

ATLANTA SPECIAL PRODUCTS DIVISION

PACE MACHINERY GROUP, INC.
P.O. Box 155 • 4N 944 LaFox Road • Wasco, Illinois 60183

ARCTIC FREEZE™ (-109 DEGREES F) CO₂ PIPE FREEZING SYSTEM INSTRUCTION MANUAL

GETTING STARTED

1. After selecting the proper size jacket, read the instructions on the jacket label carefully. Remember to take your time - do not try to rush a freeze.
2. Make sure that you have enough CO₂ on hand to complete the freeze. See table on back for estimated amount of CO₂ required for different pipe sizes. Always have more than enough to complete the freeze.
3. Be sure there is no flow of water through the pipe.
4. Keep torch flame at least 14" or more from end of jacket and place jacket 24" or more away from a closed connection.

BEGINNING THE FREEZE

1. Open valve on cylinder fully and inject liquid CO₂. (Injection time waiting time, and approximate total time is printed on the jacket label). The chart on the back also gives the approximate injection waiting and total time required for different pipe sizes.
2. During the freezing period, squeeze the jacket against the pipe to evenly distribute the CO₂. Wear gloves.
3. Note that the injection waiting and total time required is based on pipes containing cold water under 70 degrees F. It is important to fill the space between the pipe and the jacket with a solid ball of "dry ice". If upon completing the recommended injection and waiting times you squeeze the jacket and the space is not completely filled, proceed with additional injection/waiting times until "white frost rings" appear at either end of jacket and a solid ball of "dry ice" has formed around pipe. Caution - do not attempt to rush a freeze.

PROCEEDING WITH THE WORK

When "white frost rings" have formed at each end of jacket, the "ice-plug" inside the pipe has formed, and the work can be carried out.

ADDITIONAL INJECTIONS

About every 15 minutes make additional injections of CO₂ for 20 - 30 seconds to maintain a solid ball of "dry-ice" around pipe. This procedure will allow you to maintain the "freeze" until the work is completed.

UPON COMPLETION OF WORK

When the work is completed, remove the jacket and allow the pipe to thaw naturally. Do not apply heat! The "ice-plug" will melt and the flow will return to normal in about 10 minutes.

CO CYLINDER

The 20 pound cylinder weighs about 26 pounds empty and 46 pounds full. When full, it contains 18 pounds of usable CO₂ and 2 pounds of residual gas. The residual gas cannot be used for freezing. Always weigh the CO₂ cylinder before attempting a freeze to make sure that a sufficient amount is available. We recommend always having an extra tank of CO₂ on hand.

SAFETY PRECAUTIONS

Always use CO₂ in a well ventilated area as CO₂ is heavier than air.

FREEZING TABLE
COLD WATER/METAL PIPES
(UNDER 70 DEGREES F)

Pipe Size	3/8"	1/2-3/4"	1"	1 1/2"	2"	3"	4"
Injection Time	35 sec.	35 sec.	1 min.	1 min.	5 min.	5-6 min.	8-10 min.
Waiting Time	3 min.	3 min.	5 min.	5 min.	5 min.	6 min.	5 min.
No. of Injections	2	3	3	4	4	6	7-8
Approx. Total Time Required	7 min.	11 min.	18 min.	24 min.	40 min.	72 min.	120 min
Approx. Amount of CO ₂ Required	1 lb.	1 lb.	3 lb.	6 lb.	18 lb.	28 lb.	36 lb.

IMPORTANT - Read all of the instructions carefully before beginning a freeze. The above information is provided as an estimate. Individual conditions will change: injection time, waiting time, and total time required. Do not over inject CO₂ which will cause too much dry ice to form in the space between the jacket and the pipe and possibly damage the jacket.

* **3" and 4" Pipe Sizes**

* Read instructions carefully - have plenty of CO₂ available.
Contact our office if you have any questions -
800-327-3552 / FAX 708-377-0274.

TROUBLE SHOOTING - NOT OBTAINING A FREEZE

1. **There is a Flow of Water In Pipe**

A freeze will not take place if there is a significant flow of water. If a small amount of water movement is taking place, place two jackets end to end so that they touch and begin the freezing process again. Inject CO₂ to both jackets.

2. The CO₂ cylinder is empty. No dry ice will form around the pipe. If a solid ball of dry ice has not formed around the pipe, the tank is empty. Replace immediately.

