

- User-manual -



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CTS Technologies AG

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Who this manual is intended for

This manual is intended for an experienced Pest Controller, who is an unexperienced or fairly new user of Cryonite.

Introduction

Looking after the environment is an issue that concerns us all, literally. Whether as consumers, workers, producers or employers. There is an increasing demand for safe food and healthy working environments without hazardous residues. Alternatives to traditional methods and treatments of controlling pests are gradually becoming available.

CRYONITE® is one of these alternatives and has proved to be an extremely effective tool if used properly and appropriately. Easing the pressure on the environment through the removal or reduction of pesticides together with the economic advantages of reducing down time in production areas, are just some of the advantages to be gained.

Using traditional pesticides and environmental risks

Without exception, all chemical pesticides are poisonous, therefore the use of pesticides involves a significant risk to the environment and people, and there is always the risk that residues end up in the local environment, water or the food chain.

Treating pests, especially insects and mites, is a job for professionals. It is imperative that technicians have an excellent knowledge of pests, the conditions and environment that pests live in, the restrictions on and potential risks involved with pesticides usage and the knowledge of how to carry out effective pest control with minimum impact on the environment.

The Alternative

The **CRYONITE®** method utilises the cooling properties of common CO₂ (carbon dioxide) to eradicate pests. Liquid CO₂ is transformed into exceptionally cold dry-ice snow, and freezes the pests to death. CO₂ is not poisonous and leaves no residues. The method is completely dry and is physical, i.e. non-chemical therefore no risk of pesticide resistance(). The CO₂ used is food grade quality and presents no risk of contamination, even in sensitive industries. It is recycled from industrial processes. CRYONITE therefore does not result in additional CO₂ being released to the atmosphere.

The CRYONITE[®] equipment

The equipment consists of a trolley, a lance with trigger mechanism, a pressure hose, and a 10 kg CO₂ gas cylinder.

Trolley

The trolley has straps for the gas cylinder, one CO₂ hose and one earth cable for static electricity reduction and a jet nozzle. It also has clips to hold the lance, jet nozzle and spanner, and hooks for winding the hose and earth cable.

The hose

The hose is four metres long, has connections for the gun on one end, and connections for the cylinder on the other. The hose is temperature and pressure resistant.

The lance

The secret of CRYONITE is in the lance which has been developed to create the CO₂ snow. The telescopic lance mechanism allows Cryonite rates to suit the situation. It also has a trigger for the jet nozzle.



The lance has a nozzle which has optimum quality of CO₂ snow. It has a variable trigger mechanism for delivery at different rates and has a security lock.

The jet nozzle

To produce high speed carbon dioxide snow, the jet nozzle has a strong flush effect. This is useful for cleaning in hard to reach areas.

This gives a strong flush effect when it comes to cleaning in hard to reach areas.

The earth cable

While working with CRYONITE, you may get some static electricity build-up. The steel cable will lead the static away. You'll only need it when using CRYONITE near electronics (integrated circuits). See the "Safely working" section.

The cylinder

It's important to use the right type of CO₂ cylinder – one that has a dip tube inside! The dip tube is needed because CRYONITE uses the CO₂ in liquid form, otherwise it will not produce snow. If there are problems with snow production - always check the cylinder first. Cylinders come in various shapes and sizes, depending on gas supplier and country. Check with the supplier.



How does CRYONITE® work?

Making the snow

The CO₂ is in a liquid form in the tube and will come out frozen (snow) from the nozzle. About half of the CO₂ will become cold gas, blowing the snow forward into the pests hiding places.

The CO₂ snow made by CRYONITE is a mixture of 3 different types of particles: small, medium and large sizes. The three together will form snow with optimum freezing qualities. This mixture has been tested to give the optimum result against pests.

