



Dry ice cleaning technologies

CATALOGUE



MEC CO₂

The logo features the letters 'MEC' in a bold, blue, sans-serif font. The 'C' is stylized with a brushstroke effect that extends to the right, where it meets the 'CO₂' text. The 'CO₂' is in a smaller, blue, sans-serif font.



MECRIOS
GROUP

The logo consists of the word 'MECRIOS' in a bold, blue, sans-serif font. The letter 'C' is replaced by a stylized orange and blue circular graphic. Below 'MECRIOS' is the word 'GROUP' in a smaller, blue, sans-serif font.

OUR COMPANY

DRY-ICE CLEANING FROM 1991

Made in Italy



M.E.C. srl was founded in 1991 and it is the first Italian manufacturer of machines and equipments 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 work any customer's necessity out.

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



CLEANING TECHNOLOGY

with Dry Ice

NO solvents

NOT abrasive

NO waste increase

CHEMICALLY inactive

NO contamination

SOFT and/or **AGGRESSIVE**

SANITIZE and **CLEAN** (bacteria removal)

ELECTRICALLY insulating

SUITABLE for dangerous spaces

(Full pneumatic and electropneumatic versions)

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Dry Ice **BLASTER**

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Snow blasting - dry ice snow from
50 to 300 micron (from 0.05 to 0.3 mm)
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Precision blasting - micro-pellets from
300 to 1700 micron (from 0.3 to 1.7 mm)
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1700 to 3200 micron (from 1.7 to 3.2 mm)
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SERVICES AND SOLUTIONS

SNOW CLEANING – **SB SERIES**

Dry ice snow blaster



MODELS

SB/A
SB/M
SB/VH



SPECIFICATIONS Cleaning system with dry ice snow for automotive industry
 Usable with tank or liquid CO₂ cylinder

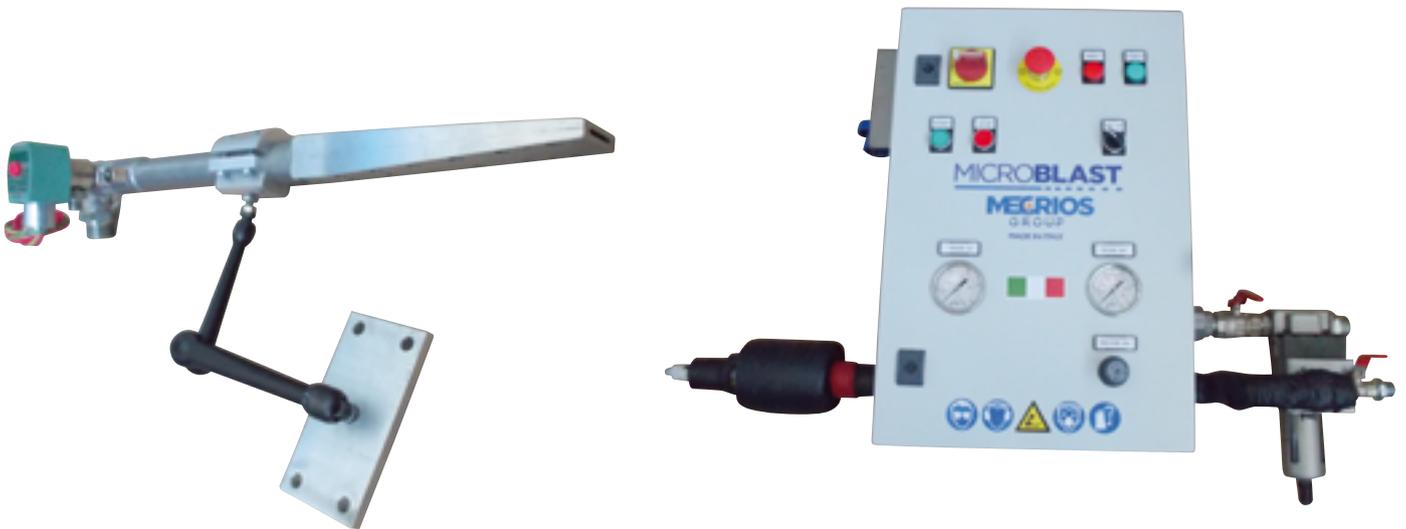
TECHNICAL DATA

Consumption	Liquid CO ₂ 0.4-1.5 kg/min Compressed air 1-5 m ³ /min Electric power – 0.25 kW
Pressure	CO ₂ 15-60 bar Air 2-13 bar
Quality	CO ₂ with H ₂ O <20 ppm Compressed air* as per ISO 8573-1 cl. 2
Feeding	CO ₂ with cylinders or tank Electric power – 230 V – 50 Hz single phase

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

SUPPLY

- Supply
- Electro-pneumatic control unit with PLC and Touch Screen
- Blasting gun with dry ice snow from liquid CO₂
- Flat nozzle 80 mm with robot support
- CO₂ hose
- Compressed air hose



SPECIFICATIONS Automatic blasting gun for dry ice snow
 Usable with tank or liquid CO₂ cylinders

TECHNICAL DATA

Consumption	Liquid CO ₂ 0.4-1.5 kg/min Compressed air 1-5 m ³ /min Electric power – 0.25 kW
Pressure	CO ₂ 15-60 bar Air 2-13 bar
Quality	CO ₂ with H ₂ O <20 ppm Compressed air* as per ISO 8573-1 cl. 2
Feeding	CO ₂ with cylinders or tank 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 panel
- Blasting gun with dry ice snow from liquid CO₂
- Flat nozzle 50 mm or cylindrical 10 mm
- Liquid CO₂ hose
- Compressed air hose



SPECIFICATIONS Portable blasting gun for dry ice snow
Usable with liquid CO₂ cylinders

