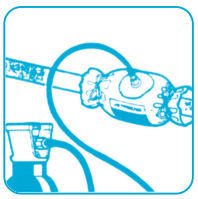
Pipe Freezer

The rules and procedures in force where people are at work may require the person responsible for this equipment to carry out a specific risk assessment.



It is important to read this entire leaflet BEFORE using the Pipe Freezer

1. Liquefied or gaseous carbon dioxide (Co2) is extremely hazardous. All operators must read the safety section of this leaflet.
2. The equipment should not be used by anyone unless they have had previous experience, or have had a course of instruction from a competent person.
3. This pipe freezer is designed to freeze the liquid in sections of pipe to enable maintenance to be carried out without draining the complete system.
4. The action of this pipe freezer can cause injury or damage if not used in a careful and controlled way.
5. If it has been some time since an operator has used the pipe freezer they should familiarise themselves with the equipment before starting work.
6. The work should be planned head and thought out to make sure that it will always be carried out safely.
7. The following items of personal protective equipment must be worn as a minimum:
   Overall with long sleeves
   Dust mask – a minimum of EN149 FFP3(s) protection
   Gloves
8. This pipe freezer must not be used by minors, or by anyone under the influence of drugs or alcohol.
9. This pipe freezer is designed for operation by an able bodied adult. Anyone with either a temporary or permanent disability must seek expert advice before using it.

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EXAMPLES OF FROZEN PLUG EFFECTIVENESS

The Frozen plug will remain effective, allowing the work to be carried out, for the following times approximately.

1. A 25mm (1") copper pipe – 15 minutes with a small jacket.
2. A 25mm (1") copper pipe – 65 minutes with a large jacket.
3. A 15mm (1/2") copper pipe – 95 minutes with a large jacket.
4. A 38mm (1,1/2") copper pipe – 20 minutes with a large jacket.

Using the Pipe Freezer

1. Gloves and long sleeved overalls must be worn.
2. Other people should be kept clear of the area.
3. The equipment should only be used as specified by the manufacturers or the hire company.
4. The work area needs to be well ventilated especially if it is low lying as in a basement.
5. The cylinders should be kept away from any form of heat. Only enough cylinders to complete the task should be kept at hand. Extra cylinders must be stored in a safe cool place with adequate ventilation.
6. Enough time should be allowed to complete the work – jobs should not be started towards the end of the work period.
7. After work the pipe freezer kit and CO2 cylinders must be safely and securely stored away to prevent unauthorised use.
8. If the equipment does not work properly, operators should not attempt to repair it. Contact the hire company.

Please keep this leaflet safely as it may be required for future reference

CO2 SAFETY

1. Liquid CO2 has a temperature well below the freezing point of water, anything cooled by CO2 must not be touched.
2. Gaseous CO2 is an asphyxiant and is heavier than air. Low lying areas and confined spaces must be ventilated if CO2 is being used.
3. Protective gloves must always be worn when working with CO2. Touching cold parts of this equipment or pipes can result on cold 'burns' or frostbite to bare skin.
4. If using more than one CO2 cylinder they should be stored indoors in the shade. Keep them out of sunlight and other sources of heat.
5. There is a safety valve on each CO2 cylinder in the form of a disc. This disc will rupture if the CO2 gets too warm and starts to evaporate. If the disc does rupture the CO2 will jet out like compressed air.
6. Cylinders of CO2 must not be carried on a vehicle in the same compartment as the driver. They should be stored in the back of the vehicle, making sure the safety valve is pointing to the rear.

BEFORE STARTING WORK

WORK AREA

1. Always ensure that there is good ventilation, if too much CO2 evaporates into the local area without being dispersed it will adversely affect breathing.
2. Make sure that the work area is clear and safe and that no-one is nearby who could cause a distraction.
3. Protect other people from danger. Warn other to keep away, put up warning signs.
4. The pipe freezer should be set up near to the pipes to be sealed..

OPERATORS

1. The following items of personal protective equipment that should be worn when using the pipe freezer. Particular jobs or environments may require a higher level of protection.
2. Gloves should be worn to keep the hands warm, and long sleeved overalls to protect bare skin that may come into contact with frozen pipework.
3. Anybody who is working nearby will also need to wear appropriate personal protective equipment.

PIPE FREEZER

1. Check the equipment including the thermal jackets and pressure hose. If anything is found to be damaged, do not use the pipe freezer – contact hire company.
2. Make sure the thermal jackets are the correct size for the job in hand. Thermal jackets are available in five sizes to fit different pipe diameters. It is possible to use a larger size jacket on a smaller pipe. Check with the hire company.
3. Check that enough cylinders of CO2 are available to complete the job. Most hire companies offer a sale or return option.
4. Operators must check on how the equipment works, before using it they must understand it.

INJECTION PROCEDURES

The following is an approximate guide and should be used in conjunction with squeezing the jacket and a visual check of the pipe either side of the jacket. These figures are based on metal pipes, plastic pipes and pipes of other materials may take longer.

1. For small diameter copper pipe used in hot and cold water systems one 15 second injection should be enough. Wait a further 3 minutes for the frozen plug to be complete.
2. For pipes from 22mm to 42mm give two or three 30 second injections with up to 5 minutes between each injection. A further 5 minutes should be allowed to complete the freeze. Larger pipes will need longer CO2 injection periods and time to freeze. Contact the hire company if more information is needed about using this equipment on large pipes.

HOW TO USE THE FREEZER KIT

1. Do not try to freezes pipes that contain heated water, or water that is flowing.
2. Make sure the part of the pipe, to which the thermal jacket will be fastened, is clean.
3. Screw the pressure hose tightly to the connector on the thermal jacket; check it is leakproof.
4. Place the jacket round the pipe and close the jacket into a loose fitting cylindrical shape round the pipe by sealing the velcro strips together. The hose attached to the jacket should be in a convenient position and not under any stress.
5. Tie the nylon cords at each end of the jacket tightly around the pipe. They must be tight to form a seal round the pipe to minimise the loss of liquid CO2 into the atmosphere.
6. Place the CO2 cylinder near enough to screw the other end of the pressure hose to the cylinder injection valve. Make sure it is secure and leakproof.
7. Read the instructions on each thermal jacket label to determine the quantity of CO2 to inject for the relevant diameter of pipe. Read also the section called injection procedures on this leaflet.
8. Open the injection valve for the required time close it.
9. While waiting for the pipe to freeze, squeeze the thermal jacket: when solid this indicates a successful freeze. Check also the pipe either side of the jacket which should become very cold and maybe form a surface frost.
10. When satisfied that the pipe is sealed by a frozen plug, work can commence.
11. If the work takes longer than a few minutes the frozen plug should be checked to make sure that it is still adequate by squeezing the thermal jacket, which should still be solid. If the jacket is not solid indicating a thaw the injection valve should be opened for a few seconds to re-freeze.
12. To freeze two sections of the same pipe system at the same time to facilitate removal or repair, the distance between each jacket must be at least 600mm (2 feet).
13. Depending on the amount of CO2 required two separate cylinders can be used or one cylinder with a double connector to attach two pressure hoses. Check with the hire company.
14. If using a blowlamp the flame should be kept at least 230 mm (9 inches) away from the frozen plug.
15. When the work is finished make sure the injection valve is closed tight then disconnect the hose from the cylinder valve and the thermal jacket. Finally remove the jacket from the pipe and allow the pipe to thaw.
16. Take care the equipment will be cold, keep hands warm. Wait for the jacket to thaw, do not apply heat to speed up the process.

Before Starting Work...

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