



WHITE LION®

COLD, COLDER **WL ANTARCTICA**

Technical data



The Dry Ice Innovators

CONTENTS

	Cold, colder, White Lion Antarctica	page 3
	The fabrication of dry ice	page 5
	Antarctica 130 240	page 7
	The raw material CO ₂	page 8
	Transport	page 10

Cold, colder, White Lion Antarctica

**MADE
IN
GERMANY**

ALMOST A COLD RECORD

Dry Ice is a multi-faceted, first-rate cooling agent with fascinating physical properties. Dry ice does not melt into water but sublimates into its gaseous state. Its coldness of -78,48 degrees Celsius is nearing the antarctic ground zero records. The temperatures in the Antarctic often fall far below -60 celsius with the lowest ever measured cold record being -93.2 degrees Celsius. This figure was determined via satellite on a high plateau in the eastern Antarctic.

Such properties as the ones mentioned contribute to dry ice being, amongst other things, an ideal cooling and blasting agent.

Without secondary waste material this procedure generates the maximum purity.

These properties are being utilised by the industry which is using it to clean sensitive tools, plants and machines with the so called dry ice blasting procedure.



WHEN IS THE PRODUCTION OF DRY ICE ADVISABLE?

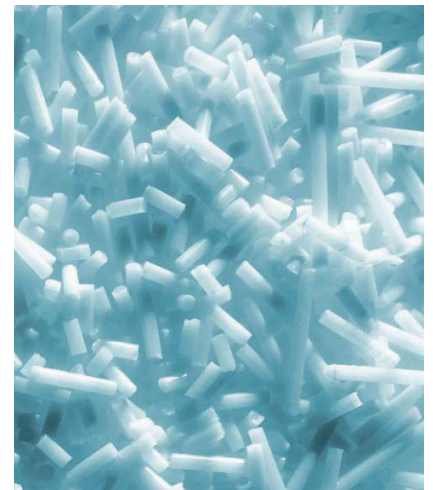
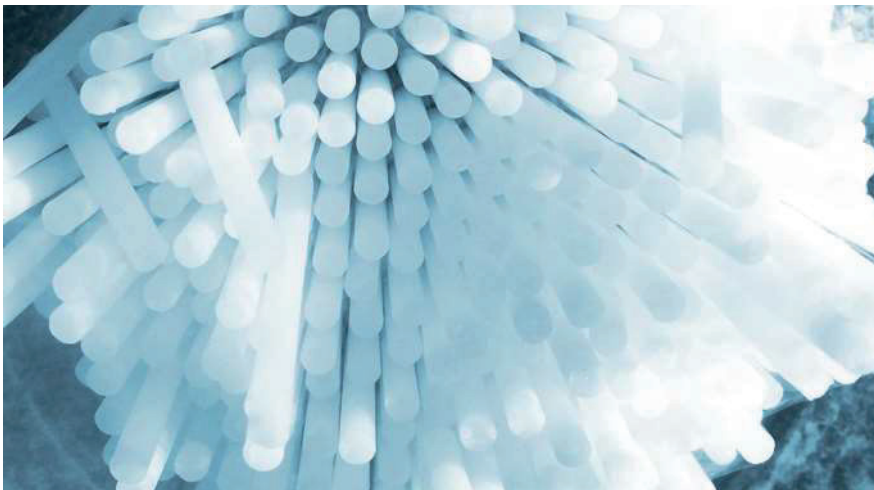
There are good reasons for being flexible.

Whenever dry ice is required in larger quantities, whether spontaneously or regularly, the production of dry ice is reasonable.

Having your own dry ice machine ensures the supply of high-quality dry ice at the right time, in the right place and in the desired quantity.

During the transport of dry ice a small loss of material is inevitable. Furthermore storage and transport, dry ice not only loses weight, but also increasingly loses quality through the condensation of ambient humidity and surface icing. Contrary to storing or transporting dry ice, liquid CO₂ can be stored in a tank for on-site production without loss.

For certain dry ice applications, such as dry ice cleaning, the quality of the dry ice determines the result of the implementation considerably!



The White Lion Arctic is a press for the production of dry ice pellets. By changing the die, the pellet size can be varied between 3, 10 and 16 mm. The production capacity lies at about 130 kg / h or 240 kg / h.

THE CALCULATION OF ECONOMY

Der Break Even Point.

If you want to produce dry ice, certain technical conditions have to be fulfilled. In the following excerpt we would like to briefly summarise the most important points for your technical and economic overview.

