METODOLOGIE ECOLOGICHE CRIOGENICHE $CO_2$

# Dry Ice Cleaning Technologies

## Catalogue


MEGRIOS GROUP

# OUR **COMPANY**

**M.E.C. srl** was founded in 1991 and it is the first Italian manufacturer of machines and equipment for technical cleaning with dry ice (Dry Ice Blasting – Dry Ice Cleaning).
The Company produces also some prototypes with application in the cryogenic industry for very low temperatures.

**M.E.C. srl** is able to provide many different services, in order to find the best solution at any customers' problem.

The Company is based in Caltignaga (NO) at 30 km from Milan Malpensa Airport.

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**DRY-ICE CLEANING FROM 1991**
**MADE in Italy**

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# CLEANING TECHNOLOGY

## WITH DRY ICE

- **NO** SOLVENTS
- **NOT** ABRASIVE
- **NO** WASTE INCREASE
- **CHEMICALLY** INACTIVE
- **NO** CONTAMINATION
- **SOFT** AND/OR AGGRESSIVE
- **SANITIZE** AND CLEAN (remove bacteria)
- **ELECTRICALLY** INSULATING
- **SUITABLE** FOR DANGEROUS ROOM
  (Full pneumatic version)

# SNOW CLEANING – SB SERIES

## Dry ice snow blaster

### Models

SB/NT-VH

SB/NT-M

SB/NT-A

### Accessories

Air and liquid $CO_2$ filter

Nozzles

# $CO_2$ SNOW GUN

## Cod. SB/NT - VH

### Specifications

Cleaning system with dry ice snow for automotive industry

Usable with tank or liquid $CO_2$ cylinder

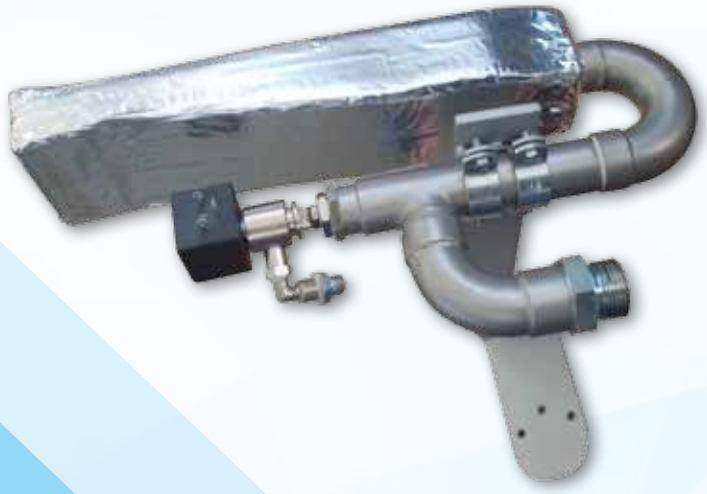
### Technical data

| | |
|---|---|
| **Consumption** | Liquid $CO_2$ 0.4-1.5 kg/min<br>Compressed air 1-5 $m^3$/min<br>Electric power – 0.25 kW |
| **Pressure** | $CO_2$ 20-80 bar<br>Air 2-10 bar |
| **Quality** | $CO_2$ with $H_2O$ <20 ppm<br>Compressed air* as per ISO 8573-1 cl. 2 |
| **Feeding** | $CO_2$ with cylinders or tank<br>Electric power – 230 V – 50 Hz single phase |

* the compressed air must be kept clean and free of oil, foreign bodies and water

### Supply

- **Electro-pneumatic control unit with PLC and Touch Screen**
- **Blasting gun with dry ice snow from liquid $CO_2$**
- **Flat nozzle 80 mm with robot support**
- **$CO_2$ hose**
- **Compressed air hose**



# $CO_2$ SNOW GUN

## Cod. SB/NT - M

## Specifications

Portable blasting gun for dry ice snow

Usable with liquid $CO_2$ cylinders

## Technical data

| | |
|---|---|
| **Consumption** | Liquid $CO_2$ 0.4-1.5 kg/min<br>Compressed air 1-5 $m^3$/min |
| **Pressure** | $CO_2$ 20-80 bar<br>Air 2-10 bar |
| **Quality** | $CO_2$ with $H_2O$ <20 ppm<br>Compressed air* as per ISO 8573-1 cl. 2 |
| **Feeding** | $CO_2$ with cylinders or tank |

*** the compressed air must be kept clean and free of oil, foreign bodies and water**

## Supply

- **Blasting gun with dry ice snow from liquid $CO_2$**
- **Supersonic nozzle (flat or cylindrical)**
- **Liquid $CO_2$ hose**
- **Compressed air hose**
- **Pneumatic control box**

# $CO_2$ SNOW GUN

## Cod. SB/NT-A

### Specifications

Automatic blasting gun for dry ice snow

Usable with tank or liquid $CO_2$ cylinders

### Technical data

| | |
|---|---|
| **Consumption** | Liquid $CO_2$ 0.4-1.5 kg/min<br>Compressed air 1-5 $m^3$/min<br>Electric power – 0.25 kW |
| **Pressure** | $CO_2$ 20-80 bar<br>Air 2-10 bar |
| **Quality** | $CO_2$ with $H_2O$ <20 ppm<br>Compressed air* as per ISO 8573-1 cl. 2 |
| **Feeding** | $CO_2$ with cylinders or tank<br>Electric power – 230 V – 50 Hz single-phase |

*the compressed air must be kept clean and free of oil, foreign bodies and water

### Supply

- **Blasting gun with dry ice snow from liquid $CO_2$**
- **Flat nozzle 50 mm or cylindrical 10 mm**
- **Liquid $CO_2$ hose**
- **Compressed air hose**
- **Electro-pneumatic control panel**

# ACCESSORIES

## Cod. SB/NT - 100

Compressed air filter

0.01 µm – filtering

## Cod. SB/NT-101

Liquid $CO_2$ filter

1 µm – filtering

## Cod. SB/NT-102 – B2

Supersonic flat nozzle

| | |
|---|---|
| Material | Aluminium |
| Usage | Flat surfaces |
| Section | 2x40 mm |

# PRECISION BLASTING – PB SERIES

## Micro-pellets blasters

| Models |
| --- |
| PB/ALICE-A |
| PB/ALICE – BIK |
| PB/ALICE-NCJ |
| PB/ALICE-NCJ-B |

| Accessories |
| --- |
| Blasting guns |
| Nozzles |
| Hoses |

# BLASTER / **ALICE**

## Single hose / production and launch of micro-pellets

### Cod. PB/ALICE-A

### Specifications

The ALICE/A is a single hose precision blasting machine for the production and launching of dry ice Micro-pellets.

**This machine can be used with different type of dry ice: blocks, pellets, etc.**

### Technical data

| | |
|---|---|
| **Operating pressure** | = 2 ÷ 6 bar |
| **Feeding pressure** | = max 10 bar |
| **Electric consumption** | = 220 V 50 Hz 0.3 kW single-phase |
| **Dry ice capacity** | = 12 kg |
| **Dry ice consumption** | = 0,1 ÷ 0,6 kg/min |
| **Quality dry ice** | = every form and dimension (pellets, cylinders, etc.) |
| **Dimensions** | = 600 x 370 x h 530 mm |
| **Weight** | = 74kg |
| **Air connection** | = ½ " gas |
| **Compressed air consumption*** | = 0.8 mc/min at 5 bar |
| **Noise level** | = 82 dB (A) at 4 bar |
| **Single hose** | |

* *the compressed air must be kept clean and free of oil, foreign bodies and water

### Supply

- **Blaster "Ice-mono" with 3 m hose**
- **Cylindrical nozzle**
- **Handbook**

# BLASTER / **ALICE**

## Dual hose / production and launch of micro-pellets

### Cod. PB/ALICE-BIK

### Specifications

ALICE/BIK is a dual hose precision blasting machine for the production and launching of dry ice Micro-pellets.

**This machine is characterized by a mixer, which blends small quantities of bicarbonate with dry ice.**

### Technical data

| | |
|---|---|
| **Operating pressure** | = 1 ÷ 8,5 bar |
| **Feeding pressure** | = max 10 bar |
| **Electronic consumption** | = 220 V 50 Hz 0.37 kW single-phase |
| **Dry ice capacity** | = 12 kg |
| **Dry ice consumption** | = 0,1 ÷ 0,6 kg/min |
| **Quality dry ice** | = pellets from Ø 3 mm and blocks |
| **Dimensions** | = 600 x 370 x h 530mm |
| **Weight** | = 78 kg |
| **Air connection** | = ½ " gas |
| **Compressed air consumption*** | = 0.8 mc/min at 5 bar |
| **Noise level** | = 82 dB (A) at 4 bar |
| **Bicarbonate capacity** | = 1.5kg |
| **Bicarbonate consumption** | = 0.2- 0.4 kg/h |

* the compressed air must be kept clean and free of oil, foreign bodies and water

### Supply

- **"Ice-mono" blasting gun with 3 m hose**
- **Cylindrical nozzle**
- **Handbook**
- **Bicarbonate feeder**

# BLASTER / **ALICE**

## Single hose / production and launch of micro-pellets

Cod. PB/ALICE-NCJ

### Specifications

ALICE/NCJ is a precision blasting machine for the production and launching of micro-pellets with pressurized single hose.

**This machine can use all type of dry ice: pellets, blocks, cylinders, tiles, etc..**

ALICE/NCJ is a Patented machine ideal for the micro-mechanic, micro-electronical delicate cleaning and for all the industries where a special and precise cleaning application is required.

### Technical data

| | |
|---|---|
| **Operating pressure** | = 2 ÷ 6 bar |
| **Feeding pressure** | = max 10 bar |
| **Electric consumption** | = 220 V 50 Hz 0.3 kW single-phase |
| **Dry ice capacity** | = 12 kg |
| **Dry ice consumption** | = 0,1 ÷ 0,6 kg/min |
| **Quality dry ice** | = all types (pellets, cylinders, tiles, etc.) |
| **Dimensions** | = 550 x 440 x h 980 mm |
| **Weight** | = 94 kg |
| **Air connection** | = ½ " gas |
| **Compressed air consumption*** | = 0.8 mc/min at 5 bar |
| **Noise level** | = 82 dB (A) at 4 bar |
| **Single hose** | |

*the compressed air must be kept clean and free of oil, foreign bodies and water

### Supply

- **"Ice-mono" blasting gun with 3 m hose**
- **Cylindrical nozzle**
- **Handbook**

# BLASTER / **ALICE**

## Single hose / production and launch of micro-pellets

### Cod. PB/ALICE-NCJ-B

### Specifications

ALICE/NCJ-B is a precision blasting machine for the production and launching of dry ice micro-pellets with single hose.

ALICE/NCJ is a Patented machine ideal for the micro-mechanic, micro-electronical delicate cleaning and for all the industries where a special and precise cleaning application is required.

**It is directly fed from liquid $CO_2$ cylinder or tank**

**Self-production of micro-pellets**

### Technical data

| | |
|---|---|
| **Operating pressure** | = 2 ÷ 6 bar |
| **Feeding pressure** | = max 10 bar |
| **Electric consumption** | = 220 V 50 Hz 0.3 kW single-phase |
| **Dry ice capacity** | = 12 kg |
| **Dry ice consumption** | = 0,1 ÷ 0,6 kg/min |
| **Quality dry ice** | = liquid $CO_2$ cylinders |
| **Dimensions** | = 550 x 440 x h 980 mm |
| **Weight** | = 104 kg |
| **Air connection** | = ½ " gas |
| **Compressed air consumption*** | = 0.8 mc/min at 5 bar |
| **Noise level** | = 82 dB (A) at 4 bar |
| **Single hose** | |

*the compressed air must be kept clean and free of oil, foreign bodies and water

### Supply

- **"Ice-mono" blasting gun with 3 m hose**
- **Cylindrical nozzle**
- **Handbook**

# GUNS / **ALICE**

## Specifications

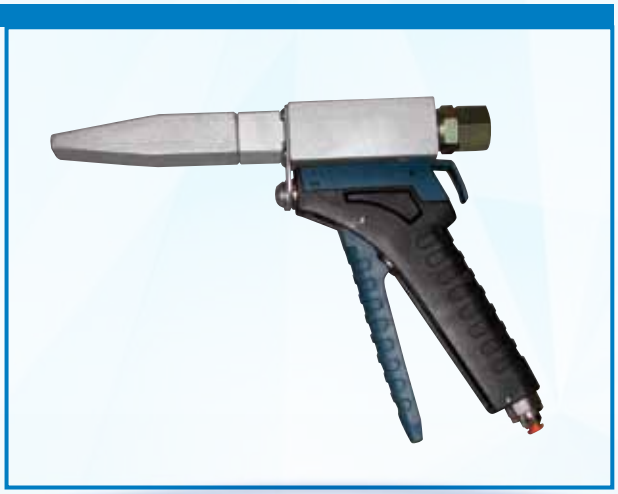
Our range of accessories is characterized by several blasting guns, hoses and nozzles to suit various cleaning requirements. For any specific request, we are able to provide prototypes and to design any special accessories in order to satisfy all customers' needs.

