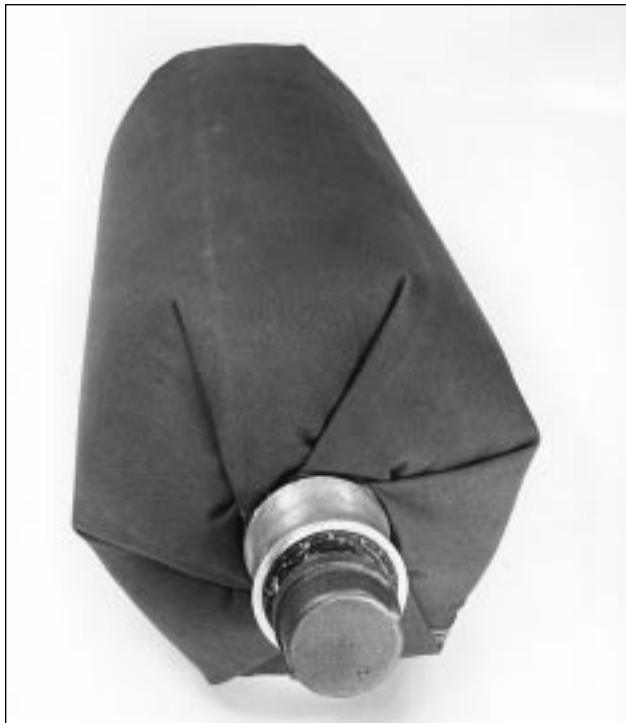


Pillow-Type Stoppers



Pillow-Type Stoppers

Cylindrical Stoppers

Round Inflatable Stoppers



Convenient Plugging For Limited Access Pipe

Limited access is no longer a problem with EST's Pillow-Type Medium Pressure Stoppers. Able to inflate as much as 10 times its original size, these stoppers are designed to navigate through small hot tap or branch pipes into a large pipeline, where they inflate with air or water to temporarily stop pipeline for maintenance. Most sizes can be easily placed by one man.

EST's Pillow-Type Medium Pressure Stoppers are rugged enough to block off concrete culverts and drainage lines during new construction or site remediation. They can also be used to block ventilation duct work or other applications where a flexible, inflatable, replaceable device is mandated.

- **Lightweight:** Allows one man application for most sizes.
- **Sized to fit your needs:** Sizes from 4" to 72".
- **Industrial Fabric:** Aids traction, grips pipe.
- **Heavy duty bag:** Specially treated, reinforced industrial fabric for maximum strength.



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Dimensions

| Nominal Size | Part No. | Max Pipe Diameter | Deflated Length | Deflated Diameter | Max Inflation ¹ | Inflation Connection | Max Back Pressure ² | |
|--------------|----------|-------------------|-----------------|-------------------|----------------------------|----------------------|--------------------------------|------------|
| | | | | | | | Water (ft) | Air (psig) |
| 4" | PT-4 | 4" | 26" | 2.9" | 70 psig | 2" male npt | 161' | 70 |
| 6" | PT-6 | 6" | 29" | 3.0" | 70 psig | 2" male npt | 161' | 70 |
| 8" | PT-8 | 8" | 32" | 3.1" | 70 psig | 2" male npt | 161' | 70 |
| 10" | PT-10 | 10" | 40" | 3.6" | 60 psig | 2" male npt | 138' | 60 |
| 12" | PT-12 | 12" | 48" | 3.7" | 60 psig | 2" male npt | 138' | 60 |
| 15" | PT-15 | 15" | 57" | 3.8" | 38 psig | 2" male npt | 87' | 38 |
| 18" | PT-18 | 18" | 66" | 4.0" | 32 psig | 2" male npt | 74' | 32 |
| 21" | PT-21 | 21" | 75" | 4.1" | 27 psig | 2" male npt | 62' | 27 |
| 24" | PT-24 | 24" | 84" | 4.2" | 25 psig | 2" male npt | 57' | 25 |
| 27" | PT-27 | 27" | 93" | 4.3" | 22 psig | 2" male npt | 51' | 22 |
| 30" | PT-30 | 30" | 102" | 4.4" | 20 psig | 2" male npt | 46' | 20 |
| 33" | PT-33 | 33" | 111" | 5.5" | 20 psig | 2" male npt | 46' | 20 |
| 36" | PT-36 | 36" | 120" | 5.6" | 18 psig | 2" male npt | 41' | 18 |
| 42" | PT-42 | 42" | 138" | 5.8" | 14 psig | 2" male npt | 32' | 14 |
| 48" | PT-48 | 48" | 160" | 5.0" | 10 psig | 2" male npt | 23' | 10 |
| 54" | PT-54 | 54" | 178" | 5.8" | 8 psig | 3" male npt | 18' | 8 |
| 60" | PT-60 | 60" | 196" | 6.9" | 6 psig | 3" male npt | 14' | 6 |
| 66" | PT-66 | 66" | 214" | 7.1" | 5.5 psig | 3" male npt | 13' | 5.5 |
| 72" | PT-72 | 72" | 232" | 7.2" | 5 psig | 3" male npt | 12' | 5 |

- (1) Maximum inflation and back pressure on the table above are for plugs fully inserted in pipe. Contact EST for application, specific back pressures, or specific applications.
- (2) Maximum water back pressures are for standard canvas covered stoppers. The maximum air back pressures are for stoppers with vapor seal covers.

Ordering Information

When ordering, please specify the following information:

- Nominal pipe size or ID
- Maximum line pressure
- Temperature
- Fluid medium

Standard Material

Outside Cover: Canvas

Inside: Nylon polyurethane bladder

Special sizes are available upon request. Contact factory for information.

Specifications subject to change without notice.



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OPERATING PROCEDURES FOR PILLOW TYPE STOPPERS

WARNINGS!

- **PRESSURE TESTING IS INHERENTLY DANGEROUS. STRICT ADHERENCE TO THESE OPERATING INSTRUCTIONS AND INDUSTRY SAFETY PRACTICES COULD PREVENT INJURY TO PERSONNEL AND PROPERTY.**
- **ALL PERSONNEL MUST BE CLEAR OF TEST AREA DURING PRESSURE TESTING.**
- **READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE USING!**

GENERAL

1. Inspect product before inflation. Aluminum clamp must not protrude over end of fabric. Fabric must not be torn, frayed or abraded. No structural damage should be apparent.
2. Pillow Type Inflatable Stoppers are not an approved pressure vessel. Use the minimum inflation pressure that will provide adequate sealing. When possible water should be used as the inflation medium.
3. The maximum inflation and back pressures shown in Table 1 are for Stoppers fully inserted in pipe. These are only estimates, maximum pressures can vary with each situation. Never exceed listed pressure. See Parts List in Table 2 for recommended Valve and Regulator Assemblies and optional Hose extensions.
4. Never stand in direct line with product ends when inflated. Never use where failure may result in injury or property damage.
5. Position where there are no sharp edges or protrusions that may puncture fabric.
6. Completely enclose unit within pipe so entire Stoppers area is supported. When not supported in a pipe, Stoppers will rupture at less than listed pressure.
7. Use rope or cable attached to pull rings when positioning, securing or removing to prevent damage to inlet hose.
8. Use an approved backflow preventive device when a potable water source is used.
9. When necessary, mechanically block or secure cable to prevent slippage.
10. The Stopper may be damaged during removal or may require removal downstream in some hot tapping applications.
11. Use an approved backflow preventive device when a potable water source is used.