TECHNICAL DATA

Consumption	Liquid CO ₂ 0.4-1.5 kg/min Compressed air 1-5 m ³ /min
Pressure	CO ₂ 20-80 bar Air 2-10 bar
Quality	CO ₂ with H ₂ O <20 ppm 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

- Pneumatic control box
- Blasting gun with dry ice snow from liquid CO₂
- Supersonic nozzle (flat or cylindrical)
- Liquid CO₂ hose
- Compressed air hose

Cod. **SB-102-B2**

SUPERSONIC FLAT NOZZLE

Material	Aluminium
Usage	Flat surfaces
Section	2x40 mm



Cod. **SB-102-IT**

CYLINDRICAL NOZZLE

Material	Thermo plastic
Usage	General surfaces
Section	Ø 10 mm



PRECISION BLASTING – **PB SERIES**

Micro-Pellets Blasters

MODELS

PB/ALICE-M
PB/ALICE-B
PB/ALICE-NCJ-B

ACCESSORIES

BLASTING GUNS
NOZZLES
HOSES

Cod. **PB/ALICE-M**

PB/SERIES Micro-Pellets Blaster



SPECIFICATIONS The ALICE/M 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, nuggets, tiles, broken pieces.

TECHNICAL DATA

Operating pressure	= 2 ÷ 6 bar
Feeding pressure	= max 10 bar
Electric consumption	= 230 V 50 Hz 0.3 kW single-phase
Dry ice capacity	= 12 kg
Dry ice consumption	= 0,1 ÷ 0,6 kg/min
Dry ice quality	= every form and dimension (pellets, nuggets, etc.)
Dimensions	= 600 x 370 x h 530 mm
Weight	= 74 kg
Air connection	= 1/2 " gas
Compressed air consumption*	= 0.8 mc/min at 5 bar
Noise level	= 82 dB (A) at 4 bar
Technology	Single hose

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

SUPPLY

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

Cod. **PB/ALICE-B**

PB/SERIES Micro-Pellets Blaster



SPECIFICATIONS ALICE/B is a double 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
Electric consumption	= 230 V 50 Hz 0.37 kW single-phase
Dry ice capacity	= 12 kg
Dry ice consumption	= 0,1 ÷ 0,6 kg/min
Dry ice quality	= 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

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

PB/SERIES Micro-Pellets Blaster



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

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 a liquid CO₂ cylinder or tank
Self-production of micro-pellets.**

TECHNICAL DATA

Operating pressure	= 2 ÷ 8,5 bar
Feeding pressure	= max 10 bar
Electric consumption	= 230 V 50 Hz 0.3 kW single-phase
Dry ice capacity	= 12 kg
Dry ice consumption	= 0,1 ÷ 0,6 kg/min
Dry ice Quality	= 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
Technology	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

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



Cod. **ALI 081**

Model	STANDARD
Material	Tufnol
Length	120 mm
Diameter	4-7mm



Cod. **ALI 006**

Model	FLAT
Material	Alluminium
Section	2x20 mm



- 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

Model	CLASSIFIER
Material	Aluminium
Usage	Delicate surfaces



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 1/2"
Material	Black rubber



DRY ICE BLASTING – **MB SERIES**

Pellets Blasters

All blasters can be made both with single hose or with double hose (Venturi technology).

All blasters can be made both with pneumatic or electro-pneumatic version.

MODELS

MB/M1 Basic single hose

MB/B1 Basic double hose

MB/M2 Advanced single hose

MB/B2 Advanced double hose

MB/B2-BK Advanced double hose with bicarbonate powder mixer

MB/M2-CR Advanced single hose with pellets' crusher

SPECIAL MACHINES

MB /10 With PLC and Touch screen

ACCESSORIES

GUNS

NOZZLES

HOSES

SUPPLEMENTARY FOR BLASTERS

COMPRESSED AIR TREATMENT

ADDITIONAL ACCESSORIES

Cod. **MB/M1**

MB/SERIES Single Hose Blasters



SPECIFICATIONS Pressurized single hose with **subsonic nozzle**
Fully pneumatic (**no usage of energy power**)
very simple, for basic entry level customers

TECHNICAL DATA

Consumptions	Dry ice 40 kg/h Compressed air* 3.7 m ³ /min at 6 bar
Pressure	At work – 6 bar
Speed	Of the flow – 340 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/M1
- "Blue" gun with 3.5 m hoses with (subsonic) nozzle
- Handbook and maintenance instructions

Cod. **MB/B1**

MB/SERIES Double Hose Blasters



SPECIFICATIONS Double hose **Venturi system**
Fully pneumatic (**no usage of energy power**)
Very simple, for basic / entry level customers

TECHNICAL DATA

Consumptions	Dry ice 40 kg/h Compressed air 4,2 m ³ /min at 6 bar
Pressure	At work - 6 bar
Flow Speed	Of the flow - 340 m/sec
Capacity	Pellets - 20 kg
Dimensions	300x500x750 mm
Weight	45 kg (42+3 hoses)
Connection	Air 1 " BSP

* The compressed air must not contain oil, foreign bodies, water

SUPPLY

- Microblast MB / B1
- "Axx" gun with 3,5 m hose and cylindrical nozzle
- Handbook

Cod. **MB/M2**

MB/SERIES Single Hose Blasters



SPECIFICATIONS Pressurized single hose system with **supersonic nozzle**
Fully pneumatic (**no usage of energy power**)

TECHNICAL DATA

Consumptions	Dry ice 30÷80 kg/h Compressed air 3,7 m ³ /min at 6 bar
Pressure	At work - 6÷13 bar
Flow Speed	Of the flow - 520 m/sec a 6 bar
Capacity	Pellets - 20 kg
Dimensions	300x500x750 mm
Weight	45 kg (42+3 hoses)
Connection	Air 1 " BSP