## Cod. ALI 100

| | |
|---|---|
| Model | "Ice Mono" cylindrical |
| Material | Polyethylene / Nylon / Tufnol |
| Usage | Multipurpose |

## Cod. ALI 101

| | |
|---|---|
| Model | "Ice Mono" flat |
| Material | Polyethylene / Nylon / Aluminium |
| Usage | Flat surfaces |



# NOZZLES / **ALICE**

## Cod. ALI 081

| Model | Standard |
|---|---|
| Material | Tufnol |
| Length | 120 mm |
| Diameter | 4-7mm |

## Cod. ALI – 006

| Model | Flat |
|---|---|
| Material | Material |
| Section | 2x20 mm |

| Model | Crusher / Classifier |
|---|---|
| Cod. ALI – 007/3 | 0.3 mm, micro-pellets |
| Cod. ALI – 007/5 | 0.5 mm, micro-pellets |
| Cod. ALI – 007/8 | 0.8 mm, micro-pellets |
| Cod. ALI – 007/10 | 1 mm, micro-pellets |

Material Aluminium  Usage Delicate surfaces

## Cod. ALI / 090

| Model | Mouldable Ø 4 mm |
|---|---|
| Material | Copper |
| Usage | Difficulties entries |

# PIPES / **ALICE**

## Cod. ALI 084 – 3

| Model | Single hose |
|---|---|
| Length | From 3 to 10 m |
| Material | Silicone |

## Cod. ALI – 005

| Model | Air compressed hose |
|---|---|
| Length | 10 m x ½” |
| Material | Black rubber |

# DRY ICE BLASTING - SERIES MB

## Pellets blasters

**THE BLASTERS CAN BE WITH SINGLE HOSE OR DUAL HOSE VENTURI TECHNOLOGY AND WITH PNEUMATIC OR ELECTRO-PNEUMATIC VERSION.**

### Models

**MB/ESZ** Standard single hose
**MB/AL** Dual hose
**MB/MONO** Single hose
**MB/BIK** Bicarbonate powder mixer
**MB/CRH** Pellets crusher

### Special machines

**MB/PS** Fully accessorised
**MB/MCR** Small dimensions
**MB /10** With PLC and Touch screen
**MB /M1** Simplified and low-cost dual hose
**MB/ Duplex** Dual hose and single hose combined
**Unit MB/GR-BLOCK** production and simultaneous launch

### Accessories

**Blaster guns**
**Nozzles**
**Hoses**

### Supplementary for Blaster

**Compressed air treatment**
**Additional accessories**

# BLASTER **MB / ESZ**

## Single hose dry ice blaster

Cod. MB/ESZ

### Pneumatic version

## Specifications

Pressurized single hose with supersonic nozzle

Fully pneumatic (no usage of energy power)

## Technical data

| | |
|---|---|
| **Consumptions** | Dry ice 40 kg/h<br>Compressed air* 3.7 m3/min at 6 bar |
| **Pressure** | At work – 6 bar |
| **Speed** | Of the flow – 520 m/sec |
| **Capacity** | Pellet – 20 kg |
| **Dimensions** | 300x500x750 mm |
| **Weight** | 45 kg (42+3 hoses) |
| **Connection** | Aria 1 “ BSP |

***the compressed air must be kept clean and free of oil, foreign bodies and water**

## Supply

- **Microblast MB/ESZ**
- **“Blue” gun with 3.5 m hoses and supersonic nozzle**
- **Handbook and maintenance instructions**

# DUAL HOSE BLASTER **MB/AL**

## Dual hose machine

### Cod. MB/AL

### Pneumatic or electro-pneumatic version

## Specifications

MB/AL, dual hose Venturi blasting unit is a very reliable machine, which does not need any maintenance. Its reliability has been proven in numerous tests and demonstrations, including field tests and endurance tests. It has been designed to be technically very simple in order to be suitable for any users with diverse cleaning requirements.

It can be used on all the materials, also on the sensible ones.

MB/AL weighs only 35 kg, it is very light and easy to raise. Its compact size allows to be fitted even in narrow spaces.

It uses dry ice pellets with Ø 3 mm.

## Technical data

| | |
|---|---|
| **Operating pressure** | = 2.5 ÷ 8,5 bar |
| **Dry ice capacity** | = 40 kg |
| **Dry ice consumption** | = 30 ÷ 60 kg/h |
| **Dimensions** | = 300 x 420 x h 800 mm |
| **Weight** | = 35 kg |
| **Air connection** | = 1" BSP |
| **Compressed air consumption*** | = 3.1 ÷ 4.2 mc/min at 6 bar |
| **Noise level** | = 90 dB (A) – 120 dB (A) depend on the surface to be clean and the nozzle type |
| **Dual hose Venturi system** | |
| **Pneumatic functioning** | |

*** the compressed air must be kept clean and free of oil, foreign bodies and water**

## Supply

- **"Coax" blasting gun with 3.5 m hose**
- **Cylindrical nozzle Ø 16 mm**
- **Handbook**

**Cod. MB/AL**

**Cod. MB/AL-ELT**
**Electro-pneumatic version**

# BLASTER **MB/MONO**

## Single hose machine

### Cod. MB/MONO

### Pneumatic or electro-pneumatic version

## Specifications

MB/MONO is a pressurized single hose system ideal for professionals that have specific cleaning requisites.

The dry ice tank has a capacity of 40 kg allowing the machine to be used for 45-60 minutes before refilling. The machine weight 47 kg, it is easy to handle, use and manage.

MB/MONO – single hose, it uses dry ice pellets Ø 3 mm.

## Technical data

| | |
|---|---|
| **Operating pressure** | = 2.5 ÷ 10bar |
| **Dry ice capacity** | = 40 kg |
| **Dry ice consumption** | = 30 ÷ 70 kg/h |
| **Dimensions** | = 300 x 470 x h 800mm |
| **Weight** | = 47 kg |
| **Air connection** | = 1" BSP |
| **Compressed air consumption*** | = 4.5 mc/min at 6 bar |
| **Noise level** | = 90 dB (A) – 120 dB (A) depend on the surface to be clean and the nozzle type |

*the compressed air must be kept clean and free of oil, foreign bodies and water

## Supply

- **"Mono" gun with 5 m hose**
- **Cylindrical nozzle Ø 12 mm**
- **Handbook**


**Cod. MB/mono**


**Cod. MB/mono-ELT**

**Electro-pneumatic version**

# BLASTER **MB/BIK**

## With powder mixer

### Cod. MB/BIK

### Single hose and dual hose version; pneumatic and electro-pneumatic version

## Specifications

MB/BIK Venturi dual hose is equipped with Powder Mixer (bicarbonate).

This machine is suitable for specific applications in the construction industry.

The Powder Mixer allows to blend dry ice with small quantities of bicarbonate, which makes lightly abrasive the dry ice action (the dry ice usually is not abrasive).

The dry ice tank has a capacity of 40 kg allowing the machine to be used for 45-60 minutes before refilling.

Its compact size allows to be fitted even in narrow spaces, without obstructing the workers movements.

MB/AL-BIK uses dry ice pellets of Ø 3 mm.

## Technical data

| | |
|---|---|
| **Operating pressure** | = 2.5 ÷ 8,5 bar |
| **Dry ice capacity** | = 40 kg |
| **Dry ice consumption** | = 30 ÷ 60 kg/h |
| **Dimensions** | = 300 x 480 x h 800 mm |
| **Weight** | = 40 kg (36+4 hoses) |
| **Air connection** | = 1" BSP |
| **Bicarbonate consumption** | = 2 ÷ 4 kg/h |
| **Compressed air consumption*** | = 3.3 ÷ 4.4 mc/min at 7 bar |
| **Noise level** | = 90 dB (A) – 120 dB (A) depend on the surface to be clean and the nozzle type |
| **Venturi dual hose system or single hose** | |
| **Pneumatic or electro-pneumatic functioning** | |
| **Powder Mixer** | |

*the compressed air must be kept clean and free of oil, foreign bodies and water

## Supply

- **Bicarbonate feeder**
- **"Coax" blasting gun with 3.5 m hose**
- **Cylindrical nozzle Ø 16 mm**
- **Handbook**

**Cod. MB/AL-BIK-ELT**
**electro-pneumatic version**

**MB/ Mono-BIK**
**single hose version**

# BLASTER **MB/CRH**

## With crusher

Cod. MB/CRH

### Single hose and dual hose version; pneumatic and electro-pneumatic version

## Specifications

MB-CRH is equipped with a pneumatic crusher device, which grinds all shape of dry ice (pellets, nuggets, tiles, blocks, etc.) in order to make micro-pellets.

The dry ice tank has a capacity of 18 kg.

This machine weighs 53 kg. It is compact in size and very useful, as it has been created to facilitate those users, who have no possibilities to procure dry ice pellets, because of country specific dry ice dimensions or micro-pellets cleaning purposes.

## Technical data

| | |
|---|---|
| **Operating pressure** | = 2.5 ÷ 10 bar |
| **Dry ice capacity** | = 18 kg |
| **Dry ice consumption** | = 30 ÷ 50 kg/h |
| **Dimensions** | = 300 x 420 x h 800mm |
| **Weight** | = 53 kg (49+4 hoses) |
| **Air connection** | = 1" BSP |
| **Compressed air consumption*** | = 4,5 mc/min a 6 bar |
| **Dry ice shape** | = all shapes (pellets, nuggets, tiles, etc.) |
| **Noise level** | = 90 dB (A) – 120 dB (A) depend on the surface to be clean and the nozzle type |
| **Crusher device** | |
| **Venturi dual hose or single hose system** | |
| **Pneumatic or electro-pneumatic functioning** | |

*the compressed air must be kept clean and free of oil, foreign bodies and water

## Supply

- **"Coax" blasting gun with 3.5 m hose**
- **Cylindrical nozzle Ø 16 mm**
- **Pneumatic crusher**
- **Handbook**


**Cod. MB/MONO-CRH**
**Single hose version**

**Crusher = CRH**

**MB/AL-CRH Dual hose version**

# Special **machines**

## Super accessorised model

### Cod. MB/PS

#### Technical data

| | |
|---|---|
| **Operating pressure** | = 2.5 ÷ 10 bar |
| **Dry ice capacity** | = 40 kg |
| **Dry ice consumption** | = 30 ÷ 70 kg/h |
| **Dimensions** | = 300 x 420 x h 800 mm |
| **Weight** | = 45 kg |
| **Air connection** | = 1" BSP |
| **Compressed air consumption*** | = 3.1 ÷ 5 mc/min at 10 bar |
| **Noise level** | = 90 dB (A) – 120 dB (A) depend on the surface to be clean and the nozzle type |
| **Venturi dual hose system** | |

#### Accessories included

- **Turbine vibrator**
- **Grounding**
- **Compressed air regulation**
- **Quick tripping barrel**
- **Anti-intruder cover**
- **Flat barrel**
- **5 m hose for guns**

## Mod. MB/MCR - extremely small dimension and low weight

### Cod. MB/MCR

#### Technical data

| | |
|---|---|
| **Operating pressure** | = 2.5 ÷ 8,5 bar |
| **Dry ice capacity** | = 20 kg |
| **Dry ice consumption** | = 30 ÷ 60 kg/h |
| **Dimensions** | = 300 x 420 x h 630 mm |
| **Weight** | = 35 kg |
| **Air connection** | = 1" BSP |
| **Compressed air consumption*** | = 3.1 ÷ 4,2 mc/min a 6 bar |
| **Noise level** | = 90 dB (A) – 120 dB (A) depend on the surface to be clean and the nozzle type |
| **Venturi dual hose system** | |
| **Pneumatic or electro-pneumatic functioning** | |