Killing the pests

When the CO₂ snow hits surfaces at normal temperatures it evaporates and becomes CO₂ gas. During this process energy is required and this heat energy is extracted from the immediate surroundings. If insects are part of the immediate surroundings the energy is taken from them and extreme cooling results, the water in their cells crystallizes to ice, killing the insects. This crystallization occurs when the pest is cooled to -20°C to -30°C. Material will only be chilled on the surface. Most materials have the ability to transport energy from their larger mass. This results in relatively small drops in temperature here. When the pest is deep frozen, it has to stay frozen for a short while. CRYONITE's particles are optimized for reaching the pest, and clinging to it.

Note: This is why Nitrogen is not as effective despite colder temperatures; because as it goes from liquid to gas it floats on a layer of gas thus forming an insulating barrier, it takes almost no energy from the surface. CRYONITE's particles hit both pests and surfaces, touching them directly.

Using CRYONITE®

It is important that the snow layer is not too thin or too thick.

Too thin and the temperature is not cold enough to kill. Too thick and the snow blanket will work as an insulator trapping a layer of gas under the snow. The temperature will not be reduced enough and insects will not be killed.

Thick layers also cause unnecessarily deep chilling of materials, possibly causing a moisture or material problem.



The best way to do it depends on the circumstances. As a guideline the layer of snow should be gone in 20–30 seconds. It's better to apply two or three treatments than one thick layer.

When using the standard nozzle, the ideal spraying distance is usually 10-20 cm but this can be varied depending on the individual characteristics of the environment being disinfested.

When treating cracks you should avoid “plugging”, especially at first, as you would not be able to get snow in there a second time. You could do this by sweeping the nozzle back and forth, instead of just once and slow.

Some adult insects have the capability to resist cold temperatures, and the result may be only a temporary knockdown effect. Bigger insects also require more freezing power. It is then important to repeat the treatment immediately in order to be effective.

Resist the temptation to give a “little” extra; this will not result in a more effective treatment!

Experience has shown that it is better to apply two or three light treatments within a short time interval than one thick layer.

Where CRYONITE works best

In general, the method works best against stored product insects in a warm environment such as mill moths, fruit moths, confused flour beetles, saw-toothed grain beetles, etc. Money spiders are combated effectively. Good test results have been obtained in disinfestation of German cockroaches and poultry mites. The equipment can also be used for disinfestation of wasps nests.

The limitations of CRYONITE relate mostly to poor cleaning or areas of inaccessibility – this is also true of failures when using traditional methods.

The main difference being that CRYONITE has no long-term effect.



CRYONITE has a flushing effect

CRYONITE has an effective “flushing out” effect on some insects that are not directly effected by the first treatment. Cockroaches, for example are disturbed by the gas pressure, and flushed immediately.

Return shortly after the initial treatment, and re-treat the area if necessary. (see also “Specific usages”)

CRYONITE has a cleaning effect

As CRYONITE produces a rather high pressure, material not cleaned away in advance, may blow loose. This means it will become even cleaner, which helps against reinfestation. You could use the jet pipe to get an even higher cleaning effect.

A prerequisite for the effective use of Cryonite is good basic pest control knowledge.

As with traditional methods cleaning and good housekeeping play a major role in effective treatments.

CRYONITE can not penetrate through thick layers of dust or product. Therefore a vacuum cleaner is an essential complementary tool.

As with all pest control it's important to be thorough and systematic.

Remember the Procedure:

1. Inspect - look for all possible hiding places, or traces of activity.
2. Clean those areas with a vacuum cleaner.
3. Treat insect harborages with CRYONITE for example; cracks, crevices, pallets, under bags etc.
4. Evaluate the findings and review the frequency of cleaning procedures.
5. Monitor on a regular basis, be aware of positive effects after changes in the cleaning procedures.
6. Repeat if necessary.

Safely working with CRYONITE®

Controlling pests has its risks; inhaling or ingesting chemical pesticides, working in small areas with bad lighting, working inside machines etc..

