din1000

Multi-media Blasting Machine

DRY ICE - SODA DRY- SODA WET

Instruction Manual

www.dryicenetwork.co.uk

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Introduction

Thank you for choosing the “din1000” multi-media blasting machine from DRY ICE NETWORK, referred to as “din” in the following text.

It is always important to to purchase the right machine for the job, but it is equally important to operate the equipment correctly in order to derive the maximum benefit from it.

This instruction manual is designed to provide the information and basic knowledge required for the din1000, but no instruction manual however well written can succeed in its purpose if it remains unread or is put aside after superficial examination, so please read and understand the manual before operating the machine and make it available to all operators.

The unique and effective design of the din1000 machine requires very little maintenance. Repairs beyond standard maintenance are not described in this manual, and any major repairs should be carried out by din.

It is inevitable that machines will be upgraded by their manufacturers from time to time and din will endeavour to continually improve the performance of their products and amend their manuals accordingly, so please ensure your machine serial number and instruction manual issue match.

If you have any difficulties with the equipment, the manual, or have any questions about its use, please do not hesitate to call us on +44 116 224 0072.

1. Deliveries / Standard Accessories

The din1000 is supplied with one of each of the following:

- Blast Handle
- Blast Nozzle - 60mm
- Pressure Regulator with Air Filter
- Blast Hose x 3 m
- Main Air Supply Hose ¾” x 10 m
- Female ¾ “ adaptor to connect to your existing compressed air system
- Open End Spanner x 14 mm
- Soda Attachment wet
- Soda attachment dry
- Instruction manual

2. Environmental Protection

Packaging : All packaging materials can be recycled. Please help to protect the environment by using designated recycling channels.

Machine : The din1000 is built with materials suitable for recycling. Please help to protect the environment by using designated recycling channels. At the end of life the din1000 cleaning machine can be returned, for proper disposal, to din.

3. Cleaning with Dry Ice

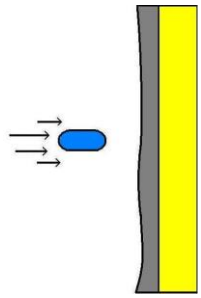
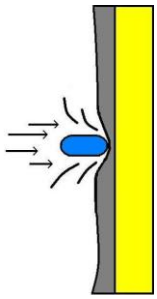
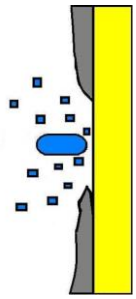
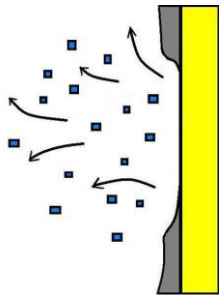
Using dry ice in the din1000 multimedia machine offers a non-abrasive, non-toxic cleaning alternative since only the material removed by the cleaning process remains, without any left-over media. No chemicals or contaminated water need to be disposed of, just the unwanted dirt.

Dry ice blasting is a process in which dry ice particles are dosed into an air stream and blown at high velocity onto the surface to be cleaned. It is a proven and cost effective way for many industries to increase product quality and maximise production capacity by achieving well maintained production equipment and reducing down time.

Dry ice is the solid form of CO2 and has a temperature of - 78.6°C. It is unstable under normal ambient conditions and is always trying to convert itself to CO2 gas. Unlike most other materials the conversion to gas does not go through a liquid phase and when a small particle of dry ice hits a solid surface at high speed the kinetic energy released caused it to convert rapidly to a large volume of CO2 gas. If this volume change takes place in or under a surface deposit then the deposit will be damaged and its bond to the substrate will be broken. If the substrate is resistant to the effects of the CO2 expansion the cleaning effect will be abrasion free, and as CO2 is inert, without any chemical action.

The “din1000” cleaning machine uses compressed air to accelerate the dry ice pellets to high velocity and by changing the air pressure and nozzle size different settings can be quickly achieved to suit different applications.

WARNING : During dry ice cleaning, the discharge of static electricity can occur. The “din1000” cleaning machine is designed in a way that earthing is ensured all the way from the blasting nozzle to the machine body. However if the workpiece been cleaned is not grounded then a static discharge between the two can occur. If the discharge is directly experience by the operator, it will not be a pleasant experience, but neither will it be life threatening. If it happens, check that both the machine and the workpiece are properly earthed to the same ground. **There is an M6 wing bolt at the rear of the machine.**

			
The Dry Ice Pellets are accelerated through specially designed nozzles to high velocity towards the contaminated area.	On release of kinetic energy on impact breaks up the pellets and allows them to enter the pores of the contaminant	The pellets then sublime into large volumes of CO2 gas and cause the contaminant to break up and loose its bond with the substrate.	The rapid continuing sublimation of the pellets clears away the debris into the compressed air stream.

