

9. PROPER PLACEMENT OF PLUG INTO A PIPE. All pneumatic pipe plugs rely on 100% contact with the pipe wall in order to achieve proper performance. Thus, pipe plugs must be placed a **minimum of one pipe diameter inside of the pipe** being plugged.

Example: If you are installing a 12" plug it should be inserted a minimum of 12" inside of the pipe being plugged.

Strict compliance with this minimum plug insertion distance should prevent the pipe plug from protruding outside of the pipe and losing 100% contact with the pipe wall.

10. PROPER INFLATION OF A PLUG. All PTI pipe plugs have a required inflation pressure molded on the front of the plug. Pipe plugs **must always** be inflated to the stated inflation pressure. Both over inflation and under inflation will adversely affect the performance of the pipe plug and could result in failure of the plug, which could result in serious bodily injury or even death.



Pipe plugs should **never** be inflated to full inflation pressure unless they are properly installed inside of a pipe. Failure to have a pipe plug contained inside a pipe during inflation could result in serious bodily injury or even death.

11. PROPER DEFLATION AND REMOVAL OF A PLUG. Prior to deflation of a pipe plug, users must ensure that all built up pressure behind or in front of the pipe plug has been released. If the pipe plug has been properly blocked/braced (see No. 8 above) to prevent plug movement, then slow deflation of the plug should allow the effluent to be gradually released in a safe manner. The pipe plug should

only be removed from the pipe upon full deflation and full release of all pressure and/or effluent.



Deflation of a pipe plug while in one of the danger zones could result in serious bodily injury or even death.

12. NEVER USE A DEFECTIVE PRESSURE GAGE. A properly functioning pressure gauge is vital to the safe use and operation of a pneumatic pipe plug. Improper handling or storage of a pressure gauge can cause faulty or improper functioning. Thus, pressure gauges should be inspected and tested before each use to ensure proper functioning. Refer to the gauge manufacturer's operating and maintenance instructions for the proper operation, maintenance, handling and storage of your pressure gauge. Defective pressure gauges should be immediately disposed of and replaced.

13. REGULAR INSPECTION OF PLUG FOR DAMAGE. Pipe plugs should be inspected regularly for any conditions that may adversely affect the plugs overall performance, including the plug's ability to hold inflation pressure or hold back pressure. Prior to and after any use, users **must always** inspect the plugs for cracks, punctures, cuts, abrasions, bulges, and corrosion. **Never** attempt to use a pipe plug that has visible damage or any irregularity.

14. PROPER STORAGE AND CLEANING OF A PLUG. Users should always attempt to store a pipe plug in as close to the original cylindrical shape as possible and out of direct sunlight. Storage of a pneumatic pipe plug in direct sunlight will shorten the life of the plug and could result in premature failure. Plugs can be cleaned using a mild detergent and water.

PLUG TECHNOLOGIES, INC. ("PTI")

SAFETY INSTRUCTIONS FOR THE PROPER USE OF PNEUMATIC PIPE PLUGS



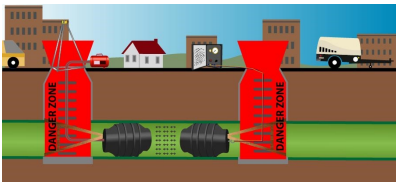
All users must read and understand this instruction sheet before using PTI pneumatic pipe plugs.

Plug Technologies, Inc.
11099 Lamont Ave NE
Hanover, MN 55341
Phone: 855-758-4489
www.plugtechinc.com



1. INTRODUCTION. Working in close proximity to pneumatic pipe plugs is extremely dangerous and can result in serious bodily injury or even death. According to OSHA standard 1926.21(b)(2) *“The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards of other exposure to illness or injury.”* PTI’s safety instructions are written as a guide to help train and educate employers and their employees on the safe use of PTI pneumatic pipe plugs.

2. BE AWARE OF AND AVOID THE DANGER ZONES. A pipe plug’s danger zone is a funnel shaped area directly in front of an inflated pipe plug. This danger zone also includes a funnel shaped area coming out of the manhole where an inflated pipe plug is installed. The entire manhole should also be considered to be in the danger zone, and users should never be in a manhole containing an inflated pipe plug. (See illustration of the danger zone)



Users should never inflate a pipe plug while in any of the above described danger zones. PTI

has a complete line of Fill Kit/Retrieval Ropes that are designed to allow users to conduct their work safely outside of the above described danger zones.