Although CRYONITE is poison-free, it still has its own risks. This chapter explains how to work safely with CO₂, transporting CO₂ and the risks when using the CRYONITE system.

Safely using CO₂

CO₂ is a well known gas, used e.g. in the food industry. CO₂ in itself is not a poison, however high concentrations are hazardous.

In enclosed, small spaces the CO₂ may easily reach a high concentration without you noticing it. The gas is also heavy, and collects in low-lying areas.

Therefore some precautions have to be taken when using CO₂ in for example cellars, crawling spaces and silos. If possible, make sure that there is good ventilation with fresh air. Have a second person standing by if problems could be expected

The CO₂ snow has a temperature of -78°C. Direct contact with the skin can cause freezing injuries, similar to burns.

In the material safety data sheet this is described under section 16 'other information'.

Safely using CRYONITE

Along with the safe use of CO₂, there are other issues which are important when using CRYONITE.

a. The gun and nozzle.

The gun is totally safe to use. However the end of the gun, near the nozzle, can get very cold when using the equipment. This can be seen as frost on the nozzle. For unscrewing the nozzle and switching to the jet nozzle, wait until the frost has evaporated, or use isolating gloves when changing the nozzle.

b. The cylinder.

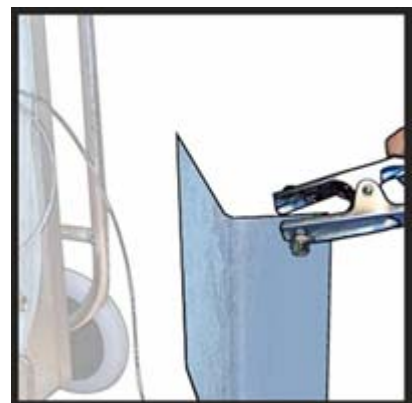
Depending on the type of cylinder to be used, always keep in mind the weight of the cylinder.

c. The snow.

The snow has a temperature of almost -78°C. The snow comes out of the gun at different speeds. The speed depends on the pressure put on the trigger and if the high speed nozzle is being used. The snow can bounce back from surfaces and hit eyes, nose or mouth. Wear safety glasses and protect your face. Getting a snow particle in the eye hurts a lot. The pressure may also blow loose dust – another reason for goggles. Both snow and dust are especially annoying when working above shoulder height.

d. Static electricity.

While working with CRYONITE, the flow of CO₂ can cause a build up of static electricity. A static discharge could knock out unprotected electronics (integrated circuits). Therefore, a steel cable on the trolley is connected to the hose and the equipment to lead the static away (earth). When using CRYONITE near electronics (integrated circuits) connect the clamp at the end of the steel cable to the machine or surface you are working on. You won't need it when you apply CRYONITE on drains, carpet floors, and walls etc.



Safely transporting CRYONITE and CO₂

The transport of CO₂ should always comply with local regulations; European as well as country-specific. If you still are uncertain, please contact the local Linde Gas company. For safe transport it is always best to secure the equipment and bottles in an area separated from the driver.

The transport of CO₂ is described in the material safety data sheet under section 14. Before transporting the equipment always make sure that the trolley is secured and that the fragile parts don't get damaged. Especially the gun should be secured to prevent damage.

Target areas for CRYONITE®

CRYONITE can be used in all types of industries and areas. It's the need for pest control that decides if CRYONITE should be applied, not the type of area. Among many other applications could be mentioned:

Food industry

Here the CRYONITE advantages are obvious: a poison-free, easy to use, dry method of pest control that minimises any downtime to production equipment.

Residential homes

In homes, poison free treatments are welcome. Small children, elderly people, and pets (especially fish!) are some of the reasons. You don't have to evacuate!

Cryonite's properties makes it very competitive to traditional, poisonous methods in many application areas.

Hospitals

One advantage of Cryonite here, is that the pests are killed instantly.

