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# TR FLEX<sup>®</sup> and HP LOK<sup>®</sup> Telescoping Sleeves

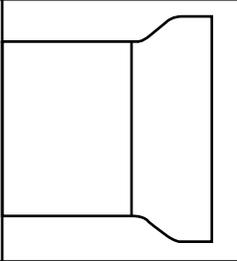


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# TR FLEX® and HP LOK® Telescoping Sleeves

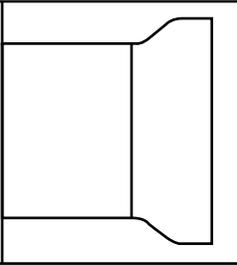


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# TR FLEX® and HP LOK® Telescoping Sleeves



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## Telescoping Sleeves

U.S. Pipe Telescoping Sleeves are Ductile Iron restrained joint fittings which can be utilized to provide expansion and contraction capability in a pipeline. Telescoping sleeves are available with TR FLEX ends for 4" through 24" sizes and with HP LOK ends for 30" through 64" sizes. The restrained joints of the telescoping sleeves are suitable for 350psi operating pressure in all sizes. Standard lining and coating is a petroleum asphaltic material.

The Telescoping Sleeves are capable of extending or contracting from approximately 10" to 24", depending upon the nominal diameter as given in Column B of Table 1, page 7.

A special section of Ductile Iron pipe is used in each end of the telescoping sleeve to make up a telescoping sleeve unit. Each pipe spigot end socketing in the sleeve has a weld bead located at a greater distance away from the end of the pipe (Column C, Table 1) than the conventional weld bead of TR FLEX / HP LOK pipe. The ends of the telescoping sleeve unit are provided with either TR FLEX / HP LOK socket(s) or with TR FLEX / HP LOK plain end(s) with weld beads as required.

### Applications

The Telescoping Sleeve may be used:

- In lieu of a mechanical joint sleeve where joint restraint is required.
- As a closure piece when connecting a new restrained joint pipeline to an existing one.
- To make repairs to an existing restrained joint pipeline.
- To facilitate the installation of fittings or valves in an existing restrained joint pipeline.
- To provide expansion or contraction capability in areas of potential extreme soil movement or where settling is anticipated.

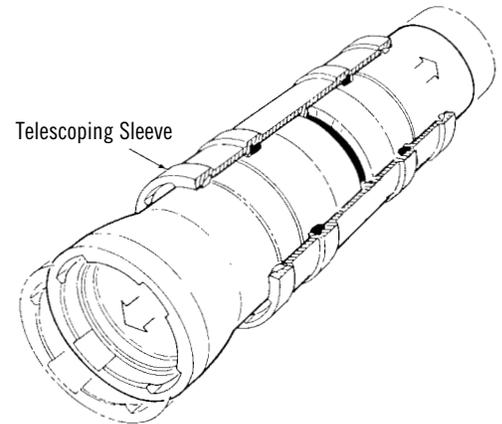
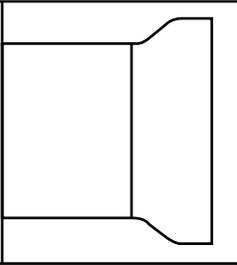


Figure 1. Telescoping Sleeve

**NOTE:** Conventional TR FLEX/HP LOK Pipe plain ends cannot be used in the telescoping sleeve. Special pipe ends are required which have weld beads located farther from the end of the pipe than the standard bead on TR FLEX/HP LOK Pipe. 6" through 64" Telescoping Sleeves are one-piece units which contain the gasket seat and locking segment cavities. The 4" size is a three-piece unit with the center section containing the gasket seats and each end section containing a locking segment cavity. The 4" unit is shipped pre-assembled. Joint restraint is not provided until the sleeve is fully extended.

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## Assembly Instructions

The special pipe sections used with the telescoping sleeve are normally furnished from the factory but can be fabricated in the field. Use the following procedure to assemble and install the Telescoping Sleeve unit.

If the special pipe sections are to be prepared in the field, these sections should first be fabricated according to the instructions for field cut pipe given on page 6.

### Insertion Slot Orientation

Orientation of the segment insertion slots at each end of the sleeve is important for ease of assembly. The slots should be oriented as shown in Figure 2.

### Gasket Installation

Telescoping Sleeves utilize the conventional TYTON® Gasket for 4" through 64" sizes.

Clean the sockets of all dirt, sand, gravel or other foreign material.

