



DRY ICE PRODUCTION

迪普干冰制造（大连）有限公司



DIP DRY ICE

Equipment & Applications

Expert Enable Growth

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Company Profile



Dip Dry Ice Production (Dalian) Co.,Ltd is a fully-owned subsidiary of Hi-Chem Group (Canada). Since 1997, the company has engaged in developing dry ice manufacture facilities and environment-friendly cleaning equipment. In order to meet the demanding needs of cold-chain industry, DIP has been improving its world standard technology continuously and has owned the full range of CO2-based portfolio of products.

With years of pragmatic striving and innovation, DIP has become one of the largest companies integrating production, research, and marketing with service in the worldwide. The company provides several overseas corporations with OEM service in addition to stable and long-term business relationships with the customers including automobile, plastic, electrical appliance, medicine, tire, part components, food industries etc. Our first-rank products with competitive price are constantly selling well at home and abroad. With tight management, strong technical capability, evolving facilities and complete detection, our company complies with the ISO9001 standards.

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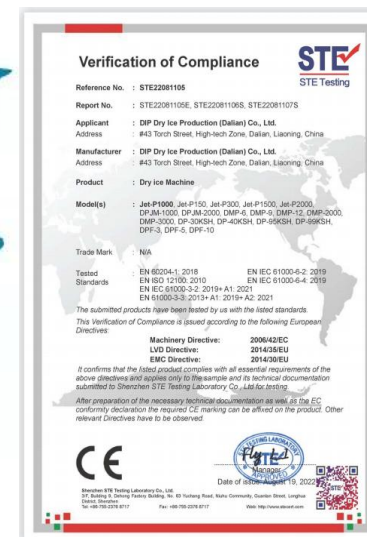
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We Specialize in...

Dry Ice Production Machine



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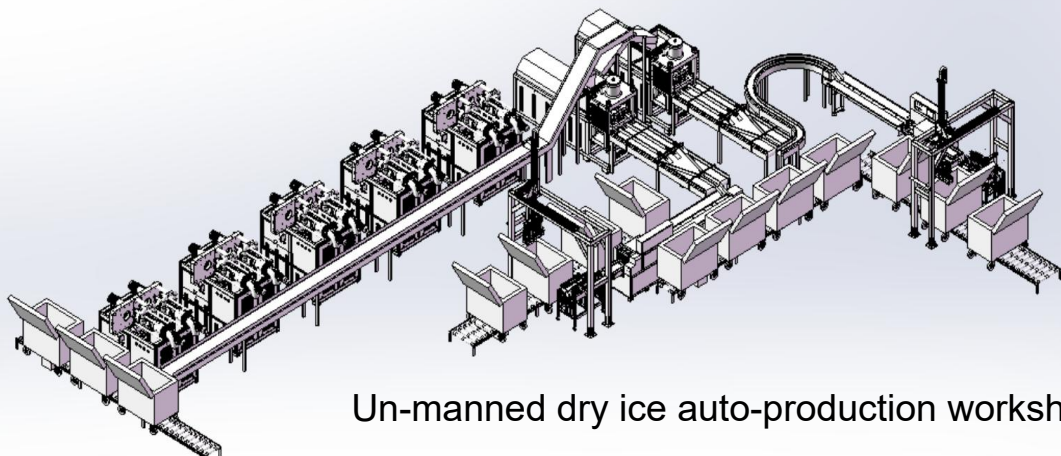
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Dry Ice Blasting Machine



