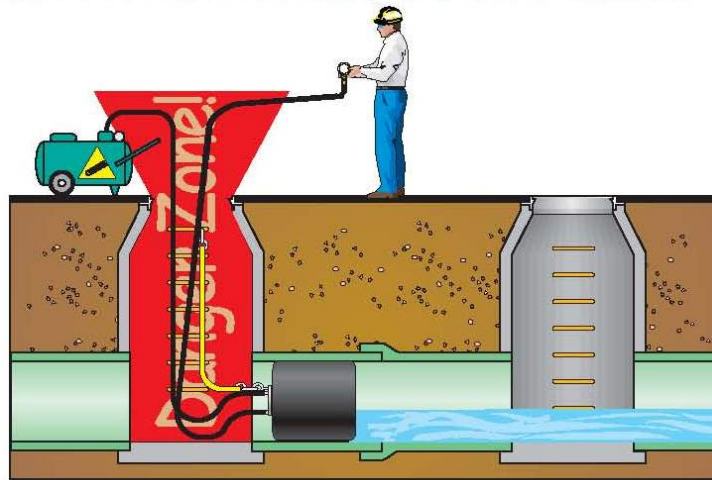


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**STAND CLEAR OF THE DANGER ZONE!
DEATH OR SERIOUS BODILY INJURY MAY RESULT!**

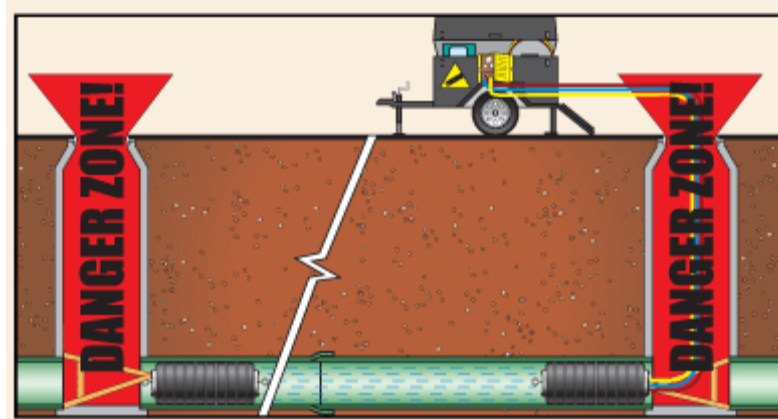


Not complying with guidelines in our accompanying Safety Instructions, not using a Safety Rope and Inflation Hose with Pressure Monitoring Gauge, removal or tampering with any safety devices on these products shall release Stemar, Inc. from all liability that may result from Injury, Death or Property Damage and void any product warranty.

User shall determine the suitability of this product for this intended use and assumes all risk and liability.

PUNCTURES ARE NOT WARRANTED!

ALWAYS BLOCK PLUGS WHEN CONDUCTING AIR TESTS!



HOW TO CALCULATE PIPELINE FORCES AND PRESSURES. 1) Determine the inside diameter of the pipeline in inches. 2) Determine the maximum backpressure. 3) Calculate the pipe area in square inches. 4) Calculate the force the plug must withstand.

Example with 36" pipe: $18" \times 18" \times 3.14 \times 5\text{psi} = \mathbf{5087 \text{ POUNDS OF FORCE!}}$

Calculating pounds of force aid in building plug blocking systems. It also illustrates the tremendous force generated by a sewer air test.

SPECIAL NOTE:

Pressures being exerted on a plug, regardless of the medium (liquid, water or air) are the same. Ten (10) PSI water is the same as ten (10) PSI air. However, **AIR IS A COMPRESSIBLE MEDIA.** Therefore, extreme caution should be observed when air testing.

Air back-pressure ratings reflect absolute back-pressure capabilities. Common engineering standards have been used to convert head pressure to PSI. **IT IS IMPERATIVE TO BLOCK PLUGS** when performing air-pressure tests and to ensure no one is in the zone of danger when a plug is in use. (Please see our Pipe Plug Safety and Operating Instructions Manual for complete details).

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PIPE PLUG SAFETY AND OPERATING INSTRUCTIONS A GUIDE TO SAFER USE

PIPE PLUG SAFETY IS A PARTNERSHIP. STEMAR'S DEDICATION TO SAFETY MUST WORK IN CONJUNCTION WITH YOUR SAFE USE OF OUR PRODUCTS. YOU MUST THINK AND PRACTICE SAFETY WHENEVER USING A PIPE PLUG.