3. Insufficient time has been allowed for the ice-plug to form. Start the freezing process over again from the beginning. Make sure that you have a sufficient amount of CO₂.

SAFETY PRECAUTIONS

1. Use Arctic-Freeze only in well ventilated areas. CO₂ is heavier than air and care should be taken to disperse CO₂ in confined and low lying areas.
2. Because solid CO₂ is very cold (-109 degrees F) it can cause a burn or frostbite to the bare skin. Always wear protective gloves when using pipe freezing equipment. Keep out of the reach of children.
3. Store CO₂ cylinders in a cool place. Do not expose to any temperature over 120 degrees F.
4. Before beginning a freeze, check all of the equipment and replace any items that are damaged.

SUMMARY

Arctic-Freeze is easy to use. Read the instructions carefully and keep in mind that the freezing table is based on cold water - in metal pipes - under 70 degrees F. Higher water temperatures will require longer injection, waiting, and total time required for each pipe size! Also the consumption of CO₂ will increase.

Always have more than enough CO₂ available to complete the freeze safely.

Do not attempt to freeze hot water.

Do not hesitate to contact our office to discuss any questions that you have about a specific pipe freezing application.

ARCTIC-FREEZE (-109 DEGREES F) **PORTABLE CO₂ PIPE FREEZING SYSTEM**

The modern "state of the art" pipe freezing system with many design features that truly makes pipe freezing quick, easy, economical and dependable.

Pipe Freezing

Eliminates the need to drain and refill a piping system when new or retrofit work is required. The "Arctic-Freeeze" jackets act as "portable valves" which attach to the pipe at most any location. This allows the flow to be stopped without the costly and time consuming task of draining and refilling the piping system.

How Does it Work

Detailed instructions are provided on each jacket. The Arctic-Freeeze jacket is secured to the pipe. A high pressure hose is attached to the jacket and to the tank of CO₂. The valve is opened on the tank and liquid CO₂ is injected into the space between the jacket and the pipe. The liquid CO₂ expands into "dry-ice". The "dry-ice" is (-109 Degrees F). At this extreme cold temperature the contents of the pipe is quickly frozen with a secure "ice-plug". The "ice-plug" forms only in the section of the pipe covered by the jacket. When the "ice-plug" has formed, white frost rings appear at both ends of the jacket. At this point the work can be started. The "ice-plug" can be maintained for several hours if necessary.

The Pipe

Copper, carbon steel, stainless steel, iron, and lead. (Plastic takes 3 times longer to freeze).

Many Advantages

Saves the time lost to drain and refill a system.

No air is introduced into the lines.

Eliminates the complete shutdown of an entire system.

Arctic-Freeze simply makes the job of new or retrofit piping work easier to complete. The system can be used in tight places. It's easy to operate and very cost effective.

Who Needs Arctic-Freeze

Just about everyone who works on pipe. Plumbing, heating, maintenance, process piping, fire sprinkler, service trucks, industrial plants, mechanical contractors, schools, hospitals, hotels, high-rise office buildings, paper mills, refineries, ship repair, and military installations.

Unique Design Features of "Arctic-Freeze"

Integrated one piece injection nozzle. No parts to lose. This design insures uniform distribution of CO₂ around pipe.

Quick release tab for easy jacket removal.

High quality, insulated jackets are made from very durable and long lasting material.

High bulk nylon cord tightly secures jacket to pipe. This special cord is engineered to have superior knot holding qualities.

Arctic-Freeze jackets are flexible and easy to work with. When secured on the pipe they form a "natural pocket" which helps the dry ice to accumulate completely around the pipe.

All thread sizes on Arctic-Freeze jackets, hoses, and tanks are interchangeable with competitive equipment.

When used as directed, Arctic-Freeze equipment will last a long time and the jackets can be used again and again.

We urge you to read the instructions carefully before starting a freeze and to contact our office if you have any questions.

Arctic-Freeze make a great demonstration.