Clean the gasket and place it with the rounded bulb end entering first, into the socket. Do not apply joint lubricant to the seating surface under the gasket. Loop the gasket as shown in Figure 3. Smaller gaskets (4" through 20") usually require only one loop. With larger sizes, additional loops may be required: 42" through 54", four to six loops; 60" and 64", six or more loops.

The inside of the socket, the gasket and the plain end to be inserted, must be kept clean throughout the assembly. If the joint is somewhat difficult to assemble, inspect for proper gasket positioning, adequate lubrication or foreign material in the joint.

Press the loop(s) of the gasket so that the gasket is uniformly seated in the socket.

Apply TYTON JOINT® Lubricant to the exposed surface of the gasket. In warm, dry weather conditions, the lubricant can dry out, especially when applied to warm or hot pipe, it will be necessary to add a small amount of water to hydrate the lubricant. Only TYTON JOINT Lubricant should be used.

**CAUTION:** *The use of spray-on lubricant is not recommended. Experience has determined that spray-on lubricant may not have sufficient lubricity to allow joint assembly without gasket displacement.*

In subfreezing weather, gaskets should be kept at temperatures above 40°F, to ensure resiliency during installation. The gaskets should be stored in a warm location or immersed in warm water prior to installation. Gaskets which have been immersed should be dried before installation.

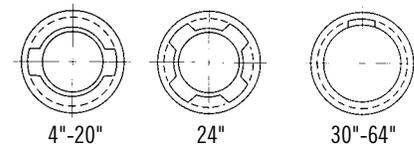


Figure 2. Slot Orientation

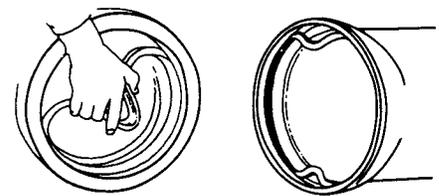
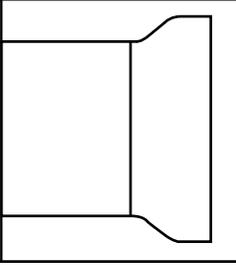


Figure 3. For illustration only — gasket seat of Telescoping Sleeves is located farther back inside socket.

**NOTE:** *If specifiers or users believe that corrosive soils will be encountered where our products are to be installed, please refer to ANSI/AWWA C105/A21.5 "Polyethylene Encasement for Ductile Iron Pipe Systems" for proper external protection procedures*



# TR FLEX® and HP LOK® Telescoping Sleeves



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## Telescoping Sleeve Assembly

Clean the plain end of the pipe to be inserted into the telescoping sleeve. Apply a heavy film of TYTON JOINT® Lubricant from the end of the pipe to the weld bead. Do not allow the lubricated plain end to touch the ground.

For TR FLEX Sleeves, insert each of the special plain ends into the telescoping sleeve until the plain end bottoms out in the socket. Insert the TR FLEX locking segments and the rubber segment retainers into the ends of the telescoping sleeve. For HP LOK Sleeves, the locking rings are factory installed. Ensure that the jack bolt in the locking ring handles is in the expanded position (i.e., the handles are apart and have the ring snug in the bell). Insert each of the special plain ends into the telescoping sleeve until each plain end bottoms out in the socket. Remove the jack bolt and install the tensioning bolt so that the locking ring ears can be brought together thus snugging the ring against the plain end. These bolts should only be snugged up to bring the ring in contact with the plain end. The bolts will be torqued once the sleeve has been installed.

The installation should be made as soon as possible after the assembly of the sleeve to ensure that the joint lubricant has not dried.

### As a Closure Piece

With the telescoping sleeve assembled unit in the closed (telescoped in) position, lay the unit between the two pipe plain ends or bells which are to be joined. For TR FLEX, first make the joint assembly on one end and insert the TR FLEX locking segments and rubber retainer(s). Then make the assembly on the other end by pulling out the telescoped joint. Insert the locking segments and rubber retainer(s) on that end and the installation is complete. For HP LOK, first ensure that the locking ring is fully expanded and make the joint assembly. Remove the jack bolt and install the tensioning bolt so that the locking ring ears can be brought together thus snugging the ring against the plain end. Then make the assembly on the other end by pulling out the telescoped joint. Remove the last jack bolt and install the tensioning bolt so that the locking ring ears can be brought together thus snugging the ring against the plain end. The bolts may now be torqued.

