

Operating Instructions for

General Cold-Shot™

For 1/8" to 2" (10-60 mm) Metal and Plastic Pipes

Your Cold-Shot pipe freeze kit is designed to give you years of trouble-free, profitable service. However, no tool is better than its operator. We therefore suggest you read these instructions through carefully before using your machine on the job. This will enable you to operate the Cold-Shot more efficiently and more profitably. Failure to follow these instructions may cause personal injury to operator or damage to equipment.



Basic Safety Instructions

- Only use the Cold-Shot for the purpose for which it was intended, with due attention to the general safety and accident prevention.
- Keep the work area clean. Clutter can be dangerous.
- Avoid dangerous flammable liquids or gases.
- Provide adequate lighting at the workplace.
- Wear suitable work clothes, keep long hair clear, take off jewelry and similar items.
- Use personal safety equipment (e.g. safety glasses, rubber gloves).
- Clamp the work piece securely; do not hold by hand.
- Check the unit occasionally for damage, and to see that it is operating correctly.
- Replace worn parts as early as possible.
- Only use genuine GENERAL spare parts and accessories, for personal safety reasons, to ensure correct operation of the Cold-Shot, and to preserve the basis for the warranty claim.
- All repair work must be performed only by an authorized repair facility.
- Any unauthorized modifications of the Cold-Shot are prohibited for safety reasons and will void the warranty.

Specific Safety Instructions

- Carbon dioxide must be drawn from the cylinder in a liquid state in order to produce dry ice. For this reason, **only cylinders equipped with a dip tube may be used.**
- Do not connect a pressure reducer to the cylinder.
- Keep the cylinder in an upright position and secure it to prevent it from falling over.
- The carbon dioxide cylinder must not be emptied completely.

- Do not interfere with nozzles, freeze heads or valves, including cylinder valves.
- **Work only in a well ventilated area.** Carbon dioxide is non-toxic and non-flammable but it is heavier than air and can therefore collect at ground level and displace the air if ventilation is inadequate, giving rise to the danger of suffocation.
- **Wear eye protection or goggles.**
- **Wear gloves.**
- Do not work with an open flame within 2 ft. (50 cm) of the freezing point.
- Never hit a chilled freeze head with a hammer or other tool. A sharp blow will cause it to fracture.
- Keep other people, particularly children, well away. Dry ice causes burns if it comes into contact with the skin. Once work is complete, any remaining dry ice in the freeze heads must be carefully disposed of or placed in a covered refuse container.
- Observe the safety instructions provided by the carbon dioxide supply company.

How the Cold-Shot Works

The Cold-Shot can be used to freeze all types of liquids, even at high pressure, inside steel, copper, cast iron, lead, aluminum and plastic pipe in sizes ranging from 1/8" to 2" (10-60 mm).

The Cold-Shot uses commercially available carbon dioxide (CO²). You can purchase or rent cylinders through your local welding supply house. Though any size cylinder can be used, it is recommended that users purchase the largest cylinder size possible. **Note: the CO² tank must have a dip tube.** The dip tube allows liquid rather than gas to flow through the spiral hoses where it will expand to form Dry-ice inside the freeze heads.

The ice pack which forms in the pipe is capable of withstanding a pressure of approximately 7000 psi (500 bar). As the liquid freezes, a layer of frost will develop on the surface of the pipe.

Preparation

1. Remove the seal from the carbon dioxide cylinder.
2. Screw connector with T-distributor on to cylinder (right-hand thread).
3. Screw spiral hoses on to the T-distributor. (Fig. 1)
4. Choose freeze heads which correspond to the size of the pipe to be frozen.



fig. 1

5. Place the freeze heads on the pipe and secure by tightening the knobs evenly, using hex head wrench provided, to give a firm but not over tight hold. (Fig. 2)
6. Push each injector into the bore of the freeze head until it is completely inserted and resting against the stop, then turn clockwise one quarter turn to lock in place. (Fig. 3).