SEWER FLUSHING

1. Remove pipe cap from (1) end of Stopper. Connect a hose between the water source and Flusher. The inside diameter of water source and hose must be larger than the Flusher outlet size. If necessary, reduce outlet size with a reducing coupling.
2. Insert in Stopper into pipeline to be cleared where no branches or outlets are between the Flusher and blockage. If necessary, block branches with a Stopper or use other Flushers simultaneously in all branches before the stoppage.
3. To begin flushing, turn on the water full force. The water force and jet action will flush the sewer clear. In large diameter pipelines it may be necessary to direct the flushing action upstream to fill the pipeline. Then, when the water to the Flusher is turned off, the large reservoir of water is released to flush out the stoppages and debris. Never fill the upstream pipeline enough to back up water into connected facilities. Hot water works best for clearing sludge, grease, paraffin, etc. Roots should be cut with an auger and then flushed clear.



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PLUGGING PIPELINES

1. Blocking for slippage: the coefficient of friction will vary with different pipe materials and also with fluids and debris inside the pipe. When necessary, mechanically block or secure with cable to prevent slippage.
2. Ensure pipe cap is installed leak tight to one end of Stopper. Use regulated pressure source. Refer to Table 2 for Regulator and Valve assemblies. Stopper should be inflated with the minimum pressure to provide and adequate seal. Changes of temperature, atmospheric pressure or fabric stretching can alter the pressure inside of the stopper. A regulated pressure source will compensate for these factors and will prevent over inflation that might rupture the Stoppers. Valve and regulator assemblies are to be connected to Pillow Type Stopper, leak tight as shown in Figure 1.
3. Plugging location: Insert Stoppers on the downstream side of a sewer manhole and pump the effluent out upstream from the Stopper.
4. Hot tapping: Stopper may be damaged during removal or may require removal down stream in some hot tapping applications. The small deflated diameter of the Pillow Type Inflatable Stoppers make them ideal for insertion through a small branch or hot tap on a live pipeline.

Table 1.

| SIZE | PART NUMBER | PIPE ID MIN RANGE (in) | PIPE ID MAX RANGE (in) | MINIMUM PIPE ID RANGE (mm) | MAXIMUM PIPE ID RANGE (mm) | A NPT INLET CONNECTION | B NPT OUTLET CONNECTION | C DEFLATED DIAMETER (in) | C DEFLATED DIAMETER (mm) | D DEFLATED LENGTH (in) | MAXIMUM INFLATION PRESSURE (psi) | MAXIMUM INFLATION PRESSURE (bar) | MAXIMUM PIPELINE HEAD (ft) | MAXIMUM PIPELINE HEAD (m) |
|------|-------------|------------------------|------------------------|----------------------------|----------------------------|------------------------|-------------------------|--------------------------|--------------------------|------------------------|----------------------------------|----------------------------------|----------------------------|---------------------------|
| 3" | PT-3 | 1.5 | 3 | 38 | 76 | 1 | 1 | 1 1/2 | 38 | 16 | 60 | 4.1 | 69 | 21.0 |
| 4" | PT-4 | 3.5 | 4 | 89 | 102 | 1 | 1 | 3 1/2 | 89 | 18 | 60 | 4.1 | 69 | 21.0 |
| 6" | PT-6 | 5 | 6 | 127 | 152 | 1 1/2 | 1 1/2 | 5 | 127 | 23 | 60 | 4.1 | 69 | 21.0 |
| 8" | PT-8 | 5 | 8 | 127 | 203 | 2 | 2 | 5 | 127 | 28 | 60 | 4.1 | 69 | 21.0 |
| 10" | PT-10 | 5 | 10 | 127 | 254 | 2 | 2 | 5 | 127 | 33 | 60 | 4.1 | 69 | 21.0 |
| 12" | PT-12 | 5 | 12 | 127 | 305 | 2 | 2 | 5 | 127 | 46 | 60 | 4.1 | 69 | 21.0 |
| 15" | PT-15 | 5 | 15 | 127 | 381 | 2 | 2 | 5 | 127 | 54 | 38 | 2.6 | 43 | 13.3 |
| 16" | PT-16 | 5 | 16 | 127 | 406 | 2 | 2 | 5 | 127 | 56 | 32 | 2.2 | 37 | 11.2 |
| 18" | PT-18 | 5 | 18 | 127 | 457 | 2 | 2 | 5 | 127 | 61 | 32 | 2.2 | 37 | 11.2 |
| 20" | PT-20 | 6 | 20 | 152 | 508 | 2 | 2 | 6 | 152 | 66 | 27 | 1.8 | 31 | 9.4 |
| 24" | PT-24 | 6 | 24 | 152 | 610 | 2 | 2 | 6 | 152 | 76 | 25 | 1.7 | 28 | 8.8 |
| 30" | PT-30 | 7 | 30 | 178 | 762 | 2 | 2 | 7 | 178 | 91 | 20 | 1.4 | 23 | 7.0 |
| 33" | PT-33 | 7 | 33 | 178 | 838 | 2 | 2 | 7 | 178 | 99 | 20 | 1.4 | 23 | 7.0 |
| 36" | PT-36 | 8 | 36 | 203 | 914 | 2 | 2 | 8 | 203 | 106 | 18 | 1.2 | 20 | 6.3 |
| 42" | PT-42 | 8 | 42 | 203 | 1067 | 3 | 3 | 8 | 203 | 121 | 14 | 1.0 | 16 | 4.9 |
| 48" | PT-48 | 10 | 48 | 254 | 1219 | 3 | 3 | 10 | 254 | 142 | 10 | 0.7 | 11 | 3.5 |
| 54" | PT-54 | 10 | 54 | 254 | 1372 | 3 | 3 | 10 | 254 | 157 | 8 | 0.5 | 9 | 2.8 |
| 60" | PT-60 | 10 | 60 | 254 | 1524 | 3 | 3 | 10 | 254 | 172 | 6 | 0.4 | 7 | 2.1 |
| 66" | PT-66 | 10 | 66 | 254 | 1676 | 3 | 3 | 10 | 254 | 187 | 5 1/2 | 0.4 | 6 | 1.9 |
| 72" | PT-72 | 12 | 72 | 305 | 1829 | 3 | 3 | 12 | 305 | 202 | 5 | 0.3 | 6 | 1.8 |

QUESTIONS? Contact EST Customer Service at any of the following locations with questions.