We are also expert to provide
The Implementation of automation solution

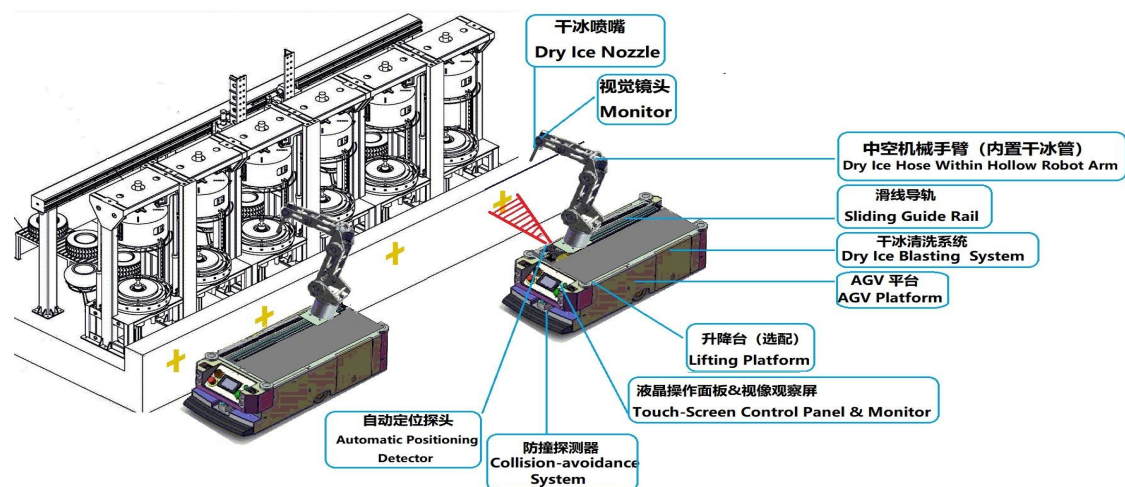
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DRY ICE PRODUCTION
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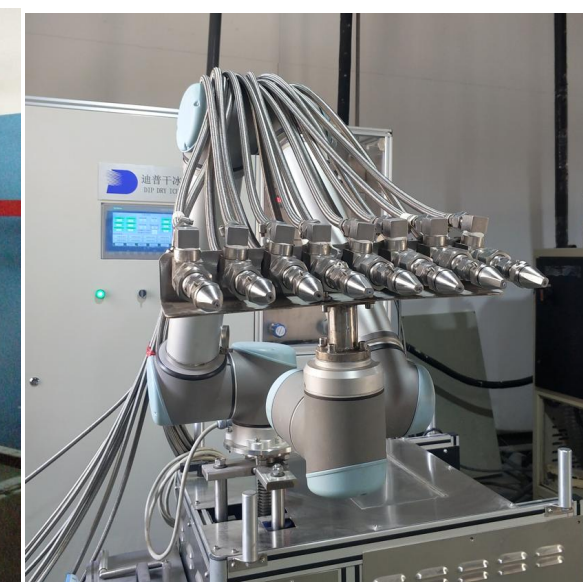
Un-manned dry ice auto-production workshop