We provide an Excel spreadsheet so you can carry out a profitability calculation. We also executed an example with realistic figures in relation to the German market for visualisation. Please enter here your individual key figures and create your personal calculation. We will gladly send you the calculation table on request.



THE MANUFACTURING PROCESS OF DRY ICE

THE MANUFACTURING PROCESS

How is dry ice formed?

In practice, the production of dry ice is conducted by relaxation of liquified CO₂ (released from a suitable tank) from a pressure of about 17 bar down to atmospheric pressure.

During the relaxation of the CO₂ (during the transition from the tank to the atmosphere) carbon dioxide snow is produced. In a further step the CO₂ is subsequently expanded in a pressure chamber with the help of nozzles. In this process, the carbon dioxide snow is created.

In the following process this snow is compressed with a press cylinder with a pressure of about 150 – 170 bar according to the snowball principle. The now very dense snow is called dry ice.

The compression during the production of dry ice creates a CO₂ exhaust gas. If required, this can be re-liquefied with the CO₂ recovery plant and recycled back into production. This significantly reduces raw material wastage. For this specific machine please feel free to contact us personally.

Customary dry ice comes in pellets, nuggets, slices and blocks. These are produced in so-called pelletizers, block presses or converters.

Pellets and nuggets are formed by pressing the dry ice through a die which of course vary in shape and size depending on the type and size of the die.

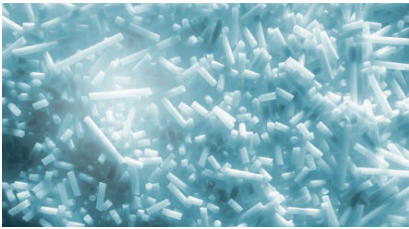
Dry ice blocks are produced in block presses and expelled as a block or disk after the carbon dioxide snow has been compacted.

There is however, another way to produce blocks or disks. This is done by pressing dry ice pellets into their desired shape in so-called converters. The great advantage of this approach is that the actual production of dry ice

by expansion and compression of CO₂ can be dispensed through the process of converting existing pellets. This process saves time and shows the high effectivity of a converter.

THE FORMS OF DRY ICE

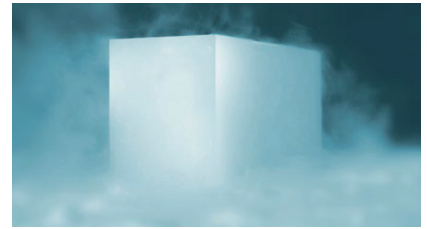
Furthermore, a converter has the ability to compact even wrongly shaped pellets again, thus basically no material is wasted.



Dry ice pellets 3 mm



Dry ice nuggets 10-16 mm

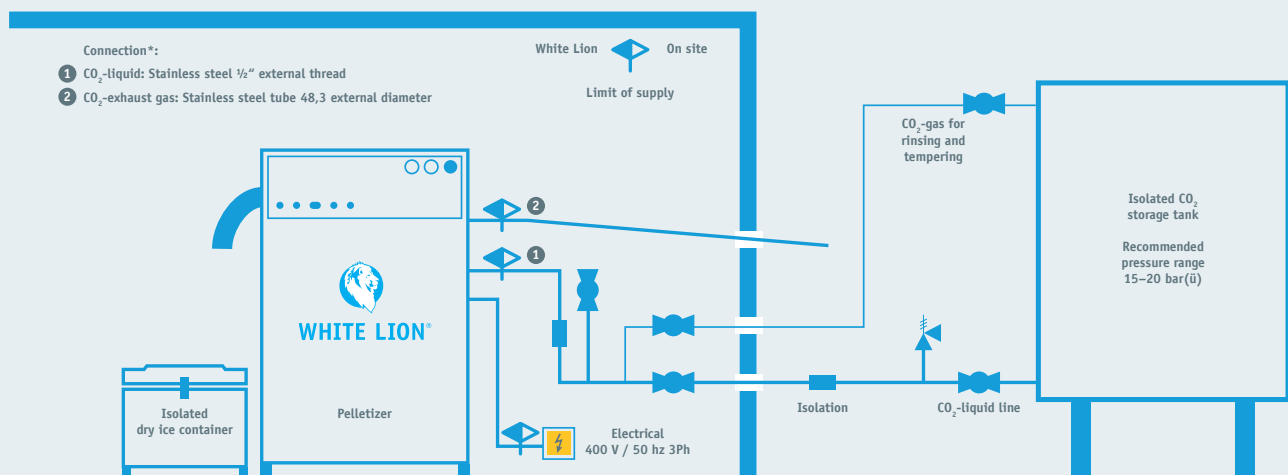


Dry ice blocks and slices



Good to know ... The dry ice is constantly sublimating, meaning it changes from its solid to its gaseous state of aggregation. Here, a volume increase with a factor of approximately 700 can be expected. This means that 1 m³ of dry ice produces 700 m³ of gaseous carbon dioxide. CO₂ is oxygen-altering, has a suffocating effect and can be fatal. Because of that, the CO₂ production must be monitored with CO₂ sensors. Excess CO₂ is led out of the building with the help of fans.