Specific usages / areas

Drains

A good treatment here is always a combination of cleaning and CRYONITE treatment. Spray CRYONITE into the drains, and further in in the sewer - take out the toggles.

Using the jet pipe

In confined and hard-to-reach spaces the jet nozzle can be used for e.g. disinfecting mite pupae. This method can also be used to disinfest and remove breeding places and coverings that would otherwise be very difficult to get off. See also "Cracks and crevices" below.

Smooth surfaces

Be careful with smooth surfaces where the insects can be spread by the gas pressure. Here the insect can first be moved into a corner or against a wall with the help of the stream of gas.

Electrical cabinets and equipment

Caution should always be used when working in these areas.

Electricity should be shut off when working on, in or around electrical apparatus.

Cryonite is in itself dry, but as the surface temperature drops, condensation may form.

Only the immediate surface is cooled, the cooling effect doesn't penetrate into the objects treated. The surfaces will regain ambient temperatures quickly, and any moisture will rapidly evaporate.

Normal amounts of moisture in the air should present no problem.

However caution should be shown in areas of higher humidity.

Important note. Do not use directly on sensitive equipment, screens or digital displays.

Machines

Here a thorough cleaning before treating with Cryonite is very important. The jet pipe can then be used for further cleaning as well as treating.

Cracks and crevices

Cryonite penetrates well, and deeply, even without the jet nozzle. If the cracks are dirty use the jet nozzle for cleaning, or if they are very thin and deep, use the jet nozzle for maximum penetration. Don't use the jet pipe if you don't have to, as the snow quality of the standard nozzle is slightly better.

Flying insects

Cryonite does not work well against insects in the air, but gives a good effect when used to treat their larvae and eggs. Traditional Insect-O-Cutor Flying Insect Killers work very well in combination with Cryonite to eliminate adult insects.

Wasp nests

Free nests: Use Cryonite on half-speed straight into the entry hole for 30 seconds.

Gradually increase pressure, and lastly, let the hole get plugged by snow. You may also want to freeze the outside. The wasps get slower by the cold and CO₂, and are mostly not aggravated.

Nests in walls: We have not had enough field reports on this to suggest a method for treatment, that has a proven effect

Moths and Tribolium

With Cryonite larvae and eggs close to the products can be exterminated. The moth-pupae higher up, in cracks and corners, also.

Moth webbings are efficiently cleaned away with the help of the jet nozzle. You can also clean cracks from food residues, to hinder further infestation.

Bedbugs

Bedbugs are very hard to treat. Tests have proved that treatment with CRYONITE can exterminate bedbugs at for instance hotels when done properly. Treat, and wait for the flushing effect. After 20 minutes the adult bed bugs will come crawling out. Use vacuum cleaner and treat again. Use diatomaceous earth afterwards, for lasting effect; necessary for a treatment without call-backs.

Cockroaches

Cryonite flushes cockroaches due to its pressure. German cockroaches are treatable in all stages. For bigger cockroach-species, the fully grown adults may be too big for Cryonite, although eggs and nymphs are still treatable.

Garden ants

Ants are readily killed. To kill the nest, expose it first (remove the tile or stone it is hiding under). By applying CRYONITE in the entrance hole, the nest will probably not be eliminated.

Tests of CRYONITE®

Tests performed by Anticimex (Sweden)

Anticimex has done a lot of tests for different kinds of pests, and a summary of these tests is outlined below:

- *Bedbugs* (*Cimex lectularius*). A successful test on bedbugs was carried out by Anticimex Sweden. Treatment with Cryonite in all hiding places, and spreading diatomaceous earth afterwards. Inspection after one month: no bedbugs.
- *Wasps* (*Vespa vulgaris*). Wasp nests are now regularly treated with CRYONITE by using low pressure from the hose for 30 seconds, after that the pressure is being gradually increased. All the wasps within the nests are killed and the nests are safely removed and destroyed.
- *Cockroaches*. Some successful tests have been done eliminating German Cockroaches (*Blattella germanica*) in factories, houses and hospitals using CRYONITE in combination with diatomaceous earth, vacuum cleaner and traps.
- *Flour Beetles and Moths*. A diversity of tests have been performed to eliminate Flour Beetles and different species of Moths. All the tests were successfully performed.
- *Crickets* (*Acheta domestica*). Some successful tests have been done on Crickets. In boiler rooms and other warm places Anticimex has done some tests by using CRYONITE first, then a vacuum cleaner. All tests gave very satisfactory results in elimination of Crickets.

