Replacement Blades for FSCUTTER-LG	5/bag	0.3

## FLEXSURE FITTING ASSEMBLY



**STEP 1: Connect Adapter-**  
Connect FlexSure adapter to system component.



**STEP 3: CSST End Prep\*-**  
Cut is centered in the valley of a corrugation. Use light roller pressure with extra rotations in one direction to leave tubing round and free of burrs.



**STEP 5: Insert Bushing-** Insert bushing assembly into adapter body.



**STEP 2: Separate Flow and Return Lines-**  
Separate insulated lines by slitting cover. Care should be taken to avoid damage to wire or insulation.



**STEP 4: Install Nut and Bushing-**  
Place nut on CSST and push back approximately 2". Place bushings on CSST as shown.



**STEP 6: Wrench Nut-** Slide nut over bushing and thread onto adapter body. Tighten nut. Some resistance will be experienced as the nut begins to compress the tubing corrugation and create the double wall flare seat. Continue to wrench the nut until the resistance to wrenching increases and the double wall flare is tightly seated.

**\*Important:** A flare fitting requires a clean CSST cut. Burrs can interfere with sealing. Use a FlexSure tubing cutter with sharp blade for best results. Caution: Ends of cut CSST are sharp.



## Solar tubing shines on.

When your customers are ready to harness the power of the sun, be ready with FlexSure. FlexSure is a system of pre-insulated corrugated stainless steel tubing and accessories for solar thermal systems. Manufactured in the USA.



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