CONNECTION DIAGRAMM



*The nominal diameter and implementation of the pipeline must be agreed with White Lion and the gas supplier.

ANTARCTICA S | L

PELLETIZER

WHITE LION ANTARCTICA S

The machine "White Lion Antarctica S" is a press for the production of dry ice pellets. By changing the die, the pellet size can be varied between 3, 10 and 16 mm. The production capacity is approx. 120 kg / h for pellets of 3 mm size.

PELLETIZER

WHITE LION ANTARCTICA L

For the machine "White Lion Antarctica M" the production capacity is approx. 240 kg / h for pellets of 3 mm size.

By changing the die, the pellet size can be varied between 3, 10 and 16 mm.

TECHNICAL SPECIFICATIONS

ELECTRIC

- Power supply: 400 V 3 ph, plug 16 A CEE
- Frequency: 50 Hz
- Control voltage: 24 V DC
- Power consumption: 5 kW

MECHANICAL

- Total weight: approx. 300 kg (without packaging)
- Dimensions (W x D x H): ca. 1320 x 700 x 1440 mm
- Raw material: CO₂ – liquid
- Inlet pressure: 15 bar (g) – 21 bar (g)
- Performance: approx. 130 kg / h with 3 mm pellets
- Hydraulic oil: approx. 44 l

ENVIRONMENT

- Recommended temperature range: 15 ° C to 35 ° C
- Recommended relative humidity: 40% – 80%

TECHNICAL SPECIFICATIONS

ELECTRIC

- Power supply: 400 V 3 ph, plug 16 A CEE
- Frequency: 50 Hz
- Control voltage: 24 V DC
- Power consumption: 8.5 kW

MECHANICAL

- Total weight: approx. 690 kg (without packaging)
- Dimensions (L x D x H): ca. 1685 x 856 x 1615 mm
- Raw material: CO₂ – liquid
- Inlet pressure: 15 bar (g) – 21 bar (g)
- Performance: approx. 240 kg / h with 3 mm pellets
- Hydraulic oil: approx. 100 l

ENVIRONMENT

- Recommended temperature range: 15 ° C to 35 ° C
- Recommended relative humidity: 40% – 80%

THE RAW MATERIAL CO₂

GREENER THAN YOU THINK ...

The raw material for dry ice, regardless of its form, is cryogenic, liquified CO₂, which is stored in a vacuum-insulated pressure tank.

The carbon dioxide used to produce dry ice comes from natural sources such as the Vulkaneifel or is an industrial by-product, which for example occurs in the production of ammonia. Accordingly, no CO₂ is produced to make dry ice but it is taken from the natural environment.

In the production of dry ice there is generally a ratio / efficiency of about 2.4 to 1. This means that 2.4 tons of liquid CO₂ produce one ton of dry ice, regardless of its shape. With the help of a CO₂ recovery plant, this ratio can be improved up to 1: 1.4.

For this reason it is sensible to use CO₂ tanks in capacity sizes of 10, 30 or 50 tons.

Dealing with these kinds of weight appropriate foundations are required, as well as space and usually a corresponding construction or operating license.

A foundation plan is usually provided by your future gas supplier.

The gas tank is provided by your supplier in the form of a tenancy.

The cost of the raw material you negotiate yourself. In the process we are however happy to advise you with our experience.

It is recommended to have a short distance between the tank and the dry ice press. The CO₂ pipe should be kept as short as possible.

Pipes up to 25 m are usually not a problem, a length of 100 m is feasible if the pipes are insulated and designed accordingly.





TRANSPORT

The transport is carried out in transport containers called boxes. These should have the lowest possible K value, be washable and enable subliming gas to escape. For this purpose White Lion offers black and grey transport boxes.

Following:
the boxes' technical data according to their different capacities.