Test performed by Insect Investigation Ltd (UK)

The test was performed in a worm conveyor situated in a flour mill in the United Kingdom. The pest was Flour Beetles (*Tribolium confusum*). The worm conveyor was opened and cleaned first, followed by treatment with CRYONITE. Both the standard applicator nozzle, as well as the high speed nozzle were used. After the test most insects were killed, but some were found alive on the base of the worm conveyor. It was probable that they could hide on the underside of the worm, as it could not be turned, and the box around it was too tight to allow Cryonite to be angled towards it.

Cryonite proved extremely effective against chicken mites in poultry houses. Treating with Cryonite was significantly more effective than treatment with traditional pesticides as well as having the added advantage of not exposing the chickens to pesticides.

Tests performed by IKARI (Japan)

The test performed by IKARI Japan was done in a bakery. The test with CRYONITE was on the Sawtoothed Grain Beetle (*Oryzaephilus surinamensis*), the Tobacco Beetle (*Lasioderma serricorne*) and some other, not specified insects. The tests were done on a lump of bread crumbs underneath a bread oven. The test went well, as a significant reduction in pests were noticed in the period following the tests, despite new raw material continuously flowing through the factory.

Results:

Bucket with >100 Flour Beetles: 2 living adults, some larvae.
Cracks and seams with high speed nozzle: Too high speed, flour dust was spread; insects were spread.
Sieves: successful.
Compartment doors of sieves: Successful, but the snow stayed too long.
Pipe with many Flour Beetles: Successful.

Tests performed by KAD and RIWA (Holland)

KAD did a few tests on their own and together with RIWA Holland. Tests were done in a potato factory, a bakery and a chocolate factory. Tested were both killing effect and cleaning effect.

Potato factory (KAD).

The test was done in the packaging room of a large potato factory. After cleaning but before treatment with Cryonite there were still some larvae of the Indian Meal Moth present. Production was still running at the time of the test. The test was done together with the QA manager who was in charge of pest control in the factory. The test also included some cleaning, as it showed during the test that some areas were found which were not cleaned properly.

The test was successful. All larvae were killed during the test and after 2 weeks no insects or larvae were found in the treated area.

Frequently Asked Questions

Question: [Why don't I get any snow?](#)

Answer: You probably have the wrong cylinder. The cylinder is filled with liquid CO₂, but above the liquid surface, at the top, there is gas. Without dip tube, gas will reach the gun instead of liquid CO₂. CRYONITE only works with liquid CO₂.

Check with your local Linde company that you are supplied with the right cylinder.

Question: [Why do I have a gas leak at the bottle?](#)

Answer: Check if the washer ring is in place and in good condition. The washer ring stops the hose-bottle connection leaking. If not: replace with a new ring. Mostly, it will be tight even without one.

Question: [Why does the connection get cold?](#)

Answer: In the hose, there is a little turbulence, making the connection slightly cold, but this has no effect on the snow or the working quality of the snow.

Question: [I can not connect the gun to the hose?](#)

Answer: You have probably connected the hose to the cylinder and opened the valve already. The pressure in the hose stops you from connecting it to the gun.

Action: close the valve of the cylinder, release the pressure in the hose by unscrewing the hose-nut by the cylinder just a little. When the pressure is gone, tighten again. Connect the hose to the gun, and open the valve again.