3. DETERMINE CORRECT PLUG SIZE. PTI pipe plugs are all rated for a specific size pipe or a defined range of pipe sizes. The front of each PTI pneumatic plug has the specified size or usage range clearly marked. Thus, users **must always** measure the inside diameter of the pipe to be plugged in order to verify that the plug’s defined usage range includes the pipe size intended to be plugged. If the pipe you are trying to plug is irregular shaped (anything other than round) pipe such as egg shaped or oval, contact PTI immediately for additional information regarding safe plugging of irregular shaped pipes.

4. CALCULATE AND MONITOR BACK PRESSURE. Users must always calculate the amount of back pressure that a pipe plug will be subjected to in order to determine the correct PTI plug for a specific application. Back pressure is the amount of air or water (head) pressure that the plug is holding back. This pressure can be behind the plug or in front of the plug. When holding back water, the head pressure can be determined by measuring the amount of water column that is above the plug’s center line. The back cover of the PTI product catalog contains a useful conversion chart.

EXAMPLE: IF A PLUG IS HOLDING A COLUMN OF WATER 15’ HIGH THEN THE PLUG WOULD BE HOLDING BACK APPROXIMATELY 6.50 PSI (15 X .4335 = 6.5025 PSI).

When holding back air, back pressure must be monitored using a properly functioning pressure gauge. Users must monitor the back pressure to ensure that it does not exceed the back pressure rating of the pipe plug being used. All PTI pipe plugs have back pressure ratings molded onto the plug. The back pressure ratings are also included in our product catalog and can be found at our website, www.plugtechinc.com.

5. TEMPERATURE AND CHEMICAL CONSIDERATIONS. The performance of a pneumatic pipe plug can be adversely affected by air temperature and the presence of certain chemicals. PTI pipe plugs are manufactured with a high quality natural rubber. Natural rubber plugs are **not** designed to be used in temperatures exceeding 150° Fahrenheit. Pipe plugs operating in an environment exceeding this temperature rating require an enhanced elastomer. Contact PTI for your elastomer options. Likewise, natural rubber plugs are not suitable for use in the presence of certain chemicals, which can have a severe adverse effect on the performance of a natural rubber plug. Users must determine what chemicals may come into contact with the pipe plug during the intended application. Always consult a natural rubber compatibility chart or contact PTI to ensure that the pipe plug being used is suitable for the anticipated chemical environment.

6. PERSONAL PROTECTION EQUIPMENT. All users, without exception, must wear personal protection equipment when using PTI pipe plugs, including, but not limited to: **safety glasses, hard hats, hearing protection, and safety boots.**

7. PROPER CLEANING OF THE PIPE. Users must ensure that the pipe being plugged is clear of all debris and foreign objects which may reduce the pipe plug’s ability to hold back pressure. Examples of debris and foreign objects typically encountered include, but are not limited to: dirt, rocks, effluent, algae, grease, and chemicals. Any type of material that is trapped between the pipe plug and the wall of the pipe can reduce the plug’s ability to meet the back pressure rating for that pipe plug. PTI’s back pressure ratings are calculated by testing plugs in a clean and dry pipe environment. Pipe conditions other than clean and dry will reduce the published back pressure ratings for our plugs.

8. PROPER BLOCKING/BRACING OF PLUG. A properly engineered blocking/bracing system must be installed to prevent the pipe plug from moving in the pipe during use. A properly installed blocking/bracing system must also be able to contain both the plug and all material behind the plug in the event of plug failure. Users should always consult with a qualified structural engineer in order to design the proper blocking/bracing safeguards. Failure to use a properly designed and installed blocking/bracing system could result in serious bodily injury or even death. Users **should never** use the eyebolts or retrieval ropes as a form of safety devices for the plugs. Eye bolts and the retrieval ropes are designed for lifting and lowering the plugs only and are not rated to tether the full amount of force that a plug can exert.