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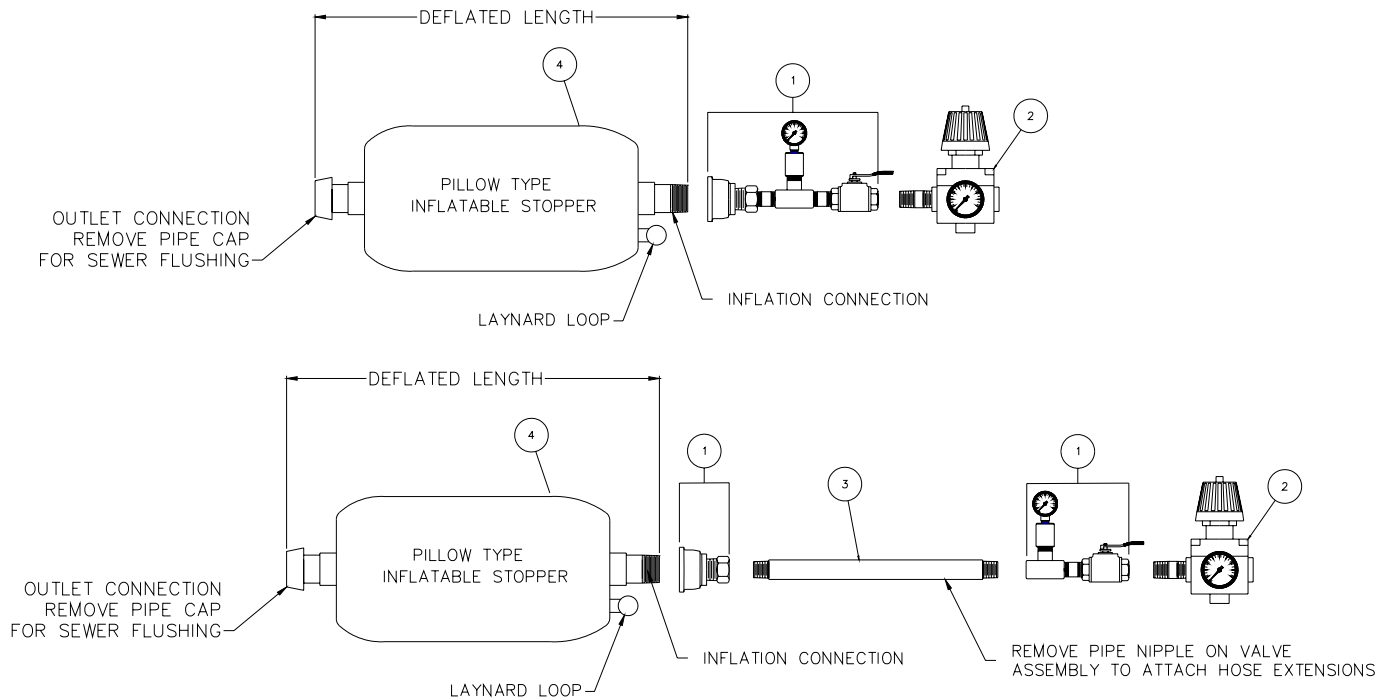
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Figure 1. Pillow Type Stopper Assembly

WARNING! READ AND UNDERSTAND CAUTIONS AND INSTRUCTIONS BEFORE USING. NEVER EXCEED LISTED PRESSURE. LISTED PRESSURES ARE ONLY ESTIMATES AND WILL VARY WITH EACH SITUATION.

| Table 2. PARTS LIST | | |
|---------------------|--|-------------|
| Item | Description | Part Number |
| 1 | Plug Sizes 4" – 48" | PT-Valve-1 |
| | Plug Sizes 54" – 72" | PT-Valve -2 |
| 2 | Regulator Assembly (recommended) | PT-Reg |
| 3 | 12 ft – Hose Extension w/ 3/8 m npt (optional) | PT-Hose-12 |
| | 25 ft – Hose Extension w/ 3/8 m npt (optional) | PT-Hose-25 |
| | 50 ft – Hose Extension w/ 3/8 m npt (optional) | PT-Hose-50 |
| 4 | Pillow Type Inflatable Stoppers | PT-XX(*) |

* Note: Item 4, Pillow Type Inflatable Stoppers, XX – Designates Stopper size in inches



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OPERATING PROCEDURES FOR TYPE B AND TYPE C ROUND TYPE STOPPERS***WARNINGS!***

- ***PRESSURE TESTING IS INHERENTLY DANGEROUS. STRICT ADHERENCE TO THESE OPERATING INSTRUCTIONS AND INDUSTRY SAFETY PRACTICES COULD PREVENT INJURY TO PERSONNEL AND PROPERTY.***
- ***ALL PERSONNEL MUST BE CLEAR OF TEST AREA DURING PRESSURE TESTING.***
- ***READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE USING!***
- ***DO NOT USE NATURAL RUBBER TYPE C STOPPERS IN OIL, GASOLINE, KEROSENE, ACIDS, OR OTHER SIMILAR SUBSTANCES. CONTACT EST CUSTOMER SERVICE FOR SPECIFIC RECOMMENDATIONS WHEN PLUGS ARE TO BE USED IN LINES CONTAINING THESE SUBSTANCES.***
- ***DO NOT ALLOW SPARKS OR HOT METAL OF ANY KIND TOUCH THE STOPPERS.***
- ***DO NOT OVER INFLATE.***
- ***DO NOT USE PRODUCT IF EVIDENCE OF DAMAGE IS APPARENT.***

UPON RECEIPT INSPECTION

Inspect hose and fitting for damage and obstructions.

WARNING! DO NOT USE IF EVIDENCE OF DAMAGE IS APPARENT.

INFLATION INSTRUCTIONS

Attach required and/or optional assemblies to stopper per Parts List in Table 1. Back off regulator all the way and attach air supply. Attach regulator air hose to valve stem on stopper hose. Slowly adjust the regulator until the bag reaches maximum inflation size or pressure depending on bag type.

TYPE B ROUND STOPPERS

Outside the pipe, inflate the stopper to the maximum inflation size listed on tag attached to Stopper or shown in Table 2. Leave inflated for (3) hours, inspect for leaks and evidence of damage.

WARNING! DO NOT USE IF EVIDENCE OF DAMAGE IS APPARENT.

TYPE C ROUND STOPPERS

Outside the pipe, inflate the Stopper to the maximum inflation pressure listed on the tag attached to the Stopper or in the Table 2. Leave inflated for (3) hours, inspect for leaks and evidence of damage.

WARNING! DO NOT USE IF EVIDENCE OF DAMAGE IS APPARENT.

MAXIMUM INFLATION SIZES / PRESSURE AND PRESSURE RATING**TYPE B ROUND STOPPERS**

This Stopper is to be used **ONLY** when there is little or no in-line pressure. These Stoppers are to be inflated only to the maximum inflation size listed in the Table 2, which is 1" larger than plug size.

WARNING! DO NOT OVER INFLATE.

TYPE C ROUND STOPPERS

Ensure that the Stopper is the correct size for the pipe ID. Do not use the Stopper in a pipe having in-line pressure in excess of recommended in-line pressures listed in the Table 2. Do not exceed the maximum inflation pressure rating for the size Stopper in use. Maximum inflation pressures are listed in the table on page 3 and on the tag attached to the Stopper. A 0 – 30 psi air pressure gauge is required to ensure Stoppers are not over inflated.

WARNING! DO NOT OVER INFLATE.



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PERSONNEL PROTECTION

Protective clothing and eye protection should be worn at all times.

WARNING! UNDER NO CIRCUMSTANCES SHOULD ANYONE BE NEAR THE PIPE WHEN STOPPER IS BEING INFLATED OR DEFLATED.

WARNING! DO NOT USE NATURAL RUBBER TYPE C STOPPERS IN OIL, GASOLINE, KEROSENE, ACIDS, OR OTHER SIMILAR SUBSTANCES. CONTACT EST CUSTOMER SERVICE FOR SPECIFIC RECOMMENDATIONS WHEN PLUGS ARE TO BE USED IN LINES CONTAINING THESE SUBSTANCES. DO NOT ALLOW SPARKS OR HOT METAL OF ANY KIND TOUCH THE STOPPERS.

BEFORE INSTALLATION

1. Unroll the air hose if necessary to avoid forming kink in the line. This is especially important where a kink could cause a false reading, lower than actual pressure.
2. Before each use the Stopper should be examined for tears, cuts or worn parts.

WARNING! DO NOT USE IF EVIDENCE OF DAMAGE IS APPARENT.

3. Inflate the Stopper just prior to inserting in line to maximum inflation size / maximum inflation pressure per inflation instructions listed above. Leave inflated for 1/4 hour prior to using and observe for any leakage.

WARNING! DO NOT OVER INFLATE.

INSTALLATION

1. Before installing a Stopper, see that the inner surface is free of accumulated debris; remove all burrs from inside tap hole if one was required. A clean surface of the matching diameter is required for a tight seal.
2. Insert Stopper into matching pipe and inflate per installation instruction above. Do not over inflate stopper or exceed maximum in line pressures listed in Table 2.