*the compressed air must be kept clean and free of oil, foreign bodies and water

# Mod. MB/10 – with PLC and touch screen

Cod. MB/10

## Technical data

| | |
|---|---|
| **Operating pressure** | = 2.5 ÷ 13 bar |
| **Dry ice capacity** | = 35 kg |
| **Dry ice consumption** | = 0 ÷ 80 kg/min |
| **Dimensions** | = 450 x 700 x h 980 mm |
| **Weight** | = 95 kg |
| **Air connection** | = 1“ BSP |
| **Compressed air consumption*** | = 4,2 mc/min a 6 bar |
| **Noise level** | = 90dB(A) – 120 dB (A) dipende dall’ ugello che si usa e dalla superficie che si deve pulire |
| **Electro-pneumatic functioning** | |

**Management with PLC and touch-screen**
**Selectable and customizable programmes**

# Mod. MB/M1 - simplified, low-cost – dual hose

Cod. MB/M1

## Technical data

| | |
|---|---|
| **Operating pressure** | = 3.5 ÷ 8.5 bar |
| **Dry ice capacity** | = 25 kg |
| **Dry ice consumption** | = 30 kg/h |
| **Dimensions** | = Ø 400 x h 900 mm |
| **Weight** | = 36 kg |
| **Air connection** | = 3/4” BSP |
| **Compressed air consumption*** | = 2,5 mc/min a 6 bar |
| **Noise level** | = 90 dB (A) – 120 dB (A) depend on the surface to be clean and the nozzle type |
| **Venturi dual hose system** | |
| **Pneumatic functioning** | |

*the compressed air must be kept clean and free of oil, foreign bodies and water

# Mod. MB/DUPLEX-single hose and dual hose combined

## Cod. MB/DUPLEX

### Technical data

| | |
|---|---|
| **Operating pressure** | = 2.5 ÷ 12 bar |
| **Dry ice capacity** | = 40 kg |
| **Dry ice consumption** | = 30 ÷ 70 kg/h |
| **Dimensions** | = 300 x 470 x h 800 mm |
| **Weight** | = 55 kg |
| **Air connection** | = 1" BSP |
| **Compressed air consumption*** | = 4.5 mc/min a 6 bar |
| **Noise level** | = 90 dB (A) – 120 dB (A) depend on the surface to be clean and the nozzle type |
| **Venturi dual hose system combined with pressurized single hose** | |
| **Pneumatic functioning** | |

# Mod. UNIT MB/GR-BLOCK
# Production and simultaneous launch

## Cod. UNIT MB/GR

### Technical data - BLASTER

| | |
|---|---|
| **Operating pressure** | = 2.5 ÷ 8.5 bar |
| **Dry ice capacity** | = 40 kg |
| **Dry ice consumption** | = 30 ÷ 60 kg/h |
| **Dimensions** | = 300 x 420 x h 800 mm |
| **Weight** | = 35 kg (31+4 hose) |
| **Air connection** | = 1" BSP |
| **Compressed air consumption*** | = 4.2 mc/min a 6 bar |
| **Noise level** | = 90 dB (A) – 120 dB (A) depend on the surface to be clean and the nozzle type |

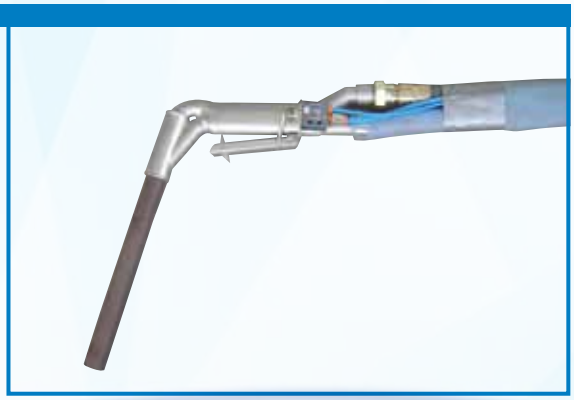
### Technical data - GR BLOCK

| | |
|---|---|
| **Pellets production** | = 50-100 kg/h |
| **Electric supply** | = 0.5 KW a 220 V |
| **Dry ice box dimensions** | = 230 x 460 x h200 mm |
| **Dimensions** | = 1150 x 550 x h1200 mm |
| **Weight** | = 86 kg |

# GUNS / **Double hose**

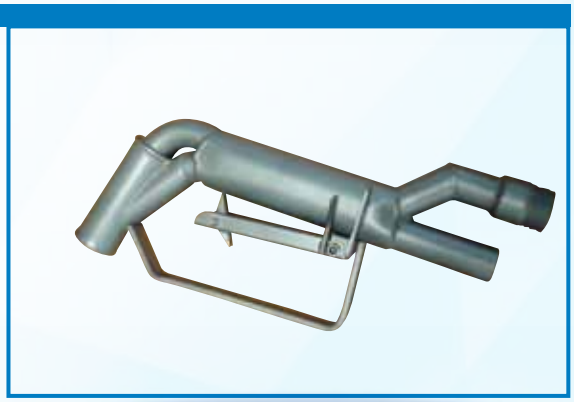
## Cod. MB/AL – 002

| Model | COAX standard |
|---|---|
| Material | Acciaio Inox 304 |



## Cod. MB/AL – 003

| Model | COAX double security |
|---|---|
| Material | Stainless steel 304 |



## Cod. MB/AL – 004

| Model | COAX long |
|---|---|
| Material | Stainless steel 304 |
| Length | 1.5 mt |

## Cod. MB/AL – 102

| Model | TIX |
|---|---|
| Material | Titanium and carbonic fibre |
| | Extra-light |

# GUNS / **Dual hose**

## Cod. MB/AL -A013bis

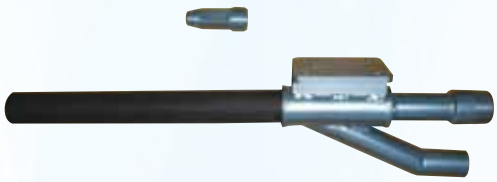
| Model | 90° moulds |
|---|---|
| Material | Stainless steel 304<br>Anti-rebound |
| Usage | High accessibility for moulds |

## Cod. MB/BIK-100

| Model | S/A – anti-abrasion gun |
|---|---|
| Material | Stainless steel 304 |
| Usage | To be use with some abrasive |

## Cod. DBS – 02

| Model | Robot 2 -automatic gun |
|---|---|
| Material | Stainless steel 304 |
| Uso | Automatic systems |



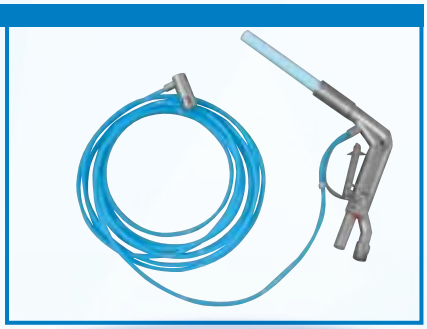
## Cod. MB/RPG

| Model | Coaxial dual hose gun |
|---|---|
| Material | Aluminium |
| Usage | Long casting |

# Special **applications**

## Powder mixer gun

Cod. MB-X1



## Long gun

Cod. MB-X2

## Gun with crusher

Cod. MB-X3

## Gun for moulds with extension

Cod. MB-X4

## Coax gun with double interchangeable nozzle flat and cylindrical

Cod. MB-X5

# NOZZLES / **Dual hose**

## Cod. MB/AL – A049

| Model | Cylindrical standard |
|---|---|
| Material | Tufnol (phenolic resin) |
| Lunghezza | 250 ÷ 750 mm |
| Usage | General application |

## Cod. MB/AL – A049A

| Modello | Cylindrical standard aluminium |
|---|---|
| Material | Aluminium |
| Lunghezza | 250 mm |
| Usage | General application |

## Cod. MB/AL – A011

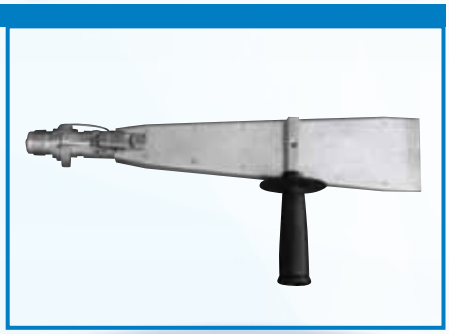
| Modello | Curved 30° cylindrical |
|---|---|
| Material | Stainless steel 340 / Aluminium |
| Length | From 150 to 350 mm |
| Usage | Tight areas |

## Cod. MB/AL – 048

| Model | Internal Venturi Nozzle (L-M-H) |
|---|---|
| Material | Aluminium / Stainless steel special |
| Payload | L – 2200 l/min<br>M – 3100 l/min<br>H - 4200 l/min |

## Cod. MB/AL – A012

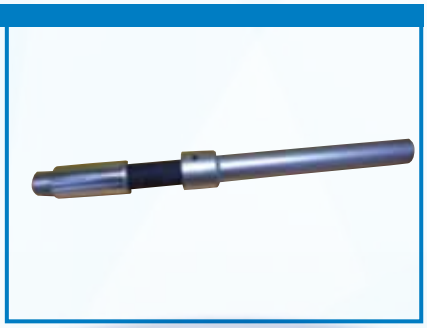
| Model | Flat nozzle |
|---|---|
| Material | Alluminio |
| Payload | 350 mm |
| Usage | For flat surfaces |



# NOZZLES / **Dual hose**

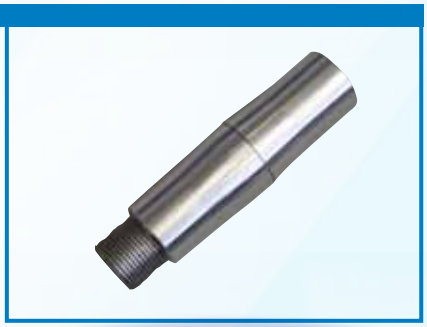
## Cod. MB/BIK - 088

| Model | AGA cylindrical nozzle |
|---|---|
| Material | Anti-wear rubber / Stainless steel |
| Usage | With abrasive mixed with dry ice |



## Cod. MB/MO - A017

| Model | Crusher |
|---|---|
| Material | Stainless steel / aluminium |
| Usage | To change pellets into dry ice powder |

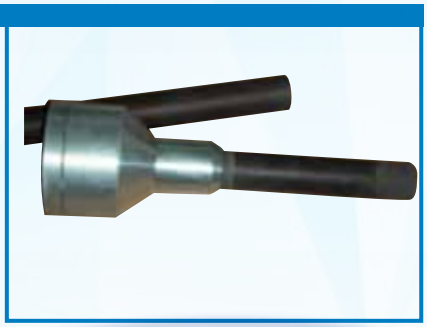


## Cod. MB/AL – 027

| Model | CCC – cylindrical |
|---|---|
| Material | Ultra-light carbonic fibre |
| Length | 100 – 250 mm |

## Cod. MB/AL – A044

| Model | Radial 360°C – Ø 80 mm |
|---|---|
| Material | Aluminium |
| Usage | Internal hoses |



## Cod. MB/AL-A045

| Model | Supersonic dual hose nozzle at 90° |
|---|---|
| Material | Stainless steel |
| Usage | For internal pipes with big diameter |

# PIPES / **Dual hose**

## Cod. MB/AL – A019 - 35
## Cod. MB/AL – A019 - 50

| Model | Silicon hose, high flexibility<br>Suitable for food industry |
|---|---|
| Material | Elastomer hose with fittings for compressed air |
| Length | 3.5 m and 5 m available up to 12 m |

## Cod. MB/AL - A030

| Model | Fire-resistant and anti-heat insulation |
|---|---|
| Dimension | Diam. 60 mm |

## Cod. MB/AL -A002

| Model | Air compressed hose 1” x 10 m |
|---|---|

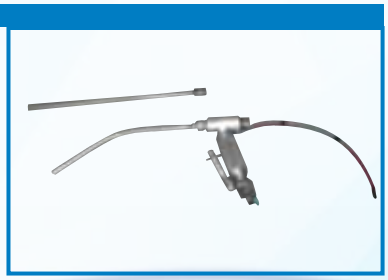
# GUNS / **Single hose**

## Specifications

Our range of accessories is characterised by several blasting guns, hoses and nozzles to suit various cleaning requirements. For any specific request, we are able to provide prototypes and to design any special accessories in order to satisfy all customers' needs.

