

# operating instructions

Dry ice cleaning device

Champ Vario

**DRY ICE ENERGY** 



**CE**

**Made in Germany**

**www.DryIceEnergy.com**  
**Wiebestr. 36-37**  
**10553 Berlin**



**Servicehotline**  
**+49 30 364 280 120**

## Preliminary remarks

Thank you very much for choosing our **champ vario** dry ice blasting machine!

Before using the blasting device, please first familiarize yourself with the device and read the operating instructions. In doing so, they avoid dangers for themselves and others.

You will receive the operating instructions as a PDF when the dry ice blasting machine is shipped. You should always have them at hand. Keep this instruction manual in such a way that it is available to the operator at all times.

The operating instructions explain installation, operation, mode of action and maintenance of the Champ Vario dry ice blasting device and the technology of CO<sub>2</sub> cleaning.

Only people who have read and understood the operating instructions may use the device. In particular, all safety instructions must be observed.

A principle of Dry-Ice-Energy GmbH is to continuously develop and improve the product ranges, which explains any differences in equipment, technical data, brochures and operating instructions.

Descriptions of activities that do not require any special knowledge were omitted.

Repair work that exceeds the normal maintenance work is not described and may only be carried out by the service of Dry-Ice-Energy GmbH or an authorized service partner.

The device is built according to recognized safety standards. Improper use may pose risks to the user.

The manufacturer of this device is not liable for damage caused to the device or by the user in the event of:

1. Improper treatment
2. Failure to comply with the operating instructions
3. Repairs by unauthorized professionals
4. Installation and replacement of non-original parts
5. Non-intended use

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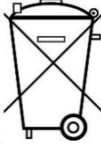
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## **1 Scope of delivery/standard accessories**

1. Dry ice blaster Champ Vario
2. Pressure regulator with filter
3. 7m compressed air hose (max. permissible working pressure 10bar)
4. Ice shovel
5. Ground cable (optional)
6. operating instructions

## 2 environmental protection








Dry-Ice-Energy is committed to comprehensive environmental protection.

	<p>All packaging materials are recyclable. Please recycle the packaging or, if possible, keep the packaging for reuse.</p> <p>For our 24-day exchange service, we use the transport packaging several times.</p>
	<p>Waste equipment contains valuable recyclable materials that should be recycled. Therefore, please dispose of old equipment via suitable collection systems.</p> <p>Dry-Ice-Energy GmbH takes back your used device.</p>

## 3 Registration

Only if your registration data is available with us, we can look after your blasting device on the service side and draw your attention to inspection dates. You can register your blasting device at any time under the given addresses of Dry-Ice-Energy GmbH, or obtain information about a registration.

## 4 Safety

 <b>danger</b>	
	<p><b>Denotes an imminent danger.</b>          If the information is not followed, there is a danger to life or serious bodily injury can be the result.</p>
 <b>warning</b>	
	<p><b>Denotes a possible annual situation.</b>          If the information is not followed, there is a danger to life or serious bodily injury can be the result.</p>
 <b>caution</b>	
	<p><b>Denotes a possible annual situation</b>          If the information is not followed, property damage as well as minor or moderate bodily injury can be the result.</p>
<b>hint</b>	
	<p><b>Denotes general information</b>          Useful user tips and work recommendations, but which have no influence on the safety and health of the staff.</p>

## 5 Directives and regulations

The blasting of surfaces when using granular blasting agents shall be subject to the regulations of the respective country.

In Germany, the provisions of the employers' liability insurance association shall apply, known as:

BGV D 26

Blasting work / implementation instructions

Other regulations are:

BGR 195 Use of protective gloves

BGR 189 Use of protective clothing

BGR 117 + BGI 534 Working in confined spaces

BGI 836 gas detector

Observe general safety rules!

If cleaning with the Champ Vario results in **dusts that** are hazardous to health, appropriate safety measures must be taken before the start of the work.

Safety instructions attached to the Champ Vario





caution



**Avoid direct skin contact with CO2 pellets!**

Risk of cold combustion due to dry ice or cold equipment parts. Dry ice has a temperature of  $-79^{\circ}\text{C}$ . Dry ice and cold equipment parts never touch unprotected. When working on the device, wear suitable cold protective clothing or remove dry ice and let it warm up. Never put dry ice in your mouth!