WARNING! DO NOT OVER INFLATE.

REMOVAL

All Stoppers should be fully deflated before they are removed from the pipe. Full deflation reduces the risk of damage to the Stopper from sharp edges. Do not pull on tubing to remove Stopper.

STORAGE

Both types of Stoppers are made of either natural rubber or Buna-N. Type C Stoppers are encased in a polyester cloth cover. Direct sunlight should be avoided for long-term storage, since the ultra-violet light component of sunlight decomposes natural rubber. They should also not be subjected to extreme temperature changes. Store in a flat position; do not kink inflation tubes.



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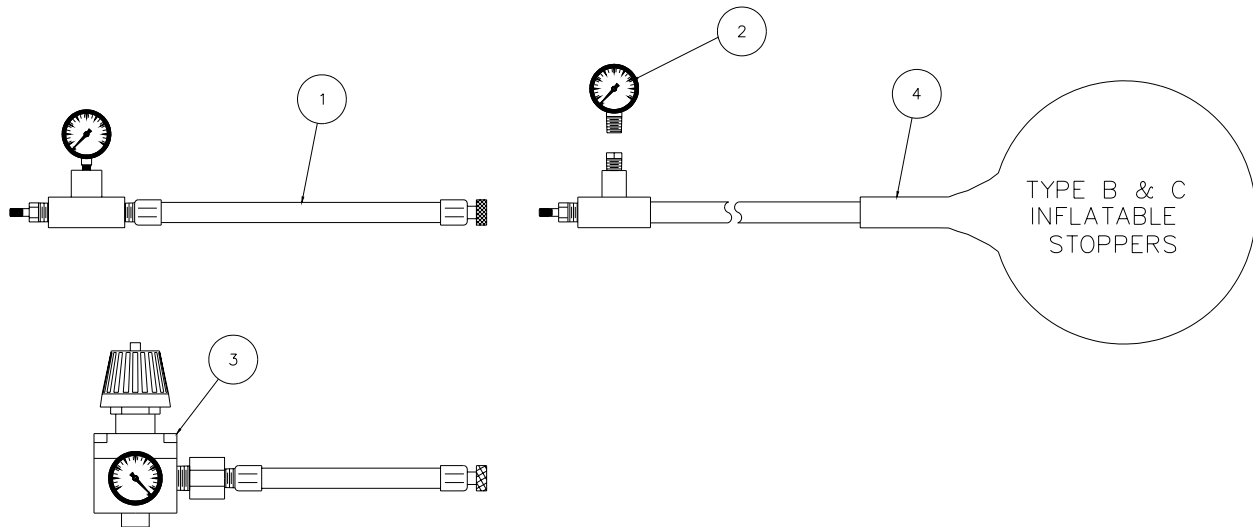
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| Table 1. Parts List | | |
|---------------------|--|---------------------|
| Item | Hose Extensions – Optional | Part Number |
| 1 | 6ft – Hose Extension w/ Schrader Valve | I-Hose-6 |
| | 12ft – Hose Extension w/ Schrader Valve | I-Hose-12 |
| | 25ft – Hose Extension w/ Schrader Valve | I-Hose-25 |
| | 50ft – Hose Extension w/ Schrader Valve | I-Hose-50 |
| 2 | Monitor Gage 0-30 Psi – Recommended | I-Gage |
| 3 | Regulator Assembly – Recommended Includes: Air regulator w/ Gage and Schrader Valve Connector | I-Reg |
| 4 | Type B - Round Stopper | IRB-XXXX-R* |
| | Type C - Round Stopper | IRC-XXXX-R or (-B)* |
| 5 | Hand Pump 50 Psi – Not Shown - Optional | I-Pump |

*Note: Item 4, Stopper Types: XXXX designates Stopper size specified in (2) decimal places (XX.XX)
-R or -B Designate Material, -R: Ntural Rubber, -B: Buna-N

Figure 1. Type B and Type C Round Stopper Assembly



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| Table 2. Type B and Type C Round Stopper Inflation Details | | | | |
|--|--------------------------------------|------------------------------------|---|---------------------------------------|
| INFLATED STOPPER OD (in) | MINIMUM INSERTION HOLE REQUIRED (in) | TYPE B MAXIMUM INFLATION SIZE (in) | TYPE C MAXIMUM INFLATION PRESSURE (psi) | TYPE C MAXIMUM IN LINE PRESSURE (psi) |
| 2 | 1" | 3 | 15 | 1 |
| 3 | 1" | 4 | 15 | 1 |
| 4 | 1-1/4" | 5 | 15 | 1 |
| 6 | 1-1/2" | 7 | 15 | 1 |
| 8 | 2" | 9 | 12 | 1 |
| 10 | 2" | 11 | 10 | 3/4 |
| 12 | 2-1/2" | 13 | 8 | 3/4 |
| 14 | 2-1/2" | 15 | 6 | 1/2 |
| 16 | 3" | 17 | 6 | 1/2 |
| 18 | 3" | 19 | 5 | 1/2 |
| 20 | 3" | 21 | 5 | 1/2 |
| 24 | 4" | 25 | 3 | 1/2 |
| 26 | 4" | 27 | 3 | 1/4 |
| 28 | 5" | 29 | 3 | 1/4 |
| 30 | 5" | 31 | 3 | 1/4 |
| 32 | 5" | 33 | 3 | 1/4 |
| 36 | 5" | 37 | 3 | 1/4 |
| 42 | 6" | 43 | 1 | 1/4 |
| 48 | 6" | 49 | 1 | 1/4 |
| 54 | 6" | 55 | 1 | 1/4 |

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OPERATING PROCEDURES FOR CYLINDRICAL STOPPERS**UPON RECEIPT INSPECTION**

Inspect hose and fitting for damage and obstructions. DO NOT USE IF EVIDENCE OF DAMAGE IS APPARENT.

INFLATION INSTRUCTIONS

Attach required and/or optional assemblies to stopper per parts list on page 2. Back off regulator all the way and attach air supply. Attach regulator air hose to valve stem on stopper hose. Slowly adjust the regulator until the bag reaches maximum inflation pressure.

PRE-TEST IN PIPE

1. Inside an empty test pipe, inflate the Stopper to the recommended pressure, which is listed on tag attached to the Stopper or in the table below and on page 2.
DO NOT OVER INFLATE
2. While the Stopper is inflated or in the open position in the test pipe, compressed air at the pressure that will actually be in the main, not exceeding recommended line pressure, should be fed into the test pipe. Examine back of Stopper for any air escaping past.
DO NOT USE IF AIR IS ESCAPING
3. Leave the Stopper in the test pipe for at least 1/2 hour. DO NOT USE IF ANY LEAKAGE IS PRESENT

PERSONNEL PROTECTION

Protective clothing and eye protection should be worn at all times.

UNDER NO CIRCUMSTANCES SHOULD ANYONE BE NEAR THE PIPE WHEN STOPPER IS BEING INFLATED OR DEFLATED.

BEFORE INSTALLATION

1. Before installing Stopper, see that the inner surface of the pipe is free from accumulated debris, remove all burrs from inside of insertion hole if one is required. Ensure the correct size Stopper is being used for the pipe I.D.
2. Unroll the air hose if necessary to avoid forming kink in the line. This is especially important where a kink could cause a false reading, lower than actual pressure.
3. Before each use the Stopper should be examined for tears, cuts or worn parts. SHOULD EVIDENCE OF DAMAGE BE VISIBLE, THE STOPPER SHOULD BE DISCARDED AND NOT USED. Just prior to inserting Stopper in main, inflate the Stopper to the recommended pressure which is listed on tag attached to the Stopper or in the table below and on page 2, observe for any leakage. Leave inflated for 1/4 hour prior to using.
IF PRESSURE DROPS, DO NOT USE. DO NOT OVER INFLATE.