**ARCTIC-FREEZE™ (-109° F)
Operating Instructions**

1. WATER MUST BE STOPPED. NO FLOW. - #1 - 3/8 - 3/4" PIPE.
2. CLEAN PIPE BEFORE ATTACHING JACKET.
3. CO₂ CYLINDER SHOULD BE UPRIGHT. CONNECT HOSE TO JACKET AND CYLINDER.
4. WRAP JACKET AROUND PIPE. LINE UP THE VELCRO STRIP EVENLY AND PRESS TOGETHER FIRMLY. TIE NYLON CORDS TIGHTLY AROUND PIPE.
5. OPEN VALVE ON CYLINDER FULLY. INJECT CO₂. FOLLOW TABLE BELOW CAREFULLY. WHILE WEARING GLOVES, GRASP EACH END OF JACKET AND SQUEEZE FIRMLY TO LIMIT CO₂ FROM ESCAPING AT ENDS OF JACKET. CLOSE VALVE.
6. ALSO WITH GLOVES ON, OCCASIONALLY PRESS JACKET AGAINST PIPE DURING FREEZING PERIOD.
7. "WHITE FROST RINGS" WILL FORM AT BOTH ENDS OF JACKET WHEN WATER IN THE PIPE IS FROZEN. AT THIS POINT YOU CAN BEGIN THE WORK. KEEP TORCH FLAME AT LEAST 14" AWAY FROM JACKET.
8. REMOVE JACKET. LET PIPE THAW NATURALLY. DO NOT APPLY HEAT.

FOLLOW THESE INSTRUCTIONS CAREFULLY

PIPE SIZE	INJECTION TIME	WAITING TIME	NO. OF INJECTIONS	APPROX. TOTAL TIME REQUIRED
3/8"	35 SEC.	3 MIN.	2	7 MIN.
1/2 - 3/4"	35 SEC.	3 MIN.	3	11 MIN.

THESE FIGURES ARE BASED ON PIPES CONTAINING COLD WATER UNDER 70° (F) HIGHER WATER TEMPERATURES REQUIRE LONGER INJECTION/WAITING TIMES. REFER TO MANUAL FOR DETAILS.

SAFETY RECOMMENDATIONS:

REFER TO DETAILED INSTRUCTION CARD. USE IN WELL VENTILATED AREA. WEAR GLOVES WHEN HANDLING FROZEN PIPE & JACKET TO AVOID FROST BITE.

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**ARCTIC-FREEZE™ (-109° F)
Operating Instructions**

1. WATER MUST BE STOPPED. NO FLOW. - #2 - ¾ - 1½" PIPE.
2. CLEAN PIPE BEFORE ATTACHING JACKET.
3. CO₂ CYLINDER SHOULD BE UPRIGHT. CONNECT HOSE TO JACKET AND CYLINDER.
4. WRAP JACKET AROUND PIPE. LINE UP THE VELCRO STRIP EVENLY AND PRESS TOGETHER FIRMLY. TIE NYLON CORDS TIGHTLY AROUND PIPE.
5. OPEN VALVE ON CYLINDER FULLY. INJECT CO₂. FOLLOW TABLE BELOW CAREFULLY. WHILE WEARING GLOVES, GRASP EACH END OF JACKET AND SQUEEZE FIRMLY TO LIMIT CO₂ FROM ESCAPING AT ENDS OF JACKET. CLOSE VALVE.
6. ALSO WITH GLOVES ON, OCCASIONALLY PRESS JACKET AGAINST PIPE DURING FREEZING PERIOD.
7. "WHITE FROST RINGS" WILL FORM AT BOTH ENDS OF JACKET WHEN WATER IN THE PIPE IS FROZEN. AT THIS POINT YOU CAN BEGIN THE WORK. KEEP TORCH FLAME AT LEAST 14" AWAY FROM JACKET.
8. REMOVE JACKET. LET PIPE THAW NATURALLY. DO NOT APPLY HEAT.

FOLLOW THESE INSTRUCTIONS CAREFULLY

PIPE SIZE	INJECTION TIME	WAITING TIME	NO. OF INJECTIONS	APPROX. TOTAL TIME REQUIRED
¾"	35 SEC.	3 MIN.	3	11 MIN.
1"	1 MIN.	5 MIN.	3	18. MIN.
1½"	1 MIN.	5 MIN.	4	24 MIN.

THESE FIGURES ARE BASED ON PIPES CONTAINING COLD WATER UNDER 70° (F) HIGHER WATER TEMPERATURES REQUIRE LONGER INJECTION/WAITING TIMES. REFER TO MANUAL FOR DETAILS.

SAFETY RECOMMENDATIONS:

REFER TO DETAILED INSTRUCTION CARD. USE IN WELL VENTILATED AREA. WEAR GLOVES WHEN HANDLING FROZEN PIPE & JACKET TO AVOID FROST BITE.