**Do not radiate against living beings – risk of injury!**

Risk of injury due to flying dry ice pellets. Jet gun does not target people or own body parts. Keep people and animals away during the holding (e.B. by means of barriers). During operation do not hold to the nozzle or in the dry ice jet.



**Compressed air connections and cleaning objects electrically ground!**





In the case of non-grounded compressed air connections, the device must also be grounded. Danger from electrostatic discharges. Risk of damage for electronic assemblies. Cleaning object electrically ground and grounding maintained throughout the cleaning process.



**Secure gun with sliding valve!**

Danger from unintentional start-up.



 danger	
    	<p><b>When blasting in closed rooms, provide enough fresh air!</b></p> <p><b>or</b></p> <p><b>Set up suction near the ground. CO2 is heavier than air!</b></p> <p>Risk of suffocation due to carbon dioxide. The dry ice pellets are made of solid carbon dioxide. When operating the device, the carbon dioxide content of the air at the workplace increases. Sufficiently ventilate the workplace, if necessary use a personal warning device.</p> <p>Signs of high concentration of carbon dioxide in the air we breathe:        3-5%: headache, high respiratory rate.        7-10%: headache, nausea, possibly loss of consciousness.</p> <p>When these signs appear, immediately turn off the device and go out into the fresh air. Before continuing work improve ventilation measures or use breathing apparatus.</p> <p>During the cleaning process, the cleaning object can charge electrically.</p>

**If the safety instructions are missing on the device or are illegible, they must be replaced!**

### Turn off in an emergency

1. Release the trigger lever of the jet gun – the airflow from the nozzle is interrupted – the dry ice conveyance is stopped.
1. Secure gun with sliding valve.
2. By turning on the compressed air connection, interrupt compressed air supply.

## 6 Procedure description

The **Champ Vario** dry ice blasting machine works with granules made of dry ice pellets (1.5mm), which is produced by pressing CO<sub>2</sub> snow.

The dry ice pellets located in the dry ice tank are mixed via a hose with the compressed air in the jet gun and accelerated via the jet nozzle.

The dirt on the surface is selectively supercooled and bursts off due to the different expansion coefficients. The CO<sub>2</sub> granules sublimate from the solid to the gaseous state at the moment of impact. And as a residue, only the original dirt remains.

**attention!**

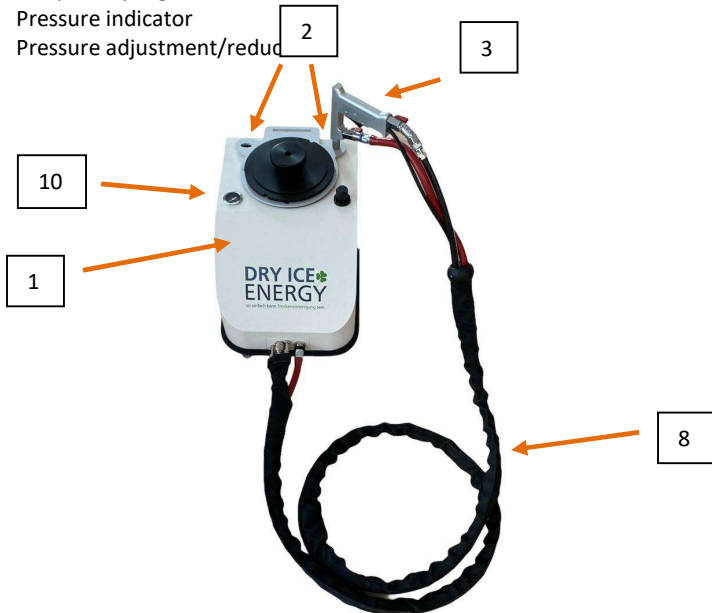
Use the dry ice blasting device **exclusively** with blasting agents, approved by Dry Ice Energy.