fig. 2

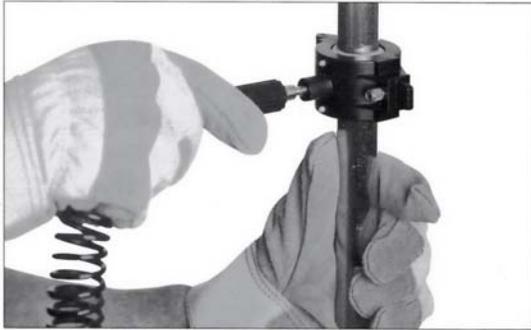


fig. 3

Operation

1. The liquid in the pipe can only be frozen when it is no longer flowing. All pumps must therefore be stopped and no liquid allowed to escape from the pipe. Allow water to cool to room temperature before freezing.
2. Fully open the cylinder valve. **The amount of carbon dioxide required is controlled automatically.** The liquid carbon dioxide expands in the injector and forms dry ice inside the freeze head with a temperature of -110 F° (-79° C) and freezes the liquid within the pipe.
3. After a brief period, frost will form on the pipe in the vicinity of the freeze heads. (See table) If frost does not form in accordance with time given in the table, then this indicates that the liquid within the pipe is still flowing or the water is too warm. (Check that all pumps have been switched off and prevent any removal or outflow of liquid)
4. **While work is in progress, the flow of carbon dioxide refrigerant must be maintained.** To ensure a sufficient supply of refrigerant is available, a stand-by cylinder is suggested. The only way to determine the amount of remaining carbon dioxide is to weigh the cylinder. If it is necessary to change the cylinder during work, it is essential that this procedure should be complete within 7 minutes to prevent the ice pack from melting.
5. Once work is complete, close the cylinder valve and wait until the pressure in the spiral hoses has returned to normal before removing them from valve. Once the ice pack **has completely melted**, carefully unscrew and remove the injector at the end of the spiral hoses from the freeze head, then remove the freeze head from the pipe.



Freezing times

The freezing times and carbon dioxide requirements given in the table below are only to be regarded as general guidelines and are valid for a water temperature of approximately 68 F° (20° C). The freezing times and refrigerant consumption values will therefore vary for other temperatures. For freezing liquids in plastic pipes much longer freezing times are generally required.

Freeze head size	Material	Freezing time	Carbon dioxide requirement	Number of freezing operations possible per 20 lbs (10 kg) cylinder per freeze head
1/8" (10 / 12 mm)	steel	1 min.	2 oz (60 g)	165
	copper	1 min.	2¼ oz (65 g)	160
1/4" (15 mm)	steel	1 min.	2½ oz (75 g)	130
	copper	2 min.	4¾ oz (135 g)	75
3/8" (18 mm)	steel	2 min.	5¼ oz (150 g)	65
	copper	3 min.	7 oz (200 g)	50
1/2" (22 mm)	steel	3 min.	8 oz (225 g)	45
	copper	5 min.	11¾ oz (330 g)	30
3/4" (28 mm)	steel	5 min.	12¼ oz (350 g)	29
	copper	7 min.	15¾ oz (450 g)	22
1" (35 mm)	steel	7 min.	17¾ oz (500 g)	20
	copper	10 min.	23 oz (650 g)	15
1-1/4" (42 mm)	steel	11 min.	24½ oz (700 g)	15
	copper	14 min.	31¾ oz (900 g)	11
1-1/2" (54 mm)	steel	16 min.	37 oz (1050 g)	10
	copper	24 min.	51 oz (1450 g)	7
2" (60 mm)	steel	29 min.	67 oz (1900 g)	5

<p>Carbon Dioxide Friendly to the environment: No. C.F.C.</p>	<p>Important! Only use cylinders with dip tube.</p>	<p>Important! Insert Injector into the bore of freeze head and rotate 1/4 turn to lock in place.</p>
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General Wire Spring Co.
1101 Thompson Avenue
McKees Rocks, PA 15136
412/771-6300 Fax: 412/771-2771