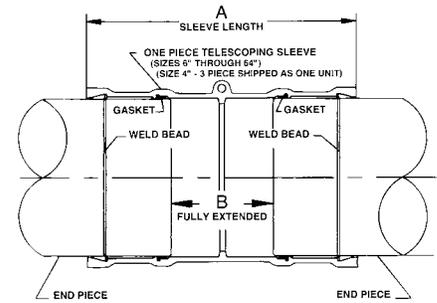


Figure 4. TR FLEX.

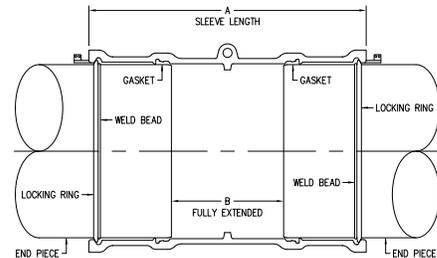
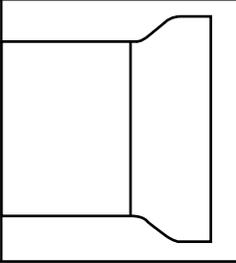


Figure 4b. HP LOK.



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## Telescoping Sleeve Assembly (cont.)

### As an Expansion Joint (To Allow Elongation of a Line)

If it is required that the sleeve be used as an expansion joint, the sleeve should be installed in the telescoped in position and left in that position.

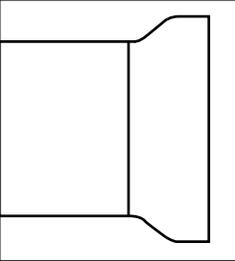
The sleeve should be encased in polyethylene wrap prior to the installation to keep the surrounding soil out of the components.

If it is required that the sleeve have both expansion (elongation) and contraction capability, the sleeve should be pulled apart approximately half of it's telescoped distance (the gap length B given in Table 1). It is very important to thoroughly compact the soil around a partially extended Telescoping Sleeve before continuing the installation or pressurizing the pipeline.

The telescoping sleeve will not resist axial thrust forces when installed in this position.  
THE SLEEVE WILL BECOME RESTRAINED ONLY WHEN THE TOTAL EXPANSION OR ELONGATION OF THE SLEEVE HAS BEEN ATTAINED.

### As a Contraction Joint (To Allow Contraction of a Line)

A fully extended sleeve will allow for contraction in a line at the sleeve. The fully extended sleeve will withstand axial thrust loads. As noted above, the sleeve should be encased in polyethylene wrap to keep the surrounding soil out of the components. After the connecting pipe are joined to the sleeve unit, the joints should be pulled out to the fullest extent possible. The sleeve and adjacent piping should then be backfilled to prevent the sleeve from telescoping in as subsequent pipe are laid.



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## Field Cut Pipe

The special pipe sections required for the telescoping sleeve can be fabricated in the field using the following procedure.

### Determining End Piece Lengths For Closures

In order that the laying lengths of the end pieces of the telescoping sleeve may be calculated, the laying length of the closure piece required must be measured. This length (L) is determined by measuring from the end of the plain end to the base (or deepest shoulder) of the socket as shown in Figure 5.

With the required closure piece laying length known, the laying length of the pipe end pieces for the telescoping sleeve can be calculated. The combined laying length of both pieces will be shorter than the length measured for the closure, since, as installed, the extended telescoping unit will have a gap between the ends of the pipe inside the telescoping sleeve. The length of this gap must be subtracted from the combined length of both end pieces to determine the combined cut length required. The gap length (B), shown in Figure 6, is given in Table 1, Column B.

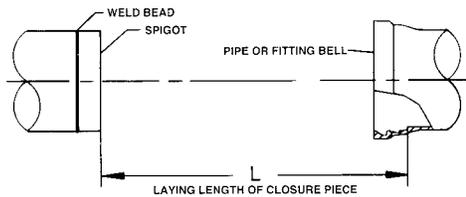


Figure 5.

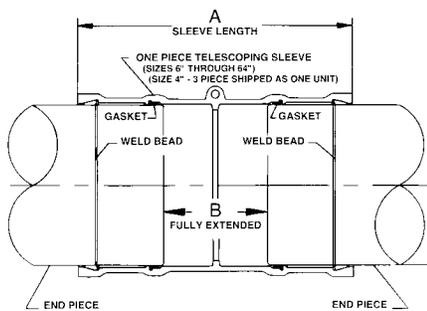


Figure 6. TR FLEX.