### Cod. MB/MO - 019

| Model | OR – Horizontal |
|---|---|
| Material | Stainless steel 304 / Aluminium |
| Usage | General |



### Cod. MB/AL – 027

| Model | VR – Vertical |
|---|---|
| Material | Stainless steel 304 |
| Usage | Simplified access |

### Cod. MB/MO - 021 bis

| Model | 90° AR |
|---|---|
| Material | Stainless steel 304 |
| Usage | Mould |

### Cod. MB/MO - 023

| Model | TIX |
|---|---|
| Material | Titanium and carbonic fibre |
| Usage | Ultra-light |

### Cod. DBS – 01

| Model | Robot 1 – Automatic |
|---|---|
| Material | Steel / Acetalic Resin |
| Usage | Automatic system |

# GUNS / **Single hose**

## Cod. MB/S2 - 03

| Model | Vertical single hose |
|---|---|
| Material | Thermoplastic<br>Vertical hose joint |
| Usage | General |

## Cod. MB/S2 - 04

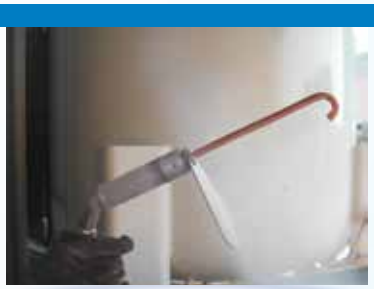
| Model | Horizontal single hose |
|---|---|
| Material | Thermoplastic<br>Horizontal hose joint |
| Usage | General with pellets' crusher |

# APPLICATIONS / **Special**

## Gun with application on PET moulds

### Cod. MB/X6

| Model | Pet |
|---|---|
| Material | Stainless steel and copper |
| Usage | PET moulds for bottles |



## Gun with rapid nozzle tripping

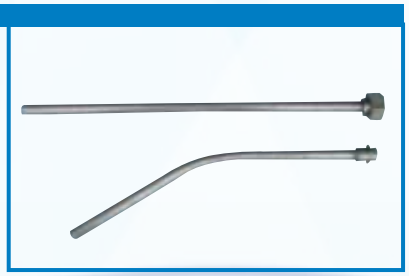
### Cod. MB/X7

| Model | Pet |
|---|---|
| Material | Stainless steel and copper |
| Usage | Flat surfaces |

# NOZZLES / **Single hose**

## Cod. MB/MO – A001

| Model | Standard 250 |
|---|---|
| Material | Aluminium / Stainless steel 304 |
| Length | 100- 750mm |
| Usage | General application |



## Cod. MB/MO – A004

| Model | PET J |
|---|---|
| Material | Stainless steel 304 – copper |
| Usage | PET moulds for bottles |

## Cod. MB/MO – A006

| Model | Flexible |
|---|---|
| Material | Silicon |
| Length | Up to 12 m |
| Usage | Heat and air conditioning pipes |

## Cod.: MB/MO – A013

| Model | Flat |
|---|---|
| Material | Aluminium |
| Length | 200 mm |
| Usage | Flat surfaces |

## Cod. MB/MO – A017

| Model | Flat with rapid tripping |
|---|---|
| Material | Aluminium |
| Length | 250 mm |
| Usage | Flat surfaces |

# NOZZLES / **Single hose**

## Cod. MB/MO – A030/3

| Model | Classificatory crusher |
|---|---|
| Material | Aluminium |
| Length | 120mm |
| Micro-pellets dimensions | Ø 0.3 mm<br>Ø 0.5 mm<br>Ø 0.8 mm<br>Ø 1 mm |

## Cod. MB/MO – A020

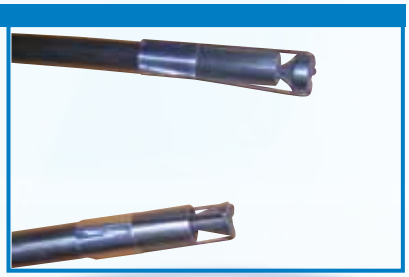
| Model | AB II |
|---|---|
| Material | Aluminium |
| Length | 400 mm |
| | Very low noise<br>89 dB (A) at 6 bar |


## Cod. MB/MO – A005

| Model | Radial 360° - Ø 120 mm |
|---|---|
| Material | Aluminium |
| Diameter | 80-120 mm |
| Length | 100-1000 mm |
| Usage | Internal pipes |

## Cod. MB/MO – A005A

| Model | Radial 360° - Ø 20 mm |
|---|---|
| Material | Stainless steel |
| Diametro | 20 mm |
| Length | 100-1000 mm |
| Usage | Internal pipes |



## Cod. MB/MO – A004K

Kit for PET moulds

# NOZZLES / **Single hose**

## Special silencer

### Cod. MB/X9

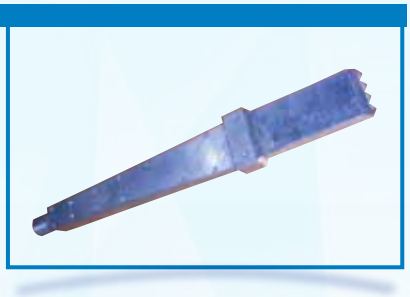
Low noise 91 dB (A) at 6 bar

### Cod. MB/X10

Very low noise 86 dB (A) at 6 bar

### Cod. MB/X11

Nozzle with silencer 95 dB (A) at 6 bar



# NOZZLES / **Supersonic single hose**

## Cod. MB/MO – S050

| Model | M2 |
|---|---|
| Material | Aluminium |
| Flow speed | ~500 m/sec |

## Cod. MB/MO – S051

| Model | IT/AL |
|---|---|
| Material | Aluminium |
| Flow speed | ~520 m/sec |

## Cod. MB/MO – S052

| Model | IT/TEK |
|---|---|
| Material | Thermoplastic |
| Flow speed | ~520 m/sec |

## Cod. MB/MO – S053

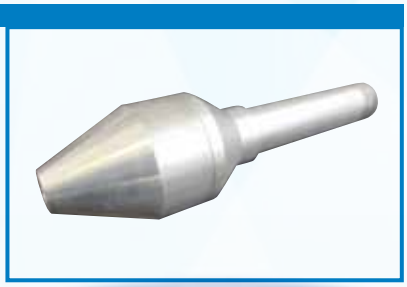
| Model | B2 |
|---|---|
| Material | Aluminium |
| Flow speed | ~470 m/sec |

## Cod. MB/MO – S054

| Model | PR |
|---|---|
| Material | Thermoplastic |
| Flow speed | ~540 m/sec |

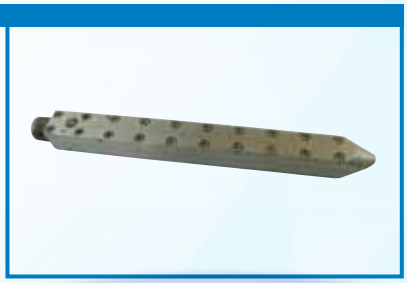
## Cod. MB/MO – S055

| Model | Coaxial |
|---|---|
| Material | Aluminium |
| Pellets speed | ~500 m/sec |
| Usage | Long launch |



## Cod. MB/MO – S057

| Model | MT |
|---|---|
| Material | Aluminium L.350 mm |
| Pellets speed | ~570 m/sec |



# PIPES / **Single hose**

## Cod. MB/MO – A021-50

| | |
|---|---|
| Model | Single hose pipes, suitable for food industry |
| Length | From 5 to 50 m |
| Material | Silicon |

## Cod. MB/AL – A002

| | |
|---|---|
| Model | Air compressed hose 1” x 10 m |

## Cod. MB/MO – A030

| | |
|---|---|
| Model | Fire-resistant and anti-heat insulation – Ø 60 mm |

# COMPLEMENTARIES

## Compressed air treatment

### Cod. MTA 42 – (Air dryer)

## Specifications

The air dryer group MTA 42 is used when the motor-compressor or the compressed air available in the plant is not purified by $H_2O$ and by oil.

## Technical data

| | |
|---|---|
| **Operating pressure** | = 16 bar max |
| **Air flow** | = 6000 l/min – 360 mc/h |
| **Max temperature air entry** | = 120 °C |
| **Dew point** | = + 3 °C |
| **Electric power** | = 1 KW at 230 V 50 Hz |
| **Dimensions** | = 1250 x 650 x h 1100 mm |
| **Weight** | = 120 kg |
| **Air entry pipe** | = 1”1/4 |
| **Air exit pipe** | = 1 |
| **Filtration degree** | = 0.01 µmm |
| **Residual oil** | = 0.01 mg/mc |

## Supply

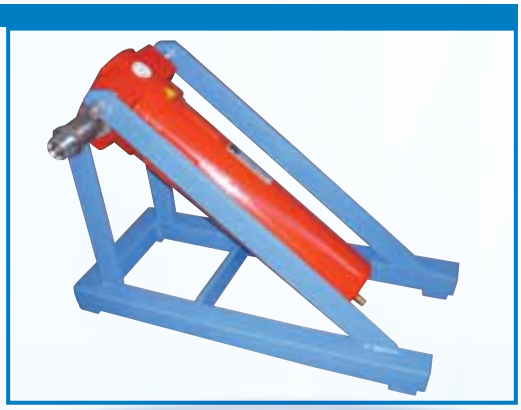
- **Air cooling system**
- **Refrigerator drier**
- **Pre-filter (oil and water)**
- **Condensation separator**

**Cod. MTA 42**

# ACCESSORIES

## Compressed air treatment

### Cod. MTA 10



Cyclone moisture separator

6 m³/min – 16 bar

Inlet 1”

Filtration 1 micron

### Cod. MTA 21

Fridge dryer

6 m³/ min

16 bar max

Dew point + 3°C

Power 1 kw 230 V 50 Hz

Weight 60 kg

Connections I=1 U=1”

### Cod. MTA 07

Air filter, anti-condensation

4.6 m³/min

16 bar

Filtration 0.01 micron

Residual oil 0.01 mg/mc

### Cod. MTA 17

Electric heater – compressed air

Capacity: 1 mc/min

Air temperature: 20-120°C

Power: 1.5 kW, 230 V 50 Hz

Air connection: ½”

# ACCESSORIES / **VARIOUS**

## Cod. MB/VR – A005

Safety kit:

Cryogenic gloves, earmuff, mask, suit

## Cod. MB/VR – A008

Led lamp for gun
Battery-operated

## Cod. MB/VR – A016

Electrostatic grounder for blasters and guns

## Cod. MB/VR – A017

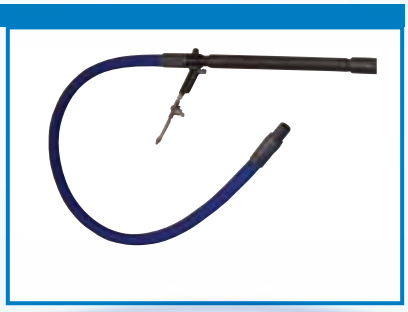
Pressure reducer for compressed air

Capacity 6 $m^3$/min

Pressure 0-10 bar

## Cod. MB/VR-PT

Pneumatic pellets' translator
Capacity 10 kg/min



# PRODUCERS

## Of dry ice

### PELLETTIZERS

P40 MC

P60 MC

P100 E

P150 E

P300 E

Draw-plate

### PRESSES

PPB 200 IS

PPB 10 MB

### LABORATORY PRESSES

B/ICE

C/ICE

### SPECIAL MACHINES

GR - BLOCK

CRH-C

S/ICE

$CO_2$ SNOW horn

### DRY ICE BOXES

CRY BOX

# PELLETTIZERS

## Maker of dry ice pellets

Cod. P40 MC

### Specifications

**OIL FREE: without lubrication**

**For alimentary and pharmaceutical usage**

**LIGHT SERIES**

**Mechanical functioning**

### Advantages

- **Productivity: 35 kg/h**
- **Ideal for laboratories, hospitals, food distributors, manufactures, etc.**

### Technical data

| | |
|---|---|
| **Pellets dimension** | = ø 3 mm |
| **Pellets length** | = 5 ÷ 10 mm |
| **Productivity** | = 35 kg/h |
| **Electric power** | = 1.1 Kw |
| **Electric supply** | = 400 V - 50Hz |
| **Dimensions** | = 1000 x 360 x 530 mm |
| **Weight** | = 75 kg |
| **Liquid $CO_2$ entry pressure** | = 20 bar |
| **Liquid $CO_2$ purity** | = max 20 ppm of $H_2O$ |
| **Liquid CO2 feeding line** | = insulated Ø ½" |
| **$CO_2$ exhaust line** | = ø 1 ¼" |