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**ARCTIC-FREEZE™ (-109° F) #3 – 1-1/2 – 3" Pipe Size
Operating Instructions**

1. WATER MUST BE STOPPED. NO FLOW.
2. CLEAN PIPE BEFORE ATTACHING JACKET.
3. CO₂ CYLINDER SHOULD BE UPRIGHT. CONNECT HOSE TO JACKET AND CYLINDER.
4. WRAP JACKET AROUND PIPE. LINE UP THE VELCRO STRIP EVENLY AND PRESS TOGETHER FIRMLY. TIE NYLON CORDS TIGHTLY AROUND PIPE.
5. OPEN VALVE ON CYLINDER FULLY. INJECT CO₂. FOLLOW TABLE BELOW CAREFULLY. WHILE WEARING GLOVES, GRASP EACH END OF JACKET AND SQUEEZE FIRMLY TO LIMIT CO₂ FROM ESCAPING AT ENDS OF JACKET CLOSE VALVE.
6. ALSO WITH GLOVES ON, OCCASIONALLY PRESS JACKET AGAINST PIPE DURING FREEZING PERIOD.
7. "WHITE FROST RINGS" WILL FORM AT BOTH ENDS OF JACKET WHEN WATER IN THE PIPE IS FROZEN. AT THIS POINT YOU CAN BEGIN THE WORK. KEEP TORCH FLAME AT LEAST 14" AWAY FROM JACKET.
8. REMOVE JACKET. LET PIPE THAW NATURALLY. DO NOT APPLY HEAT.

FOLLOW THESE INSTRUCTIONS CAREFULLY

PIPE SIZE	INJECTION TIME	WAITING TIME	NO. OF INJECTIONS	APPROX. TOTAL TIME REQUIRED
1-1/2"	1 MIN.	5 MIN.	4	24 MIN.
2"	5 MIN.	5 MIN.	4	40 MIN.
*3"	5-6 MIN.	6 MIN.	6	72 MIN.

*READ INSTRUCTIONS CAREFULLY. CONTACT OUR OFFICE IF ANY QUESTIONS.

THESE FIGURES ARE BASED ON PIPES CONTAINING COLD WATER UNDER 70° (F). HIGHER WATER TEMPERATURES REQUIRE LONGER INJECTION/WAITING TIMES. REFER TO MANUAL FOR DETAILS.

SAFETY RECOMMENDATIONS:

REFER TO DETAILED INSTRUCTION CARD. USE IN WELL VENTILATED AREA. WEAR GLOVES WHEN HANDLING FROZEN PIPE & JACKET TO AVOID FROST BITE.

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**ARCTIC-FREEZE™ (-109° F)
Operating Instructions**

1. WATER MUST BE STOPPED. NO FLOW.
2. CLEAN PIPE BEFORE ATTACHING JACKET.
3. CO₂ CYLINDER SHOULD BE UPRIGHT. CONNECT HOSE TO JACKET AND CYLINDER.
4. WRAP JACKET AROUND PIPE. LINE UP THE VELCRO STRIP EVENLY AND PRESS TOGETHER FIRMLY. TIE NYLON CORDS TIGHTLY AROUND PIPE.
5. OPEN VALVE ON CYLINDER FULLY. INJECT CO₂. FOLLOW TABLE BELOW CAREFULLY. WHILE WEARING GLOVES, GRASP EACH END OF JACKET AND SQUEEZE FIRMLY TO LIMIT CO₂ FROM ESCAPING AT ENDS OF JACKET. CLOSE VALVE.
6. ALSO WITH GLOVES ON, OCCASIONALLY PRESS JACKET AGAINST PIPE DURING FREEZING PERIOD.
7. "WHITE FROST RINGS" WILL FORM AT BOTH ENDS OF JACKET WHEN WATER IN THE PIPE IS FROZEN. AT THIS POINT YOU CAN BEGIN THE WORK. KEEP TORCH FLAME AT LEAST 14" AWAY FROM JACKET.
8. REMOVE JACKET. LET PIPE THAW NATURALLY. DO NOT APPLY HEAT.