Question: [When should I use the high speed nozzle?](#)

Answer: The high speed nozzle is for use in deep cracks or for cleaning purposes, such as removing moth webbings. The use of the high speed nozzle has the advantage that webbing and filth in cracks will be blown out, but be careful so that you do not spread them around.

Question: [When using the high speed nozzle, it sometimes freezes?](#)

Answer: The high speed nozzle is not meant for continuous use.

Action: when this occurs, wait for 20-30 seconds, or until the snow/ice has evaporated and try again.

Question: [Why does the snow stay so long on the surface?](#)

Answer: This can have several causes:

- The snowlayer is too thick.
- The surface is insulating isolating; with insulating isolating materials the snow stays longer on the surface. For example, in carpets and light materials (flour) there is a lot of air. Air is a poor energy provider and the snow will remain longer.

Question: [Can I spray on different surfaces?](#)

Answer: Yes, you can use it on almost every material. It is best to test very thin materials before spraying, if you are in doubt.

Question: [Does the surface get wet when applying Cryonite?](#)

Answer: No, not from the CO₂. The snow converts directly from a solid to gas, there is no liquid phase. However, when the surface gets cold, it will attract moisture out of the air. As the materials are only cold on the surface, they will regain their usual temperature, and any moisture will evaporate quickly. Be careful in more moist surroundings. See "Safely working"...

Question: [Can I use it on electric installations?](#)

Answer: Yes. CO₂ is safe to use with electric equipment. But when too much is used moisture can be created and a bridge can form for transporting electricity. For safety: switch the electricity off first. See “Safely working”...

Question: [Do I always have to use the earth connector?](#)

Answer: No. The earth connector will reduce the static charges; when applying on electronic equipment use the earth connector. In for example homes you do not have to use the earth connector. See “Safely working”...

Question: [Can everybody use it?](#)

Answer: There are no restrictions by law to use CRYONITE. However there are always some risks for the user, and the method differs from standard, poisonous methods. Some training is recommended and always useful.

Question: [How cold does it get?](#)

Answer: The snow is -78,5 °C. For the conversion to gas, a lot of energy is required, that will come from the surface. The surface temperature can drop, depending on the spraying, the type of surface and other circumstances, to -30 to -40°C and is cold enough to kill all development stages of insects or mites.

Question: [How heavy is the machine?](#)

Answer: The nozzle itself weighs about 1 kg, the hose and trolley 12 kg. The weight of the cylinder depends on its size. An aluminium cylinder containing 10 kg CO₂ weighs about 25 kg.

Question: [How do I store the cylinders?](#)

Answer: Keep the cylinder in storage under 30 °C. The recommended temperature is about 15-25 °C. This temperature is also important when transporting the cylinder. This normally has nothing to do with the safety of the CO₂, but if the temperature in the cylinder exceeds 50 °C the security valve may open, as the pressure in the cylinder gets to high. Too high temperature in the cylinder can also have an effect on the quality of the snow coming out of the nozzle. Never leave the cylinder in direct sun exposure (either outside or in the car); the cylinder can reach its critical temperature quicker than in a warm car or room without sun exposure.

Tip: for use in factories, store the cylinders in cool rooms, and leave the transport of the cylinders to the gas company.

Appendix

Facts & figures

On full throttle, the Cryonite uses about 1 kg gas / minute.

Dry-ice snow temperature is -78.5°C.

Lethal temperatures →→→

Cryonite cooling in different geometries

Original tests:
Bertil Eliasson, October 2001.