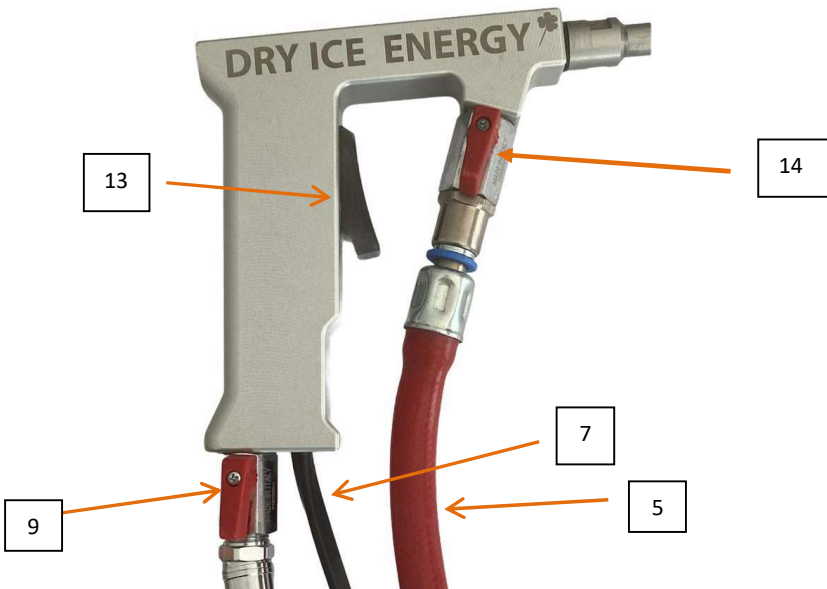
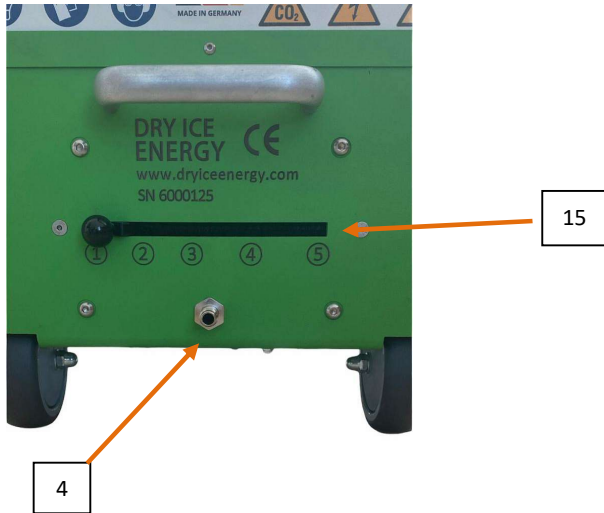
## 7 Technical data Champ Vario

length	520 mm
width	330 mm
height	360 mm
tare	13 kg
Dry ice filling capacity	3 kg
Dry ice consumption	4kg/h – 38kg/h at 5.5 bar beam pressure, per according to set consumption quantity and pellet size used
Required supply pressure	min. 2 bar - max. 10 bar
Compressed air consumption	300 - 1500 l/min (depending on the beam pressure and nozzle)
Pressure	max. 10 bar
<b>Compressed air requirements</b>	<b>Compressed air must be clean, oil-free and dry. Min. quality: ISO 8573- 1 class 3</b>
Compressed air connection	European standard hose NW 7.2
Noise	60 dB (A) - 90 dB(A) – abhängig von der Düsenkombination und der Oberfläche des zu reinigenden Objekts
Blasting agent	1,5mm Minipellets oder 3mm Powerpellets von Dry-Ice-Energy (empfohlen)
Hose length working hose	3,0 m
Hose length compressed air hose	7,0 m