AN INHERENT DANGER EXISTS WITH ALL INFLATABLE PRODUCTS. IF ANY CONDITIONS WITH THIS EQUIPMENT EXIST THAT MAY JEOPARDIZE YOU, OR YOUR CO-WORKERS SAFETY, OR OTHERS, DO NOT USE IT. CONTACT YOUR COMPETENT PERSON OR SUPERVISOR FOR INSTRUCTIONS. FAILURE TO COMPLY WITH THESE SAFETY INSTRUCTIONS, OR THOSE OF O.S.H.A., MAY RESULT IN PROPERTY DAMAGE, SERIOUS BODILY INJURY OR DEATH.

1. DO NOT DRAG PLUGS, THE SAFETY INFLATION LINE AND GAUGE LINE ARE NOT DESIGNED FOR RESTRAINING OR PULLING. THE SUPPLIED RESTRAINING BRIDLES AND/OR EYEBOLTS ARE USED ONLY FOR LIFTING & LOWERING THE PLUG.
2. BE SURE THE PIPE IS CLEAN & DRY WHERE THE PLUG COMES IN CONTACT WITH THE PLUG. DO NOT USE THE PLUG WHERE OIL, GASOLINE, OR CAUSTIC CHEMICALS MAY BE FOUND.
3. BE SURE THAT THERE ARE NO SHARP OBJECTS OR EDGES IN THE PIPE WHICH COULD PUNCTURE THE PLUG WHEN INFLATED. NEVER USE A PLUG THAT HAS BEEN DAMAGED OR THAT YOU SUSPECT MAY BE DAMAGED. DON'T MODIFY OR ATTEMPT TO REPAIR IN ANYWAY.
Please note: If a plug needs to be patched, or in some way is damaged and determined by Stemar, Inc. to no longer be in rentable condition, the plug will be purchased by the entity that was responsible for the damage.
4. INFLATE THE PLUG TO THE *EXACT* MAXIMUM INFLATION PRESSURE INDICATED ON THE PLUG. DO NOT UNDERINFLATE. **NEVER EXCEED THE MAXIMUM INFLATION PRESSURE!**
5. **BRACING/BLOCKING MUST BE USED** TO PREVENT THE MOVEMENT OR COMPLETE DISLODGING OF THE PIPE PLUG. BRACE EACH PLUG, SO THAT IF AIR PRESSURE IS LOST IN THE PLUG, THE PLUG WILL NOT MOVE *AT ALL*. USE OF A CERTIFIED PROFESSIONAL ENGINEER FOR THE DESIGN, CONSTRUCTION, & MAINTENANCE OF A CONTAINMENT SYSTEM IS RECOMMENDED. EYEBOLTS ARE DESIGNED *ONLY* FOR LIFTING AND LOWERING OF THE PLUG.
6. **AVOID THE "DANGER ZONE"**, WHICH IS IN FRONT OF PLUG, IN THE PIPE, IN THE MANHOLE, AND JUST OUTSIDE THE MANHOLE. AVOID THE "DANGER ZONE" WHILE PRESSURIZING, TESTING, OR DEPRESSURIZING THE TEST SPACE AND WHILE INFLATING AND DEFLATING THE PLUG.
7. NEVER INFLATE THE PLUG OVER AN UNRESTRAINED AREA OR A VOID IN THE PIPE, SUCH AS A LATERAL. THE PLUG MUST HAVE FULL CONTACT WITH THE PIPE AT ALL TIMES. USE PNEUMATIC PLUGS ONLY IN PIPE AND PIPE SIZE FOR WHICH THEY WERE DESIGNED.
8. DURING THE TESTING PERIOD, YOU MUST MONITOR THE INFLATION PRESSURE IN THE PLUG, WITH A PROPERLY CALIBRATED GAUGE. VARIOUS LENGTHS, OF REMOTE INFLATION LINES WITH GAUGES, ARE AVAILABLE.
9. FOR MORE INFORMATION ON INFLATION/TEST PRESSURES, OR FOR TABULATED DATA, CALL STEMAR AT 1-800-992-0100.
10. WASH PLUGS WITH WATER & A MILD DETERGENT AFTER USE. RINSE WELL AND LET DRY. STORE IN A COOL DRY AREA. INSPECT THOROUGHLY BEFORE USING