* The compressed air must not contain oil, foreign bodies, water

SUPPLY

- Microblast MB / M2
- "Blue" gun with 5 m gun hoses and supersonic nozzle
- Handbook and maintenance instructions

Cod. **MB/B2**

MB/SERIES Double Hose Blaster



SPECIFICATIONS Double hose **Venturi system**
Fully pneumatic (**no usage of energy power**)

TECHNICAL DATA

Consumptions	Dry ice 30 ÷ 80 kg/h Compressed air 4,2 m ³ /min at 6 bar
Pressure	At work - 6 ÷ 13 bar
Flow Speed	Of the flow - 380 m/sec
Capacity	Pellets - 20 kg
Dimensions	300x500x750 mm
Weight	45 kg (42+3 pipes)
Connection	Air 1 " BSP

* The compressed air must be kept clean and free of oil, external bodies and water

SUPPLY

- Microblast MB / B2
- "AXM" gun with 3,5 m gun hoses and cylindrical nozzle
- Handbook and maintenance guide

Cod. **MB/B2-BK**

MB/SERIES Double Hose Blasters



SPECIFICATIONS The MB/B2-BK Venturi double 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 (dry ice is usually 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 workers' movements. MB/B2-BK 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) depending on the surface to be cleared and the nozzle type
Technology	Venturi dual hose system or single hose
Function	Pneumatic or electro-pneumatic
Peculiarity	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



SPECIFICATIONS MB/M2-CR is equipped with a pneumatic crusher device, which grinds all shapes 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 users, with no possibilities to procure dry ice pellets.

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) depending on the surface to be clean and the nozzle type
Peculiarity	Crusher device
Technology	Venturi double hose or single hose system
Function	Pneumatic or electro-pneumatic

*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

SPECIAL MACHINES

Cod. **MB/10**

MB/SERIES Blasters



TECHNICAL DATA

Operating pressure	= 2.5 ÷ 16 bar
Dry ice capacity	= 35 kg
Dry ice consumption	= 0 ÷ 100 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	= 90 dB(A) – 120 dB (A) depending on the surface to be cleaned and on the nozzle type
Function	Electro-pneumatic functioning

SUPPLY

- Microblast MB/10
- Gun MB/10
- Cylindrical nozzle
- Handbook
- With PLC + touchscreen

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 – 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. **DBS – 01**

Model	ROBOT – AUTOMATIC
Material	Steel / Acetalic Resin
Usage	Automatic system



Cod. **MB/S2 - 03**

Model	VERTICAL SINGLE HOSE
Material	Thermoplastic
Usage	General, soft applications



Cod. **MB/S2 - 04**

Model	HORIZONTAL SINGLE HOSE
Material	Thermoplastic
Usage	General, hard applications



Cod. **MB/AL – 002**

Model	COAX STANDARD
Material	Stainless steel 304



Cod. **MB/AL - A013-bis**

Model	90° MOULDS
Material	Stainless steel 304 Anti-rebound,
Usage	High accessibility for moulds



Cod. **DBS – 02**

Model	ROBOT 2 -AUTOMATIC GUN
Material	Stainless steel 304
Usage	Automatic systems



Cod. **MB/RPG**

Model	COAXIAL DUAL HOSE GUN
Material	Aluminium
Usage	Long shot



Cod. **MB/MO – A001**

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



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



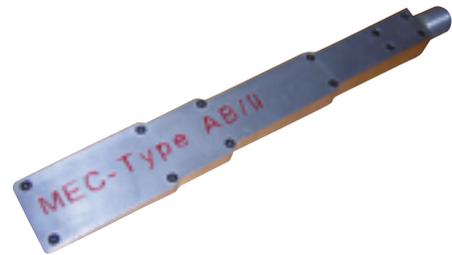
Cod. **MB/A017**

Model	CRUSHER
Material	Stainless steel / aluminium
Usage	It turns pellets into dry ice powder



Cod. **MB/MO – A020**

Model	AB II
Material	Aluminium
Length	400 mm
	Very low noise 89 dB (A) at 6 bar



ACCESSORIES SUPERSONIC NOZZLES

MB/SERIES 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 – S057

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



Cod. **MB/AL – A049**

Model	CYLINDRICAL STANDARD
Material	Tufnol (phenolic resin)
Length	250 ÷ 750 mm
Usage	General application



Cod. **MB/AL – A049A**

Model	CYLINDRICAL STANDARD ALUMINIUM
Material	Aluminium
Length	250 mm
Usage	General application



Cod. **MB/AL – A011**

Model	CURVED 30° CYLINDRICAL
Material	Stainless steel / Aluminium
Length	From 150 to 350 mm
Usage	Tight areas



Cod. **MB/AL – 048**

Model	INTERNAL VENTURI NOZZLE (L-M-H)
Material	Aluminium
Flow	L - 2200 l/min M - 3100 l/min H - 4200 l/min



Cod. **MB/AL – A012**

Model	FLAT NOZZLE
Material	Aluminium
Flow	350 mm
Usage	For flat surfaces



Cod. **MB/MO – A021-50**

Model	SINGLE HOSE PIPES, SUITABLE FOR FOOD INDUSTRY
Length	From 5 to 50 m
Material	Silicon



Cod. **MB/AL - A019 - 35**

Cod. **MB/AL - A019 - 50**

Model	SILICON HOSE, HIGH FLEXIBILITY SUITABLE FOR FOOD INDUSTRY
Material	Elastomer hose with fittings for compressed air
Length	3.5 m and 5 m available up to 10 m



Cod. **MB/AL -A002**

Model	AIR COMPRESSED HOSE
Material	NBR rubber
Length	1" x 10 m



ACCESSORIES

Compressed air treatment

Cod. MTA 10

CYCLONE MOISTURE SEPARATOR

6 m³/min – 16 bar

Inlet 1"

