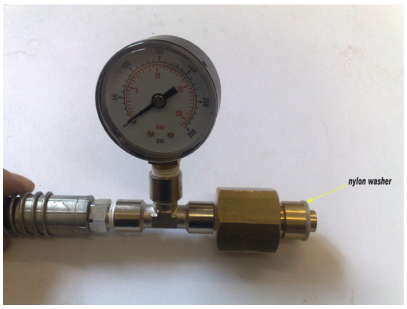
Day-Impex

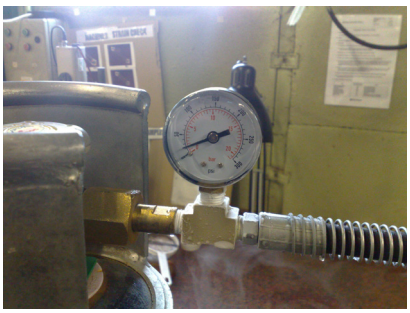
FIRE HYGIENE ANIMAL TIME SCIENTIFIC

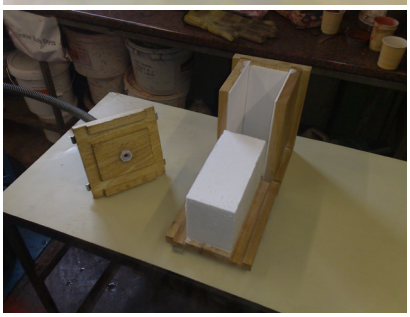
Dry Ice Machine

OPERATING INSTRUCTIONS

Important: This machine can only be used with a liquid CO_2 cylinder equipped with a built in siphon tube. When ordering CO^2 be certain to get liquid CO^2 with a siphon.







1. Firmly connect machine hose to CO_2 cylinder. Use plastic washer supplied for inside of hexagonal nut that attaches to cylinder.

2. Ensure nothing obstructs flow of CO_2 through hose. Attach end of hose firmly to top fitting on Dry Ice Machine.

3. Open CO_2 cylinder valve no more than 1-2 small divisions on inner scale (0-20) of gauge. This gives maximum number of ice blocks and does not waste CO^2. Be sure vapour escaping from vents of machine does not carry snow solids. If there are, close down valve slightly. After ice builds up in machine, speed up process by opening the valve another degree or two. If needle reaches 10 on inner scale turn valve off.

4. **Vapour will discharge through vertical filter slots as dry ice block is forming.** When vapour discharges from space between lid and body of machine (and sound changes), the dry ice block is formed. Immediately close cylinder valve.

   The first 1-2 blocks will take slightly longer to process because the box and feed pipe are being cooled to proper temperature. Time then becomes shorter to produce additional blocks.

5. Open dry ice block machine by loosening latches and folding down sides. Remove block for use or storage. **Caution: always wear protective gloves** when handling dry ice; **can cause burns and frostbite**. Blocks can be stored in Dilvac Dewar Flasks.

6. During and after making dry ice block, handle feed hose carefully. Hose will appear white and is frozen. If bent, pulled or twisted hose can be damaged or broken.

WARNING

1. Gaseous CO_2 vapours can cause suffocation. Use machine only in well ventilated areas.
2. Disconnect feed hose of machine from cylinder **when not in use**. Store cylinder indoors or in shade, away from any heat source. (See Helpful Information below)

3. Use machine only on **level supporting surface** during operation. Never allow machine to hang from feed hose.

SPECIFICATIONS	MODEL A
Dimensions of dry ice	80 x 110 x 180
Weight of dry ice block	1Kg ± 10%
Yield from 34Kg liquid CO_2 cylinder at room temperature.*	5 –6 blocks†
Total weight of dry ice	6Kg ± 10%†

* A 34Kg CO_2 cylinder at room temperature will contain approximately 30Kg of useable liquid CO_2, the balance is vapor which does not convert to solid dry ice. † Yield can be appreciably increased at lower temperatures i.e. @ 0°C approximately 1/3 more blocks will be produced.

HELPFUL INFORMATION

Conversion Weight: The usual 34Kg liquid CO_2 cylinder actually contains only 30Kg of liquid CO_2, the remaining 4Kg is vapour gas which does not convert to solid dry ice.

Weight Checks: Empty cylinder weight (Tare) is stamped on shoulder of cylinder below threaded fitting. Cylinder should read 65Kg ±1Kg Gas and filled should weigh 99Kg ±1Kg.

TEMPERATURE	LIQUID CO_2	VAPOUR
16°C	72%	28%
21°C	70%	30%
27°C	61%	39%
31°C	0%	100%

Above 31.1°C (the critical temperature) only vapour exists in the cylinder and no additional dry ice will be formed.

Storage: If possible, CO_2 cylinder, dry ice machine and feed pipe should be kept in a low temperature environment up to time of usage. This will increase the yield of dry ice.

Making Dry Ice from Liquid CO_2 Converting liquid CO_2 to solid dry ice blocks is accomplished by utilizing **Adiabatic Expansion Principle** (The Joule Thompson Effect).

When liquid CO_2 is released from cylinder through the supply valve and feed tube, it leaves at an environmental pressure of 838 PSI and is forced through the tube into the ice making unit, which is at atmospheric pressure.

It then vaporizes and expands to form snow which packs onto retaining walls lined with specialized filter pads whilst CO_2 gas escapes through ports and filters. The machine fills with dry ice within 1-2 minutes. The colder the components, the shorter the fill time.

At 21°C and 775-800PSI, the method described is 26.15% efficient. At 0°C and 290PSI efficiency is increased to 39%. The lower the temperature, the greater the yield of dry ice.

+44 (0) 1787 223232

info@day-impex.co.uk

www.day-impex.co.uk

Registered in England: No. 415552 Established: 1946

Day-Impex Ltd

Station Works
Earls Colne
Colchester
Essex
CO6 2ER