INSTALLATION

Insert Stopper into matching pipe and inflate per inflation instructions above.

DO NOT OVER INFLATE STOPPER OR EXCEED MAXIMUM PRESSURES LISTED IN TABLE BELOW AND ON PAGE 2

SEWERS

Insert Stopper into manhole, allow Stopper to drift to desire point. Hold position by rope and inflate per inflation instructions above.

TIDE WORK FOR SEWER OR SUCTION

For installation when tide is rising, lower Stopper into sewer, allow Stopper to drift to desired point. Fast the rope to a fastening on the bank and inflate per inflation instructions above. Always use Stoppers in series with a vent pipe extending vertically between them on either side of the area to be isolated when actually working on live mains. Examine the back Stopper for any air escaping past. DO NOT USE IF LEAKAGE IS APPARENT PAST THE BACK STOPPER.

REMOVAL

All Stoppers should be fully deflated before they are removed from the pipe. Full deflation reduces the risk of damage to the Stopper from sharp edges. Do not pull on tubing to remove Stopper.

STORAGE

Cylindrical Stoppers are made of natural rubber or BUNA-N and may be encased in a polyester cloth cover. Direct sunlight should be avoided for long-term storage, since the ultra-violet light component of sunlight decomposes natural rubber. They should also not be subjected to extreme temperature changes. Store in a flat position; do not kink inflation tubes.



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SPECIALISTS IN TUBE TESTING, SLEEVING AND PLUGGING TECHNOLOGY

AN ISO-9001 REGISTERED COMPANY

| CYLINDRICAL INFLATABLE STOPPERS - GAS LINE | | |
|--|--|---------------------------------|
| INFLATED STOPPER OD | MAXIMUM INFLATION PRESSURE (SAME AS WATER MAIN) | MAXIMUM IN LINE PSI GAS LINE |
| 2" - 8" | SEE BELOW | 1.0 |
| 9" - 12" | SEE BELOW | .75 |
| 13" - 24" | SEE BELOW | .50 |
| OVER 24" | SEE BELOW | .25 |

| CYLINDRICAL INFLATABLE STOPPERS - WATER MAIN | | | |
|--|---------------------------------|----------------------------|-----------------------------------|
| INFLATED STOPPER OD | MINIMUM INSERTION HOLE REQUIRED | MAXIMUM INFLATION PRESSURE | MAXIMUM IN LINE PSI WATER MAIN |
| 2 | 1" | 15 | 9.0 |
| 3 | 1" | 15 | 9.0 |
| 4 | 1-1/4" | 15 | 9.0 |
| 6 | 1-1/2" | 15 | 9.0 |
| 8 | 2" | 12 | 7.2 |
| 10 | 2" | 10 | 6.0 |
| 12 | 2-1/2" | 8 | 4.8 |
| 14 | 2-1/2" | 6 | 3.6 |
| 16 | 3" | 6 | 3.6 |
| 18 | 3" | 5 | 3.0 |
| 20 | 4" | 5 | 3.0 |
| 22 | 4" | 3 | 1.8 |
| 24 | 4" | 3 | 1.8 |
| 30 | 5" | 3 | 1.8 |
| 32 | 5" | 3 | 1.8 |
| 36 | 5" | 3 | 1.8 |



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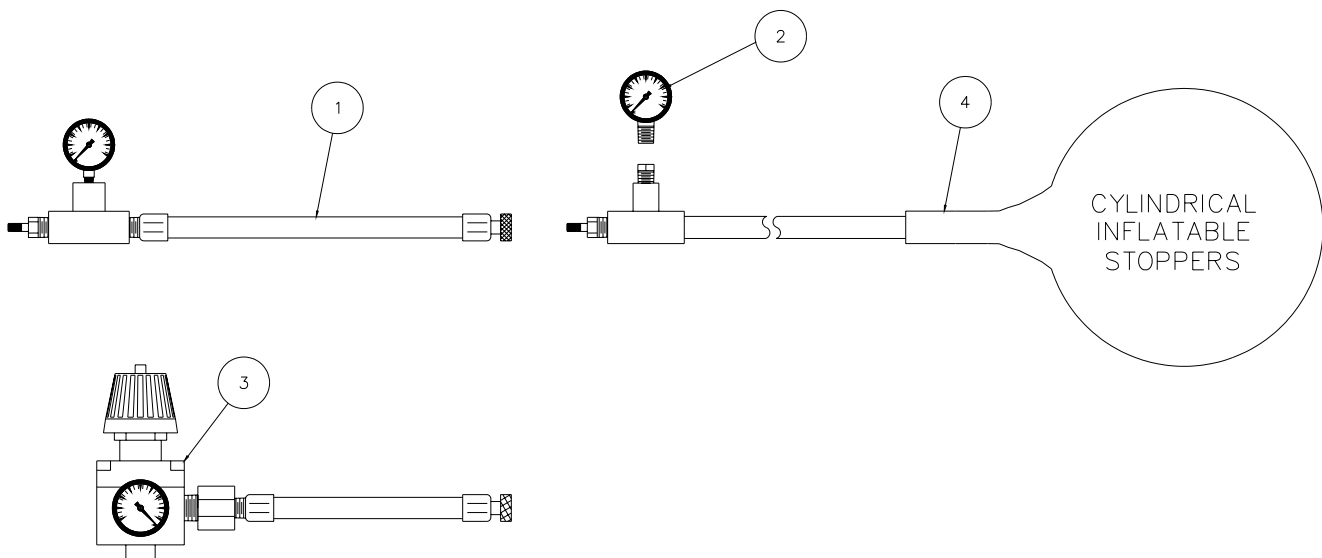
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| PARTS LIST | | |
|------------|--|--------------------|
| Item | Hose Extensions – Optional | Part Number |
| 1 | 6ft - Hose Extension w/ Schrader Valve | I-Hose-6 |
| | 12ft – Hose Extension w/ Schrader Valve | I-Hose-12 |
| | 25ft – Hose Extension w/ Schrader Valve | I-Hose-25 |
| | 50ft – Hose Extension w/ Schrader Valve | I-Hose-50 |
| 2 | Monitor Gage 0-30 Psi – Recommended | I-Gage |
| 3 | Regulator Assembly – Recommended Includes: Air regulator w/ Gage and Schrader Valve Connector | I-Reg |
| 4 | Cylindrical Inflatable Stopper | ICS-XXXX-R or (-B) |
| 5 | Hand Pump 50 Psi – Not Shown – Optional | I-Pump |

Note, Item 4, Cylindrical Stopper:

XXXX designates Stopper size specified in (2) decimal places (XX.XX)
-R or -B Designate Material, -R: Natural Rubber, -B: Buna-N



QUESTIONS? Contact EST Customer Service at any of the following locations with questions.