Filtration 1 micron



Cod. MTA 21

AIR 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

4.6 m³/min

16 bar

Filtration 0.01 micron

Residual oil 0.01 mg/mc



Cod. MTA 17

ELECTRIC HEATER

Capacity: 1 mc/min

Air temperature: 20-120 °C

Power: 1.5 kW, 230 V 50 Hz

Air connection: 1/2"



Cod. MTA42

ELECTRIC HEATER

Capacity: 5 mc/min

Air temperature: 20-250 °C

Power: 12 kW, 230 V 50 Hz

Air connection: 1



Cod. MB/VR – A005

Safety kit:

Cryogenic gloves, earmuff, mask protective, suit



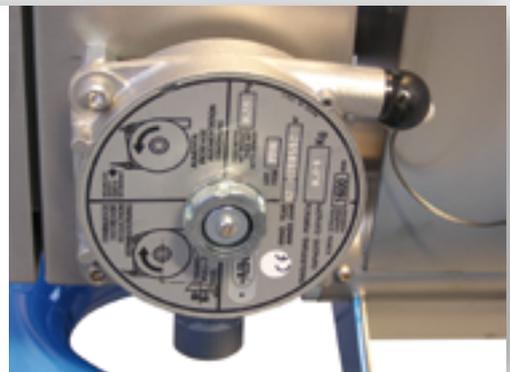
Cod. MB/VR – A008

Led lamp for gun
Battery-operated



Cod. MB/VR – A016

Electrostatic grounding
for blasters and guns

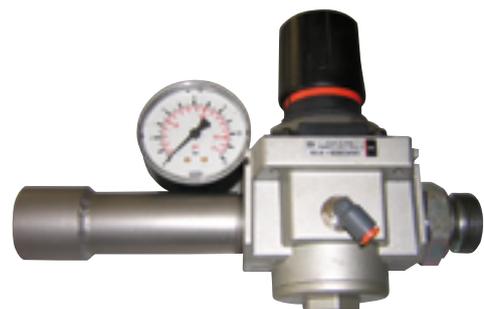


Cod. MB/VR – A017

Pressure reducer for
compressed air

Capacity 6 m³/min

Pressure 0-10 bar



Cod. **MB-X3**

Gun with selector

Selector	Size 0,5 mm Size 0,8 mm Size 1,0 mm
Material	Inox



DRY ICE

Markers

PELLETIZERS

P40 MC-B
P60 MC
P100 E
P150 E
P300 E
Accessories

PRESSES

PPB 20 MB
PPB 300 IR

DRY ICE BOXES

CRYO BOX

Cod. **P40MC**

Pelletizers

OIL FREE



**SPECIFICATIONS
ADVANTAGES**

- OIL FREE: without lubrication
For alimentary and pharmaceutical usage
LIGHT series
Mechanical functioning
- Productivity: 35 kg/h
 - Ideal for laboratories, hospitals, food distributors, manufactures, etc.

TECHNICAL DATA

Pellets dimension	= \varnothing 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	= 15 bar
Liquid CO ₂ purity	= max 20 ppm of H ₂ O
Liquid CO ₂ feeding line	= \varnothing 1/2"
CO ₂ exhaust line	= \varnothing 1 1/4"

- SUPPLY**
- Die-plate \varnothing 3 mm
 - Handbook

- ACCESSORIES**
- Die-plate \varnothing 9 mm and \varnothing 16 mm

Cod. **P40MC-B**

Pelletizers

OIL FREE



SPECIFICATIONS OIL FREE: without lubrication
LIGHT series
Mechanical functioning

ADVANTAGES

- Productivity: 25 kg/h
- Powered with a bundle of cylinders of liquid CO₂ with dip. tube

TECHNICAL DATA

Dimensione pellets	Ø 3 mm
Pellets length	= 5 ÷ 10 mm
Productivity	= 25 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	= 50 bar
Liquid CO ₂ purity	= max 20 ppm of H ₂ O
Liquid CO ₂ feeding line	= Ø 1/2"
CO ₂ exhaust line	= ø 1 1/4"

SUPPLY

- Die-plate Ø 3 mm
- Handbook

ACCESSORIES

- Die-plate Ø 9 mm and Ø 16 mm

Cod. **P60MC**

Pelletizers

OIL FREE



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	= \varnothing 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 ₂ O
Liquid CO ₂ feeding line	= \varnothing 1/2"
CO ₂ exhaust line	= \varnothing 1 1/4"

SUPPLY

- Die-plate \varnothing 3 mm
- Handbook

ACCESSORIES

- Die-plate \varnothing 9 mm and \varnothing 16 mm

Cod. **P100E**

Pelletizers

OIL FREE



SPECIFICATIONS OIL FREE: without lubrication
For alimentary, pharmaceutical and industrial usage
HEAVY DUTY series
Mechanical functioning

TECHNICAL DATA

Pellets dimension	= \varnothing 3 mm
Pellets length	= 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	= 15 bar
Liquid CO ₂ purity	= max 20 ppm of H ₂ O
Liquid CO ₂ feeding line	= \varnothing 3/4"
CO ₂ exhaust line	= \varnothing 2"

SUPPLY - Die-plate \varnothing 3 mm
- Handbook

ACCESSORIES - Die-plate \varnothing 9 and 16 mm

Cod. **P150E**

Pelletizers

OIL FREE



SPECIFICATIONS OIL FREE: without lubrication
For alimentary, pharmaceutical and industrial usage
HEAVY DUTY series
Mechanical functioning

TECHNICAL DATA

Pellets dimension	= \varnothing 3 mm
Pellets length	= 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	= 15 bar
Liquid CO ₂ purity	= max 20 ppm of H ₂ O
Liquid CO ₂ feeding line	= \varnothing 3/4"
CO ₂ exhaust line	= \varnothing 2"

