



**Triple O-ring Sealed Telescoping Design
 Available With 6" and 12" Travel**



Linear expansion and contraction from temperature fluctuations can be a major problem in thermoplastic piping systems. Forces left uncontrolled can literally tear systems apart. Spears® Expansion Joint allows a telescoping movement of an inner pipe within a firmly mounted outer tube to eliminate such damage. Available for CPVC 1/2" through 12" and PVC 1/2" through 14" IPS piping systems in 6" or 12" maximum travel lengths. Custom produced for virtually any pipe diameter.

**Compact Installation -
 Eliminates Need For Expansion Loops**

Telescoping design allows more compact installation than possible with conventional expansion loops and permits rigid mounting between two fixed points.

**EPDM or FKM Pressure O-ring Seal with
 Dual "Wiper" O-ring for Extended Life**

Designed for sealing dependability, O-ring pressure seal utilizes two (2) additional "wiper" O-rings to remove dirt and particles that would normally wear joint seals during operation. Long-life Expansion Joint requires no repair or replacement. Standard O-ring for PVC is EPDM, for CPVC is FKM.

**Support Piston Eliminates Binding,
 Minimizes Alignment Problems**

Alignment is critical in use of expansion joints. Specially designed support piston eliminates binding and minimizes alignment problems which can result in cocking or breakage.

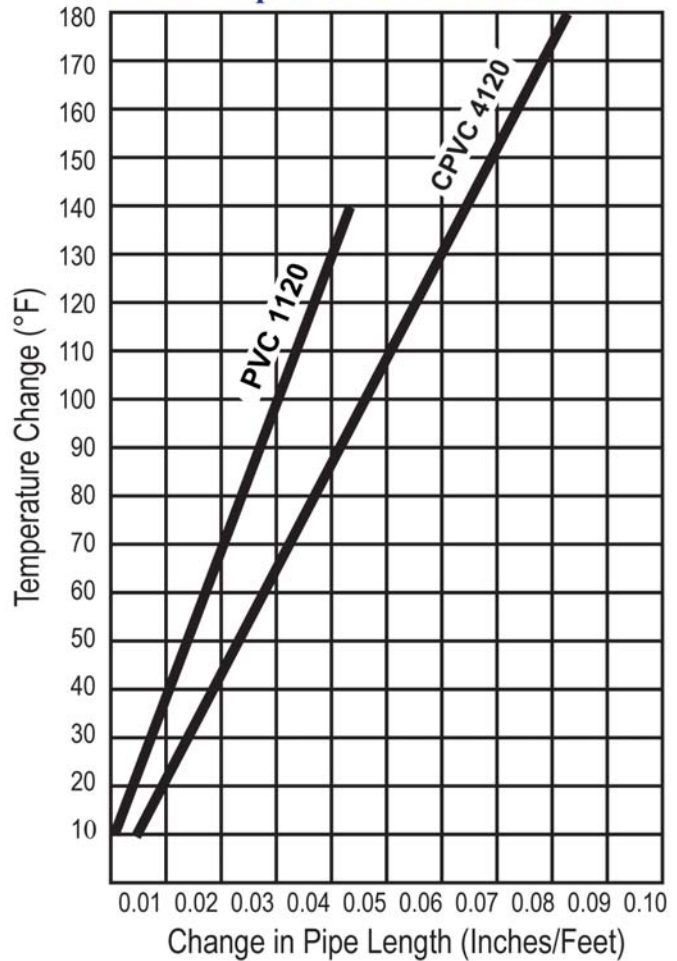
Excellent For Use as a Repair Coupling

Simply cut damaged pipe section from line, collapse expansion joint, solvent cement ends and expand halfway to install.

Sample Engineering Specifications

All Expansion Joints shall be telescoping design with triple (3) EPDM or FKM O-ring seals, including center pressure seal and outer debris seals, and internal support piston. Maximum joint travel length shall be either 6" or 12". All Expansion Joints shall be pressure rated according to the manufacturer's specifications [see table] for water at 73°F. All Expansion Joints shall be fabricated from PVC or CPVC material conforming to ASTM D 1784. All sockets shall meet the dimensional requirements of ASTM D 2467, as manufactured by Spears® Manufacturing Company.

Linear Expansion and Contraction



Coefficient of Thermal Linear Expansion

PVC 1120	=	2.8 x 10 ⁻⁵ in/in/°F
CPVC 4120	=	3.4 x 10 ⁻⁵ in/in/°F



Expansion Joints Technical Expansion Joint Overview

DETERMINING TRAVEL LENGTH NEEDED

General Rule: For PVC systems, allow 3/8" expansion for every 10°F change in temperature per 100 feet of pipe, (all diameters). For CPVC systems, allow 1/2" expansion for every 10°F change in temperature per 100 feet of pipe, (all diameters). For example, a 6" travel expansion joint will accommodate approximately 160°F temperature change in 100 ft. of PVC pipe (16 x 3/8" = 6") or approximately 120°F temperature change in 100 ft. of CPVC pipe (12 x 1/2" = 6").