DRY ICE TRANSPORT CONTAINER BLACK BOX 100



GENERAL DATA

Black Box 100

Dimensions outside 800 × 600 × 570 mm

Inside dimensions 663 × 456 × 420 mm

Wall thickness 70 mm

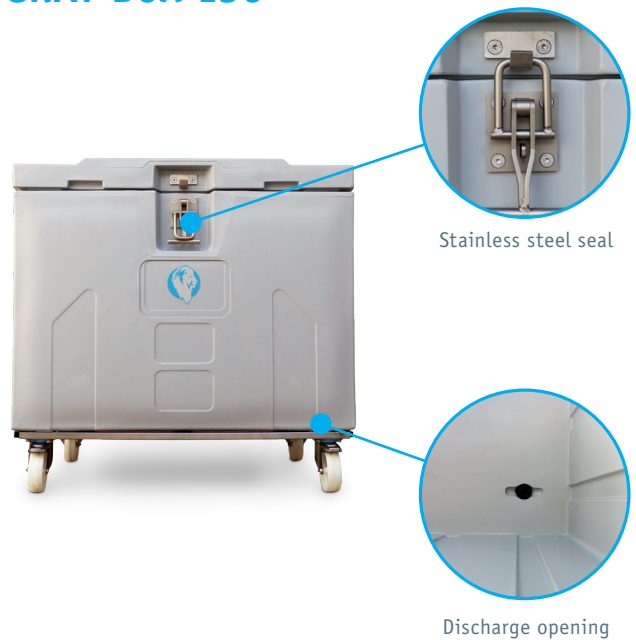
Material extruded environmentally friendly PP foam (EPP approx. 60 g / ltr)

Volume approx. 126 liters

Capacity dry ice pellets approx. 100 kg / dry weight approx. 150 kg

Tare weight approx. 10.5 kg

DRY ICE TRANSPORT CONTAINER GRAY BOX 150



HIGHLIGHTS

- + Practical external dimensions
- + For dry ice and grocery transport
- + Top opening
- + Produced, moulded from one piece
- + Hollow sheath insulated with low density polyurethane foam and reinforced with internal metal inserts
- + Stainless steel latch and hinges
- + Braces for extra stability
- + Removable silicone gasket, easy to clean

GENERAL DATA

Gray Box 150

Outside dimensions mm 800 × 600 × 930 (960 roller version)

Inside dimensions mm 605 × 405 × 610

Version with feet stainless steel frame with 4 rails. The underbody is 100 mm above the ground.

Version with reels reel seat made of galvanised steel with 2 fixed and 2 movable reels, diam. 125 mm, from the floor 140 mm

Volume (liters) 150

Empty weight (kg) 53

Heat transmission coefficient 0.320 W / (m² K)

DRY ICE TRANSPORT CONTAINER GRAY BOX 300



DRY ICE TRANSPORT CONTAINER GRAY BOX 500



Cushion
Stainless steel
hinge



HIGHLIGHTS

- + Practical external dimensions
- + For dry ice and grocery transport
- + Opening on the top
- + Produced, moulded from one piece
- + Hollow sheath insulated with low density polyurethane foam and reinforced with internal metal inserts
- + Stainless steel latch and hinges
- + Braces for extra stability
- + Removable silicone gasket, easy to clean
- + Lid opening with gas straps
- + The airtight closure of the lid is guaranteed even without locking
- + Stackable through suitable space on the lid



HIGHLIGHTS

- + Practical external dimensions
- + For dry ice and grocery transport
- + Opening on the top
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- + Stainless steel latch and hinges
- + Braces for extra stability
- + Removable silicone gasket, easy to clean
- + Lid opening with gas straps
- + The airtight closure of the lid is guaranteed even without locking
- + Stackable through suitable space on the lid

GENERAL DATA

Gray Box 300

Outside dimensions mm 800 × 600 × 930 (960 roller version)

Inside dimensions mm 805 × 605 × 610

Version with feet stainless steel frame with 4 rails. The underbody is 100 mm above the ground.

Version with reels reel seat of galvanized steel with 2 fixed and 2 movable reels or 4 movable reels, diam. 125 mm, from the floor 140 mm

Volume (liters) 300

Empty weight (kg) 80

Heat transmission coefficient 0.295 W / (m² K)

GENERAL DATA

Gray Box 500

Outside dimensions mm 1200 × 1000 × 930 (970 reel version)

Inside dimensions mm 1000 × 805 × 610

Version with feet stainless steel frame with 4 rails. The underbody is 100 mm above the ground.

Version with reels galvanised steel reel seat with 2 fixed and 2 movable reels or 4 movable reels, diam. 125 mm, from the floor 140 mm

Volume (liters) 500

Empty weight (kg) 100

Heat transmission coefficient 0.270 W / (m² K)



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Made with passion.