FOLLOW THESE INSTRUCTIONS CAREFULLY

PIPE SIZE	INJECTION TIME	WAITING TIME	NO. OF INJECTIONS	APPROX. TOTAL TIME REQUIRED
*3"	5-6 MINUTES	6 MINUTES	6	72 MINUTES
*4"	8-10 MINUTES	5 MINUTES	7-8	120 MINUTES

*READ INSTRUCTIONS CAREFULLY. CONTACT OUR OFFICE IF ANY QUESTIONS.

THESE FIGURES ARE BASED ON PIPES CONTAINING COLD WATER UNDER 70° (F) HIGHER WATER TEMPERATURES REQUIRE LONGER INJECTION/WAITING TIMES. REFER TO MANUAL FOR DETAILS.

SAFETY RECOMMENDATIONS:

REFER TO DETAILED INSTRUCTION CARD. USE IN WELL VENTILATED AREA. WEAR GLOVES WHEN HANDLING FROZEN PIPE & JACKET TO AVOID FROST BITE.

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**ARCTIC-FREEZE (-109°F)
CO₂ PIPE FREEZING SYSTEM
JACKET #5 – 5" & 6" PIPE – #7018**

1. READ INSTRUCTIONS CAREFULLY.
Call 1-800-327-3552 to review 5" & 6" Pipe Freezing procedures and CO₂ requirements.
2. Water must be stopped. No flow.
3. CO₂ cylinders must have siphon dip tube.
4. When injecting CO₂ open valve fully for required injection time—then close valve. Follow 5" & 6" sequence log chart carefully.
5. Use mallet to break up and evenly distribute the "Dry Ice" along entire length of pipe. Tap jacket with mallet gently.
6. "White Frost Rings" will appear at ends of jacket when water is frozen. At this point you can begin the work.
7. Make an additional injection every 15 minutes. This will maintain the freeze for as long as required.
8. When work is completed – remove jacket and allow pipe to thaw naturally. DO NOT APPLY HEAT. The system will return to normal in just a few minutes.
9. Wear gloves when handling frozen pipe & jacket to avoid frost bite. Also, use in well ventilated areas.
10. Freezing time is based on (70°F) water temperature in metal pipe.

APPROX. TOTAL FREEZING TIME	
5" Pipe	3 hrs.
6" Pipe	3 hrs. & 40 min.
Follow sequence log chart carefully.	

APPROX. CO ₂ REQUIRED FOR EACH JACKET	
5" Pipe	250 lbs.
6" Pipe	300 lbs.
We recommend at least 50 lb. backup for each jacket.	

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5" PIPE FREEZING SEQUENCE LOG CHART

1. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
2. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
3. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
4. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
5. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
6. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
7. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
8. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
9. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	

Step 1 After jacket has been secured around the pipe the freezing process is ready to begin. Open valve on CO₂ cylinder fully for required injection time - then close valve. Check off this operation.

Step 2 Pause for the required waiting time. Check off their operation.

Step 3 Continue with the injection and waiting times and check off each operation as complete.

6" PIPE FREEZING SEQUENCE LOG CHART

1. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
2. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
3. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
4. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
5. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
6. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
7. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
8. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
9. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
10. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	
11. INJECT	12	MINUTES	<input type="checkbox"/>	
WAIT	8	MINUTES	<input type="checkbox"/>	

- Step 1 After jacket has been secured around the pipe the freezing process is ready to begin. Open valve on CO₂ cylinder fully for required injection time - then close valve. Check off this operation.
- Step 2 Pause for the required waiting time. Check off their operation.
- Step 3 Continue with the injection and waiting times and check off each operation as completed.

ARCTIC - FREEZE CO-2 PIPE FREEZING EQUIPMENT
3/8" - 6" PIPE SIZE

ARCTIC FREEZE CO-2 PIPE FREEZING EQUIPMENT IS VERY EASY TO USE. NO SPECIAL TRAINING IS REQUIRED. WE RECOMMEND THAT FIRST TIME USERS CONTACT OUR OFFICE TO REVIEW THE OPERATING INSTRUCTIONS AND TO DISCUSS GENERAL PIPE FREEZING PROCEDURES. KEEP THESE IMPORTANT POINTS IN MIND.

