Simplifies Pipe Repair or Modification

The Qwik-Freezer™ Technique

The Qwik-Freezer™ kit is easy to use. A specially-designed jacket is wrapped around the pipe at the point where the freeze is required. A nozzle on the jacket is then coupled to a cylinder of liquid CO₂ by means of a high pressure hose. When the liquid CO₂ is injected into the space between the jacket and the pipe, it immediately expands to form solid carbon dioxide (dry ice) at a temperature of -109°F (-78°C). This low temperature quickly freezes the contents forming a secure “ice plug” which seals the pipe.

The “ice plug” forms only in the section of pipe covered by the jacket so the resulting rise in pressure is very small, and there is no damage to the pipe. The technique can be used safely on iron, lead, stainless steel, copper, brass and plastic pipe.

Major Advantages

- Saves valuable time normally lost draining down and refilling a system
- Avoids complete shutdown of systems and equipment (as in a sprinkler or water supply system)
- Prevents waste of large amounts of water
- Eliminates handling of wasted water
- Safe and cost effective

For Use in Many Industries

Office and commercial buildings
Petro/chemical refineries
Food & beverage plants
Municipalities
Hospitals/nursing homes
Industrial plants
Water treatment facilities
Conventional & nuclear power plants
Residential
Restaurants
Ships
Schools/Universities
Hotels/motels
Water utilities
Aerospace

Qwik-Freezer™ Standard Equipment

Qwik-Freezer™ Kits Standard Equipment:
Insulating pipe jackets
CO₂ cylinder(s)
Reinforced high pressure hose
Fittings
Insulated work gloves
Rubber mallet
Safety glasses
Operating manual
Timing log
Rigid fibre carrying case
See table for exact contents.

Qwik-Freezer™ Jackets:
- QF 101 for 3/8” (9.375mm) to 3/4” (18.75mm) pipe size
- QF 102 for 3/4” (18.75mm) to 1 1/2” (37.5mm) pipe size
- QF 103 for 1 1/2” (37.5mm) to 3” (75mm) pipe size
- QF 104 for 3” (87.5mm) to 4” (100mm) pipe size
- QF 106 for 5” (125mm) to 6” (150mm) pipe size
- QF 108 for 7” (175mm) to 8” (200mm) pipe size

CO₂ Cylinder

COB provides specially adapted liquid CO₂ cylinders for use with Qwik-Freezer™ equipment. The COB QFAL 20, a 20-lb. aluminum cylinder with protective handle, is supplied with 3/8” to 3” kits.

A 50-lb. aluminum cylinder, COB QFAL 50, is supplied with 4”-8” kits as standard equipment.

CO₂ cylinders can be filled by local welding and carbonic gas distributors.

A Typical Qwik-Freezer™ Application:
Replacing a defective valve.

The water is brought to a static condition. The Qwik-Freezer™ jacket (orange) is then wrapped around the pipe. Jacket #1, at a nearby upstream location. Injecting liquid CO₂ into the jacket rapidly freezes the water in the pipe, permitting valve removal for servicing or replacement. Jacket #2 shows position of a second freeze downstream from the repair. The downstream is then drained and the repair completed.

Qwik-Freezer™ jacket and tank used when a double freeze is required to block flow on both sides of the valve.
**Qwik-Freezer™ Pipe Freezing Kits**

3/8" to 3" PIPE FREEZING KITS

These kits contain the following standard accessories: gloves, rubber mallet, timing log, safety glasses, operating manual, and carrying case. Individual items (jackets) may also be ordered separately. Double freeze kits available through 8". Please contact factory.

<table>
<thead>
<tr>
<th>QF101 8&quot; JKT (203mm)</th>
<th>QF102 12&quot; JKT (305mm)</th>
<th>QF103 14&quot; JKT (356mm)</th>
<th>QF104 20&quot; JKT (508mm)</th>
<th>QF105 28&quot; JKT (711mm)</th>
<th>QF106 33&quot; JKT (838mm)</th>
<th>QF600B Hose (10ft)</th>
<th>QF001 Valve Adaptor</th>
<th>QF002 T-Connector</th>
<th>QF015 Timing Board</th>
<th>QF310 50lb CO2 Cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot; (9.375mm) to 1 1/2&quot; (37.5mm) pipe (Double Freeze)</td>
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**Qwik-Freezer™ Pipe Freezing Tables**

The tables below are for typical freezing of static water at BBF in Schedule 40 steel pipe. Higher temperatures will require additional injection and waiting periods. Plastic pipe will take up to 3 times longer. Refer to Operating Manual for detailed instructions. For freezing applications on pipes larger than 8" (203mm) in diameter, please contact COB Industries for information.