INSTALLATION

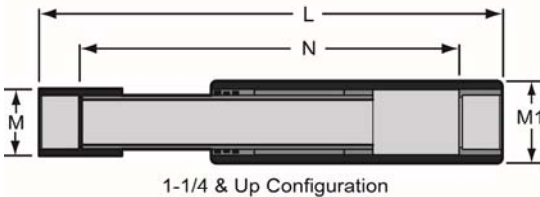
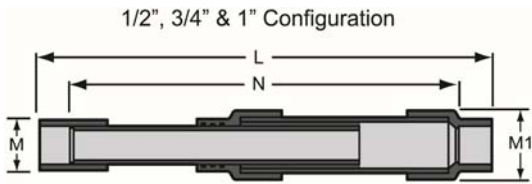
Expansion Joints consist of two telescoping tubes with internal O-ring seals. For proper operation, the outer tube should be firmly anchored to allow free movement of the inner tube or "piston". Support and thrust block the system to direct movement squarely into the Expansion Joint. Alignment is critical, axial guides should be installed to ensure straight movement into expansion joint. Provisions should be made to protect the cylinder shaft from scratches, damage and debris to prevent leaks. Expansion Joints can be installed at the travel range midpoint for most general installations and are shipped from the factory in this position. If desired, the extended position for installation may be additionally adjusted to specific system and installation parameters using the following calculation:

$$P = E \left(\frac{T-A}{T-F} \right)$$

T = Maximum Temperature of Pipe Exposure E = Maximum Expansion Joint Travel (6" or 12")
 A = Temperature of Pipe at time of Installation P = Piston Extension for Installation Position (inches)
 F = Minimum Temperature of Pipe Exposure

Example: A straight run of pipe will operate at temperatures between 60°F and 110°F. Temperature at time of installation is 75°F using a 6" travel Expansion Joint.

$$P = 6 \left(\frac{110-75}{110-60} \right) = 4.2 \text{ inches extended at installation.}$$



6" EXPANSION JOINT DIMENSION							
Size	M	M1	L-CLOSED	L-OPEN	N-CLOSED	N-OPEN	Pressure Rating @ 73°F
1/2"	1-3/16	1-3/4	10-9/16	16-9/16	8-13/16	14-13/16	235
3/4"	1-7/16	2-1/8	12	18	10	16	235
1"	1-5/8	2-3/8	12-1/2	18-1/2	10-1/4	16-1/4	235
1-1/4"	2-1/4	2-3/8	13-1/16	19-1/16	10-1/2	16-1/2	235
1-1/2"	2-3/8	2-7/8	13-1/4	19-1/4	10-7/16	16-7/16	235
2"	2-7/8	3-1/2	14-7/16	20-7/16	11-7/16	17-7/16	235
2-1/2"	4-3/16	4-1/2	16-1/4	22-1/4	12-3/4	18-3/4	150
3"	4-3/16	4-1/2	15-5/8	21-5/8	11-13/16	17-13/16	150
4"	5-1/4	5-9/16	16-15/16	22-15/16	12-9/16	18-9/16	150
6"	7-9/16	8-5/8	19-3/4	25-3/4	13-5/8	19-5/8	150
8"	9-11/16	10-3/4	24-1/2	30-1/2	16-9/16	22-9/16	150
10"	12-1/16	12-3/4	28-7/8	34-7/8	18-7/8	24-7/8	150
12"	14-1/4	16	34	40	22	28	150
14"	15-1/2	16	40-3/4	46-3/4	26	32	100

12" EXPANSION JOINT DIMENSIONS							
Size	M	M1	L-CLOSED	L-OPEN	N-CLOSED	N-OPEN	Pressure Rating @ 73°F
1/2"	1-3/16	1-3/4	16-9/16	28-9/16	14-13/16	26-13/16	235
3/4"	1-7/16	2-1/8	18	30	16	28	235
1"	1-5/8	2-3/8	18-1/2	30-1/2	16-1/4	28-1/4	235
1-1/4"	2-1/4	2-3/8	19-1/16	31-1/16	16-1/2	28-1/2	235
1-1/2"	2-3/8	2-7/8	19-1/4	31-1/4	16-7/16	28-7/16	235
2"	2-7/8	3-1/2	20-7/16	32-7/16	17-7/16	29-7/16	235
2-1/2"	4-3/16	4-1/2	22-1/4	34-1/4	18-3/4	30-3/4	150
3"	4-3/16	4-1/2	21-5/8	33-5/8	17-13/16	29-13/16	150
4"	5-1/4	5-9/16	22-15/16	34-15/16	18-9/16	30-9/16	150
6"	7-9/16	8-5/8	25-3/4	37-3/4	19-5/8	31-5/8	150
8"	9-11/16	10-3/4	30-1/2	42-1/2	22-9/16	34-9/16	150
10"	12-1/16	12-3/4	34-7/8	46-7/8	24-7/8	36-7/8	150
12"	14-1/4	16	40	52	28	40	150
14"	15-1/2	16	46-3/4	58-3/4	32	44	100