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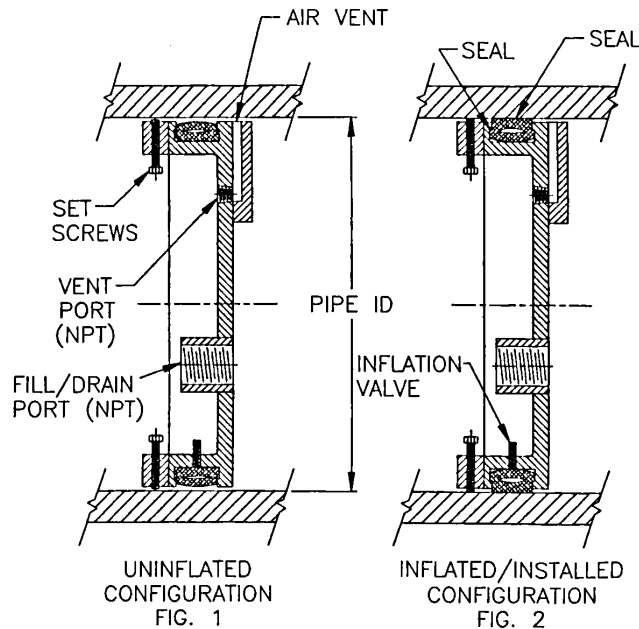
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MEDIUM PRESSURE INFLATE-A-PLUG OPERATING PROCEDURES

**DANGER!**

EPOXY OR ANY OTHER COATINGS ON THE PIPE ID MUST BE COMPLETELY REMOVED IN THE AREA WHERE THE SET SCREWS CONTACT THE PIPE ID. THE CUP POINT SET SCREWS MUST INTIMATELY CONTACT THE STEEL PIPE. FAILURE TO REMOVE THE EPOXY OR OTHER COATINGS WILL RESULT IN UNSAFE OPERATION AND POTENTIAL EXPULSION OF THE PLUG.

WARNINGS!

- **READ ALL INSTRUCTIONS FIRST. HYDROSTATIC (WATER) TEST METHOD SHOULD ALWAYS BE USED TO INSURE MAXIMUM SAFETY.**
- **DO NOT UNDER INFLATE.**
- **ALWAYS USE SET SCREWS WHEN PROVIDED.**
- **IF INFLATION PRESSURE IS ABOVE NORMAL AIR SUPPLY FOR HIGHER LINE (TEST) PRESSURE REQUIREMENTS, INFLATE SEAL WITH WATER.**
- **NEVER INFLATE PLUG OUTSIDE OF PIPE (UNCONSTRAINED) AS A LEAK MAY OCCUR IN SEAL.**
- **PLUGS RATED FOR 15 PSI OR MORE ARE DESIGNED FOR SCH 40 PIPE AND STRONGER (THICKER WALL). THIN WALL PIPE MUST BE SUPPORTED BY A PIPE CLAMP ON THE OD OF THE PIPE. THE PLUG WILL NOT HOLD ON ITS OWN.**

PLUG INSTALLATION & TEST INSTRUCTIONS

IMPORTANT! READ ALL INFORMATION BEFORE USING PLUG! IF PRESSURE IS ON BOTH SIDES, CONSULT FACTORY FOR SPECIAL INSTRUCTIONS.

1. Remove all debris from pipe ID and wipe clean.
2. Insert plug inside pipe with solid back-plate side against pressure, thus creating a compression state between back-plate and screws.
3. Install plug so that vent inlet is at the highest point in pipe line to allow all air to vent from pipe prior to testing.

DANGER!

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EPOXY OR ANY OTHER COATINGS ON THE PIPE ID MUST BE COMPLETELY REMOVED IN THE AREA WHERE THE SET SCREWS CONTACT THE PIPE ID. THE CUP POINT SET SCREWS MUST INTIMATELY CONTACT THE STEEL PIPE. FAILURE TO REMOVE THE EPOXY OR OTHER COATINGS WILL RESULT IN UNSAFE OPERATION AND POTENTIAL EXPULSION OF THE PLUG.

4. Install plug so that you allow a minimum 4" recess of the plug from the end of the pipe.
5. Inflate ring slightly to form a light seal, then "square" plug by tapping with a rubber maul or hammer and wood block.
6. Inflate ring to full pressure on "data" plate or 50 psi above line test pressure. For tests longer than one hour, maintain a constant monitored air supply to the plug's seal at the data plate recommended pressure.
7. Torque all set screws "lightly" to the ID of the pipe.
8. Torque all set screws to indicated Ft./Lbs using diagonal (criss cross) rotational method.

NOTE: IMPORTANT! MUST USE TORQUE WRENCH. DO NOT EXPECT PLUG TO HOLD RATED TEST PRESSURE IF PROPER SET SCREW TORQUE CANNOT BE ASSURED.

9. Re-torque all set screws until all "take -up" due to stress relaxation is eliminated.

WARNING! WHEN TIGHTENING SET SCREWS IN LINED PIPELINE (i.e. concrete, glass, plastic) TORQUE SET SCREWS AS INDICATED ABOVE, THEN BACK SET SCREWS OUT USING DIAGONAL (CRISS CROSS) ROTATIONAL METHOD. REMOVE THE PUNCHED OUT PLUG UNDER EACH SET SCREW, THEN RE-TORQUE IN ACCORDANCE WITH PREVIOUS INSTRUCTIONS. THIS ALLOWS THE SET SCREW TO REGISTER INTO THE PIPE WALL.

WARNING! INSPECT CUP POINTS OF SET SCREWS AFTER EACH TEST TO INSURE THAT ALL DEBRIS (i.e. concrete, glass, plastic) IS REMOVED FROM CUP. REPLACE SET SCREWS WHEN CUP POINT OF SET SCREW IS WORN TO THE POINT WHERE IT IS NOT SHARP. FAILURE TO INSPECT AND REPLACE SET SCREWS MAY CAUSE PLUG TO BE DISLODGED AND DAMAGED DURING TEST. PLUG WILL NOT HOLD RATED PRESSURE WITH WORN SET SCREWS. APPLY NEVER SEIZE LUBRICANT TO SET SCREWS THREADS FREQUENTLY IF PLUG IS IMMERSSED IN WATER.

10. Fill line test area through access, until steady flow of water passes through air vent valve, thus exhausting all air from the line test area.
11. Close vent valve.
12. Pressurize line test area, and perform hydro test.

WARNING! NEVER INFLATE PLUG OUTSIDE OF PIPE (UNCONSTRAINED) AS LEAK CAN OCCUR IN SEAL.

PLUG REMOVAL INSTRUCTIONS

1. Release all back pressure from the system.
2. Drain all water from pipe line.
3. Remove all fittings, hose and pipes, attached to the test plug.
4. Depressurize the seal.
5. Loosen all set screws in a criss-cross rotational fashion.
6. Remove plug from pipeline.



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STORAGE & MAINTENANCE INSTRUCTIONS

- 1 Depressurize seal.
2. Blow off excess water and debris especially on fasteners. Remove fasteners one at a time and lightly grease. Re-install fasteners.
3. Store plugs away from direct sunlight, ultraviolet rays exposure will deteriorate the rubber seal.
4. Store plugs off of the ground using wood blocking.

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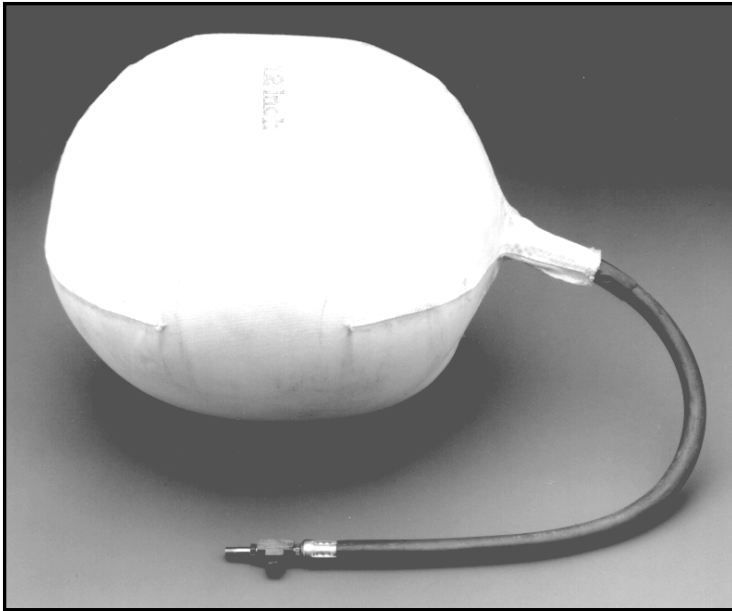


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Round Inflatable Stoppers



Round Inflatable Stoppers



Cylindrical Stoppers



Pillow Type Stoppers

EST Low Pressure Stopper

Round, polyester covered inflatable stopper for use in water pipeline with low pressure. Can be used to plug steam extraction line during turbine overhauls. Constructed of Natural Rubber or Nitrile/Buna-N.