4. Dry Ice Pellets

Dry ice pellets are made by Dry ice Network in Leicester from liquid CO2 and certified as Food Grade.

Please refer to the CO2 specification and Material Safety Data Sheet for Dry Ice on pages 17 - 22.

As soon as it is produced dry ice will always be trying to convert to CO2 gas. This process is called sublimation. The only way to limit sublimation losses is to keep the dry ice below -78.6 deg C and under pressure, which is impractical for either storage or transport.

If you leave dry ice in a closed container at ambient conditions after production it will sublime at a rate which will depend upon the amount of dry ice in the container, the room temperature and the thermal properties of the container.

Dry ice will as a general rule, sublime at a rate of 2 - 4 kg every 24 hours in a typical insulated 20 kg ice box. This sublimation continues from the time of production until the box is empty so the dry ice should be delivered quickly and as close to time needed as possible.

It is advisable to let your dry ice supplier handle the transport since they have commercial storage containers and have the expertise on how to handle dry ice during transportation.

If dry ice is transported inside a vehicle the box must not be in the same compartment as the driver or any passengers and adequate ventilation must be allowed before entering the compartment containing the dry ice box. Always follow the safety instructions from your dry ice supplier.

Dry ice pellets can be left unwrapped in an adequately ventilated area for disposal, but it must be ensured that the area is restricted and cannot be accessed by unauthorised persons, children or animals.

WARNING :

DO NOT STORE dry ice in an unventilated or poorly ventilated room (e.g. car boot ,cellar, unventilated work area). The CO_2 gas will accumulate to low lying areas and replace oxygenated air. This could cause suffocation if breathed extensively.

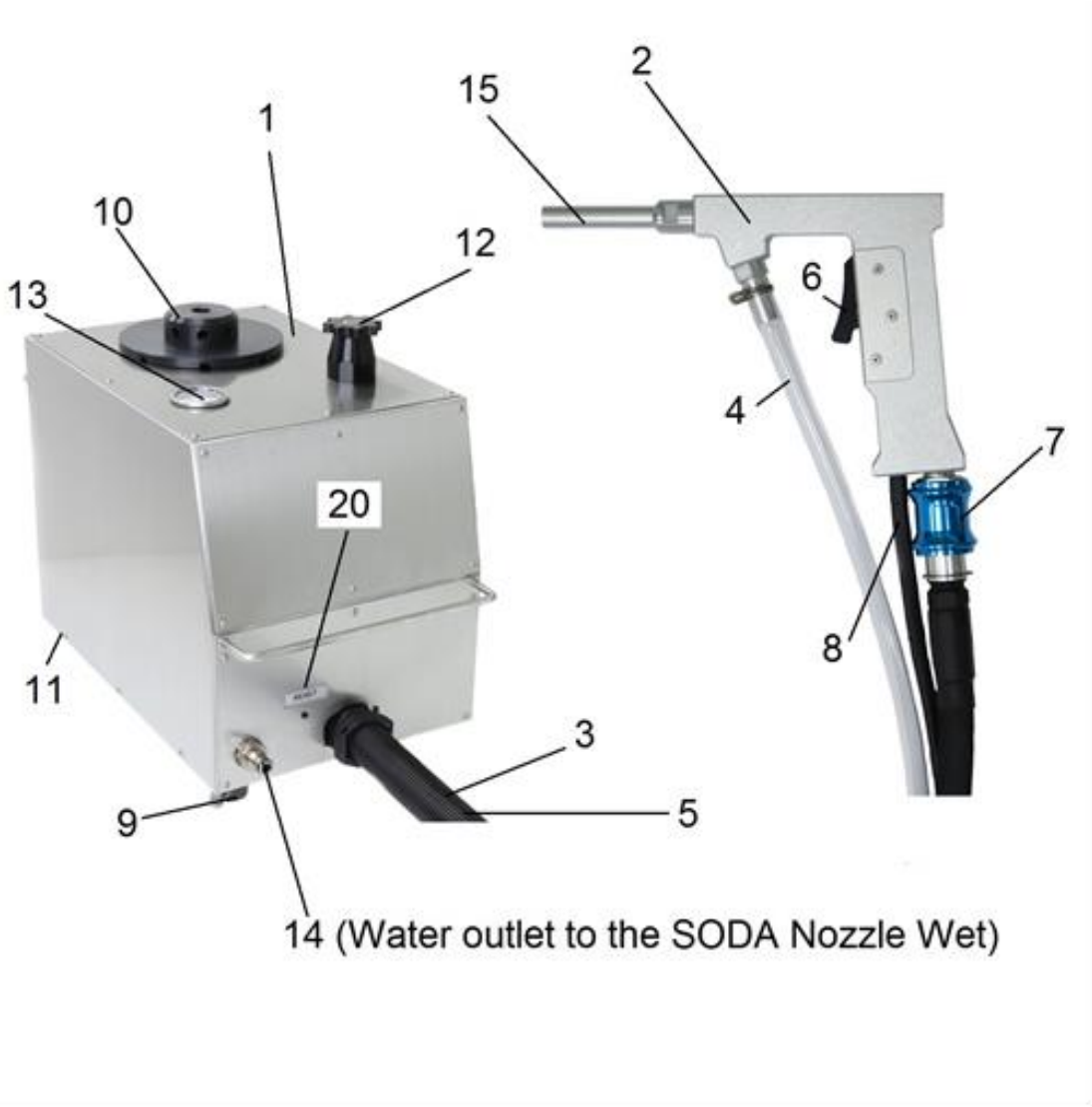
DO NOT STORE dry ice in a refrigerator. The extremely cold temperature of dry ice will cause the thermostat to turn the refrigerator off.