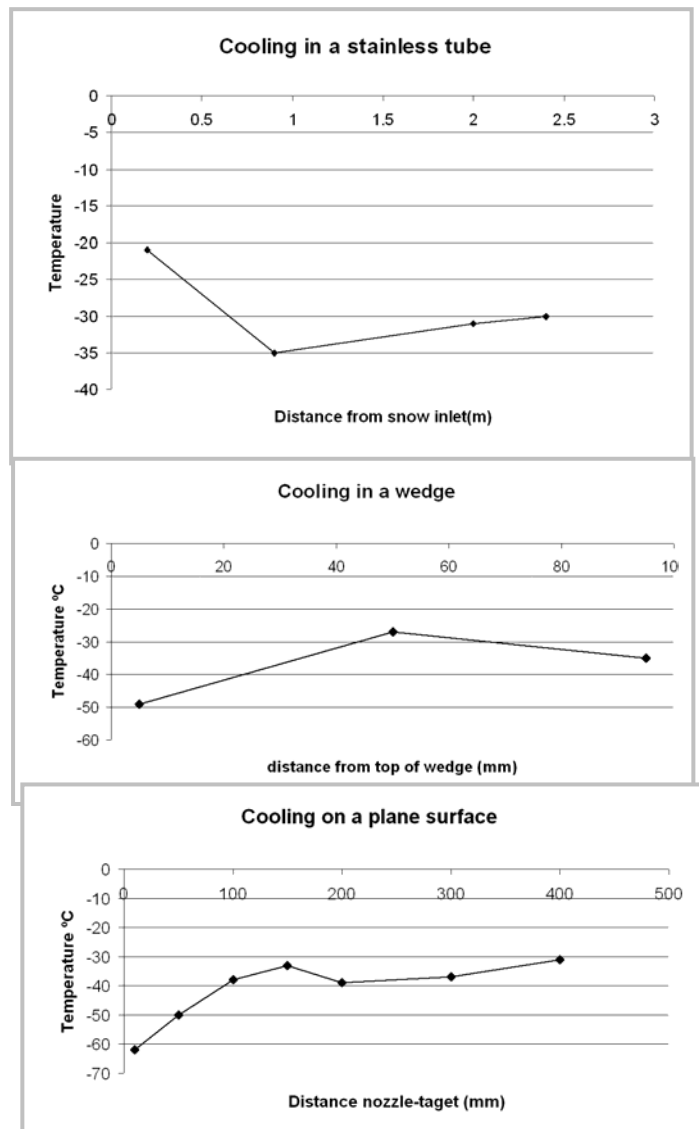
Tube:
Inner diameter: 45mm.
Thickness: 4mm.
Two 90° bends at 1.87 and 2.37 m.
Time of spraying: 30s.

Wedge:
Opening 1mm, 100 mm deep.
400 mm long.
Thickness: 3mm.
Distance nozzle-top of wedge: 60 mm.
Time of spraying: 3s.

Plane:
Aluminium sheet 30x30x0,5mm.
Time of spraying: 3s.

species	Lethal temperature in °C			
	eggs	larvae	pupae	adults
<i>Anobium punctatum</i>				-19,2
<i>Anthrenus flavipes</i>		-26,2		-22,3
<i>Anthrenus museorum</i>		-27,3		
<i>Anthrenus verbasci</i>	-27,8	-27,0	-23,5	-20,6
<i>Attagenus sminorvi</i>		-25,3		-22,3
<i>Attagenus woodroffeii</i>		-24,0	-18,5	-20,8
<i>Dermestes haemorrhoidalis</i>	-26,2	-26,3		-20,4
<i>Dermestes lardarius</i>		-18,2		
<i>Hylotrupes bajulus</i>		-26,9		
<i>Lasioderma serricorne</i>	-28,8	-26,2	-25,3	-20,2
<i>Oryzaephilus surinamensis</i>				-30,0
<i>Ptinus tectus</i>		-26,8		-23,7
<i>Reesa vespulae</i>		-25,1		-23,1
<i>Stegobium paniceum</i>		-24,0		-24,0
<i>Tenobrio molitor</i>	-25,8	-24,7	-21,3	-14,3
<i>Tinea pellionella</i>	-33,4	-23,1	-23,5	-23,1
<i>Tineola bisselliella</i>	-29,8	-28,1	-25,6	-24,0
<i>Tribolium confusum</i>		-24,3		-20,2
<i>Tribolium destructor</i>		-20,8		-22,0

- T. Skytte, Naturhistorisk museum, Århus, Denmark, 1993



Handling CRYONITE

Before use

Make sure that the cylinder is tightened to the trolley.