- 1. NO FLOW OF WATER IN THE PIPE.**
- 2. 70 DEGREE WATER IS RECOMMENDED. (FREEZING TIMES ARE BASED ON THIS WATER TEMPERATURE.**
- 3. READ THE INSTRUCTIONS ON EACH JACKET AND THE PIPE FREEZING MANUAL CAREFULLY.**
- 4. DO NOT TRY TO RUSH A FREEZE. ALLOW FOR TOTAL FREEZING TIME.**
- 5. CALL 1-800-327-3552 TO REVIEW THE APPLICATION, CORRECT PROCEDURES AND CO-2 REQUIREMENT FOR 3", 4", 5" & 6" PIPE SIZES. BUT, DON'T HESITATE TO CALL US REGARDLESS WHENEVER THERE ARE QUESTIONS.**
- 6. PLAN THE WORK. HAVE ALL NECESSARY TOOLS, VALVES, SOLDER, TORCH, PIPE, ETC IN PLACE BEFORE STARTING THE FREEZE.**
- 7. KEEP IN MIND THAT A DOUBLE FREEZE WILL REQUIRE TWICE THE AMOUNT OF CO-2.**
- 8. THE LIQUID CO-2 EXPANDS INTO DRY ICE AND FILLS THE SPACE BETWEEN THE PIPE AND JACKET. BE CAREFUL NOT TO BUILD UP A LARGER BALL OF DRY ICE AROUND THE PIPE THAN WHAT THERE IS SPACE FOR. AT TIMES IS NECESSARY TO REDUCE THE INJECTION TIME. BUT DO NOT REDUCE THE TOTAL FREEZING TIME.**

ARCTIC - FREEZE CO-2 PIPE FREEZING SEQUENCE LOG CHART

3/8" - DIAMETER PIPE

(1) INJECT 35 SECONDS ----
WAIT 3 MINUTES ----

(2) INJECT 35 SECONDS ----
WAIT 3 MINUTES ----

APPROX. TOTAL FREEZING TIME - 7 MINUTES

1/2" & 3/4" DIAMETER PIPE

(1) INJECT 35 SECONDS ----
WAIT 3 MINUTES ----

(2) INJECT 35 SECONDS ----
WAIT 3 MINUTES ----

(3) INJECT 35 SECONDS ----
WAIT 3 MINUTES ----

APPROX. TOTAL FREEZING TIME - 11 MINUTES

1" DIAMETER PIPE

(1) INJECT 1 MINUTE ----
WAIT 5 MINUTES ----

(2) INJECT 1 MINUTE ----
WAIT 5 MINUTES ----

(3) INJECT 1 MINUTE ----
WAIT 5 MINUTES ----

APPROX. TOTAL FREEZING TIME - 18 MINUTES

ARCTIC - FREEZE CO-2 PIPE FREEZING SEQUENCE LOG CHART

1 1/2" DIAMETER PIPE

- | | |
|---|---|
| (1) INJECT 1 MINUTE -----
WAIT 5 MINUTES ----- | (3) INJECT 1 MINUTE -----
WAIT 5 MINUTES ----- |
| (2) INJECT 1 MINUTE -----
WAIT 5 MINUTES ----- | (4) INJECT 1 MINUTE -----
WAIT 5 MINUTES ----- |

APPROX TOTAL FREEZING TIME - 24 MINUTES

2" DIAMETER PIPE

- | | |
|--|--|
| (1) INJECT 5 MINUTES -----
WAIT 5 MINUTES ----- | (3) INJECT 5 MINUTES -----
WAIT 5 MINUTES ----- |
| (2) INJECT 5 MINUTES -----
WAIT 5 MINUTES ----- | (4) INJECT 5 MINUTES -----
WAIT 5 MINUTES ----- |

APPROX. TOTAL FREEZING TIME - 40 MINUTES

3" DIAMETER PIPE

- | | |
|--|--|
| (1) INJECT 5 - 6 MINUTES -----
WAIT 6 MINUTES ----- | (4) INJECT 5 - 6 MINUTES -----
WAIT 6 MINUTES ----- |
| (2) INJECT 5 - 6 MINUTES -----
WAIT 6 MINUTES ----- | (5) INJECT 5 - 6 MINUTES -----
WAIT 6 MINUTES ----- |
| (3) INJECT 5 - 6 MINUTES -----
WAIT 6 MINUTES ----- | (6) INJECT 5 - 6 MINUTES -----
WAIT 6 MINUTES ----- |