SUPPLY - Die-plate \varnothing 3 mm
- Handbook

ACCESSORIES - Die-plate \varnothing 9 and 16 mm

Cod. **P300E**

Pelletizers

OIL FREE



SPECIFICATIONS OIL FREE: without lubrication
For alimentary, pharmaceutical and industrial usage
HEAVY DUTY series
Mechanical functioning

TECHNICAL DATA

Pellets dimension	= \varnothing 3 mm
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	= 15 bar
Liquid CO ₂ purity	= max 20 ppm of H ₂ O
Liquid CO ₂ feeding line	= \varnothing 3/4"
CO ₂ exhaust line	= \varnothing 2"

SUPPLY - Die-plate \varnothing 3 mm
- Handbook

ACCESSORIES - Die-plate \varnothing 9 and 16 mm

ACCESSORIES

Pelletizers

Cod. P - 40 - 3

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



Cod. P - 40 - 9

Interchangeable plate Ø 9 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 - 40-20

Interchangeable plate Ø 20 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



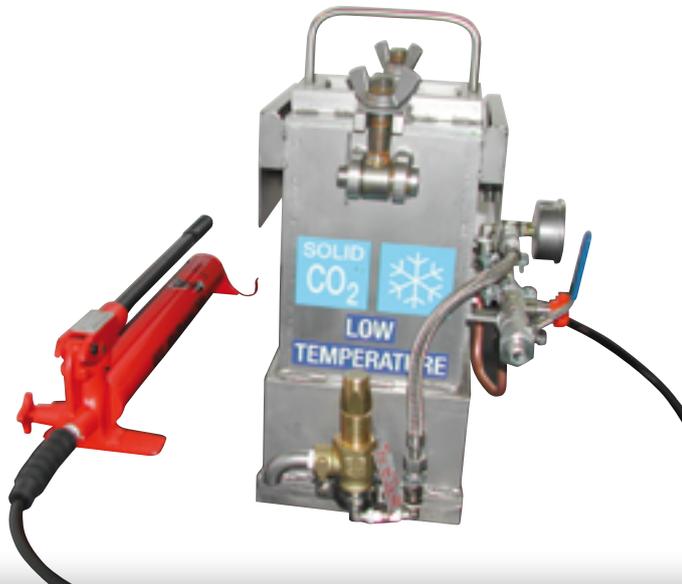
Cod. P - 100 - 16

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



Cod. **PPB-20-MB**

PRESS Dry ice tiles maker



SPECIFICATIONS Functioning: MANUAL
Supply: liquid CO₂ 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	= 15 kg/h
Dimensions	= 170 x 170 x h 340 mm
Weight	= 18 kg
Liquid CO ₂ entry pressure	= 12 ÷ 50 bar
Liquid CO ₂ purity	= max 20 ppm di H ₂ O
Liquid CO ₂ feeding line	= Ø 1/4"
CO ₂ exhaust line	= free

SUPPLY - Press
- Handbook

Cod. **PPB 300 IR**

PRESS Dry ice and blocks maker



SPECIFICATIONS Functioning: hydraulic
Reformer press
It produces dry ice tiles and blocks using pellets

TECHNICAL DATA

Tile dimensions	= 125 x 250 x h 20 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 Ø 3 mm

SUPPLY - Reformer
- Handbook

DRY ICE STORAGE

Cryoboxes

Cod. **CRY 60M** - Cryobox 60 kg

Material	Thermoplastic
External dimensions	400 x 850 x h 380 mm
Pellets capacity kg	60
Tare kg	12
Thermal conductivity	0.42 W/m ² /K



Cod. **CRY 125 M** - Cryobox 125 kg

Material	Thermoplastic
External dimensions	570 x 725 x h 840 mm
Pellets capacity kg	125
Tare kg	40
Thermal conductivity	0.42 W/m ² /K



Cod. **CRY 250 A** - Cryobox 250 kg

Material	Thermoplastic
External dimensions	1000 x 800 x h 930 mm
Pellets capacity kg	250
Tare kg	80
Thermal conductivity	0.38 W/m ² /K



ENGINEERED SYSTEM

SOUNDPROOF BOOTHS

Silent box
Blast room

AUTOMATIC SYSTEM

ABS (Automatic blasting System)
IM FXX
CRYO BARRIQUES

Cod. CA/SI **SILENT BOX**

Soundproof booths



TECHNICAL DATA

Internal useful dimensions	= 1100 x 1100 x h 1100 mm
Operating platform dimensions	= \varnothing 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	= 400 V 50 Hz

ACCESSORIES

- Soundproof booth
- Rotating platform for cleaning work
- Air aspiration and filtration system
- Handbook
- Operating platform with electrical mechanic rotation
- CO₂ level detector in the working area

MODELS

Cod. CA/SI - 1.0	Silent Box \varnothing 1.000 mm
Cod. CA/SI - 1.2	Silent Box \varnothing 1.200 mm
Cod. CA/SI - 1.5	Silent Box \varnothing 1.500 mm

Cod. CA/BR BLAST ROOM

Soundproof booths



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

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

*Other dimensions available; all systems are customizable according to the application



TECHNICAL DATA

Room useful dimensions	= 4200 x 5000 x h 3500 mm	X & Y axes translation speed	= 3 m/min
Doors opening	= 2500 x h 2500mm	Z axes 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	Pellets diameter	= Ø 3 mm cylindrical for blasting
Cartesian reciprocator axes	= 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 20 ppm di H ₂ O
Translating weight	= 10 kg	Liquid CO ₂ feeding line	= Ø 3/4"
Max power of the nozzle	= 400 N	CO ₂ exhaust line	= Ø 2

All systems are customizable 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
- CO₂ gas detector
- Pelletizer P100E
- Die plate Ø 3 mm
- Flexible connection P100E – Micro-blaster
- Blaster
- Gun with 15 m hose and cylindrical nozzle
- Handbook and maintenance instructions