### Supply

- **Draw-plate Ø 3 mm**
- **Handbook**

### Accessories

- **Draw-plate Ø 16 mm**


**OIL FREE**

**Cod. P40 MC**

# PELLETTIZERS

## Maker of dry ice pellets

### Cod. P60 MC

### Specifications

**OIL FREE: without lubrication**

**For alimentary and pharmaceutical usage**

**LIGHT SERIES**

**Mechanical functioning**

### Advantages

- **Productivity: 55 kg/h**
- **Ideal for laboratories, hospitals, food distributors, manufactures, etc.**

### Technical data

| | |
|---|---|
| **Pellets dimension** | = ø 3 mm |
| **Pellets length** | = 5 ÷ 10 mm |
| **Productivity** | = 55 kg/h |
| **Electric power** | = 1.1 KW |
| **Electric supply** | = 400 V - 50Hz |
| **Dimensions** | = 1000 x 360 x 530 mm |
| **Weight** | = 75 kg |
| **Liquid $CO_2$ entry pressure** | = 20 bar |
| **Liquid $CO_2$ purity** | = max 20 ppm of $H_2O$ |
| **Liquid $CO_2$ feeding line** | = insulated Ø ½" |
| **$CO_2$ exhaust line** | = ø 1 ¼" |

### Supply

- **Draw-plate Ø 3 mm**
- **Handbook**

### Accessories

- **Draw-plate Ø 16 mm**


**OIL FREE**

**Cod. P60 MC**

# PELLETTIZERS

## Maker of dry ice pellets

### Cod. P100 E

### Specifications

**OIL FREE: without lubrication**

**For alimentary, pharmaceutical and industrial usage**

**HEAVY DUTY SERIES**

**Mechanical functioning**

### Technical data

| | |
|---|---|
| **Pellets dimension** | = ø 3 mm cylindrical |
| **Pellets length** | = ø 5 ÷10 mm |
| **Productivity** | = 100 kg/h |
| **Electric power** | = 3 KW |
| **Electric supply** | = 400 V - 50Hz |
| **Dimensions** | = 1400 x 550 x 1330 mm |
| **Weight** | = 540 kg |
| **Liquid $CO_2$ entry pressure** | = 12 ÷ 21 bar |
| **Liquid $CO_2$ purity** | = max 20 ppm di $H_2O$ |
| **Liquid $CO_2$ feeding line** | = insulated ø ¾" |
| **$CO_2$ exhaust line** | = ø 2" |

### Supply

- **Draw-plate Ø 3 mm**
- **Handbook**

### Accessories

- **Draw-plate Ø 9 and 16 mm**


**OIL FREE**

**Cod. P 100 E**

# PELLETTIZERS

## Maker of dry ice pellets

### Cod. P150 E

## Specifications

**OIL FREE: without lubrication**

**For alimentary, pharmaceutical and industrial usage**

**HEAVY DUTY SERIES**

**Mechanical functioning**

## Technical data

| | |
|---|---|
| **Pellets dimension** | = ø 3 mm cylindrical |
| **Pellets length** | = ø 5 ÷ 10 mm |
| **Productivity** | = 150 kg/h |
| **Electric power** | = 3 KW |
| **Electric supply** | = 400 V - 50Hz |
| **Dimensions** | = 1400 x 550 x 1330 mm |
| **Weight** | = 580 kg |
| **Liquid $CO_2$ entry pressure** | = 12 ÷ 21 bar |
| **Liquid $CO_2$ purity** | = max 20 ppm di $H_2O$ |
| **Liquid $CO_2$ feeding line** | = insulated ø ¾” |
| **$CO_2$ exhaust line** | = ø 2” |

## Supply

- **Draw-plate Ø 3 mm**
- **Handbook**

## Accessories

- **Draw-plate Ø 9 and 16 mm**

**OIL FREE**

**Cod. P150 E**

# PELLETTIZERS

## Maker of dry ice pellets

Cod. P300 E

### Specifications

**OIL FREE: without lubrication**

**For alimentary, pharmaceutical and industrial usage**

**HEAVY DUTY series**

**Mechanical functioning**

### Technical data

| | |
|---|---|
| **Pellets dimension** | = ø 3 mm cylindrical |
| **Pellets length** | = 5 ÷ 10 mm |
| **Productivity** | = 300 kg/h |
| **Electric power** | = 4 KW |
| **Electric supply** | = 400 V - 50Hz |
| **Dimensions** | = 1400 x 850 x 1330 mm |
| **Weight** | = 890 kg |
| **Liquid $CO_2$ entry pressure** | = 12 ÷ 21 bar |
| **Liquid $CO_2$ purity** | = max 20 ppm of $H_2O$ |
| **Liquid $CO_2$ feeding line** | = insulated ø ¾" |
| **$CO_2$ exhaust line** | = ø 2" |

### Supply

- **Draw-plate Ø 3 mm**
- **Handbook**

### Accessories

- **Draw-plate Ø 9 and 16 mm**


**OIL FREE**

**Cod. P300 E**

# Accessories for / **PELLETIZERS**

## Cod. P – 40 - 3

Interchangeable plate Ø 3 mm for
Pelletizer P 40 and P 60 MC

## Cod. P – 40-16

Interchangeable plate Ø 16 mm for
Pelletizer P 40 and P 60 MC

## Cod. P-100 - 3

Interchangeable plate Ø 3 mm for
Pelletizer P 100-150-300 E

## Cod. P – 100 - 9

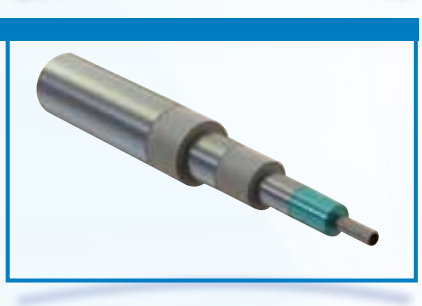
Interchangeable plate Ø 9 mm for
Pelletizer P 100-150-300 E

## Cod. P – 100 – 16

Interchangeable plate Ø 16 mm for
Pelletizer P 100-150-300 E

## Cod. P-LCO2

Thermic insulated line for $CO_2$
transfer
From tank to pelletizer
Diameter Ø 1/2" – 3/4"



# PRESS – Reformer

## Dry ice tiles and blocks producer

Cod. PPB 300 IR

### Specifications

**Functioning: hydraulic**

**Reformer press**

**It produces dry ice tiles and blocks using pellets**

### Technical data

| | |
|---|---|
| **Tile dimensions** | = 125 x 250 x h20 mm |
| **Tile weight** | = 1 kg |
| **Block dimensions** | = 125 x 250 x h 50 mm |
| **Block weight** | = 2.5 kg. |
| **Productivity** | = 300 kg/h |
| **Electric power** | = 7.5 KW |
| **Electric supply** | = 400 V 50 Hz |
| **Dimensions** | = 1500 x 900 x h2400 mm. |
| **Weight** | = 1090 kg |
| **Reformer feeding** | = dry ice pellets from 3 to 16 mm |

### Supply

- Reformer
- Handbook

**Cod. PPB 300 IR**

# PRESS-Manual

## Dry ice tiles producer

### Cod. PPB-20 MB

### Specifications

**Functioning: MANUAL**

**Supply: liquid $CO_2$ from tank or cylinder**

**It produces tiles from dry ice snow**

### Technical data

| | |
|---|---|
| **Tile dimensions** | = 125 x 125 x h 20 mm |
| **Tile weight** | = 0.5 kg |
| **Productivity** | = 20 kg/h |
| **Dimensions** | = 170 x 170 x h340 mm |
| **Weight** | = 18 kg |
| **Liquid $CO_2$ entry pressure** | = 12 ÷ 70 bar |
| **Liquid $CO_2$ purity** | = max 20 ppm di $H_2O$ |
| **Liquid $CO_2$ feeding line** | = insulated Ø ¼" |
| **$CO_2$ exhaust line** | = free |

### Supply

- **Press**
- **Handbook**


**Cod. PPB-20 MB**

# PRESS-FOR LABORATORY

## Dry ice blocks producer

Cod. B/ICE - 750

### Specifications

**This is an easy and economical solution for customers who have the need to produce small quantities of dry ice occasionally and directly at their premises.**

**The dry ice blocks producer has to be connected to the liquid $CO_2$ tank with dip tube.**

**Cod. B/ICE -750**

### Technical data

| Weight | gr | 750 |
|---|---|---|
| Dry ice block dimension | mm | 70 x 70 x h 200 |
| Production | Nr | 10 blocks with 30 kg of liquid $CO_2$ |
| Net weight of the machine | Kg | 3 |
| Machine dimension | mm | 120 x 120 x h 240 |

**Dry ice block**

# PRESS-for laboratory

## Dry ice packs producer

### Cod. C/ICE - 500

### Specifications

This is an easy and economical solution for customers who have the need to produce small quantities of dry ice occasionally and directly at their premises.

The dry ice blocks producer has to be connected to the liquid $CO_2$ tank with dip tube.

**Cod. C/ICE - 500**

### Technical data

| Weight | gr | 750 |
|---|---|---|
| Dry ice packs dimension | mm | Diameter 100 x h 60 mm |
| Production | Nr | 10-15 packs per hours |
| Net weight of the machine | Kg | 1 |

**Dry ice pack**

# SPECIAL MODELS

## Dry ice pellets producer

Cod. GR-BLOCK

### Technical data

| | |
|---|---|
| **Production** | = 50 ÷100 kg/h |
| **Compressed air consumption** | = 20 l/min at 2 bar |
| **Electric power** | = 0.5 Kw at 220 V |
| **Dry ice compartment dimensions** | = 230 x 460 x 200 h mm |
| **Dimensions** | = 1150 x 550 x h 1200 mm |
| **Weight** | = 86 kg |
| **Construction** | = Stainless steel Aisi 304 |
| **Particle-size pellets** | = 0.5- 2.5 mm |

## Dry ice pellets producer

Cod. CRH-C

### Technical data

| | |
|---|---|
| **Production** | = 20 ÷ 50 kg/h |
| **Compressed air consumption** | = 450 l/min at 6 bar |
| **Dimensions** | = 200 x 300 x h 450 mm |
| **Weight** | = 13 kg |
| **Construction** | = Stainless steel Aisi 304 |
| **Particle-size pellets** | = 0.5 - 2.5 mm |

# Dry ice snow producer, small quantities

## Cod. S/ICE

### Technical data

| | |
|---|---|
| **Dry ice snow production** | = 25 kg/h at 50 bar from cylinder |
| **Dimensions** | = diameter 30 x 250 mm |
| **Weight** | = 1.5 kg |
| **Construction** | = Stainless steel Aisi 304 |
| **Particle-size dry ice snow** | = 0 a 300 micron |
| **Feeding** | = liquid $CO_2$ cylinder with dip tube |

# Dry ice snow producer, big quantities

## Cod. $CO_2$ SNOW HORN

### Technical data

| | |
|---|---|
| **Dry ice snow production** | = 220 kg/h at 17/50 bar from tank or from cylinders |
| **Dimensions** | = diameter 100 x 350 mm |
| **Weight** | = 2.5 kg |
| **Construction** | = Stainless steel Aisi 304 |
| **Particle-size** | = from 0 to 300 micron |
| **Feeding** | = tank with dip tube or cylinder |

# CRYOBOX

## Insulated containers for the storage of dry ice

### Cod. CRY 60M
### Cryobox 60 kg

| | |
|---|---|
| Material | Thermoplastic |
| External dimensions | 400 x 850 x h380 mm |
| Pellets capacity kg | 60 |
| Tare kg | 12 |
| Thermal conductivity | 0.42 W/m2/K |

### Cod. CRY 125 M
### Cryobox 125 kg

| | |
|---|---|
| Material | Thermoplastic |
| External dimensions | 570x725xh840 mm |
| Pellets capacity kg | 125 |
| Tare kg | 40 |
| Thermal conductivity | 0.42 W/m2/K |

### Cod. CRY 300 A
### Cryobox 300 kg

| | |
|---|---|
| Material | Thermoplastic |
| External dimensions | 1000x800xh930 mm |
| Pellets capacity kg | 250 |
| Tare kg | 80 |
| Thermal conductivity | 0.38 W/m2/K |

### Cod. CRY 500 A
### Cryobox 500 kg

| | |
|---|---|
| Material | Thermoplastic |
| External dimensions | 1200x1000xh930 mm |
| Pellets capacity kg | 400 |
| Tare kg | 100 |
| Thermal conductivity | 0.38 W/m2/K |