APPROX. TOTAL FREEZING TIME - 72 MINUTES

ARCTIC - FREEZE CO-2 PIPE FREEZING SEQUENCE LOG CHART

4" DIAMETER PIPE

(1) INJECT 8 - 10 MINUTES -----
WAIT 5 MINUTES -----

(2) INJECT 8 - 10 MINUTES -----
WAIT 5 MINUTES -----

(3) INJECT 8 - 10 MINUTES -----
WAIT 5 MINUTES -----

(4) INJECT 8 - 10 MINUTES -----
WAIT 5 MINUTES -----

(5) INJECT 8 - 10 MINUTES -----
WAIT 5 MINUTES -----

(6) INJECT 8 - 10 MINUTES -----
WAIT 5 MINUTES -----

(7) INJECT 8 - 10 MINUTES -----
WAIT 5 MINUTES -----

(8) INJECT 8 - 10 MINUTES -----
WAIT 5 MINUTES -----

NOTE: AT THIS POINT, 8 - 10 MINUTES
INJECTION TIME MIGHT BE TOO
MUCH. TRY 4 - 5 MINUTES,
BUT INCREASE WAITING TIME
TO 10 MINUTES.

APPROX. TOTAL FREEZING TIME - 2 HRS.

WE RECOMMEND THAT YOU CONTACT OUR OFFICE BEFORE STARTING ANY FREEZE ON 3", 4", 5", & 6" PIPE. THESE SIZES ARE EASY TO FREEZE, BUT IT IS ALWAYS A GOOD IDEA TO REVIEW THE APPLICATION. THE FOLLOWING CONDITIONS ARE VERY IMPORTANT:

1. NO FLOW OF WATER THROUGH THE PIPE.
2. WATER TEMPERATURE 70 DEGREES OR COOLER.
3. HAVE SUFFICIENT AMOUNT OF CO-2. (A DOUBLE FREEZE WILL REQUIRE TWICE THE AMOUNT OF CO-2.)

For K.I.S.S. KIT Jacket #6 Only

ARCTIC - FREEZE (-109 F) K.I.S.S. KIT 1" - 2" OPERATING INSTRUCTIONS

1. WATER MUST BE STOPPED. NO FLOW.
2. CLEAN PIPE DOWN TO BARE METAL BEFORE ATTACHING JACKET.
3. WRAP JACKET AROUND PIPE. LINE UP THE VELCRO STRIP AND PRESS TOGETHER FIRMLY. TIE NYLON CORDS TIGHTLY AT EACH END OF JACKET.
4. ATTACH HOSE TO JACKET & CO-2 CYLINDER.
5. FOLLOWING INSTRUCTIONS BELOW, OPEN VALVE ON CO-2 CYLINDER AND INJECT CO-2. WHILE WEARING GLOVES, GRASP EACH END OF JACKET AND SQUEEZE TOGETHER TO LIMIT CO-2 FROM ESCAPING AT ENDS OF JACKET. CLOSE THE VALVE.
6. "WHITE FROST RINGS" WILL APPEAR AT BOTH ENDS OF JACKET WHEN WATER IN THE PIPE IS FROZEN. AT THIS POINT YOU CAN BEGIN THE WORK.
7. KEEP TORCH FLAME 24" AWAY FROM JACKET. WE STRONGLY RECOMMEND OUR "HOT DAM" #9000 WHICH STOPS HEAT TRAVEL ON METAL PIPES.
8. REMOVE JACKET. LET PIPE THAW NATURALLY. DO NOT APPLY HEAT.

FOLLOW THESE INSTRUCTIONS CAREFULLY

PIPE SIZE	INJECTION TIME	WAITING TIME	NO. OF INJECTIONS	APPROX. TOTAL TIME REQUIRED
1"	2 MIN	4 MIN	4	24 MINUTES
1 1/2"	2 MIN	5 MIN	6	42 MINUTES
2"	2 MIN	5 MIN	7	49 MINUTES

FREEZING TIMES ARE BASED ON 70 DEGREE WATER TEMPERATURE. CONSULT FACTORY (1-800-327-3552) BEFORE ATTEMPTING TO FREEZE HIGHER TEMPERATURE WATER.

FOLLOW SEQUENCE LOG CHART FOR EACH PIPE SIZE CAREFULLY.

SAFETY RECOMMENDATIONS:

CALL THE FACTORY (1-800-327-3552 TO DISCUSS ANY QUESTIONS ABOUT PIPE FREEZING.