**BENEFITS**

- Uninterrupted operation 24h/24h
- No contact with dry ice pellets
- The only manual operation is the replacement of cryoboxes, 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

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 cryobox had an average autonomy of 2 hours at a rate of 45 kg/h
- Interchangeable cryobox
- Measurement of the substrate temperature
- Integration and external control possible.
- Shelf life of CO₂ pellets in the cryobox 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 customizable according on the application

Cod. IM/BRQ
CRYO BARRIQUES

Automatic system



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-50 Hz
Safety	= Anti-intrusion, soundproofed, accidentprevention, anti-pollution box
Aspiration / filtration system	= Automatic
Atmosphere emission	powder < 5mg/m ³
Conformity certification	= CE
Microbiological certification	= CRA – CNR
Uninterrupted operation	= 24h / 24h

SUPPLY

- Palletized box, loadable on van
- PLC controlled equipment and Touch Screen
- Pre-installed and customizable 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



TECHNICAL INFORMATION

- Pag. 55 **Dry ice blasting technology**

- Pag. 56 **Dry ice**

- Pag. 57 **Technical cleaning with dry ice**

- Pag. 58 **Electrical applications**

- Pag. 59 **Dry ice blasting application ares**

- Pag. 60 **Carbonic snow cleaning**

- Pag. 61 **Dry ice blasting applications**

- Pag. 62 **Single hose blasting system**

- Pag. 63 **Double hose blasting system**

- Pag. 64 **Sanitization**

- Pag. 65 **Services and solutions offered by Mec**

DRY ICE BLASTING TECHNOLOGY

HOW IT WORKS? Dry ice blasting uses dry ice pellets which are sprayed through a jet nozzle with compressed air; this technology can remove paints, oil, grease, dirt, ink, adhesive and other contaminants. The extremely low temperature of dry ice (-78.5°C) causes the separation of the contaminant from the surface to be cleaned. The immediate impact causes dry ice sublimation, which dissipates in the atmosphere as CO₂ at gas state, without creating any kind of damage, being it a natural and inoffensive gas.

THE KINETIC ENERGY The energy associated with mass and speed is immediately transmitted against the dirty surface to be cleaned. This is the basis on which this cleaning system is based, but also the other traditional systems, like the ones that uses sand or water.

$$E = \frac{1}{2} mv^2$$

THERMIC DIFFERENTIAL When dry ice pellets get in contact with the surface, they create a thermal shock between the contaminant and the substratum, due to very low temperature. This provokes breaches and separations, making the cleaning process even easier.

$$\Delta t^{\circ}\text{C} > 100^{\circ}\text{C}$$

MICRO EXPLOSION When dry ice touches the surface and turns in CO₂ at gas state, it tends to invade cracks and pores entering the contaminant, then it warms up and expands rapidly like micro-explosions, getting the contaminant out from the substratum making the cleaning process and also the removal of the contaminant even easier.

gas volume \approx 800 times > than solid volume

SUBLIMATION Solid CO₂ turns directly into gas state without passing through liquid state if at an atmospheric pressure < than 5,2 bar: however, if blasting pressure is > than 5,2 bar (5,2 x 14,7 = 76,44 psi), CO₂ at its gas state could show some characteristics of its liquid state, while at its "triple point". it is proved that liquid CO₂ is a very strong organic solvent, therefore it is reasonable to suppose that this solvent action could exist when blasting pressure is > than 5,2 bar.

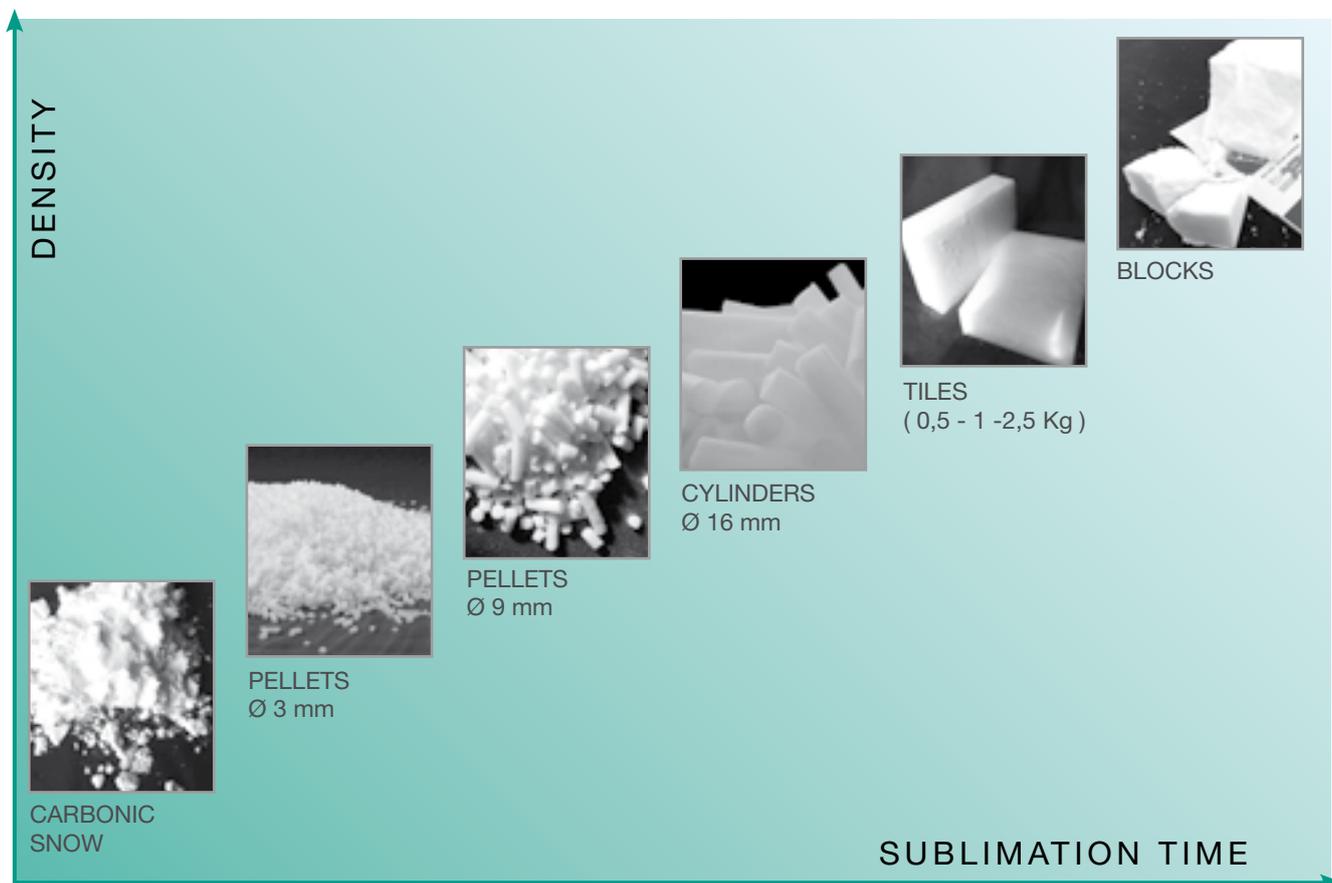
WHAT IS DRY ICE?