DO NOT STORE dry ice in an airtight container. During sublimation, the gas expands by approximately 700 times the dry ice volume and can cause an airtight container to violently explode.

DO NOT LEAVE dry ice unattended around children or animals.

DO NOT LEAVE dry ice packed in paper or plastic bags. The extreme cold of dry ice may cause damage to the surface where you leave the dry ice (e.g. machine parts - flooring - table tops).

5. “din1000” - Parts Identification (Front)



1…….Stainless Steel Housing

2…….Blast Handle

3…….3m Blast Hose

4…….Dry Ice Hose

5…….Protective Hose Sleeve

6…….Trigger

7…….Sliding Valve

8…….Control Lines

9…….Front Wheels (Swivel)

10……..Dry Ice Compartment / Cover

11……..Rear Wheel

5. “din1000” - Parts Identification (Rear)

12……..Pressure Regulator

13……..Pressure Gauge

14……..Water outlet to the SODA Nozzle Wet

15……..Blast Nozzle

16……..Compressed Air Connection Point

17……..Earth Point

18……..Rear Wheel

19……..Water Inlet (for SODA wet use only)

20……..RESET Button

6. “din1000” - Technical Specification

Length	53 cm
Width	30 cm
Height	41 cm
Net weight	16 kg
Air consumption	700 - 1500 l/min (25 - 50 cfm)
Blast pressure range	3.5 - 8.5 bar
Max. inlet pressure at the compressed air connection point	8.5 bar
Min. Air Quality	ISO 8573 - 1 Class 3
Recommended dry ice pellet size	1.5 - 3 mm diameter
Dry ice consumption	6 - 12 kg / hr (using 3mm Dry Ice Pellets)
Sound level	~ 97db (A) depending on the blasting pressure and distance from the nozzle to the part to be cleaned.
Blast hose	3 m bundle
Main air supply hose	3/4” x 10 m
Factory requirements :	
Recommended air compressor size	15 - 20Hp or bigger screw type with dryer and filter
Recommended compressed air pipe	below 25m = ½ inch pipe / above 25m = ¾ inch pipe
Advice : Compressed air pipe connection (recommended)	Ball valve with ¾ inch - female tread

7. Safety Instruction

“din1000” has safety stickers, on the rear side, of the machine. Please ensure that the safety stickers are not damaged and readable at all times.

The followings warnings and instructions must be observed at all times :

Do not point nozzle at
People or animals

Always wear
ear and eye protection

Always wear
face mask

Always wear
protective gloves

Always wear
protective clothing

Ensure proper earthing on
Machine & object to be cleaned

Do not touch CO2
pellets
(Coldburns -78*C)

Ensure adequate
fresh air ventilation

Close nozzle with sliding
valve when not in use

Do not use in explosion
prone areas

8. Installation / Start Up / Stop

Installation

1) Wear all protective clothing and safety gear.