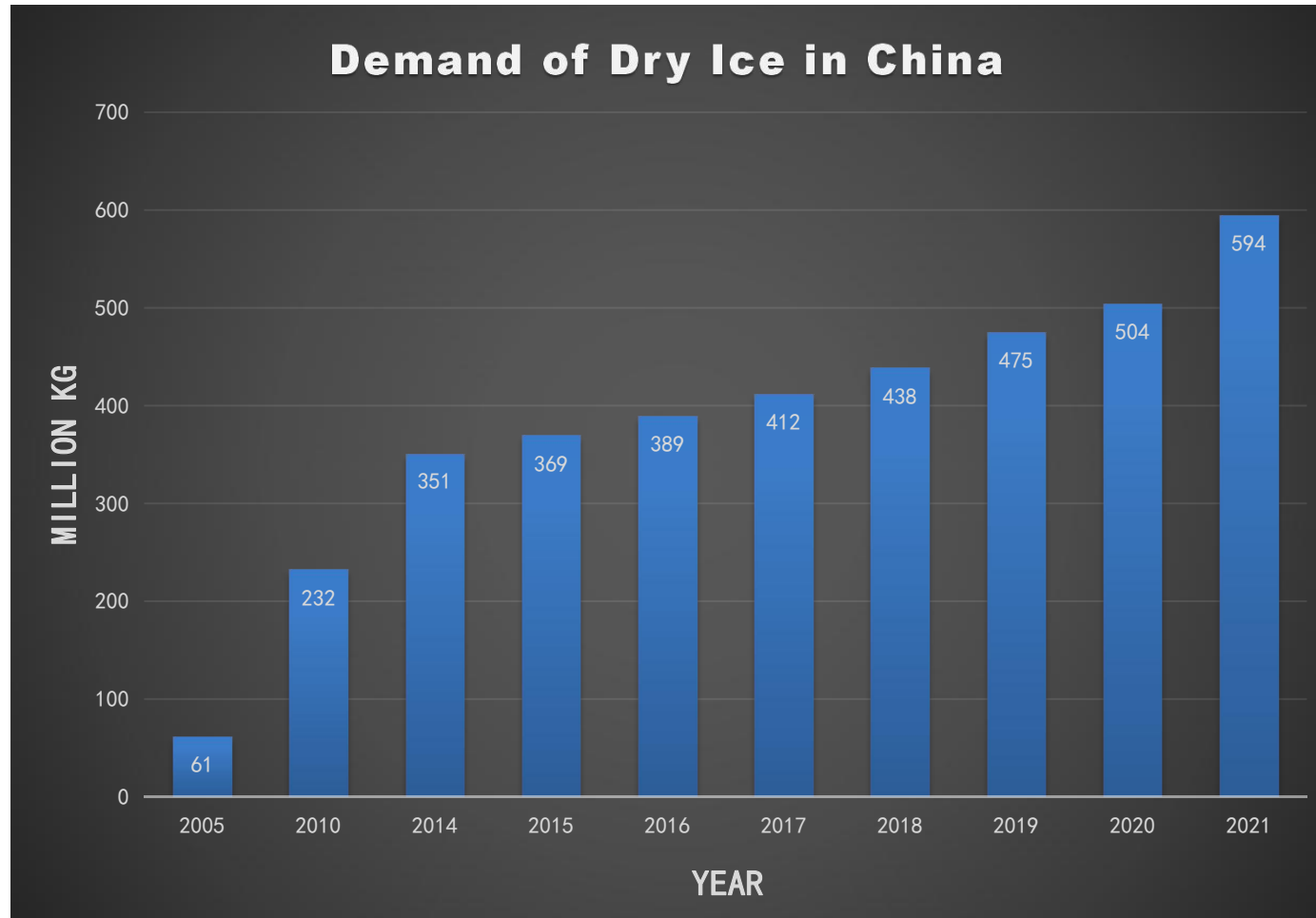
All-in-one dry ice
auto-production machine



Dry ice auto-cleaning by AGV (Auto Guided Vehicle)



Demand of Dry Ice rapid growth in China...



Back to millennium, **DIP** first introduce the technical dry ice manufacture into China. At that time, the people in China weren't really sure how dry ice was going to be used and how dry ice was going to be bought since it had a very limited shelf life.

It was pretty much a leap of faith to enter into that market. Since then, dry ice has become an extremely versatile product. It allows you some way of clean, temporary and portable refrigeration. The demand for dry ice, especially as part of the cold chain, has been rapidly growing in China.

Use Dry Ice as a cooling media in Cold Chain



Applications & Benefits:

E-commerce

- Over 500,000,000 people use E-commerce everyday in China
- Over 80% dry ice consumption from great brand E-commerce Co.

Last mile delivery

- Maximize last mile efficiency. Minimum the refrigerated transport cost at the meantime.
- Its portability to put into foam boxes carried by motorcycle without extra electricity needed.
- No residue of melting water. No contamination.

Food

- EPA, FSMA approved for use around food.
- Dry ice melting to turn into CO2 gas to decelerate the food oxidation process.
- Heavy CO2 gas insulate the air from food to postpone the bacteria creation.