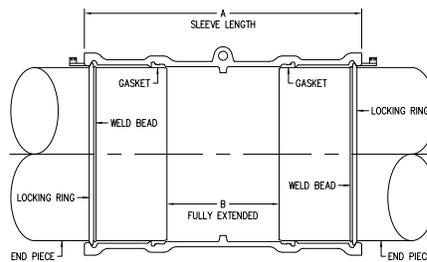
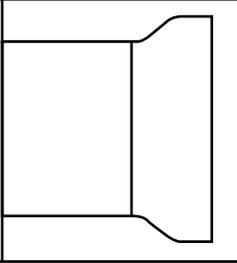


Figure 6b. HP LOK.



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## Gap and Laying Lengths

Table 1.

SIZE Inches	A SLEEVE LENGTH Inches	B MAXIMUM GAP LENGTH Inches	C WELD BEAD OR BAR LOCATION FROM SPIGOT END Inches	D UNIT MINIMUM EXTENDED LAYING LENGTH Inches	E END PIECE MINIMUM LAYING LENGTH Inches
4	29.10	10.68	7.72	49.24	19.28
6	31.70	11.54	8.39	53.40	20.93
8	35.48	12.64	9.49	58.90	23.13
10	37.14	13.06	9.96	61.04	23.99
12	38.96	13.60	10.33	63.36	24.88
14	46.26	16.50	12.38	75.96	29.73
16	49.00	17.10	13.25	79.10	31.00
18	49.40	17.88	12.82	79.98	31.05
20	50.80	18.44	13.03	81.80	31.68
24	53.60	19.40	13.49	85.50	33.05
30†	58.60	23.47	15.51	105.47	41.00
36†	61.30	24.80	16.20	108.80	42.00
42†	58.20	22.00	15.51	110.04	43.00
48†	63.31	23.21	17.20	107.21	42.00
54†	61.80	22.93	16.62	106.93	42.00
60†	62.74	23.30	16.94	107.30	42.00
64†	65.00	24.08	17.73	124.08	50.00

†: HP LOK

**NOTE:** If a Telescoping Sleeve is to be used within two full pipe lengths of a bend, subtract an additional joint pull out from the lay length of the required closure piece. (i.e. in the example below with the 16" pipe connecting into a fitting bell the closure piece would be:  $172.40" - .6" = 171.80"$  then divide this by 2 equaling a lay length for each piece of 85.90" instead of 86.20" as shown in Figure 7). This procedure prevents the bend from being over rotated or deflected.

### Example:

A closure piece is required between a 16" TR FLEX Pipe Bell and TR FLEX Pipe Spigot. The laying length (L) of the required closure piece is measured to be 15'-9-1/2" or 189.50" long.

The gap length (B in Figure 6) of a 16" sleeve from Table 1 is 17.10" long. The combined laying length of the two pieces of pipe used in the telescoping sleeve must be 17.10" shorter than the measured closure length of 189.50" as follows:

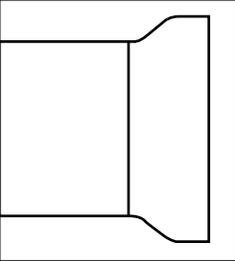
$$189.50" - 17.10" = 172.40"$$

It is usually best to position the telescoping sleeve in the middle of the unit; therefore, the laying length of each pipe would be half that value or,

$$172.40" \div 2 = 86.20"$$

For this example a bell x plain end piece and plain end x plain end piece, each with a laying length of 86.20", would be required as shown in Figure 7.

The minimum end piece laying length that can be produced is also given in Column E, Table 1, and the minimum laying length which can be produced of the telescoping sleeve assembled unit is given in Column D.



# TR FLEX® and HP LOK® Telescoping Sleeves



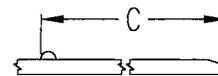
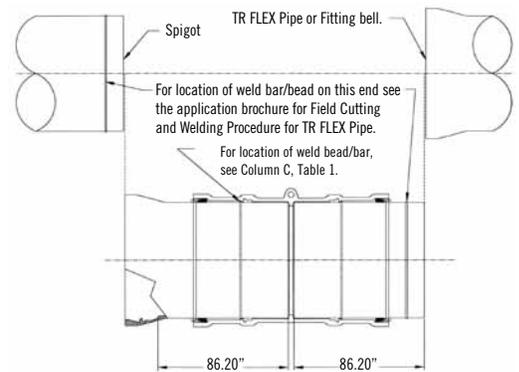
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## Field Applied Bar

For field cut pieces, a bar must be welded around the pipe end at the location shown in Figure 7, (Column C, Table 1, Page 8). For field cutting and welding of TR FLEX® Pipe, follow the guidelines given in U.S. Pipe's brochure, Field Cutting and Welding Procedure for TR FLEX Pipe.