REFER TO DETAILED INSTRUCTION MANUAL. USE IN WELL VENTILATED AREAS WEAR GLOVES WHEN HANDLING FROZEN PIPE & JACKET TO AVOID FROST BITE.

ATLANTA SPECIAL PRODUCTS DIV. PACE MACHINERY GROUP, INC.
4N944 LaFOX ROAD, WASCO, IL 60183 (1-800-327-3552) FAX 630-377-0274

For K.I.S.S. KIT Jacket #6 Only

SEQUENCE LOG CHART FOR ARCTIC - FREEZE K.I.S.S. KIT
1" PIPE SIZE

TOTAL FREEZING TIME APPROX. 24 MINUTES START TIME _____
FINISH TIME _____

INJECT 2 MINUTES
 WAIT 4 MINUTES

APPROX. TOTAL FREEZING TIME IS 24 MINUTES.
CHECK OFF EACH SEQUENCE WHEN COMPLETED TO KNOW
WHERE YOU ARE IN THE FREEZING PROCESS.

1. FREEZING TIME IS BASED ON METAL PIPES WITH 70 DEGREE WATER.
2. FLOW MUST BE STOPPED.
3. KEEP TORCH FLAME AT LEAST 24" AWAY FROM JACKET. USE HOT DAM #9000 TO STOP HEAT TRANSFER ON METAL PIPES.

For K.I.S.S. KIT Jacket #6 Only

SEQUENCE LOG CHART - FOR ARCTIC - FREEZE K.I.S.S. KIT
1 1/2" PIPE SIZE

TOTAL FREEZING TIME APPROX. 42 MINUTES START TIME _____
FINISH TIME _____

INJECT 2 MINUTES
 WAIT 5 MINUTES

INJECT 2 MINUTES*
 WAIT 5 MINUTES

*AT THIS POINT IF AMBIENT TEMPERATURE IS 70 DEGREES OR COOLER, INJECTION TIME MIGHT HAVE TO BE REDUCED. IF THE "DRY ICE" BUILD UP AROUND THE PIPE IS STRAINING THE JACKET, REDUCE THE INJECTION TIME TO ONE MINUTE OR LESS AND ADD THE TIME TO THE WAITING TIME. DO NOT TRY TO RUSH A FREEZE.

APPROX. TOTAL FREEZING TIME IS 42 MINUTES.
CHECK OFF EACH SEQUENCE WHEN COMPLETED TO KNOW WHERE YOU ARE IN THE FREEZING PROCESS.

1. FREEZING TIME BASED ON METAL PIPES WITH 70 DEGREE WATER.
2. FLOW MUST BE STOPPED.
3. KEEP TORCH FLAME AT LEAST 24" AWAY FROM JACKET. USE HOT DAM #9000 TO STOP HEAT TRANSFER ON METAL PIPES.

For K.I.S.S. KIT Jacket #6 Only

SEQUENCE LOG CHART - FOR ARCTIC-FREEZE K.I.S.S. KIT JACKET
2" PIPE SIZE

TOTAL FREEZING TIME APPROX. 49 MINUTES. START TIME _____
FINISH TIME _____

___ INJECT 2 MINUTES
___ WAIT 5 MINUTES

___ INJECT 2 MINUTES*
___ WAIT 5 MINUTES

___ INJECT 2 MINUTES
___ WAIT 5 MINUTES

___ INJECT 2 MINUTES
___ WAIT 5 MINUTES

AT THIS POINT IF AMBIENT TEMPERATURE IS 70 DEGREES (F) OR COOLER, INJECTION TIME MIGHT HAVE TO BE REDUCED. IF THE "DRY ICE" BUILD UP AROUND PIPE IS STRAINING THE JACKET, REDUCE INJECTION TIME TO ONE MINUTE OR LESS AND ADD THE TIME TO THE WAITING TIME. DO NOT TRY TO RUSH A FREEZE

APPROX. TOTAL FREEZING TIME 49 MINUTES.
CHECK OFF EACH SEQUENCE WHEN COMPLETED TO KNOW WHERE YOU ARE IN THE FREEZING PROCESS.

1. FREEZING TIME BASED ON METAL PIPES WITH 70 DEGREE WATER.
2. FLOW MUST BE STOPPED. NO FLOW.
3. KEEP TORCH AT LEAST 24" AWAY FROM JACKET. USE HOT DAM #9000 TO STOP HEAT TRANSFER ON METAL PIPES.