Pharmaceuticals & Biological:

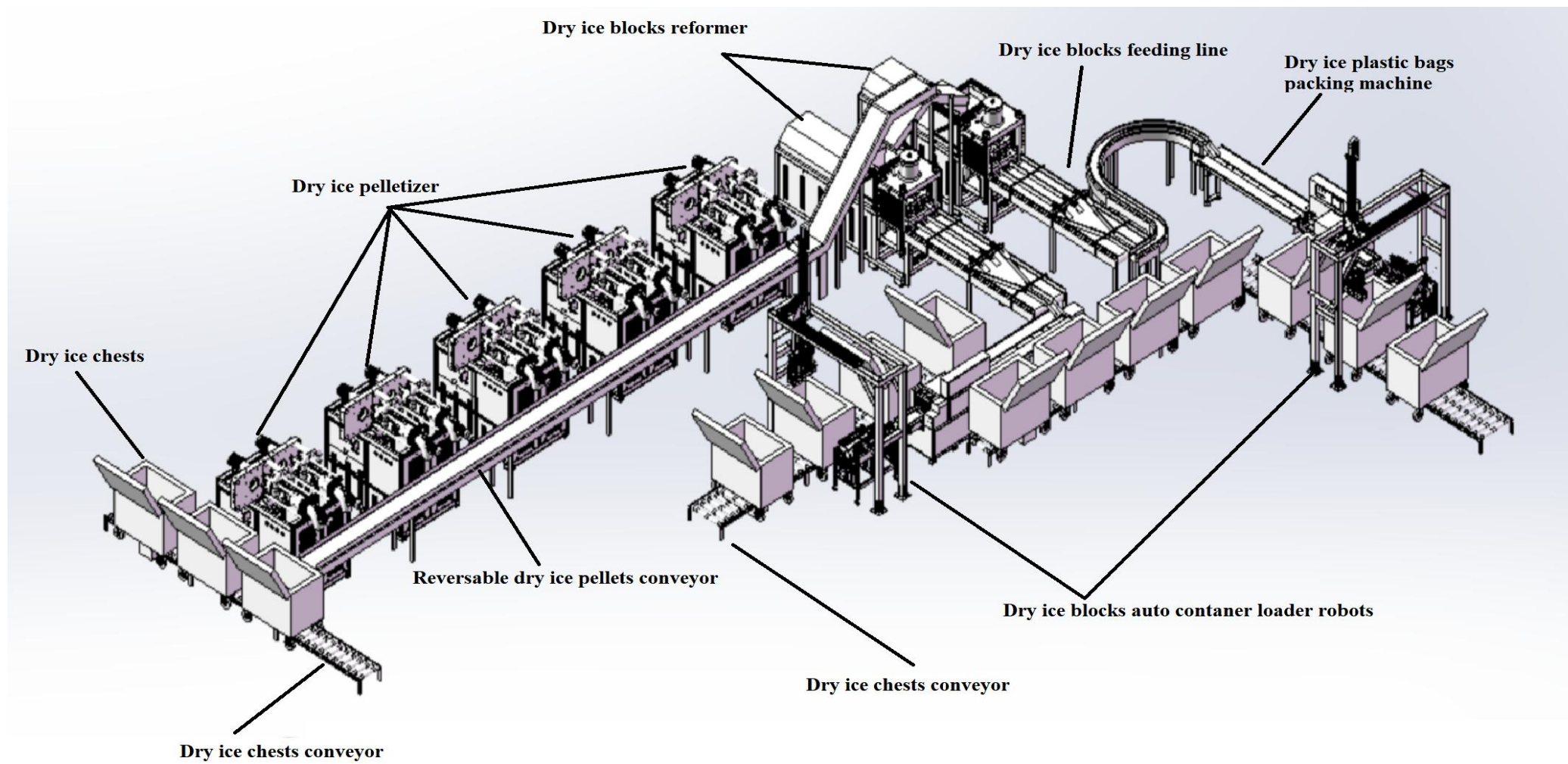
- Meet FDA and USDA requirement
- Meet the COVID-19 Vaccine transportation and storage requirement.
- 3X the refrigeration power of normal ice.
- Non-flammable.