**3/8" to 3" FREEZING TABLE**

<table>
<thead>
<tr>
<th>PIPE JACKET</th>
<th>QF101 (8 INCHES)</th>
<th>QF102 (12 INCHES)</th>
<th>QF103 (14 INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (12.5mm)</td>
<td>(16.7mm)</td>
<td>(25mm)</td>
<td>(27.5mm)</td>
</tr>
<tr>
<td>No. of Injections</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Injection Time</td>
<td>1 min</td>
<td>1 min</td>
<td>1 min</td>
</tr>
<tr>
<td>Waiting Time</td>
<td>3 min</td>
<td>3 min</td>
<td>5 min</td>
</tr>
<tr>
<td>Total Time Required</td>
<td>8 min</td>
<td>18 min</td>
<td>24 min</td>
</tr>
<tr>
<td>Approx CO2 Required</td>
<td>1 lb</td>
<td>3 lbs</td>
<td>6 lbs</td>
</tr>
</tbody>
</table>

**4" to 8" FREEZING TABLE**

<table>
<thead>
<tr>
<th>PIPE JACKET</th>
<th>QF104 (20 INCHES)</th>
<th>QF105 (28 INCHES)</th>
<th>QF106 (33 INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (152mm)</td>
<td>(305mm)</td>
<td>(356mm)</td>
<td>(406mm)</td>
</tr>
<tr>
<td>No. of Injections</td>
<td>6</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Injection Time</td>
<td>6 min</td>
<td>6 min</td>
<td>10 min</td>
</tr>
<tr>
<td>Waiting Time</td>
<td>8 min</td>
<td>8 min</td>
<td>10 min</td>
</tr>
<tr>
<td>Total Time Required</td>
<td>24 min</td>
<td>30 min</td>
<td>60 min</td>
</tr>
<tr>
<td>Approx CO2 Required</td>
<td>1 lb</td>
<td>3 lbs</td>
<td>6 lbs</td>
</tr>
</tbody>
</table>

**Accu-Freeze™ (patented) The Controlled Liquid Nitrogen Pipe Freezing System**

- Larger diameter pipe
- Challenging freezes (glycol, oil, etc.)
- Controls the temperature of the pipe wall

Accu-Freeze® was created to meet a specific need in the nuclear industry for “controlled pipe freezing”. In other words, the ability to freeze pipes to create an ice plug while controlling the temperature that the pipe wall is subjected to. Accu-Freeze Kits include a digital controller and a solenoid header assembly that allow the operator to actually set and control the temperature of the pipe wall. The system then automatically injects the necessary amounts of LN2 required to freeze the pipe to the programmed temperature. The system can also be operated from remotely. Accu-Freeze is used by nuclear facilities and power plants across the USA and Europe and by the US Navy on nuclear powered vessels. Accu-Freeze was also used by NASA for an urgent hydraulic line repair on the Space Shuttle Atlantis while on the launch pad. Standard Accu-Freeze Kits are available for up to 12" diameter pipe (can be modified to accommodate larger pipe diameters) and can be used to freeze fluids with lower freeze points than water such as glycol.

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**Qwik-Freezer™ Pipe Freezing Kits**

3/8" to 8" PIPE FREEZING KITS

These kits contain the following standard accessories: gloves, rubber mallet, timing log, safety glasses, operating manual, and carrying case. Individual items (jackets) may also be ordered separately. Refer to the price list for a complete parts listing.

<table>
<thead>
<tr>
<th>KIT NO.</th>
<th>QF101 8&quot; JKT (203mm)</th>
<th>QF102 12&quot; JKT (305mm)</th>
<th>QF103 14&quot; JKT (356mm)</th>
<th>QF105 20&quot; JKT (508mm)</th>
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<th>QF001 Valve Adaptor</th>
<th>QF002 T-Connector</th>
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<tbody>
<tr>
<td>3/8&quot; (9.375mm) to 1 1/2&quot; (37.5mm) pipe</td>
<td></td>
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**LIQUID CO2 INJECTION**

TAKE THE COB ADVANTAGE • 1.800.431.1311 • www.cob-industries.com • sales@cob-industries.com
Setup Preparations
- Be sure there is enough liquid CO₂ on hand for the job.
- Be sure there is no flow of water through pipe.
- Connect hose to nozzle on jacket and to cylinder.
- Fit the jacket around the pipe. Always keep the jacket at least 16” (406mm) or more from the point of repair if a torch is to be used and 12” for every inch of pipe from the nearest closed connection or freeze plug.

Beginning the Freeze
- Open COB cylinder valve fully and inject liquid CO₂ (for times, see table)
- During the freezing period, distribute the dry ice around the pipe by pressing the jacket firmly or tapping the jacket with the rubber mallet supplied with kit. Wear gloves and safety glasses.

Proceeding with Repair
- Frost forms on the outside of the pipe near the edges of the jacket when the contents are frozen. The pipe is now sealed by the ice plug and repairs can be carried out.
- Make an additional injection every 15 minutes. This procedure will maintain the freeze for as long as required. Extra cylinders required.
- Upon finishing repair, remove jacket and allow pipe to thaw naturally. Do not use a torch. The water system should return to normal in a matter of minutes.

CO₂ Cylinder
- The COB QFAL20 cylinder weighs 27 lbs. empty and 47 lbs. full. When full, it contains 18 lbs. of usable liquid CO₂ and 2 lbs. of residual gas.
- The COB QFAL50 cylinder weighs 49 lbs. empty and 99 lbs. full. When full it contains 48 lbs. of usable liquid CO₂ and 2 lbs. of residual gas. The residual gas cannot be used for freezing.
- Always weigh your cylinder before attempting a freeze to ensure that more than enough CO₂ is available to do the job safely.

Safety Precautions
- AS CO₂ is heavier than air, care should be taken to disperse CO₂ in confined and low lying areas. Always provide good ventilation in the work area.
Qwik-Freezer™ equipment utilizes liquid carbon dioxide (CO₂) to freeze stationary water in selected sections of pipe or tubing. By producing very low “dry ice” temperatures, Qwik-Freezer™ forms a secure in-line ice plug. This temporarily isolates the water in the system and allows repairs or modifications to be made without draining down or shutting off systems.