- Sizes available 2" thru 60".
- Supplied with Schrader Valves.
- Entire bladder is vulcanized & polyester cover seam triple sewn.
- Flame resistant or acid resistant coverings available.
- For other materials contact EST.



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| NOMINAL SIZE | NATURAL RUBBER PART NO. | BUNA-N PART NO. | INFLATION PRESSURE (PSI) | MAXIMUM PRESSURE | | INFLATED DIMENSION (LGTH) | TAP HOLE SIZE REQUIRED | APPROX. WEIGHT |
|-----------------|-------------------------------|--------------------|--------------------------------|---------------------|--------------------|---------------------------------|------------------------------|-------------------|
| | | | | PSI | IN WATER COLUMN | | | |
| 2 | IRC-0200-R | IRC-0200-B | 15 | 1 | 28 | 4 | 1" | 9 oz |
| 3 | IRC-0300-R | IRC-0300-B | | | | 5 | | 10 oz |
| 4 | IRC-0400-R | IRC-0400-B | | | | 6 | 1.25" | 12 oz |
| 5 | IRC-0500-R | IRC-0500-B | | | | 7 | | 14.5 oz |
| 6 | IRC-0600-R | IRC-0600-B | | | | 8 | 1.5" | 1.25 lbs. |
| 8 | IRC-0800-R | IRC-0800-B | 12 | 3/4 | 21 | 9 | 2" | 1.4 lbs. |
| 10 | IRC-1000-R | IRC-1000-B | 10 | | | 11 | | 1.5 lbs. |
| 12 | IRC-1200-R | IRC-1200-B | 8 | | | 14 | 2.5" | 2.25 lbs. |
| 14 | IRC-1400-R | IRC-1400-B | 6 | 1/2 | 14 | 16 | 3" | 4 lbs. |
| 15 | IRC-1500-R | IRC-1500-B | | | | 17 | | 4.5 lbs. |
| 16 | IRC-1600-R | IRC-1600-B | | | | 18 | | 4.75 lbs. |
| 18 | IRC-1800-R | IRC-1800-B | 5 | | | 19 | 5.75 lbs. | |
| 20 | IRC-2000-R | IRC-2000-B | | | | 23 | 4" | 7 lbs. |
| 22 | IRC-2200-R | IRC-2200-B | 25 | | | 7.5 lbs. | | |
| 24 | IRC-2400-R | IRC-2400-B | 3 | 27 | 9 lbs. | | | |
| 26 | IRC-2600-R | IRC-2600-B | | 1/4 | 7 | 31 | 5" | 11.5 lbs. |
| 28 | IRC-2800-R | IRC-2800-B | | | | 32 | | 12.5 lbs. |
| 30 | IRC-3000-R | IRC-3000-B | | | | 34 | | 13 lbs. |
| 32 | IRC-3200-R | IRC-3200-B | | | | 36 | | 14.5 lbs. |
| 34 | IRC-3400-R | IRC-3400-B | | | | 38 | | 15.5 lbs. |
| 36 | IRC-3600-R | IRC-3600-B | | | | 42 | 21 lbs. | |
| 40 | IRC-4000-R | IRC-4000-B | | | | 1 | 49 | 6" |
| 42 | IRC-4200-R | IRC-4200-B | 53 | | | | 27 lbs. | |
| 44 | IRC-4400-R | IRC-4400-B | 54 | 29.5 lbs. | | | | |
| 48 | IRC-4800-R | IRC-4800-B | 56 | 31 lbs. | | | | |
| 54 | IRC-5400-R | IRC-5400-B | 66 | N/A | 40.25 lbs. | | | |
| 60 | IRC-6000-R | IRC-6000-B | 70 | | 56 lbs. | | | |

Other Parts Available for use with Round Stoppers:

| PART NO. | DESCRIPTION |
|----------|--|
| IHOSE-6 | HOSE EXTENSION W/SCHRADER VALVE, 6FT |
| IHOSE-12 | HOSE EXTENSION W/SCHRADER VALVE, 12FT |
| IHOSE-25 | HOSE EXTENSION W/SCHRADER VALVE, 25FT |
| IHOSE-50 | HOSE EXTENSION W/SCHRADER VALVE, 50FT |
| IGAGE | MONITOR GAGE (0-30PSI) |
| IREG | REGULATOR ASSY, INCLUDES: AIR REGULATOR W/GAUGE & SCHRADER VALVE CONNECTOR |
| IPUMP | HAND PUMP, 50PSI |

Ordering Information:

When ordering, please supply the following information:

1. Nominal Pipe Sizes or I.D.
2. Maximum Line Pressure
3. Temperature
4. Fluid Medium



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Inflate-A-Plugs



Inflate-A-Plug

Rim Bolt Test Plug

Wing Nut Test Plug

Threaded Pipe Stopper

Economy Test Plug

Bolt Type Test Plug



Inflatable Medium Pressure Pipe Plugs

The EST Inflate-A-Plug can be used in storm drains, sewers, pipeline testing, and marine applications.

- **Rapid Inflation**
- **Easy Installation**
- **Lightweight**
- **Easy Seal Replacement**
- **Positive "Seal" Against Line Test Pressure**
- **Positive "Hold" Against Total Line Force**
- **Sizes from 4" to 96"**
- **Can Be Inflated Remotely**



