

## Amjutan Ltd

### Health, Environmental & Safety Management System

#### Generic Method Statement No. 13

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#### Jet Freezing

- Have all relevant permits issued and On-Site Risk Assessment been carried out?
1. Select the correct jacket size for the pipe to be frozen – visually check the jet on the jacket is clean and free of dirt and the wrap it around the pipe and press the Velcro strips together to make the jacket into a tube. Tie the nylon cords, ensuring that they are as tight as possible to make an enclosed 'bag' around the pipe. Ensure there is no flow of water through the pipe.
  2. Stand the cylinder in a vertical position with the valve uppermost. Connect the high-pressure hose between the CO<sub>2</sub> cylinder and jacket, using the special CO<sub>2</sub> sealing washer on the cylinder connection. The jacket has a conical fitting and needs no other sealing. Use the spanner to ensure a gas tight seal on the 'cone end' joint.
  3. Open the cylinder valve and inject CO<sub>2</sub> into the jacket until full. Note that gaseous CO<sub>2</sub> particles should be trapped by the jacket and should not escape. Wearing the appropriate gloves, periodically press the jacket around the pipe so that the solid CO<sub>2</sub> inside the jacket is evenly packed around and in contact with the pipe walls. Don't forget that plastic pipes take about three times as long to freeze as metal ones.
  4. Once the ice plug has formed, and providing the jacket is left in position, no further injections will normally be required for 30-45 minutes, depending upon the ambient temperature. To secure the plug for longer than this a further injection of CO<sub>2</sub> can be made. Alternatively, for long jobs, the pipe can be capped-off and re-frozen when the job is ready for connection, There is no danger of the pipe bursting – when jet freezing, only the water immediately beneath the jacket is frozen. When an ice plug is formed, the upstream water supply may be turned on if it is necessary to do so.
  5. With the section isolated by the ice plug, work can proceed with the repair or extension. The jacket should be positioned at least 200mm (9 inches) from any work requiring a blowlamp to ensure satisfactory solder flow. When the job is finished, the jacket can be removed and the ice plug inside the pipe will melt away within minutes. The dry ice remaining in the jacket can be flushed down a toilet, or put in a dustbin. The dry ice will evaporate to CO<sub>2</sub> gas by itself within a few minutes. It will not damage carpets or polished floors. Ensure that children or animals do not come into contact with the dry ice. Always wear protective gloves when handling the dry ice.
  6. To insert a tee piece or isolate a valve two jet freezing jackets should be used. The jet freezer tee enables them to be connected to one cylinder. To freeze warm water, place two jet freezer jackets of the correct size side by side, touching each other. This will act like a single double-length jacket. Freeze with both jackets simultaneously to produce a double-length ice plug. This extra long ice plug will stop any convection currents in the hot water but you will have used up a lot of CO<sub>2</sub> cooling down the pipe. Warm horizontal pipes are easier to freeze than warm vertical pipes.

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#### **Jet Freezing – Safety Precautions**

1. Under normal operating conditions jet freezing kit is absolutely safe, but as CO<sub>2</sub> gas in low lying and confined spaces, before commencing repair work.
2. Solid CO<sub>2</sub> is intensely cold (-78.5°) and can cause cold burns and frostbite to bare skin. Always use suitable protective gloves. Keep animals and small children away from jet freezing equipment at all times.
3. All CO<sub>2</sub> cylinder valves are fitted with a safety-bursting disc to guard against overpressure. The disc may rupture, either if the cylinder is over-filled or if it subjected to excessively high temperature (about 50 °C - 120 °C). Always store cylinder indoors in the shade and never in strong sunlight or near other sources of heat. This will also conserve the freezing power of the CO<sub>2</sub>, which is reduced when the cylinder becomes excessively warm.
4. Check the condition of your jet freezing equipment before use. If there is visible damage to the cylinder or hose, or signs of wear on any screw threads, that piece of equipment must not be used.
5. Jet freezer cylinders must be reliably secured inside vans with the valves adjacent to the rear doors and should be check weighed before loading to ensure that they are not over-filled.
6. Never carry a cylinder next to the driver in a lorry cab. If a bursting disc should rupture, the noise and discharge of CO<sub>2</sub> will distract the driver's attention.

**Water Company specific requirements should be adhered to at all times. Refer to your Team Information Pack & ensure that all of the required information is confirmed on every track-sheet upon completion of works.**

If there are any health, safety or environmental incidents, please contact your supervisor immediately.

**OUT OF HOURS INCIDENTS MUST BE REPORTED TO YOUR SUPERVISOR**