2) Attach the **¾ Female Coupling** to the compressed air pipe.

3) Connect the **10m Main Air Supply Hose** to the machine

4) Connect the **10m Main Air Supply Hose** to the **¾ Female Coupling** on the compressed air pipe.

Start Up

5) Open the ¾ Ball valve on the **10m Main Air Supply Hose.**

6) Open the cover for the **Dry Ice Compartment** on the machine.

7) Check the **Dry Ice Compartment** for any contamination or solid particles. If necessary remove all contamination.

8) Top up the **Dry Ice Compartment** with Dry Ice Pellets (1.5 To 3 mm dia only)

9) Close the **Cover** of the **Dry Ice Compartment**.

10) Pick up the **Blast Handle**.

11) Point the blasting nozzle at a non critical area. (e.g. Floor / Wall)

12) Open the **Sliding Valve** and press the **Trigger** to check the blasting pressure.

13) Reduce / Increase the blasting pressure, using the **Pressure Regulator** to suit the cleaning task

14) Start the cleaning process.

Stop

15) Finish up the dry ice in the **Dry Ice Compartment**.

16) Close the ¾ ball valve on the **10m Main Air Supply Hose.**

17) Point the blast nozzle at a non critical area and press the **Trigger** to release the pressure.

18) Park the Blast Handle in the designated area on the machine.

19) Disconnect the **10m Main Air Supply Hose** from the machine.

20) Disconnect the **10m Main Air Supply Hose** from the compressed air pipe.

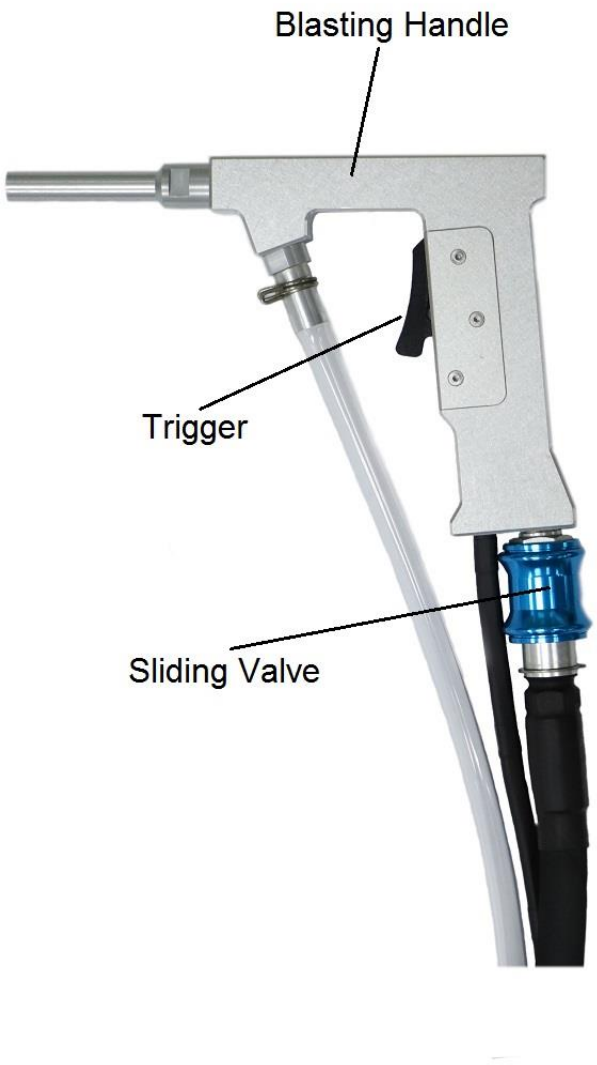
WARNING :

Always secure the **Blast Handle** with the **Sliding Valve** when not in operation, during a short break, and at the end of the cleaning process!

RECOMMENDATION :

It is recommended to finish up all the Dry Ice in the **Dry Ice Compartment** before taking a break or at the end of the cleaning process. Left over Dry Ice in the **Dry Ice Compartment** can cause freezing of the system. However, in most cases it will simply evaporate.

9. EMERGENCY STOP



1) Release the **Trigger** on the **Blast Handle**.