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PIPE PLUG SAFETY AND OPERATING INSTRUCTIONS

LOW PRESSURE TESTING & POUNDS OF FORCE

1. How much **FORCED PRESSURE** are you really dealing with?
2. The question of actual **POUNDS OF FORCE** should be answered before beginning your job. It will help the Competent Person, supervisor, or Certified Engineer, determine how much and what kind of blocking material must be used.
3. **POUNDS OF FORCE** is calculated as follows:

$$\Pi r^2 \times \text{PSI} \quad \text{Where: } \Pi = 3.14 \text{ (}\Pi \text{ is pronounced PIE)}$$

Radius or $r = \frac{1}{2}$ the diameter of the pipe (i.e. the radius of 12" pipe is 6.)

$$r^2 = r \times r$$

PSI = pounds per square inch*

*If you're water testing, multiply .434 X feet of head = PSI (i.e. 8 feet/head of water = 3.47 PSI)

4. **Example:** 12" pipe, Air Test at 3 PSI

$$r^2 \times \text{PSI} = \text{Total Pounds of Force}$$

$$3.14 \times 6 \times 6 \times 3 = 339.12 \text{ Pounds of Force}$$

$$\Pi \times r \times r \times \text{PSI}$$

In example #4, there is the equivalent of a 339 Lb. man standing on each plug in your test. Even at low pressure, you are dealing with hundreds of pounds of force.

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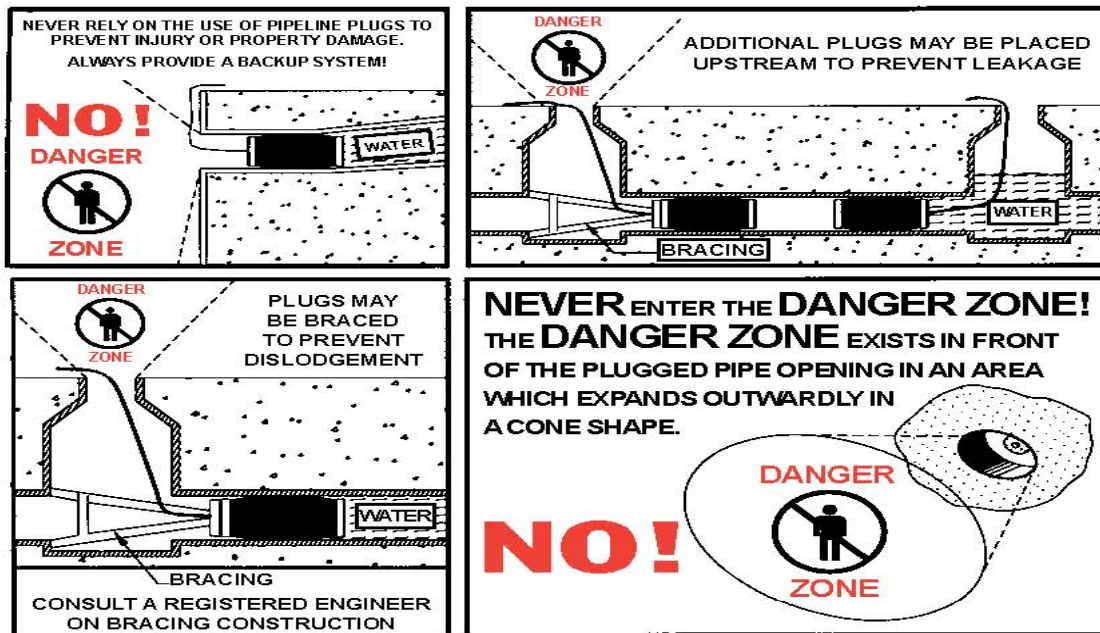
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PROVIDE A BACKUP SYSTEM FOR SAFETY

NEVER RELY ON PIPELINE PLUGS AS THE ONLY MEANS TO PREVENT INJURY OR PROPERTY DAMAGE. NEVER ENTER THE DANGER ZONE DURING USE.