DIP world-leading dry ice auto-production line

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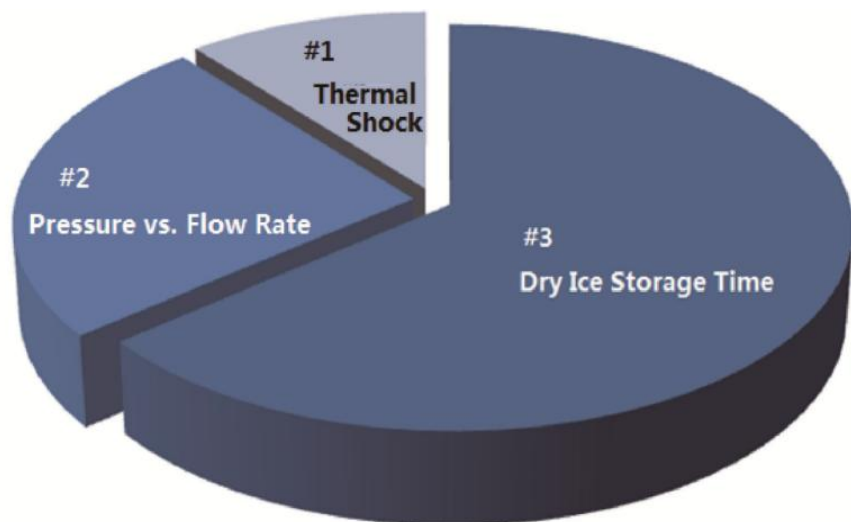
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Dry Ice Blasting Removes:

Carbon deposit , rubber/silicone, residue, painting, grease, resin, adhesive, glue, dirt, wax, scale, rust, bitumen, graffiti and Much More.

The effect and efficiency of Dry Ice Blasting is mainly depend on three aspects:

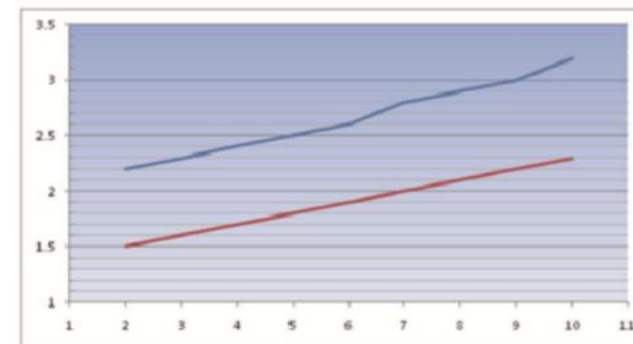


#1 Partial Thermal Shock of Dry Ice Blasting

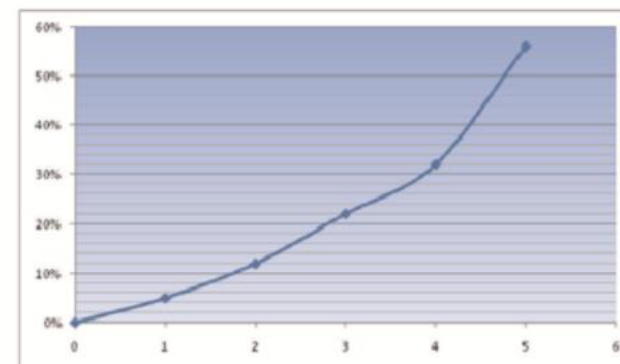
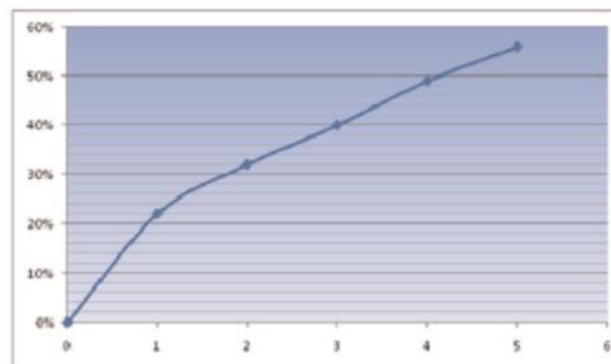
During the dry ice cleaning process, the low temperature (-78.9°C) of dry ice pellets/snow sublimate when it hits the surface of the contamination. This sublimation process absorbs a large volume of heat from the surface, producing shear stresses due to thermal shock. Hereby, it makes the contamination on the surface crack. Therefore, the warmer the surface, the better effect and efficiency of dry ice cleaning does.