### Cod. CRY 500 M
### Cryobox 500 kg

| | |
|---|---|
| Material | Thermoplastic |
| External dimensions | 1650x715xh970 mm |
| Pellets capacity kg | 400 |
| Tare kg | 127 |
| Thermal conductivity | 0.42 W/m2/K |

# ENGINEERED SYSTEMS

## SOUND-INSULATED EQUIPMENT

Silent box

Blast room

## AUTOMATIC EQUIPMENT

ABS (Automatic blasting System)

MB FXX

CRYO BARRIQUES

BOX TYRES

# SOUND-INSULATED EQUIPMENT SILENT BOX

## Technical data

| | |
|---|---|
| **Internal useful dimensions** | = 1100 x 1100 x h 1100 mm |
| **Operating platform dimensions** | = ∅ 1000 mm |
| **Dust filtration grade** | = < 5 mg/mc |
| **Sound level for the operator** | = 80/85 dB(A) |
| **Noise attenuation** | = about 30 dB (A) at 7 bar |
| **Operating platform capacity** | = 400 kg |
| **Air aspiration** | = up to 1000 mc/h |
| **Installed power** | = 1.5 KW |
| **Electric supply** | = 380 V 50 Hz |

## Supply

- **Soundproof cabin**
- **Rotating platform for cleaning work**
- **Air aspiration and filtration system**
- **Handbook**

## Accessories

- **Operating platform with electrical mechanic rotation**
- **$CO_2$ level detector in the working area**

| MODELS | |
|---|---|
| Cod. CA/SI – 1.0 | Silent Box 1.0 |
| Cod. CA/SI – 1.2 | Silent Box 1.2 |
| Cod. CA/SI – 1.5 | Silent Box 1.5 |

**Cod. CA/SI – 1.0**

# SOUND-INSULATED EQUIPMENT BLAST ROOM

## Technical data

| | |
|---|---|
| **Useful dimensions** | = 4200 x 5000 x h 3500 mm* |
| **Doors opening** | = 2500 x h 2500 mm |
| **Air flow of dust remover** | = 7000 mc/h |
| **Dust filtration grade** | = < 5 mg/mc |
| **Noise reduction** | = > 40 dB(A) |
| **Installed power** | = 7.5 KW |
| **Electric supply** | = 400 V 50 Hz |

## Supply

- **Cabin completed with automatic dust remover**
- **Sequencer for filter cleaning**
- **Illumination system**
- **Handbook**

**Cod. CA/BR**

*Other dimensions available on request
All systems are customable according to the application

# AUTOMATIC EQUIPMENT - AUTOMATIC BLASTING SYSTEM

## Cod. IM/ABS

## Technical data

| | | | |
|---|---|---|---|
| Room useful dimensions | = 4200 x 5000 x h 3500 mm | X &Y axles translation speed | = 3 m/min |
| Doors opening | = 2500 x h 2500mm | Z axles translation speed | = 1 m/min |
| Air flow of dust remover | = 7000 mc/h | Rotating platform capacity | = 8.000 kg |
| Dust filtration grade | = < 5 mg/mc | Platform inclination | = 0° ÷ 45° |
| Noise reduction | = > 40 dB(A) | Platform rotation | = 0° ÷ 180° |
| Installed power | = 14 KW | Visual control system | = high solution coloured video camera |
| Electric power | = 400 V 50 Hz | $CO_2$ detector | = alarm at 1500 ppm |
| Software | = PLC Allen-Bradlel | Pellets diameter | = Ø 3 mm cylindrical for blasting |
| Cartesian reciprocator axles | = 6 degree of freedom | Pellets length | = 5 ÷ 10 mm. Ø 3 mm |
| Useful courses of axle X | = 2000 mm | Productivity | = 80 kg/h |
| Useful courses of axle Y | = 1800 mm | Electric power | = 3 KW |
| Useful courses of axle Z | = 500 mm | Electrical supply | = 400 V 50 Hz |
| Reciprocator inclination | = 0°÷ 45° | Dimensions | = 1.750 x 550 x h 1.350 mm |
| Vertical wrist translation | = ± 30° | Liquid $CO_2$ entry pressure | = 12 ÷ 21 bar |
| Horizontal wrist translation | = ± 30° | Liquid $CO_2$ purity | = max 2 ppm di $H_20$ |
| Translating weight | = 10 kg | Liquid $CO_2$ feeding line | = insulated Ø ¾" |
| Max power of the nozzle | = 400 N | $CO_2$ exhaust line | = Ø 2 |

**All systems are customable according to the application**

## Supply

- Cabin completed with automatic dust remover
- Sequencer for filter cleaning
- Illumination system
- Cartesian reciprocator
- Rotating/inclinable platform
- Visual control system
- Commanding pulpit
- $CO_2$ gas detector
- Pelletizer P100E
- Draw plate Ø 3 mm
- Flexible connection P100E – Micro-blaster
- Automatic control system of pellets quantity
- Micro-blaster
- Gun with 15 m hose and cylindrical nozzle
- Handbook and maintenance instructions

**Cod. IM/ABS**

# AUTOMATIC EQUIPMENT

## Directly on the production line

### Cod. IM/FXX

## Benefits

- Uninterrupted operation 24h/24h
- No contact with dry ice pellets
- The only manual operation is the replacement of container, which serves as a pellet hopper system
- Pellets capacity from 20 to 80 kg/h
- System monitored and managed continuously on all physical and functional parameters
- No contact of pellets with the humidity of the air
- Venturi double hose blasting technology of dry ice pellets launching or single hose pressurized

**Cod. IM/FXX**

## Technology advantages

- Fully automatic machine
- Manual or controlled by a program operation
- Weighing and continuous setting of the CO2 pellets flow (20 to 80 kg/h)
- Continuous operation for long time. A 100 kg tank had an average autonomy of 2 hours at a rate of 45 kg/h
- Interchangeable tank
- Measurement of the substrate temperature
- Integration and external control possible. Digital inputs, Profibus, on demand
- Shelf life of $CO_2$ pellets in the tank up to 48 hours


## Applications

- Cleaning, degreasing and de-oxidation of surfaces before undergoing a surface treatment
- Cooling system integrated in the process

All systems are customable according on the application

# AUTOMATIC EQUIPMENT

## For the sanitization and the rejuvenation of the barrel

Cod. IM/BRQ

### Technical data

| | |
|---|---|
| **Barrels treated** | = Barriques 220 – 230 lt |
| **Automatic working cycles** | = n. 2 – sanitization and rejuvenation |
| **Production** | = 2.5 – 3 barrels per hour |
| **Dry ice consumption** | = 15 ÷ 20 kg/barrel |
| **Air compressed consumption** | = 4.2 $m^3$/h at 7 bar |
| **Results** | = Brettanomyces and lactic bacterium elimination |
| **Removal** | = 1 mm old toasted wood |
| **Dimensions** | = 4 x 2.2 x h2 mt |
| **Weight** | = 1450 kg |
| **Air connection** | = 1” Gas |
| **Electric connection** | = 400V-3F+T |
| **Safety** | = Anti-intrusion, soundproofed, accident-prevention, anti-pollution box |
| **Aspiration / filtration system** | = Automatic |
| **Atmosphere emission** | = according to the law 152 – powder < 5 mg/$m^3$ |
| **Conformity certification** | = CE |
| **Microbiological certification** | = CRA – CNR |
| **Uninterrupted operation** | = 24h / 24h |

### Characteristics

- **Palletized box, loadable on van**
- **PLC controlled equipment and Touch Screen**
- **Pre-installed and customable programs**
- **Single hose and dual hose blaster**
- **Application reciprocators at 6 degree of freedom**
- **Safety doors / opening**
- **Cycle time 20 – 25 minutes per barrel**
- **Manual work limited to barrel load/unload**
- **System fully customizable**

**Cod. IM/BRQ**

# AUTOMATIC EQUIPMENT

## Cleaning of tyres' moulds

### Cod. IM/TYR

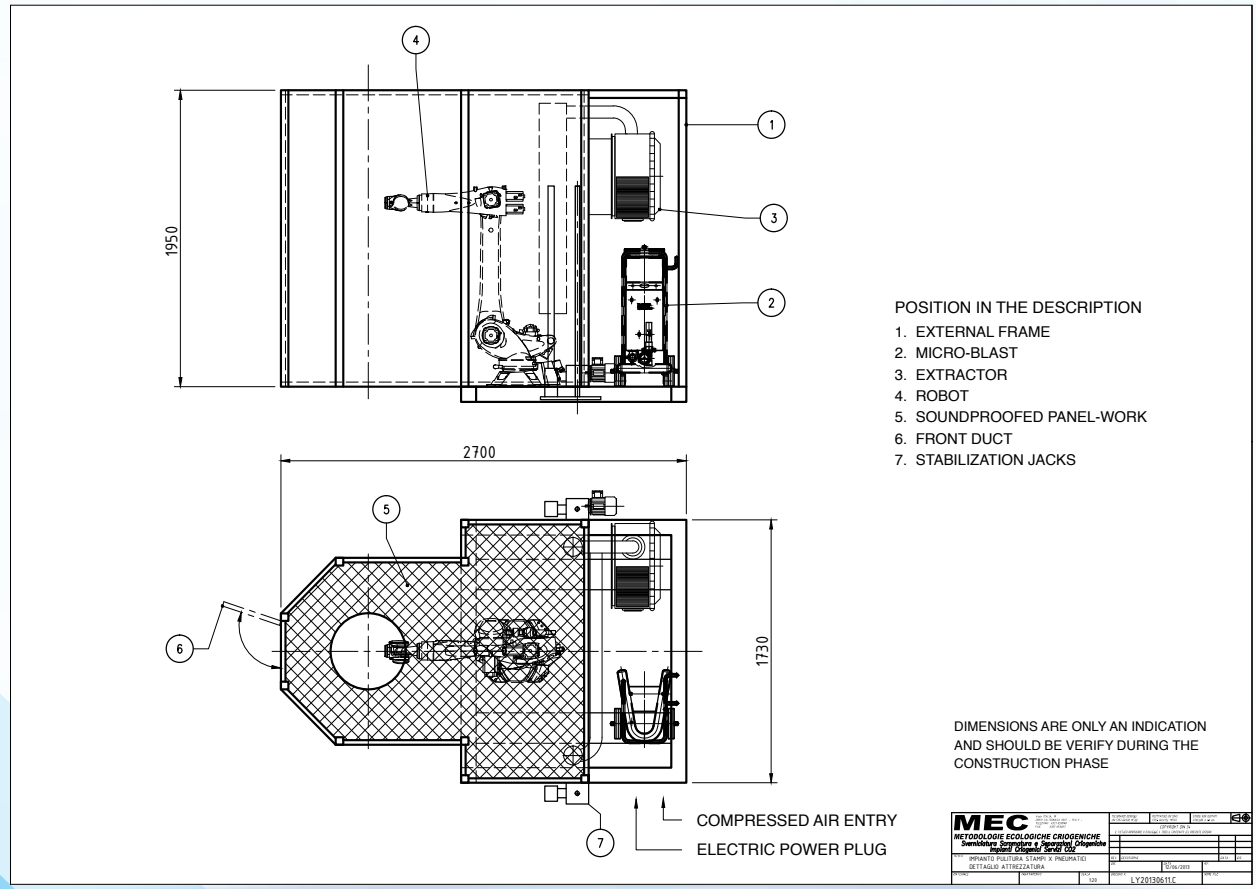
## Benefits

- Fully automatized
- Cleaning for every kind of tyres' moulds
- Accident-prevention, soundproofed and anti-pollution box
- Transportable with forklift
- Programmable cycles

**Cod. IB/TYR**

## Supply

1) Soundproofed module "BOX PT"
2) Anthropomorphic robot ABB-COMAU-KAWASAKI
3) Aspiration and filtration system AIR – AF
4) Dry ice pellets blaster MB MONO – CRH+S
5) Balancing and positioning system with box press: SAMP LASER



# DRY ICE

## What is dry ice?

The blasting agent which consists of dry ice is the solid form of CO2 (carbon dioxide) at a temperature of -78.5°C. $CO_2$ is a natural medium, which has an inherent thermal energy ready to be tapped.
At atmospheric pressure, solid $CO_2$ sublimates directly to vapour without a liquid phase. This unique property means that the dry ice blast medium simply disappears, leaving only the original contaminant to be disposed of.
The quality degree of carbon dioxide used in blasting is the same as the one used in the food and beverage industry and has been specifically approved by the FDA, the EPA and the USDA.
The carbon dioxide is an odourless, non-toxic gas, which is used in the drinks industry as an additive in beer and mineral water. It is also used in the food industry for cooling meat, sausage, etc. Carbon dioxide is a non-poisonous, liquefied gas that is both inexpensive and easily stored at work sites.
Of equal importance, it is nonconductive and non-flammable. $CO_2$ is a natural by-product of several industrial manufacturing processes such as fermentation and petrochemical refining.
The $CO_2$ given off by the above production processes is captured and stored without losses until needed. When the $CO_2$ returns to the atmosphere during the blasting process, no new $CO_2$ is produced.