! WARNING NEVER ATTEMPT TO USE THE EYE BOLTS, INFLATION HOSE, OR CARRYING HANDLE OF A PNEUMATIC PLUG AS A SAFETY TETHER OR AS A MEANS TO RESTRAIN THE PLUG IF IT IS DEFLATED WHILE HOLDING BACK PRESSURE! Safely bracing properly designed and constructed to withstand the tremendous forces involved is required. Eye bolts and carrying handles on most Cherne pneumatic plugs are designed only for carrying, lifting and lowering pneumatic plugs. They are NOT designed to withstand the large forces encountered when plugs are deflated when restraining back pressure. The carrying handles, eye bolts or their attachment to the pneumatic plug may fail, thereby damaging the plug itself and may result in unsafe conditions. THIS MAY CAUSE PLUG FAILURE WHICH MAY RESULT IN DEATH, SERIOUS BODILY INJURY AND/OR PROPERTY DAMAGE!

! DANGER A FULLY OPERATIONAL BACKUP SYSTEM MUST BE USED IF THE PLUG IS USED IN ANY ENVIRONMENT WHERE PLUG LEAKAGE, FAILURE OR DISLODGE MENT FOR ANY REASON, COULD RESULT IN LIFE ENDANGERMENT, BODILY INJURY OR PROPERTY DAMAGE! The backup system must be designed to safely stop a dislodged plug and the pipeline media that will discharge upon plug failure. Consult a registered professional engineer for proper construction and maintenance of such a system. FAILURE TO PROVIDE A BACKUP SYSTEM MAY RESULT IN DEATH, SERIOUS BODILY INJURY AND/OR PROPERTY DAMAGE!

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PIPE PLUG PRESSURE GUIDE-for most types of pipe

ATTN: IN PVC OR PVC LINED PIPE-CONSULT STEMAR FOR CORRECT PRESSURES!

ALWAYS INFLATE PNEUMATIC PLUG TO EXACT RECOMMENDED INFLATION PRESSURE. PROPER INFLATION PRESSURE IS CLEARLY MARKED ON EACH PRODUCT. OVER-INFLATION MAY CAUSE PLUG RUPTURE. UNDER-INFLATION MAY CAUSE THE PLUG TO DISLODGE FROM PIPELINE WHEN BACK PRESSURE IS APPLIED. IMPORTANT: READ "PIPE PLUG SAFETY SHEET".

IF YOU ARE NOT SURE OF EXACT SIZE OF PLUG, CHECK THE TAG ON THE PLUG ITSELF. FOR BIGGER SIZE PLUGS, PLEASE REFER TO TAG ON FRONT OF THE PLUG. IF TAG IS NOT FOUND, CONTACT STEMAR EQUIPMENT & SUPPLY CO., INC FOR PROPER INFLATION PRESSURE.

If you need a professional engineering firm to consult with regard to Blocking, Bracing, Restraining a Pipe Plug for any application:

Company: J. M. Turner Engineering, Inc. - Santa Rosa, CA

Contact: Hans J. Vermeulen, P.E. - Sr. Engineer/Owner

Phone: (707) 528-4503

Email: hans@jmteng.com

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TEN COMMANDMENTS

Of Safe Pipe Plug Operation

1. Always stay out of danger zone, and block plug.
2. Always wear safety glasses & a hard hat.
3. Always use properly calibrated pressure gauge.
4. Never exceed plug inflation or pipe back pressure ratings.
5. Always release back pressure from the pipe FIRST BEFORE deflating plug.
6. Always inspect plugs for damage and clean before and after every use.
7. Only use properly sized product for pipe,
Do not exceed rated pressures.
8. Always use the properly specified plug for the job.
9. Always use proper length extension hose(s).
10. Always completely install plugs in a clean, dry pipe.

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LOS DIEZ MANDAMIENTOS

Para evitar en la operacion de obturar Tuberias con tapones inflables

1. Siempre bloquear el tapon y permanezca fuera de la zona de peligro.
2. Ponerse siempre gafas de seguridad y casco duro.
3. Emplear siempre manómetros debidamente calibrados.
4. Jamas exceder los valores nominales de inflacion de los tapones y de las contrapresiones de la tuberia.
5. ANTES DE desinflar el tapon, es necesario PRIMERO desahogar la contrapresion de la tuberia.
6. Inspeccionar siempre los tapones para ver que no esten danados y limpiarlos antes de usarlos.
7. Usar solamente los productos de tamano apropiado para la tuberia. No exceder las presiones nominales.
8. Emplear siempre el tapon que tenga las especificaciones correctas para el trabajo de que se trate.
9. Utilizar siempre manguera(s) de extension de la longitud adecuada.
10. Instalar siempre los tapones en una tuberia limpia y seca.

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