2) Secure the **Blast Handle** with the **Sliding Valve**.

3) Close the ball valve on the **10m Main Air Supply Hose.**

10. Maintenance

The unique and effective design of the “din1000” requires very little maintenance.
Repairs, beyond the standard maintenance, are not described in this manual. All repairs shall be carried out by the manufacturer or their authorized distributors with a repair facility.

WARNING :

Always disconnect the **10m Main Air Supply Hose** from the “din1000” **before** carrying out any maintenance.

Mode of Maintenance	**Schedule**				
	Daily	**Weekly**	**Monthly**	**Half Yearly**	**Yearly**
Manual	Clean the “din1000” inside & out	Check the function of the **Sliding Valve**. Check the function of the **Auto Drain Valve.**	Check the **3m Blast Hose** connection on the **Blast Handle**. Check the **Earth Point** connection from the **Blast Handle** to the **Earth Point.**	Check the **Front** and **Rear Wheels**.	Check the entire “din1000” for air leakage.
Action	Polish	Replace	Tighten	Tighten	Tighten
Recom. Tool	Cotton Cloth / Facial Tissues.	Spanner	Spanner / Digital Multi-meter	Spanner	Spanner
Visual		Check the **Air Filter** of the **Pressure Regulator**.	Check the **10m Main Air Supply Hose** for damages.	Check the **3m Blast Hose** for damage.	Check the **Protective Hose Sleeve** for damage.
Action		Wash / Replace	Replace	Replace	Replace

11. Failure Analysis

Failure	Analysis	Solution
No air pressure at the nozzle	The “din1000” is not connected to the compressed air source	Connect the 10m Main Air Supply Hose to your compressed air source.
	Sliding Valve is closed	Open the Sliding Valve.
No dry ice from the Blasting Nozzle	No pulsation sound in the machine	Press the RESET button. (Refer 5. “din1000” - Parts Identification)
	Dry Ice Hose at the Blast Handle is disconnected	Connect the Dry Ice Hose at the Blasting Handle.
	Twisted Dry Ice Hose	Untangle the Dry Ice Hose.
	Clumped Dry Ice in the Dry Ice Compartment or Dry Ice Hose	Flush the “din1000” (Refer 12. “din1000” - Flush-Back)
	Insufficient compressed air available	Check the specification of your air compressor. (Refer 6. “din1000” - Technical Specification)
	The Dry Ice Compartment is empty	Refill the Dry Ice Compartment with dry ice pellets.
	Wrong Dry Ice Pellet diameter	Check the Dry Ice Pellet diameter. Recommended Dry Ice Pellet diameter is 1.5 – 3mm.
	Contamination or solid particle in the Dry Ice Compartment or Dry Ice Hose	Flush - Back the “din1000” Clean the Dry Ice Compartment and refill with Dry Ice. (Refer 12. “din1000” - Flush-Back)
Loss of cleaning power	Insufficient compressed air available	Check the specification of your air compressor. (Refer 6. “din1000” - Technical Specification)
	Control Lines at the Blast Handle are damaged	Contact your distributor for replacement.
	The “din1000” system is frozen.	Empty the Dry Ice Compartment and wait for approx. 5 - 10min. to let the system unfreeze.
	Drop of air pressure at the Pressure Regulator (pressure drop should not exceed 1 bar)	Check the 10m Main Air Supply Hose for damages and if necessary contact your distributor for replacement.
		Check your compressed air supply piping. (Refer 6. “din1000” - Technical Specification)

12. DRY ICE JET - Flush Back

If the “din1000” system is frozen or blocked firmly press the nozzle of the **Blast Handle** into the recessed area of the **Cover** from the **Dry Ice Compartment** and press the **Trigger** of the **Blast Handle** frequently for a very short time (pulsing).

Repeat this procedure until there is “cold smoke” evenly dispersed from the **Cover** of the **Dry Ice Compartment**.

Important :

It is important that the nozzle from the **Blast Handle** is firmly pressed against the **Cover** of the **Dry Ice Compartment** (and not somewhere else) to ensure the **Cover** stays on the **Dry Ice Compartment** during pulsing. As a result the Dry Ice will not be blown out of the **Dry Ice Compartment** and discharged uncontrolled.

13. Warranties and Limitation of Liability

The “din1000” is warranted to be free from defects in materials and workmanship for a period of 12 month from the date of invoice on condition the “din1000” is used according to these recommended usage instructions and that none of the fixed seals are tampered with.