## DRY ICE TYPOLOGY

Apparent high density – slow sublimation

Blocks

Tiles

Cylinders Ø 16 mm

Pellets Ø 3 mm

Dry ice snow

Apparent low density – fast sublimation

# The dry ice blasting technology

## How it works?

The dry ice blasting uses pellets of dry ice sprayed through a jet nozzle with compressed air to remove paints, oil, grease, dirt, ink, adhesives and other contaminants you want to remove. The frigid temperature of the dry ice (-78°C) against the dirty surface causes adhesion to shrink and loosen from the surface. On immediate impact, the dry ice evaporates into environmentally safe and innocuous $CO_2$ gas.

## The kinetic energy

The energy associated to the mass and to the speed is transferred to the surface to be cleaned/coating removal. This is the fundamental way to work either with this dry ice cleaning method or with sand/water etc.

## Thermal differential

When the dry ice pellets cold touch the surface, a small thermic difference occurs between the coating material, the contaminant and the substrate. This provokes cracks and the detaching facilitating the removal process.

## Micro – Explosion

When the dry ice touches the surface and it transforms into innocuous $CO_2$ gas, this tends to invade the cracks and the pores penetrating into the coating/contaminant, then it warms up and it expands rapidly, like micro-explosions. This makes the coating/contaminant detaching from the substrate, favouring still further the coating removal or the cleaning process.

## Sublimation

With an inferior pressure at 5.2 bar, the solid $CO_2$ transforms directly in gaseous state without turning into the liquid state. However, if the blasting pressure is superior at 5.2 bar (5.2 x 14.7 = 76.44 psi), the $CO_2$ in the sublimation state will show some characteristics of the liquid $CO_2$ while the same reaches its “triple point”.
It has been proved that the Liquid $CO_2$ is a strong organic solvent so it is reasonable to suppose that this solvent action can be present when the blasting pressure is superior at 5.2 bar.

# TECHNICAL **CLEANING**

## With dry ice

## Equipment needed for the technical cleaning with dry ice

**Compressor**

From 0.8 to 6 m³/min at 6 bar, depending on the Blaster type used: fixed or portable

**M.E.C. Blaster**

Dual hose or Single hose blaster

**Dry ice pellets**

Produced with M.E.C. pelletizers
Cryogenic boxes for the pellets storage

**Safety accessories**

Safety goggles, earmuff, cryogenic gloves, suit

## Compressed air treatment

In order to improve the compressed air quality, it is necessary to treat it considering 3 types of impurity, which compromise the machines' durability.

- Water quantity in the air
- Oil quantity in the air
- Solid particles in the air

| CLASS | SOLID PARTICLES | | QUANTITY OF WATER | QUANTITY OF OIL |
|---|---|---|---|---|
| | Max particles dimension (µm) | Max particles density (mg/m³) | Max dew point under pressure (°C) | Max oil concentration (mg/m³) |
| 1 | 0.1 | 0.1 | -70 | 0.01 |
| 2 | 1 | 1 | -40 | 0.1 |
| 3 | 5 | 5 | -20 | 1 |
| 4 | 15 | 8 | +3 | 5 |
| 5 | 40 | 10 | +7 | 25 |
| 6 | / | / | +10 | / |
| 7 | / | / | / | / |

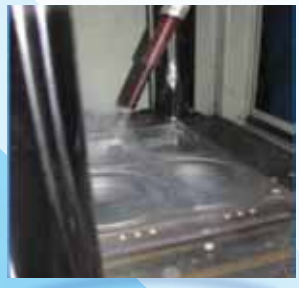
| | SOLID PARTICLES | | WATER DEW POINT | | MAX CONTAINED OIL | |
|---|---|---|---|---|---|---|
| USAGE | Class | (mm) | Class | °C | Class | Mg/m³ |
| Mining industry | 5 | 40 | 7 | / | 5 | 25 |
| Cleaning equipment and washing | 5 | 40 | 6 | +10 | 4 | 5 |
| Welding machines | 5 | 40 | 6 | +10 | 5 | 25 |
| Shaping | 5 | 40 | 4 | +3 | 5 | 25 |
| Pneumatic cylinders | 5 | 40 | 4 | +3 | 2 | 0.1 |
| Pneumatic valves | 3 ÷ 5 | 5 ÷ 40 | 4 | +3 | 2 | 0.1 |
| Packages | 5 | 40 | 4 | +3 | 3 | 1 |
| Measurement instruments | 2 | 1 | 4 | +3 | 3 | 1 |
| Bearings | 2 | 1 | 3 | -20 | 3 | 1 |
| Sensors | 2 | 1 | 2÷3 | -40 ÷ -20 | 2 | 0.1 |
| Food | 2 | | 4 | +3 | 1 | 0.01 |
| Photograph | 1 | 0.01 ÷ 0.1 | 2 | -40 | 1 | 0.01 |

# Sector where to use dry ice **blasting**

| | |
|---|---|
| **Aeronautic** | Delicate mechanical components cleaning for aeronautics |
| **Automation** | Mounting, transfer machines; belt conveyors (different types); carrier carts |
| **Automotive** | Mould for car parabola headlights; cleaning of cars, motor, gears, combustion chambers, “dry-clean” of vehicles inside part |
| **Chemistry** | Silos, containers, stocking reservoirs, chemical reactors |
| **Electric** | Electric transformers maintenance; inside electric board cleaning |
| **Environment** | Removing graffiti from walls, monuments conservative cleaning, removing “chewing-gum” from pavements; prefabricated industrial workshop inside cleaning |
| **Food industry** | Food containers, stocking reservoirs, food belt conveyors, food moulds (wafer, chocolates, cakes, etc.), metal strips for ovens (biscuits, crackers), food packaging machine (coffee, sauce, etc.); PET bottle moulds cleaning |
| **Foundry** | Pressure-fusion moulds for cast iron and aluminium (single block, head, cycle); foundry “shells” cleaning, foundry “core box” cleaning |
| **Hi-tech** | Cabin for anti-wearing layer application; gold-plating removing of quartz bell for epitaxial machines |
| **House hold article** | Moulds and lines for expanded insulator injection (refrigerators) |
| **Internal transport** | “Dry-clean” of elevator carts |
| **Maintenance** | Paint removing of signs and irremovable parts, moving stair |
| **Mechanic** | Tool machines, working centres, big fans |
| **Motorcycle** | Moulds for fibreglass articles production (safety helmet) |
| **Naval** | Ship kitchen ventilation pipes cleaning, removing anti-vegetative paint from boats |
| **Painting** | Airplane transporters, conveyors, liquid painting cabin, inside oven of plaint polymerisation, phosphorous-degreasing tunnel, manufactures paint-removing |
| **Petrol chemistry** | Decontamination of titanium coated reactors |
| **Plastic** | Plastic extruder screws and filters, moulds for plastics articles |
| **Printing** | Printing press (rotogravure and flexography), rollers for printing off set |
| **Railway** | Inside railway carriage cleaning, maintenance of train electrical driving system |
| **Rubber** | Tyre moulds (gaskets, sleeves, belts, silent block) |
| **Transportation** | “Dry-clean” of inside trucks and motor vehicles, containers cleaning |








# DRY ICE BLASTING APPLICATIONS

| Material | Surface | Equipment |
|---|---|---|
| Adhesive | Glass, metals, painted surfaces, plastics | Applicators, coating machines, labelling machines |
| Animal feed | Metals, plastics, rubbers | Bagging machines, extruders |
| Asbestos | Brick, concrete, metals, piping | Boilers, buildings, heaters |
| Biscuit | Conveyors, moulds | Baking ovens |
| Bitumen | Concrete, glass, metal, plastics | Construction equipment |
| Boiler scale | Boiler internal | Manifolds, valves |
| Bread | Baking tins, conveyors | Baking ovens |
| Carbon deposits | Commutators, electric and electronic components, metals | Electric motor windings, engine cylinder heads, generators, printed circuit boards (PCB's) |
| Chewing gum | Street paving | Process and packing equipment |
| Chocolate | Conveyors, moulds | Coating equipment |
| Combustion residues | Boiler membrane walls, fire tubes, flues | Burners, combustors, exhaust systems, reaction chambers |
| Crude oil | Holding vessel, piping | Drilling equipment, valves |
| Die coatings | Aluminium, steel, GRP | Casting and hot forming moulds |
| Fermentation residues | Vats | Distillery and brewing equipment, fermentation vessels |
| Fish residue | Working surfaces | Cutting and slicing equipment |
| Flour | Millstones, plastics, rubber, stainless steel | Milling and process equipment |
| Fluxes | Printed circuit board | PCB contact probes, PCB test equipment, welded surfaces |
| Foam residues | Cables, ducting, hydraulic hoses, mould vents | EPS and EPU processing equipment |
| Grease | Practically all | Acts as a degreasing process |
| Logos | Glass, metals, painted surfaces, plastics, rubber | Screen and tampon printed components |
| Mastics | Glass, metals, plastics, painted surfaces | Applications, sealed components |
| Meat residues | Bones, hides, metals, plastics | Animal by-products, cutting and processing equipment |
| Milk scale | Glass, stainless steel, plastics | Processing equipment |
| Mineral oils | Practically all, especially as degreasing process | Electrical and mechanical components, surfaces to be coated |
| Mould release agents | Low MP, alloys, aluminium, composite tooling, GRP, tool and stainless, etc. | Moulding tools and adjacent press equipment |
| Oil, grease and dirt | Cables, ducting, drive shafts, gears, hoses, switchgear, machine | All machines and engines especially when refurbishing |
| Organic growth | Ceramics, metals, stoneware, plastic | Holding tanks, water storage and purification equipment |
| Over spray | Glass, metal, painted surfaces, plastics, rubber | Spraying equipment, jigs, tools, etc. |
| Paint | Glass, metals, plastics, rubber | Conveyors, strayed components, jigs, pre-painted panels |
| Paper residues | Metals, plastics, painted surfaces, rubber | Printing presses |
| Vegetable oils | Glass, plastics, rubber, stainless steel | Mixing equipment |

# DRY ICE SNOW CLEANING

## TECHNOLOGY

During the cleaning process with dry ice snow, the liquid $CO_2$ turns into solid particles of dry ice, with diameter between 1 and 100 micron, through physical and thermodynamic processes. These snow particles from dry ice have a temperature of -78.5°C. The $CO_2$ particles are added proportionally to the compressed air. The particle acceleration is inserted through the flow of air compressed in a special nozzle. It is possible to generate a free homogenous blast observing the conditions of the flow, the temperature and the pressure. Different blasts can be created according to the nozzle type; as per example, a circular nozzle generates a circular blast with high precision and cleaning power, whereas a flat nozzle generates a large and constant blast with efficient cleaning. These dry ice snow blasts clean and prepare the surfaces. When the $CO_2$ particles hit the surface, they sublimate immediately.

## CLEANING METHODOLOGY

The cleaning with dry ice snow allows a delicate treatment of the surfaces. The $CO_2$ cleaning is based on a complicated mechanical process that includes temperature, cleaning and solvent effects. The dry ice snow particles cool down the contaminant immediately, causing a separation between them and the surface. Due to the immediate sublimation of the $CO_2$ particles, small pressure picks are created. They release micro impurities on the surfaces and in the pores. By cleaning along the whole surface, the contaminant is removed and disposed. A precision cleaning, especially for oil and grease, is realized thanks to the physical solubility of the $CO_2$ organic properties. The compressed air flow helps the removal of the contaminant.

## DISPOSAL

With the dry ice snow cleaning, the removed contaminants are now particles in the exhaust air. According to the application, an extractor and an exhaust filter can improve the quality of the surface, which has to be cleaned. Without a good extractor, the contaminants can be mixed with fresh air and therefore extracted and removed. The cleaning method self-converts into gaseous state, in this way only the contaminants have to be disposed.

