LANSAS® PRODUCTS
Manufactured by Vanderlans & Sons, Inc.

Product Knowledge – SAFELY INSTALLING PIPE PLUGS

⚠WARNING Always read and understand how to safely use Pipe Plugs and testing equipment. LANSAS attaches SAFETY INSTRUCTIONS to every plug sold. These instructions can also be downloaded from the LANSAS website. Additionally, LANSAS has a safety video which is available for viewing online at http://www.lansas.com/video_safety_English.htm.

- **Safety should always be of the utmost importance when installing and using Pipe Plugs.**
- Prior to doing any installation, a review of any Pipe Plug Safety Instructions, Safety Videos, Confined Space Entry requirements, and any Federal, State, or local laws regarding this type of work would be recommended and should be followed at all times.
- Review the intended installation procedures and complete a checklist to ensure all the required equipment to complete the installation is available and in good working condition for the application.

  Here are a few examples –

  -Pipe Plug
  -Protective Sleeve to keep the plug from sustaining damage during insertion and use.
  -Lifting device
  -Inflation Kit or extension air hose
  -Gauge to monitor the plug inflation pressure
  -Air compressor
  -Lift rope or for larger plugs, a triple bridle lifting sling
  -Designs for Blocking/Bracing/Restraining system
  -Materials to construct Blocking/Bracing/Restraining system
  -Etc.

- Check the condition of the plug and ensure there are no missing or damaged fittings including the lifting Eye-Nuts, air fittings, plugs for blocking bypass ports if those bypasses are not needed for the application. Replace any missing or damaged fittings to ensure the proper use of the plug. Look to

ensure the Pipe Plug integrity by making sure there are no cuts, gouges, or holes in the plug. Make sure the rubber is supple, in good condition and not aged or cracked in appearance.

- Make sure you know the correct pipe diameter/s in which the Pipe Plug is designed to be used. Do not attempt to use the Pipe Plug in a pipe that exceeds the maximum pipe diameter for which the Pipe Plug was designed.
- Make sure you know the Required Inflation Pressure and the Maximum Back / Test Pressures the Pipe Plug being used is designed to handle.
- Make sure you know the maximum forces that will be exerted on the Pipe Plug throughout the application.
- Here are some important questions to ask and answer before installing your plug and trying to start your job.

    1. Are my workers familiar with using Pipe Plugs safely?
    2. Do we have the correct plug for the pipe size we are working in?
    3. Is the Back / Test Pressure rating for the plug we plan on using sufficient for the application?
    4. Have we checked to ensure the Pipe Plug and all accessories are in good working condition and ready to use in the application?
    5. Do we know if the access is large enough to accept the plug for installation and removal?
    6. Do we have the equipment to properly insert and inflate the Pipe Plug? For example:
        a. An Inflation Kit of the appropriate length to stay out of the DANGER ZONE?
        b. An Inflation Kit with a gauge to monitor the Inflation Pressure throughout the application?
        c. An Inflation Kit with a hook to attach to a single Pipe Plug Eye-Nut or Eye-Bolt on smaller plugs? (15”-30” Multi-Size Pipe Plugs or smaller)
        d. Ropes, cables or a triple bridle sling to attach to all three Eye-Nuts or Eye-Bolts on larger Pipe Plugs? (20”-36” Multi-Size Pipe Plugs or larger) Only attaching to a single Eye-Nut or Eye-Bolt on larger plugs risks damage as the heavier weight of the larger plugs is more than one Eye-Nut stud is designed to handle. LANSAS® plugs are designed with (3) Eye-Nuts on each end of larger Pipe Plugs for this purpose.
    7. Do we have equipment and materials to properly Block or Brace the Pipe Plug to ensure it doesn’t slip or slide in the pipe or become completely dislodged?

8. Did we consult with an Engineer to properly determine the materials and construction of the Blocking or Bracing system we plan to use?

9. Do we have plans in place to quickly remove the Pipe Plug if something should go wrong and require us to do so?

This will not cover all the questions for every application, but it is a good starting point and hopefully serves to get you thinking along the right lines. Remember, the safety of every individual on the jobsite is the priority!

INSTALLING THE PIPE PLUG

A. Ensure the Pipe Plug you're using is the correct size for the pipe it is being used in.

B. Ensure you know the Required Inflation Pressure of the Pipe Plug.

C. Ensure the Pipe Plug is rated to handle the Back / Test Pressures for the application.

D. Ensure that the pipe is clean and free of debris or damage which can damage the Pipe Plug, cause the Pipe Plug to fail or dislodge from the pipe.

E. Once you are sure of these factors, insert the Pipe Plug fully into the pipe.

    1. There should be no portion of the inflated Pipe Plug protruding from the pipe at any time before or during the application.

    2. If you are using an all-rubber plug like the A.R., M.W., or other all-rubber designed plugs, be aware that these plugs will inflate in all directions like a balloon or ball and if not inserted far enough into the pipe, they will bulge out of the pipe and could burst. A good rule of thumb when using plugs of an all-rubber design is to install them one pipe diameter into the pipe.

F. Once you have the Pipe Plug inserted into the pipe correctly, lay out your Inflation Kit (inflation hose) which should be of a length that keeps you out of the DANGER ZONE while inflating the Pipe Plug and throughout the use in the application. Per the LANSAS® SAFETY INSTRUCTIONS, the DANGER ZONE "is the area within or around a pipe or manhole where a plug is installed." It "is a cone shaped area, getting larger as it extends away from a pipe or manhole." You should always use an Inflation Kit or hose with a gauge to monitor the inflation pressure of the plug throughout the entire application while the Pipe Plug is in use.