Dry ice is the solid form of CO_2 (carbon dioxide). CO_2 turns into solid at a temperature of -78.5°C degrees. It is a natural medium which has an intrinsic thermal energy. When at solid state (dry ice), CO_2 sublimates (sublimation: the transition of a substance directly from the solid to the gas phase, without passing through the intermediate liquid phase) when at atmospheric pressure (10-15% per day).

The peculiarity of dry ice consists in the fact that it simply disappears, getting back to its gas state.

CO_2 quality degree used for blasting is the same used in food and beverage industries and it has been specifically approved by FDA, EPA and USDA. CO_2 is an odorless, non-conductive and non-flammable gas used in beverage industries as an additive (for example in the production of beer and sparkling water), but also in food industries (to freeze different kind of products).

CO_2 is a non-toxic liquefied gas. It is easily storable at companies and it is not very expensive. Moreover, CO_2 is a natural product obtained from a series of industrial production processes, like fermentation and petrochemical refining. The CO_2 emitted by these production processes is recaptured and restored without waste, in order to be reused again. When CO_2 turns into atmosphere, during blasting process, no more CO_2 is produced.



EQUIPMENT NEEDED FOR THE TECHNICAL CLEANING WITH DRY ICE

Compressor	Dry ice pellets
From 0.8 to 6 m ³ /min at 6 bar, depending on the Blaster type used: fixed or portable	Produced with M.E.C. pelletizers Cryogenic boxes for pellets storage
M.E.C. Blaster	Safety accessories
Dual hose or Single hose blasters	Safety goggles, earmuff, cryogenic gloves, safety 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/m ³)	Max dew point under pressure (°C)	Max oil concentration (mg/m ³)
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	/	/	/	/

Usage	Solid particles		Water dew point		Max contained oil	
	Class	(mm)	Class	°C	Class	Mg/m ³
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

ELECTRICAL APPLICATIONS

Mec Microblast are machines intended for the cleaning of machinery, plant, surfaces and so on, by using dry ice pellets, which are sprayed with a specific gun. All blasters have a maintenance and usage handbook, that contain all technical characteristics, all safety cautions to be applied while using the machine, leaving its users' the autonomy of deciding what to clean and how. In particular, the handbook does not mention the fact that the blaster can be used also for the cleaning of electrical boxes in tension, even if it gives the limits of this usage in that sense under explicit request of the customers: actually, it is possible to clean electrical boxes in tension until 1000 V (that is at low tension) and not further.

During the cleaning of electrical boxes in tension, the user, who must be correctly taught and equipped with the right individual protection devices, is never in contact with the active parts of electrical boxes and CO₂ is not and in no way an element of transmission of electrical current and, for obvious practical reasons, working distances make the user works in a largely safe zone.

Italian CEI terms, connected with the European terms for safety in electrical plants, allow operations on electrical boxes at low tension if done by respecting the specific procedures reported in CEI 11/37 and 11/48 even if without expressly specifying the activity of cleaning boxes and the use of CO₂, without asking particular certifications on the used equipment or on the users, but only imposing the specific precautions to be followed and obliging users to be equipped with the right individual protection devices.

On the contrary, Italian and European laws do not allow to work on or close to electrical plants and boxes under high electrical tension, that is when electrical power is higher than 1000 V.

CE mark placed on all equipments and the declaration of conformity given together with the maintenance and usage handbook guarantee that the equipments follow all requirements existing in the machinery directive 2006/42/CE transposed into D.Lgs. N° 17 dated 27th of January 2010, requirements concerning the legislations of all Member States about equipments, particularly for what the construction of the machines, their maintenance and their usage is concerned, in order not to affect the safety and the security of the user within the limits and for the purposes in which he could operate.

DRY ICE BLASTING

APPLICATION AREAS

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 plait 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



CARBONIC SNOW CLEANING

TECHNOLOGY

When cleaning with carbonic snow, liquid CO₂ turns into dry ice particles (each particle has a diameter between 1 and 100 micron) due to physic and thermodynamic processes.

These particles have a temperature of -78.5°C. CO₂ particles are added in proportion to compressed air. Particles' acceleration is inserted through air compressed flow in a specific nozzle. It is possible to generate an homogeneous free jet by observing flow, pressure and temperature conditions. It is possible to generate different jets depending on the kind of nozzle: for example, a circular nozzle generates a circular flow which has a high pressure and a strong cleaning power, whereas a flat nozzle generates a wide constant flow with an efficient cleaning.