#2 Pressure vs. Air Flow Rate of Dry Ice Blasting

Pressure (Bar) vs. Air Flow Rate (m³/min)



#3 The Important of "Fresh" Dry Ice



Why choose Dry Ice?

Advantage of Dry Ice Blasting

Issue	Traditional Clean Techniques	Dry Ice Cleaning
Equipment downtime	Power shutdown, cool, disassemble, move to the place, drying, resemble time and process required.	Equipment can be cleaned on site with power & temperature. Restoration right after cleaning.
Equipment Damage	Accuracy deviation, abrasion, corrosion may reduced the lifetime of the equipment.	No accuracy deviation, No abrasion, No corrosion. Preserve the lifetime of the equipment.
Labor	Intensive hand work. Dust/chemical hazard to human body.	Operator /robot holding shotgun. No hazard to human body.
Waste collect	Dust, grit, grease or chemical contaminant need be collected and deal with.	No waste at all
Costs	Equipment downtime cost, labor cost, waste collect cost, equipment lifetime reduction cost.	Dry ice & compressed air ONLY
Safety	Fire prevention is required. Liquid conductivity may cause injure.	Fire proofing, no blasting risk, no conducting electricity

Clean Techniques Comparison Chart

Technique	Waste Collect	Abrasive	Toxic	Conductive	Performance
Dry Ice	NO	NO	NO	NO	Excellent
Sand	Yes	Yes	NO	NO	Excellent
Steam	NO	NO	NO	Yes	Good
Solvents	Yes	NO	Yes	Yes	Good

Dry Ice cleaning application

- Oil industry



Variety	∅ 3mm dry ice pellets
Pressure	≥0.5-1Mpa
Object	Heat conducting strip; Oil storage tank; Oil pipeline; etc.
Dirt Type	Oil; Chemical residue; grease; reacting media residue; etc.
Advantage	✓ Cleaning on-site; ✓No abrasion; ✓No corrosion; ✓No waste; ✓No hazard to human body; ✓Fire proofing
Note	Fire proofing is one of the major concerns by using dry ice clean in oil industry.



Dry Ice cleaning application

- Equipment renovation



Variety	∅ 3mm dry ice pellets;	∅ 0.3-0.8mm dry ice particles
Pressure	≥0.5Mpa	≥0.2Mpa
Object	Construction machinery; vehicle; electrical machinery; etc	electrical machinery; etc Low voltage power distribution; etc.
Dirt Type	Carbon deposit; residue; painting; bitumen; rust; dirt; glue; adhesive; etc.	Resin; grease; dirt; etc.
Advantage	✔ Cleaning on-site; ✔ No abrasion; ✔ No corrosion; ✔ No waste; ✔ No hazard to human body; ✔ No conduction electricity; ✔ Fire proofing	
Note	Widly used for equipment renovation to extend the service life effectively.	

Dry Ice cleaning application

- Solar



Variety	LCO2 Snow
Pressure	$\geq 0.2\text{Mpa}$
Object	Solar panel surface
Dirt Type	Dust; sand; residue.
Advantage	☒ Cleaning on-site; ☒ High efficiency ☒ No corrosion; ☒ No waste; ☒ No hazard to human body; ☒ No conduction electricity; ☒ Fire proofing
Note	Efeevtively boosting the conversion rate by cleaning the panel surface, reduces the per-unit cost of generating the elctricity, producing more power without requiring more spaces for the panels