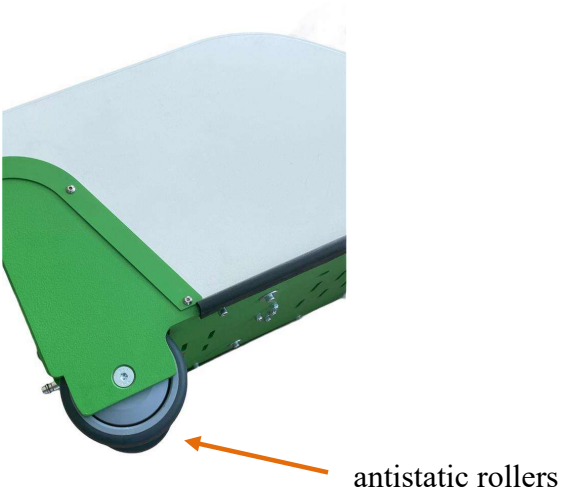
## 8 Construction of the Champ Vario

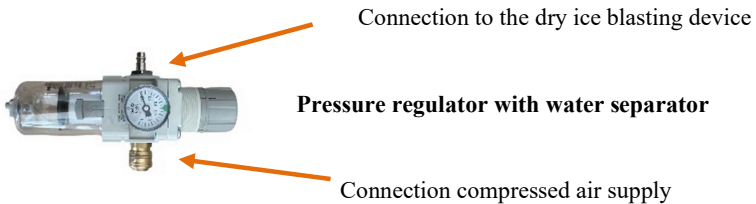
- 1 Housing with integrated dry ice container
- 2 jet gun holders (round or flat nozzle)
- 3 Jet gun
- 4 Pressure air connection at the back of the device
- 5 Ice pellet hose - red
- 6 Pressure air hose - black (maximum permissible supply pressure 10 bar)
- 7 Control line
- 8 Protection hose
- 9 short-term pressure adjustment
- 10 dry ice container lid
- 11 castors
- 12 safety instructions on the back of the device
- 13 Sion lever
- 14 Ice feed lever
- 15 Ice quantity regulation
- 16 Pressure indicator
- 17 Pressure adjustment/reduc













Mount pressure regulators on the dry ice blasting device. If the system-side requirements (pressure regulator, water separator) are met at the place of use, the pressure regulator can be dispensed with.

## 9 commissioning

**Please note the following points before commissioning:**

 <b>caution</b>	
	<p><b>Compressed air connections and cleaning objects electrically ground!</b></p> <p>In the case of non-grounded compressed air connections, the device must also be grounded.</p> <p>Danger from electrostatic discharges. Risk of damage for electronic assemblies. Ground the cleaning object electrically with the attached grounding cable and maintain grounding throughout the cleaning process.</p> <p>In the absence of grounding, flammable materials can ignite due to static discharge!</p>



hint



Before filling with dry ice, press the device in the empty state for 5 seconds. This prevents the pellet dosing when filled with dry ice.

Risk of damage to the device. Ausfinally use blasting agents approved by Dry Ice Energy. The use of other blasting agents leads to the loss of the warranty.







caution



**Avoid direct skin contact with CO2 pellets!**

Risk of cold combustion due to dry ice or cold equipment parts. Dry ice has a temperature of  $-79^{\circ}\text{C}$ . Dry ice and cold equipment parts never touch unprotected. When working on the device, wear suitable cold protective clothing or remove dry ice and let the device warm up. Never put dry ice in your mouth!

 <b>danger</b>	
    	<p><b>When blasting in closed rooms, provide enough fresh air!</b>  <b>or</b>  <b>Set up suction near the ground. CO2 is heavier than air!</b></p> <p>Risk of suffocation due to carbon dioxide. The dry ice pellets are made of solid carbon dioxide. When operating the device, the carbon dioxide content increases. of the air in the workplace. Sufficiently ventilate the workplace, if necessary use a personal warning device (see page 15 "Accessories").</p> <p>Signs of high concentration of carbon dioxide in the air we breathe:          3-5%: headache, high respiratory rate.          7-10%: headache, nausea, possibly loss of consciousness.</p> <p>When these signs appear, immediately turn off the device and go out into the fresh air. Before continuing work improve ventilation measures or use breathing apparatus.</p> <p><b>The Champ Vario must not be operated in an explosive environment!</b>          During the cleaning process, the cleaning object can charge electrically.</p>

**commissioning:**


Compare the air supply (available pressure, capacity, temperature and humidity) with the given values.

- a. If necessary, fix the cleaning object and ground it electrically.
- b. Wear protective clothing, protective gloves, tightly closing goggles, hearing protection and appropriate protective mask.
- c. The settings on the pressure regulator depend on the material of the cleaning object and the contamination. The jet pressure influences the speed at which the dry ice pellets exit the nozzle. The higher the set beam pressure, the higher the cleaning effect.
- d. 4 - 5,5 bar for light dirt

- e. 6 - 10 bar for heavy soiling
- f. Activate compressed air supply by **sliding valve**.
- g. Hold the beam gun securely in your hand.
- h. Dry ice jet by actuating **the trigger first** activate 5 sec. without dry ice "blow through".
- i. Fill dry ice pellets with the supplied ice cream sundae into the dry ice container.
- j. During filling, it should be noted that no foreign objects fall into the dry ice container. The foreign bodies can clog the pellet dosage when blasting.
- k. Close lid
- l. Perform cleaning process.