The Manufacturer is specifically excluded from and shall assume no liability for losses or damages incurred as a result of:

- Inappropriate or improper use or storage prior to commencement of operations.
- Incorrect assembly, repairs or maintenance made by the customer or third parties.
- Normal wear and tear, incorrect or careless treatment, unsuitable operation techniques.
- The use of blasting media other than those recommended.

The Manufacturer’s “Terms and Condition of Sales” apply.

15. SODA Blasting (Wet & Dry)

The “din1000” multimedia machine allows the addition of both wet and dry SODA Blasting.

SODA is correctly known as Bi-Carbonate of Soda, or more generally as Baking Soda.

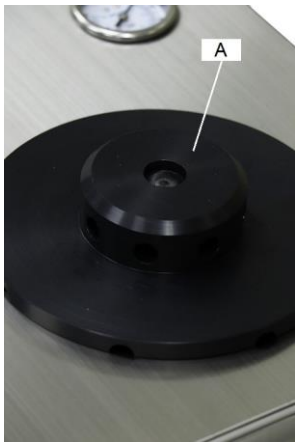
Please do not use SODA Carbonate as it is very harmful to your health.?????

Using SODA blasting requires all operators and bi-standers to wear a face mask!

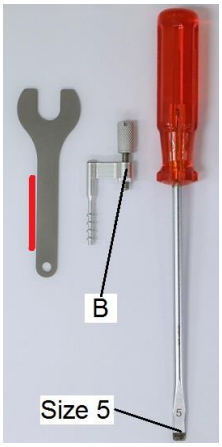
16. SODA Blasting DRY

To change from DRY ICE blasting to SODA blasting simply follow the below steps :

Step 1 :
Remove the Dry Ice Compartment / Cover (A) and empty the Dry Ice Compartment if necessary.

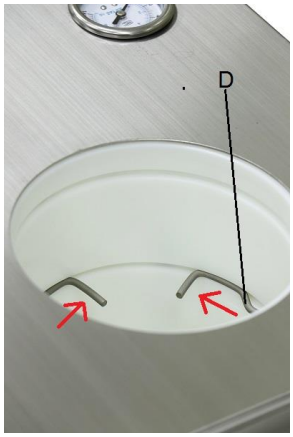


Step 2 :
Remove item (B), inside the Dry Ice Compartment, using the side of the spanner (included in the delivery) or using a screw driver size 5.

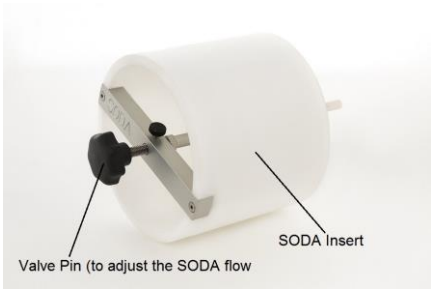


Step 3 :
Remove item (C).

Step 4 :
Remove item (D) from the lower groove by manually pressing the two ends together.

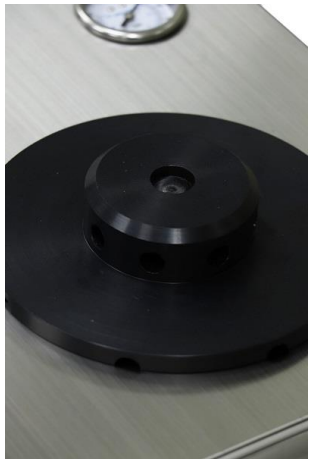


Step 5 :
Insert the SODA Insert into the DRY ICE Compartment. Ensure the higher groove is visible.



Step 6 :
Insert Item (D) into the higher groove.

Step 8 : Fill with the SODA insert with Bi-Carbonate and close the Dry Ice Compartment / Cover.



For SODA Blasting DRY there is no need to change the standard Nozzle on the Blast Handle.

17. SODA Blasting Wet

Step 9 : Connect a standard “garden hose” with the quick connect coupling to the rear side of the machine.

Step 10 : Connect a standard “garden hose” with the quick connect coupling at the front side of the machine and the open end at the SODA - Nozzle - Wet. Secure the hose at the nozzle with a hose clip.

Step 11 :
Remove Nozzle (4) with the spanner (3) and replace the Nozzle (4) with the SODA - Nozzle - Wet (1).