These carbonic snow flows clean and prepare the surfaces. When CO₂ particles hit the surface, they immediately sublimate.

CLEANING METHODOLOGY

Cleaning with carbonic snow allow surfaces to be treated delicately. CO₂ cleaning is based on a complicate mechanical process which includes cleaning, temperature and solvent's effect.

Carbonic snow particles cool immediately all impurities with their subsequent detachment from the surface. Because of the immediate sublimation of CO₂ particles, some small pressure pikes are generated, which release micro impurities on the surfaces and on the pores.

Cleaning on the whole surface, impurities are removed and discarded. A precision cleaning, especially for oil and grease, is made thanks to the physical solubility of the organic properties of CO₂. The flow of the compressed air helps in the removal of impurities

DISPOSAL

With dry ice cleaning all impurities that have been swept away are now particles in exhaust air. Depending on the application, an aspiration and an escapement filter can improve the quality of the surface to be cleaned.

Without a good aspiration, all impurities can be placed in clean air and therefore being withdrawn or swept away. The cleaning method, both dry ice pellets or carbonic snow, turns naturally into gas state and this way the only things to be cleaned are impurities.

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

SINGLE HOSE BLASTING SYSTEM

The single hose system uses a mechanical mixer, a sort of niches or holes dispenser. Pellets enter from the upper part of the distributor, which, for rotation, takes them to its lower part where the compressed air, which will take them out from the blasting gun, is injected.

During the course in the single hose, pellets and compressed air are mixed together and then they are accelerated inside the blasting gun against the object that needs to be cleaned.

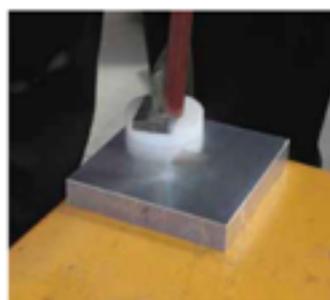
Being the single hose a pressure pushing system for pellets, the fluid dynamic balance is very steady, in the sense that any possible counter pressure created inside of the different nozzles does not modify the pellets' blasting speed. For this reason, it is possible to use all kind of nozzles with the single hose system, even the most particular and special ones, with higher pressures of compressed air supply.

In the single hose system, two different types of nozzles exist, which differ on building system:

- A "subsonic nozzle" with a blasting speed which is lower than Mach 1
- A "supersonic nozzle" with a blasting speed higher than Mach 1

BENEFITS

- This system can use all kind of nozzles, independently from the pressure of the air supply
- The length of the gun hose can reach 35-40 m
- Possibility of vertical cleaning almost without aggression reduction



DOUBLE HOSE BLASTING SYSTEM

The dual hose system uses the fluid-dynamic principle known as "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:

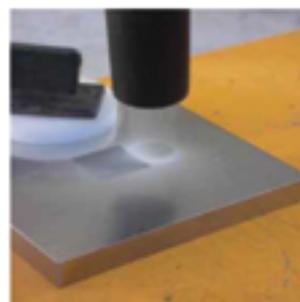
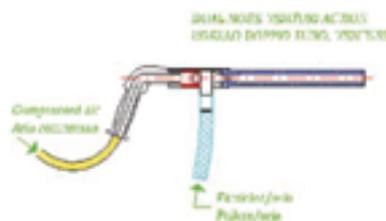
This expansion generates a vacuum and dry ice pellets are sucked into the second hose. Pellets and compressed air are mixed together and accelerated by the blasting nozzle against the object to clean.

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 fluid 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



CLEANING WITHOUT DISASSEMBLING

Dry ice is the solid form of CO₂, an odourless, tasteless and colourless gas already present in the atmosphere. It is a non-toxic gas, very cheap and easy to stock. Moreover, it is not electronically and thermally conductive.

CO₂ cleaning system uses dry ice pellets with high speed compressed air flow to remove contaminants from surfaces without additional costs and without the treatment disadvantage of secondary waste removal. The only things to be removed, if necessary, are the residual of the removed contaminant.

Different than all other cleaning methods, cleaning with dry ice uses CO₂ pellets, which have a very low temperature, around -78.5°. Actually, the cleaning occurs through thermal shock: the cold causes the crystallization of the surface to be cleaned and the gas expansion breaks and removes the contaminant.

This is a "dry process", which is not based on chemical substances: it does not release any residue and it allows the immediate usage of the treated surface. Moreover, it does not damage electrical components, sensors, switches or electrical boards. Moreover, it is scientifically proven that dry ice can sterilize and disinfect rooms and spaces: in fact, it is in line with law EN556, that says that the probability of finding survived microorganisms after the treatment is 1 out of 1 million. It is also 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

This technology has many advantages:

1. In case the extraction of oil, sludge, grease, scale is required

- No chemical product is used
- It is not corrosive
- There are no residuals to be discarded
- Infiltration in holes and interstices
- No preventive protection requested for the components
- No need to dry the surface after the treatment
- No machine downtime or disassembly needed for the surfaces to be cleaned
- No electric supply needed, the machine is autonomous
- Lower cleaning time and reduced costs

2. Where an environmental sanitization is required, in addition to the characteristics mentioned here above:

- It allows the immediate utilization of chairs, armchairs, sofa, reducing the waiting time after the cleaning;
- It breaks the bacteriological pollutants and the allergenic down
- It grants a bactericide action useful for public health

ADVANTAGES IN THE USAGE OF CO₂

- The substance is easy to find
- It is not inflammable
- It is not combustible
- It is not carcinogenic
- It is not corrosive
- It is non-reacting
- It is not toxic
- It is an inert gas
- It is recyclable
- It is abundant
- It separates immediately from the contaminants
- It is suitable to clean 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.

CO2 SERVICE

The CO₂ 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 CO₂ 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.







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