INFLATING THE PIPE PLUG

G. Once you are in a safe area, out of the DANGER ZONE with an Inflation Kit or hose to inflate the Pipe Plug to the Required Inflation Pressure and an attached pressure gauge to constantly monitor the inflation pressure on the Pipe Plug you can inflate the Pipe Plug.

1. Do NOT Under-Inflate the Pipe Plug!

    i. Be aware that under-inflating a Pipe Plug may allow a Pipe Plug to slip or become completely dislodged out of the pipe when pressure is put against it.

    ii. Be aware that under-inflating a Pipe Plug may allow water, sewage, air or other materials to leak past it while the Pipe Plug is installed.

    iii. Be aware that exceeding the Maximum Back/Test Pressure of a Pipe Plug may allow the Pipe Plug to slip or become completely dislodged from the pipe when pressure is put against it.

    iv. Be aware that exceeding the Maximum Back/Test Pressure of a Pipe Plug may allow water, sewage, air or other materials to leak past it while it is installed.

2. Do NOT Over-Inflate the Pipe Plug! - Be aware that over-inflating a Pipe Plug may cause the Pipe Plug to burst, rupture or explode causing damage and potentially injuring people.

MONITORING THE PIPE PLUG

Once the installation and inflation of plug is complete and you are working the application, the plug should be monitored regularly. The Required Inflation Pressure should be checked every 4 hours at a minimum, but more often in critical situations. You must always be cautious to ensure you do not endanger the application, the plug, the structure where the plug is installed and most importantly the workers on the job.

BLOCKING / BRACING / RESTRAINING THE PIPE PLUG

The LANSAS SAFETY INSTRUCTIONS indicate "Blocking / Bracing must be used to prevent the movement or complete dislodging of Pipe Plugs." A certified Engineer should be consulted to design, construct and maintain the containment system for safety.

A) Some of the key considerations when blocking, bracing, or restraining Pipe Plugs are as follows:

1. Do not "Point Load" the Pipe Plug when Blocking / Bracing. A "Point Load" is a load which is localized to a specific location on a structure.

2. Instead, use multiple points of contact on the plug in order to spread the back pressure or test pressure forces over the largest possible area on the Pipe Plug.

3. Be aware that Rubber Eyelets, Steel Rings, Metal Eye-Bolts, Eyelets, and Eye-Nuts are not to be used for restraining Pipe Plugs. These Eyelets, Steel Rings, Metal Eye-Bolts, Eyelets, and Eye-Nuts are used for the lifting or lowering of Pipe Plugs during installation or removal.

4. Know what the amount of force is that will be exerted on the Pipe Plug throughout the application.

   For example, a Pipe Plug in a 12" diameter pipe with 5 psi Back Pressure will have a total force behind that Pipe Plug of approximately 565 lbs. However, that same 12" diameter pipe with a Pipe Plug holding 100 psi of Back Pressure will have over 11,000 lbs. of force behind it.

   Consider a 24" diameter pipe with a Pipe Plug installed holding 5 psi Back Pressure will have 2,260 lbs. of force behind it, but if the plug must hold 100 psi the force becomes over 45,000 lbs.

5. Make sure to use materials that are strong enough to withstand the forces that will be exerted by the application.

6. Again, LANSAS® recommends consulting a certified Engineer to work with you to develop a containment system to ensure your safety.

Here are a few pictures of Blocking/Bracing Pipe Plugs during use. While they worked for the End-Users in these respective applications, LANSAS® does not endorse any individual method. We simply wanted to give some examples of methodology.



If you need an Engineering Firm to consult with regard to Blocking, Bracing or Restraining a Pipe Plug for an application, LANSAS has referred customers to the following company with excellent success. They are PE licensed in all 50 states and most of Canada.

Company:	**D.H. Charles Engineering, Inc. – Santa Rosa, CA**
Contact:	**Jasper Calcara, P.E. – President**
Phone:	**(707) 537-8282**
Email:	**calcara@charlesengineering.com**

DEFLATING AND REMOVING THE PIPE PLUG

Once your application is complete and you are ready to pull your equipment out, you must still be cautious to ensure you don't damage equipment, jobsite structures or injure workers.

A) 

Before attempting to remove any Pipe Plug, always make sure all Back Pressures or Test Pressures have been completely released and that there are no forces working against the Pipe Plug before deflating. If there is still Back / Test Pressure against the plug, when it deflates it can shoot out of the pipe like a project

B) Only after making sure all Back / Test Pressures are completely gone or zeroed out is it safe to deflate the Pipe Plug.

C) Allow the Pipe Plug to fully deflate (zero out on the gauge) before attempting to remove the materials used for Blocking / Bracing. Once you are sure the Pipe Plug is completely deflated, you can carefully remove the materials used to Block or Brace. Ensure you don't cause damage by carefully removing all materials in front of the plug and double check to make sure the plug is fully deflated. Attempting to pull the plug out partially deflated can result in damage to the Pipe Plug. It is best to connect and pull larger Pipe Plugs from all three Eye-Nuts to keep from putting too much tension on only one Eye-Nut or stud.

These instructions are not meant to be all inclusive, but rather to be used as building blocks to help guide in the safe use of Pipe Plugs. If you have any questions, please feel free to contact LANSAS directly.