**Turn off in an emergency**

- a. Release the trigger lever of the jet gun – the airflow from the nozzle is interrupted – the dry ice conveyance is stopped.
- b. Secure gun with sliding valve
- c. By turning on the compressed air connection interrupt compressed air supply

hint	
	<p>During operation, leave the lid of the dry ice container closed. This prevents the ingress of radiated dirt.</p> <p>In order to avoid disturbances caused by clumped dry ice pellets, it makes sense to consume the contents of the dry ice container completely before refilling new dry ice.</p> <p>Before prolonged work interruptions, operate the device until the dry ice container is empty or dry ice can be removed by knocking the device.</p> <p>Insert the jet gun into the pistol holder of the cover and interrupt the compressed air supply by turning on the compressed air connection. Open the lid so that the condensation in the drying tank can dry.</p>

## 10 Finishing the blasting work




- a. If there is still dry ice in the funnel, the Champ Vario will shine completely empty.
- b. As soon as no more pellets come out of the jet nozzle you radiate about 10 sec. further to completely empty the jet hose.
- c. release trigger;
- d. Push sliding valve to OFF position;
- e. To relieve the compressed air hose of the pressure, switch off the compressed air supply at the compressed air source (compressor).
- f. First relieve compressed air hose (by pressing the trigger), then hold hose well and peel off. Beam pressure gauge indicates 0 bar.

 <b>caution</b>	
	<p><b>Avoid direct skin contact with CO2 pellets!</b></p> <p>Risk of cold combustion due to dry ice or cold equipment parts. Dry ice has a temperature of <math>-79^{\circ}\text{C}</math>. Dry ice and cold equipment parts never touch unprotected. When working on the G, wear suitable cold protective clothing or remove dry ice and let Gerät warm up. Never put dry ice in your mouth!</p>

## 11 transport

Before transport, perform all the steps in the chapter "Finishing the blasting work".

- Attach device to transport vehicle with tension straps.

	
<p><b>danger</b></p>	<div style="display: flex; flex-direction: column; gap: 10px;"> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p>Risk of accident due to dry ice residues in the device. Before transport in closed vehicles or when parking in small unventilated rooms e.B. lift, the dry ice must be completely removed from the device.</p> </div> </div> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p><b>Set up suction near the ground. CO2 is heavier than air!</b></p> <p>Risk of suffocation due to carbon dioxide. The dry ice pellets are made of solid carbon dioxide. When operating the device, the carbon dioxide content of the air at the workplace increases. Sufficiently ventilate the workplace, if necessary use a personal warning device (see page 15 "Accessories").</p> <p>Signs of high concentration of carbon dioxide in the air we breathe:            3-5%: headache, high respiratory rate.            7-10%: headache, nausea, possibly loss of consciousness.</p> <p>When these signs appear, immediately turn off the device and go out into the fresh air. Before continuing work improve ventilation measures or use breathing apparatus.</p> </div> </div> </div>

## 12 maintenance

Due to the pneumatic design of the **Champ Vario**, there is an extremely low maintenance requirement. However, control before each use is very important.

The **Champ Vario** is factory designed in such a way that only a few components require maintenance; you can carry out the following work yourself.

Before or after each mission

- Check hoses for damage, buckling points and fixed seat
- Check pressure regulator (if mounted) on fixed seat.

**attention!**

All other work may only be carried out by  
Dry-Ice-Energy Service!

Have the device tested by the Dry-Ice-Energy Service 1x annually.  
See also 24h exchange service.

### maintenance contract

In order to ensure reliable operation of the system, we recommend that you conclude a maintenance contract with our 24-day replacement service. Please contact our sales or customer service.

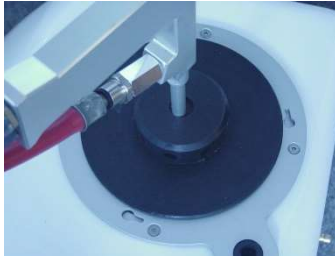
## 13 Disassembly and disposal

For the disposal of the device, the national regulations must be observed.  
Dry-Ice-Energy GmbH takesback used equipment.