# ELECTRICAL APPLICATIONS

The M.E.C. Microblast machines are units for cleaning equipment, machineries, plants, surfaces and so on by using pellets of solid $CO_2$ (dry ice), blasted with an appropriate gun made on this purpose. The user's and maintenance guide supplied with the machine reports the technical data and all the using precaution; furthermore, it gives to the users different examples about "what to clean". Especially the guide does not quote that the machine can also be used on electrical boxes under tension, but it specifies the right limits for this use, that means that it is permitted to work on electrical boxes under tension until 1000 Volt (light tension) but not over.

During the cleaning of boxes with electrical tension, the operator, with all the necessary protections and instructions, will not touch the electrical components and the $CO_2$ is not absolutely an element of electrical transmission, and so for evident practical reasons the working's distances place the operator in a very safe area.

The Italian CEI rules, according to the European rules for the safety of the electrical plants, permit to work on electrical box with light tension, as for CEI 11/37 and 11/47 procedures. Even if they do not specify the cleaning of electrical box and in particular the CO2 using, without requesting any particular certification on the machines employed, or on the operators, but only requesting the necessary good sense and the use of individual protections.

The laws and the Italian rules forbid works on and near machines and parts with tension over 1000 Volt.

The European CE plate on the MICROBLAST machine and the conformity declaration on the user's and maintenance guide grant that the machines follow the requisitions of 2006/42/CE, implemented in Italy with D. Lgs. N° 17 on 27th January 2010, regarding machines legislation of member states. These rules regulate the constructions of machines, the maintenance, and the purpose for which they are on the market, so that the safety and the health of the operators are granted, respecting the limits and for the purposes, he can work.

# DUAL HOSE **BLASTING SYSTEM**

The dual hose system uses the flu dynamic principle named “Venturi system”. The dried compressed air flows inside a hose and it reaches the gun: inside this gun, a “Venturi” nozzle creates before, through a constriction, an increase of the air speed, to leave it expand after.

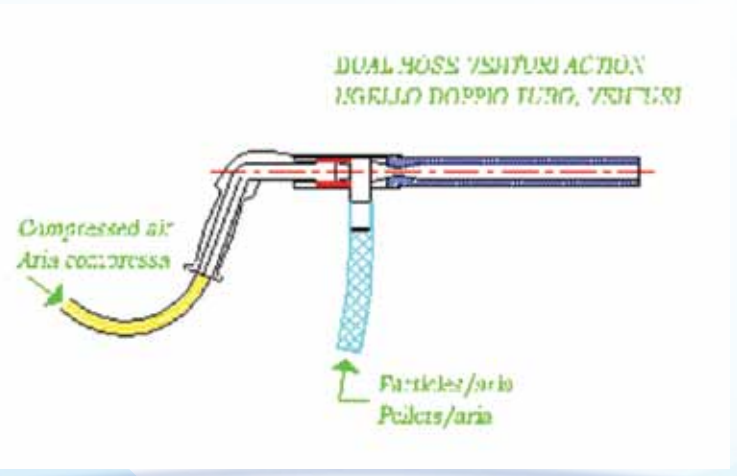
This expansion creates a vacuum and through the second hose, dry ice pellets are sucked.

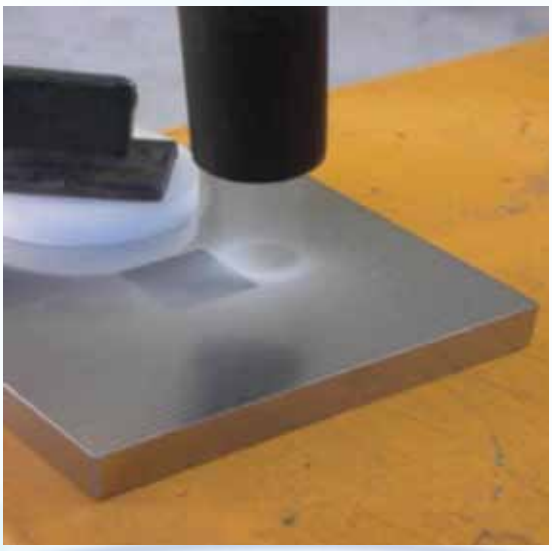
Pellets and compressed air are mixed and accelerated by the blasting barrel against the object to clean. With the double hose system the proportion between the nozzle (of the Venturi system) and the blasting barrel is very precise and with a very low variance to get an optimal flu dynamic performance and high speed. In particular the counter pressures which can be generated inside the barrel, for different construction reasons or of compressed air supply, can reduce or cancel the Venturi effect and in this way not aspirating pellets anymore or blasting them at lower speeds, therefore do not substitute the nozzle with not original ones.

## Benefits

The dual hose system can be used for 80% of all applications.

- **Simple machine**
- **Reliable**
- **Maintenance almost non-existent**
- **Machine easy to use**
- **Extremely regular pellets supply (without pulse)**
- **Lower pellets consumption compared with the single hose because the pellets are conveyed through the separate pellets hose to the gun without being destroyed**
- **Usable on all the materials, also on the sensible ones**



# SINGLE HOSE **BLASTING SYSTEM**

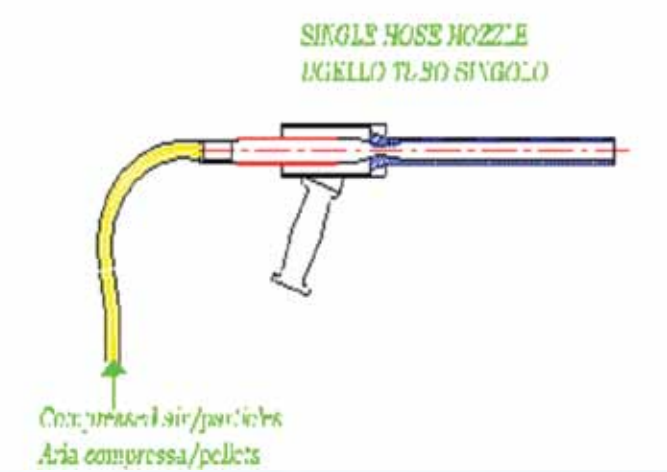
The single hose system uses a mechanical mixer, like a niches or holes dispenser. Pellets come in from the upper part of the distributor and this one, by turning, takes them to its lower part where the compressed air, which will take them out to the blasting gun, is injected. During this course, pellets and compressed air are mixed together inside the single-hose, and then they are accelerated inside the blasting barrel against the object to clean.
In the single hose system, since it is a pressure pushing system for the pellets, the flu dynamic nozzle/barrel balance is very stable and also the work efficiency will take advantage since any possible counter pressures created inside different blasting barrels do not modify the blasting speed and for this reason. With the single hose system it is possible to use all kind of barrels, also the most particular and special ones and with higher pressures of compressed air supply.

In the single hose system, two different type of nozzle type exists, which differ on building system:

- Subsonic nozzle with blasting speed lower than Mach 1
- Supersonic nozzle with blasting speed higher than Mach 1

## Benefits

- **All kind of nozzles can be used independently from the pressure of the air supply**
- **Length of the gun hose until 35-40 m.**
- **Possibility of vertical cleaning almost without aggression reduction**




# SANITIZATION

Dry ice is the $CO_2$ solid status, a gas devoid of colour, tasteless, odourless and it is available in the environment.
It is non-toxic gas, cheap and easy to stock; it is not electronically and thermally conductive.
The $CO_2$ cleaning uses dry ice pallets with high-speed airflow to remove contaminants from the surfaces without additional costs and without the treatment disadvantage of secondary waste removal.
Only the removed contaminant has to be collected.

## Cleaning without disassembling

Other than further cleaning methods, the $CO_2$ pellets have a very low temperature of -78.5°C.
The cleaning occurs through thermal shock: it crystallizes the material to be cleaned and the gas expansion breaks and removes the contaminants. The contaminant temperature is lowered and therefore it becomes more fragile.

It is a "dry process" and not based on chemical substances, it does not release any residue and it allows the immediate usage of the treated surfaces. It does not damage electrical components, sensors, switches or electrical boards.

It is scientifically proofed that the dry ice is able to sterilize and disinfect rooms.
According to the law EN 556, the probability of finding survived microorganisms after the treatment is 1 out of 1 million.
It is bactericide and it inactivates the virus in the environment and therefore it is used in medical fields. It is particularly suitable to grant environmental hygiene and public health.

## ADVANTAGES

Coming from the usage of this technology for the residue cleaning and for the environmental sanitization:

**1) Where it is requested the extraction of oil, sludge, grease, scale:**
- **a) Avoidance of cleaning chemicals**
- **b) Abrasion – free use**
- **c) No residuals or powder left**
- **d) Infiltration in holes and interstices**
- **e) No preventive protection requested for the components**
- **f) No need to dry the piece after the treatment**
- **g) No downtime or disassembly needed for the pieces to be cleaned**
- **h) No electric supply needed, the machine is autonomous**
- **i) Lower cleaning time and savings in costs**

**2) Where it is requested an environmental sanitization: in addition to the characteristics mentioned above**
- **a) It allows the immediate utilization of chairs, armchairs, sofa, reducing the waiting time after the cleaning**
- **b) It cuts down the bacteriological pollutants and the allergenic, it grants a bactericide action useful for public health**

## ADVANTAGES IN THE $CO_2$ USAGE:

- **The substance is easy to find**
- **Not inflammable**
- **Not combustible**
- **Not carcinogenic**
- **Not corrosive**
- **Not reagent**
- **Not toxic**
- **Inactive gas**
- **Recyclable**
- **Abundant**
- **It separates immediately from the contaminants**
- **It is suitable for cleaning of parts incompatible with water and high temperature**

Its applications are numerous: from the cleaning of typographic printing machines to the tank, and for the sanitization of aircrafts, train, buses, cars, hospitals and public rooms.

# SERVICES AND **SOLUTIONS**

## offered by M.E.C.

In order to satisfy our customers' needs, M.E.C. offers services and solutions of technical cleaning with dry ice.

### Dry Ice production

M.E.C. produces and delivers dry ice high density in different shapes:

- Pellets Ø 3 mm
- Cylinders Ø16 mm
- Tiles 125 x 125 – thickness 20 mm – weight 1 kg each
- Tiles 125 x 250 – thickness 50 mm – weight 2.5 kg each
- Blocks 500 gr and 750 gr

### Dry Ice supply

M.E.C. provides delivery of the Dry Ice within 24h also during Christmas time and mid – August holiday. M.E.C. does not effectuate holiday closure. Furthermore, M.E.C. coordinates delivery schedules in order to satisfy any customer needs.

### $CO_2$ Service

The $CO_2$ cleaning service with dry ice offered by M.E.C. is handled either at the customer's site or in our cleaning facility. Factory-trained technicians are able to handle any customer requests and any applications event after hours and weekends.

Furthermore, M.E.C. offers an In-house $CO_2$ cleaning service at our facility fully equipped to handle a range of cleaning and stripping applications.

### Rental

M.E.C. offers rentals services, providing the customer with the right quantity of dry ice necessary for the use of M.E.C. Blasters. For the quotation, contact M.E.C.

### Assistance

M.E.C. puts at the customer's disposal the ability of its professionals for maintenance works on M.E.C. plants and cryogenic machines. M.E.C. professionals are able to:

- Handle complex installations in order to maximise the performance of the machines
- Manage regularly scheduled maintenance programs to keep your machine working at maximum efficiency
- Answer questions and provide support when customer needs it
- Provide maintenance and replacements when needed
- Provide temporary replacement machines while your system is being repaired at our factory.

### Training

M.E.C. offers a Training useful for the correct use of the cryogenic machines. The training can be handle in - house or to the customer.

### Maintenance Programs

M.E.C. offers to the customers regularly scheduled maintenance programs, by stipulating an annual contract with fixed rated. If during the maintenance it would be necessary to replace parts, M.E.C. guarantees the replacement as soon as possible at an additional cost.

### Spare parts and accessories

M.E.C. offers a continuous support to customer, by providing useful advices to guarantee high performances to machines and equipment.

M.E.C. warehouse is complete with all accessories and spare parts in order to guarantee the delivery of them, with express courier in 24 – 48 h. Abroad, in some Countries as for example the Middle East the delivery is guaranteed in 72 h. M.E.C. professionals are able to handle the installation of spare parts when requested by the customer.

METODOLOGIE
ECOLOGICHE
CRIOGENICHE
MEC $CO_2$

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