Ensure that hose to the handle connection is secure and that the locking ring is in the locked position (fig.) . Check that the hoses are securely tightened. The nut on the front edge of the nozzle must be tight. Tighten only by hand. Open the tap on the gas cylinder fully. NB: The equipment is now pressurised.

Push the security lock forwards to unlock (fig). Ready!

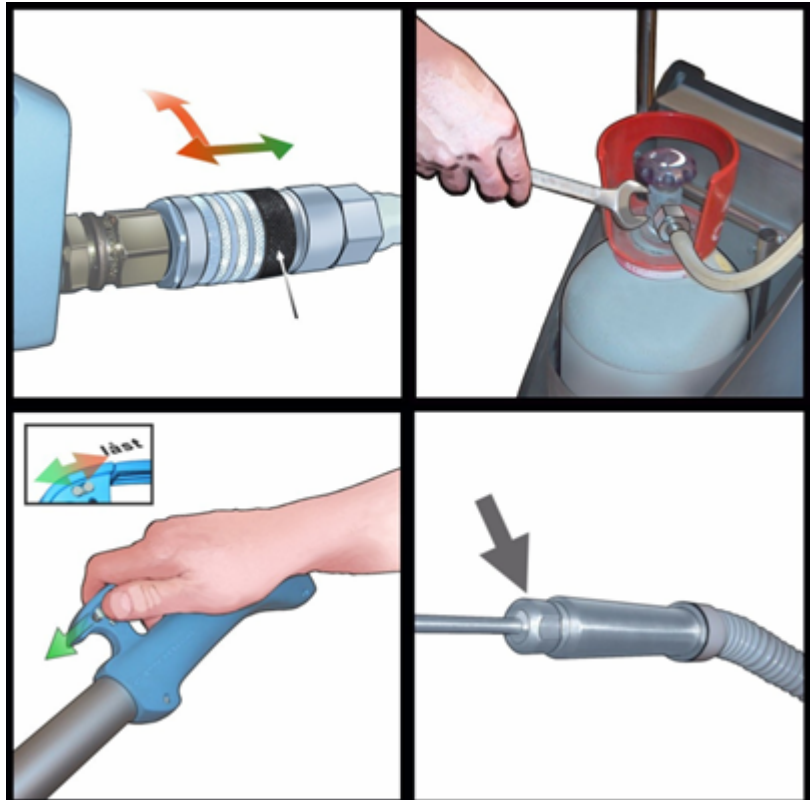
Jet nozzle

The jet nozzle should be inserted in the standard nozzle. First unscrew the front-end nut. Insert the jet nozzle. Refit the nut (fig.). Only use hand-power. If you insert and there is still snow in the standard nozzle, the jet nozzle may become plugged. Take it out and let the snow evaporate.

After use

Relock the security lock. After use, the container tap must always be shut off. Empty hose and handle of gas by pressing the trigger.

Note that the handle can only be released from the hose once the hose has been emptied of gas.



Change of gas container

Ensure that the tap on the gas container is closed. Empty hose and handle of gas by pressing the trigger. Loosen the connecting nut at the cylinder with a box wrench. (fig.). Loosen the cylinder straps. Replace cylinder. Tighten straps. Attach connecting nut and tighten. Open tap.

Comments are welcome

If you think something is missing, or too much of, wrong or even right - any comments about this manual are most welcome.

Also, if you would like to make a manual to suit your special needs (field use, brush-up, education, supervisor, executive, customer-oriented), we would be happy to assist.

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Safety Data Sheet

- insert local CO₂ SDS here -