## 14 Operational fault analysis

disturbance	Cause Solution
Keine Druckluft an der Pistole	Connect compressed air – Switch on the main switch on the compressor – Open sliding valve (9) on the gun
No pellet production	<p>Kinked pellet hose Pellets cannot be sucked in Pellet hose check for kinks and replace them if necessary. →→</p> <p>Clumped ice in the pellet dosage Backwash see note next page →→</p> <p>Check if 600 l/min compressed air is present.</p> <p>No pellets in the container or false pellets for the Champ →Vario may only be used minipellets from Dry Ice Energy.</p> <p>Foreign bodies in dry ice containers – Styrofoam parts, etc. Backwash and refill dry ice containers →.</p> <p>Dosage does not turn on see next →cause.</p>
Dosage does not turn on	<p>Check the compressed air supply.</p> <p>Jet pressure falls during operation below 3 bar check whether at least →600 l / min compressed air is present.</p>
Poor cleaning performance	Too little pressure or too small supply line cross-section – if a pressure of 6 bar is set, the display on the upstream pressure regulator must not fall below 4 bar during cleaning.
Device switches off delayed	Pistol nozzle iced compressed air contains too much water refrigeration dryer of the compressed air system check water cutter on the compressor empty. →→→

hint



**In case of irregular ice flow when blasting - backtoss:**

Put the pistol with the nozzle into the bore provided in the lid. Press the gun vigorously against the lid. Actuate the trigger lever until a uniform flow of air flows out of the openings of the lid.



## 15 Warranty and service documentation

The warranty has a validity period of 12 months after delivery.

For an assessment of the warranty, the spare part or the machine must be sent to the company Dry-Ice-Energy GmbH.

The warranty does not cover defects that are wholly or partly the result of:

- Derogation from the operating and operating rules relating to normal use in the case of prescribed pressure settings or use of blasting agents other than dry ice pellets.
- Normal wear, also wear of the jet hose.
- Installation/installation or repair by third parties or clients.
- Insufficient maintenance.

**Attention: The machine may only be opened by the service of Dry-Ice-Energy GmbH. In the event of unauthorized opening of the housing from the machine, the warranty claim expires.**

In case of warranty, please contact Dry-Ice-Energy GmbH or one of our sales partners.

Dry-Ice-Energy GmbH  
Wiebestraße 36-37  
10553 Berlin

Fon +49 (0) 30-364 280 120  
Fax +49 (0) 30-364 280 129  
info@dryiceenergy.com  
[www.dryiceenergy.com](http://www.dryiceenergy.com)

**Shipping requirements:**

In the event of a return shipment of the Champ Turbo, the original box must be used if possible. This was specially designed for the Champ Turbo and guarantees the highest possible protection of the machine against transport damage.

The Champ Turbo should also be protected by damping material from abrupt blows to the packaging or the falling of the carton.

The following is an example of how the Champ Turbo should not be packed under any circumstances, otherwise transport damage is inevitable:

**False:**



**Correct:**



## EC Declaration of Conformity

According to the EC Machinery Directive(MRL) 2006/42/EC of May 17, 2006, Annex II A  
for machines

The design type of the machine (trade name): Dry ice blasting machine

Brand/Function/Model/Type: Series Champ

Serial No./Year of construction: Indication on the type plate of the  
machine

was developed, designed and manufactured under sole responsibility of

**Manufacturer:** DRY-Ice-Energy GmbH  
Wiebestraße 36-37  
10553 Berlin  
T.: +49 (0) 30 364280127  
E.: [info@dryiceenergy.com](mailto:info@dryiceenergy.com)

and complies with all relevant provisions of MRL 2006/42/EC.

The technical documentation has been prepared in accordance with Annex V II A of the MRL 2006/42/EC and can be submitted to the competent market surveillance authority upon request.

**Person responsible for documentation (located in the Community): Gernot Schnettler**

The operating manual(s) belonging to the machine (original and translations, if applicable) and installation declarations and assembly instructions, if applicable - are available.

Berlin 16.11.2023  
Ort, Datum

Gernot Schnettler, Geschäftsführer  
Name, Funktion des Bevollmächtigten



DRY ICE  
ENERGY  
so einfach kann Trockeneisreinigung sein

Stempel, Unterschrift des Bevollmächtigten

# Service Documentation

## Service Documentation

# DRY ICE ENERGY



so einfach kann **Trockeneisreinigung** sein