For field cutting and welding of HP LOK Pipe, follow the guidelines given in U.S. Pipe's brochure, Field Cutting and Welding Procedure for HP LOK Pipe.

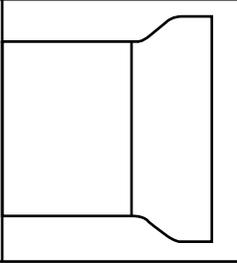


WELD LOCATION

Figure 7.

**NOTE:** It is imperative that pipe cut in the field be within the O.D. tolerances as given in Table 1 of U.S. Pipe's brochure, Field Cutting and Welding Procedure for TR FLEX® Pipe.

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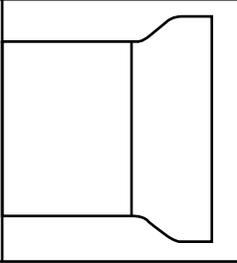
## Ordering Information

A standard Telescoping Sleeve Unit consists of two sections of pipe and a telescoping sleeve. Standard Telescoping Sleeve Units are furnished with pipe sections cut from one full length of Pipe. They are ordered by specifying a Telescoping Sleeve Unit and the diameter required.

Special Telescoping Sleeve Units are ordered by specifying the pipe diameter, the end configurations and the extended laying length required.

A Telescoping Sleeve (without the pipe sections) can be ordered by simply specifying a Telescoping Sleeve and the diameter required.

Field weldment bars, kits and instructions are available from U.S. Pipe. (See U.S. Pipe Brochure, Field Cutting and Welding Procedure for TR FLEX® Pipe) or Field Cutting and Welding Procedure for HP LOK Pipe.



# TR FLEX® and HP LOK® Telescoping Sleeves



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## Products for Water, Wastewater and Fire Protection

Ductile Iron Pipe	SIZE RANGE
TYTON JOINT® Pipe	4"-64" Ductile Iron
Mechanical Joint Pipe	4"-12" Ductile Iron
TR FLEX® Pipe	4"-36" Ductile Iron
HP LOK® Pipe	30"-64" Ductile Iron
Flanged Pipe	3"-64" Ductile Iron
Grooved Pipe	4"-36" Ductile Iron
USIFLEX® Boltless Ball Joint Pipe For Subaqueous Installations	4"-48" Ductile Iron
<b>Restrained Joints</b>	
TR FLEX® Restrained Joint	4"-36" Ductile Iron
HP LOK® Restrained Joint	30"-64" Ductile Iron
MJ FIELD LOK® Gaskets	4"-24"
FIELD LOK 350® Gaskets	4"-24"
FIELD LOK® Gasket	30" & 36"
TR FLEX GRIPPER® Rings	4"-36" Ductile Iron
TR TELE FLEX® Assemblies	4"-24" Ductile Iron
<b>Fittings</b>	
TYTON® Fittings	14"-24" Ductile Iron
TRIM TYTON® Fittings	4"-12" Ductile Iron
TR FLEX® Fittings and TR FLEX® Telescoping Sleeves	4"-36" Ductile Iron
HP LOK® Fittings and HP LOK® Telescoping Sleeves	30"-64" Ductile Iron
Mechanical Joint Fittings	30"-48" Ductile Iron
Flanged Fittings	30"-64" Ductile Iron
XTRA FLEX® Couplings	4"-24" Ductile Iron
<b>Miscellaneous Products</b>	
PROTECTO 401™ Lined Ductile Iron Pipe for Domestic Sewage and Industrial Wastes	4"-64" Ductile Iron
GLASS Lined Ductile Iron Pipe for Wastewater Treatment Plants	4"-30" Ductile Iron
RING FLANGE-TYTE® Gaskets	4"-36"
FULL FACE FLANGE-TYTE® Gaskets	4"-64"
MJ Harness-Lok	4"-48" Ductile Iron
Saddle Outlets	Various Ductile Iron
Welded Outlets	Various Ductile Iron
Polyethylene Encasement	4"-64"

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P.O. BOX 10406  
BIRMINGHAM, AL 35202  
866.DIP.PIPE (866.347.7473)  
FAX: 205.254.7165  
EMAIL: [INFO@USPIPE.COM](mailto:INFO@USPIPE.COM)  
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