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| Nominal Size | Part No. | Weight | | Port | Min Pipe ID | | Max Pipe ID | | Pressure | |
|-----------------|------------|--------|------|--------|-------------|-------|-------------|-------|----------|-------|
| | | (lb) | (kg) | | (in) | (mm) | (in) | (mm) | (PSI) | (Bar) |
| 4 | MPI-0400-A | 3 | 1.4 | 1/4" | 3.81 | 96.8 | 4.13 | 104.9 | 100 | 6.8 |
| 5 | MPI-0500-A | 5 | 2.3 | | 4.88 | 123.9 | 5.25 | 132.8 | 100 | 6.8 |
| 6 | MPI-0600-A | 6 | 2.7 | 1/2" | 6.00 | 152.4 | 6.38 | 162.1 | 100 | 6.8 |
| 8 | MPI-0800-A | 10 | 4.5 | 3/4" | 7.63 | 193.8 | 8.13 | 206.5 | 100 | 6.8 |
| 10 | MPI-1000-A | 17 | 7.7 | 1" | 9.63 | 244.4 | 10.13 | 257.3 | 100 | 6.8 |
| 12 | MPI-1200-A | 31 | 14.1 | | 11.88 | 301.8 | 12.63 | 320.8 | 100 | 6.8 |
| 14 | MPI-1400-A | 34 | 15.5 | 1-1/2" | 12.63 | 320.8 | 13.38 | 339.9 | 100 | 6.8 |
| 16 | MPI-1600-A | 44 | 20.0 | | 14.88 | 377.9 | 15.63 | 396.8 | 100 | 6.8 |
| 18 | MPI-1800-A | 63 | 28.6 | 2" | 17.13 | 435.1 | 17.88 | 454.2 | 100 | 6.8 |
| 20 | MPI-2000-A | 70 | 31.8 | | 18.88 | 479.6 | 19.88 | 504.9 | 100 | 6.8 |
| 22 | MPI-2200-A | 78 | 35.4 | 2-1/2" | 20.88 | 530.4 | 21.88 | 555.8 | 100 | 6.8 |
| 24 | MPI-2400-A | 85 | 38.6 | | 22.88 | 581.2 | 23.88 | 606.6 | 100 | 6.8 |
| 26 | MPI-2600-A | 105 | 47.2 | 3" | 24.88 | 631.9 | 25.88 | 657.4 | 100 | 6.8 |
| 28 | MPI-2800-A | 123 | 55.9 | | 26.88 | 682.8 | 27.88 | 708.2 | 100 | 6.8 |
| 30 | MPI-3000-A | 140 | 63.6 | | 28.88 | 733.6 | 29.88 | 758.9 | 100 | 6.8 |
| 32 | MPI-3200-A | 154 | 70.0 | | 30.88 | 784.4 | 31.88 | 809.8 | 100 | 6.8 |
| 34 | MPI-3400-A | 165 | 75.0 | | 32.88 | 835.2 | 33.88 | 860.6 | 100 | 6.8 |
| 36 | MPI-3600-A | 176 | 80.0 | | 34.88 | 885.8 | 35.88 | 911.4 | 100 | 6.8 |

Ordering Information

When ordering, please specify the following information:

- Size information (OD, ID & Wall Thickness)
- Pipe Materials
- Maximum test pressure
- Temperature
- Fluid Medium

Note: Please contact factory for all non-metallic applications such as plastics, concrete, etc. These applications will be evaluated on an as needed basis. Applications where the wall thickness is less than 1/4" must also be evaluated.

Special sizes are available upon request. Contact EST Customer Service for information.

Specifications subject to change without notice.



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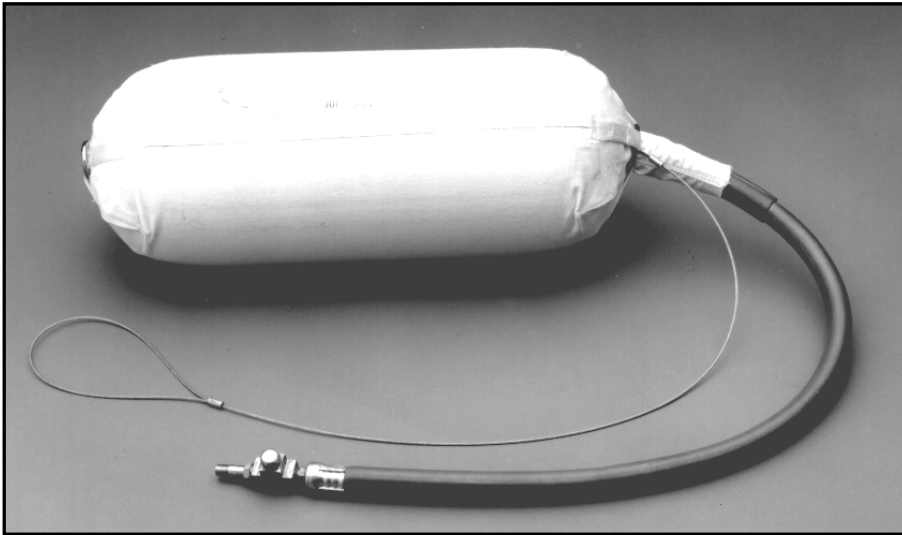
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Expansion Seal Technologies Asia Pte Ltd.
 35 Tannery Rd, #11-10 Tannery Block
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SPECIALISTS IN TUBE TESTING, SLEEVING AND PLUGGING TECHNOLOGY

AN ISO-9001 REGISTERED COMPANY

Cylindrical Stoppers



- ☒ **Cylindrical Stoppers**
- ☐ Round Inflatable Stoppers
- ☐ Pillow Type Stoppers

EST Low Pressure Stopper

Cylindrical, polyester covered inflatable stopper for use in water pipeline with low pressure. Can be used to plug sewer or water main lines or flushing pipes.

- Available in Natural Rubber or Buna-N
- Hose Assembly & hand pump are available
- Restraints available
- Flame or Acid resistant coverings available
- Sizes 2" thru 96"
- Simple- Just inflate and monitor inflation pressure



World Headquarters:
Expansion Seal Technologies
2701 Township Line Road
Hatfield, PA 19440-1770 USA
Tel: 1-215-721-1100 Fax: 1-215-721-1101
Toll-Free: 1-800-355-7044

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| NOMINAL SIZE | PRESSURE (PSI) | NATURAL RUBBER PART NO. | BUNA-N PART NO. |
|--------------|----------------|-------------------------|-----------------|
| 2 | 9 | ICS-0200-R | ICS-0200-B |
| 3 | | ICS-0300-R | ICS-0300-B |
| 4 | | ICS-0400-R | ICS-0400-B |
| 6 | | ICS-0600-R | ICS-0600-B |
| 8 | 7 | ICS-0800-R | ICS-0800-B |
| 10 | 6 | ICS-1000-R | ICS-1000-B |
| 12 | 5 | ICS-1200-R | ICS-1200-B |
| 14 | 4 | ICS-1400-R | ICS-1400-B |
| 16 | | ICS-1600-R | ICS-1600-B |
| 18 | 3 | ICS-1800-R | ICS-1800-B |
| 20 | | ICS-2000-R | ICS-2000-B |
| 24 | 2 | ICS-2400-R | ICS-2400-B |
| 26 | | ICS-2600-R | ICS-2600-B |
| 28 | | ICS-2800-R | ICS-2800-B |
| 30 | | ICS-3000-R | ICS-3000-B |
| 32 | | ICS-3200-R | ICS-3200-B |
| 36 | | ICS-3600-R | ICS-3600-B |
| 42 | CALL FACTORY | ICS-4200-R | ICS-4200-B |
| 48 | | ICS-4800-R | ICS-4800-B |
| 54 | | ICS-5400-R | ICS-5400-B |
| 60 | | ICS-6000-R | ICS-6000-B |
| 66 | | ICS-6600-R | ICS-6600-B |
| 72 | | ICS-7200-R | ICS-7200-B |
| 84 | | ICS-8400-R | ICS-8400-B |
| 96 | | ICS-9600-R | ICS-9600-B |

Other Parts Available for use with Cylindrical Stoppers:

| PART NO. | DESCRIPTION |
|----------|--|
| IHOSE-6 | HOSE EXTENSION W/SCHRADER VALVE, 6FT |
| IHOSE-12 | HOSE EXTENSION W/SCHRADER VALVE, 12FT |
| IHOSE-25 | HOSE EXTENSION W/SCHRADER VALVE, 25FT |
| IHOSE-50 | HOSE EXTENSION W/SCHRADER VALVE, 50FT |
| IGAGE | MONITOR GAGE (0-30PSI) |
| IREG | REGULATOR ASSY, INCLUDES: AIR REGULATOR W/GAUGE & SCHRADER VALVE CONNECTOR |
| IPUMP | HAND PUMP, 50PSI |

Ordering Information:

When ordering, please supply the following information:

1. Nominal Pipe Sizes or I.D.
2. Maximum Line Pressure
3. Temperature
4. Fluid Medium



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