Dry Ice cleaning application

- Electric / Nuclear Power industry

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Variety	∅ 3mm dry ice pellets;	∅ 0.3-0.8mm dry ice particles
Pressure	≥0.5Mpa	≥0.2Mpa
Object	Generator stator & rotor; wiring terminal; porcelain insulator; etc	Low voltage power distribution; wire; electricity transformer; etc.
Dirt Type	Carbon deposit; silicon crystal residue; bird excrement; aluminium paste; etc.	Resin; grease; dirt; residue; nuclear pollution ; etc.
Advantage	✓No conduction electricity; ✓Fire proofing ✓ Cleaning on-site; ✓No abrasion; ✓No corrosion; ✓No waste; ✓No hazard to human body;	
Note	No environmental polluted waste is one of the major concerns in electric/ nuclear power industry.	

Dry Ice cleaning application - Automobile production

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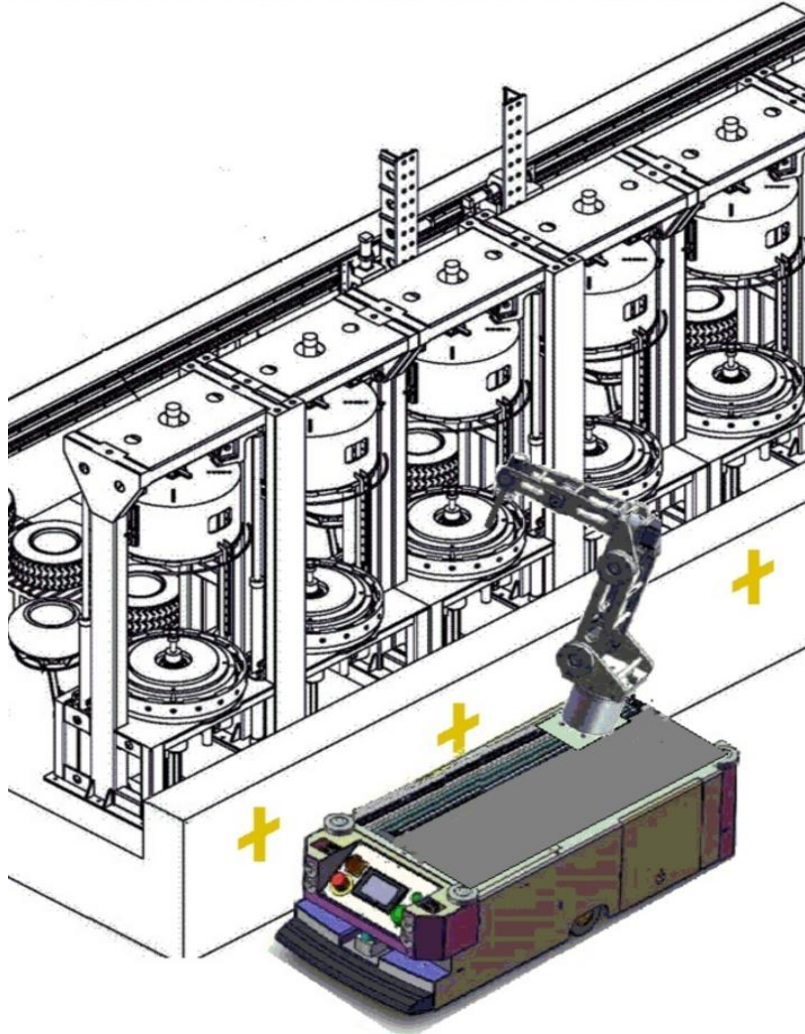


Variety	∅ 3mm dry ice pellets
Pressure	≥0.5Mpa
Object	Sand mold of engine core; welding head; etc.
Dirt Type	Mold releasing agent; sand; welding slag; etc.
Advantage	✓ Cleaning on-site; ✓No abrasion; ✓No corrosion; ✓No waste; ✓No hazard to human body; ✓No conduction electricity; ✓Fire proofing
Note	Widly used by almost all famous brand auto-manufacture company

Dry Ice cleaning application

- Tire production

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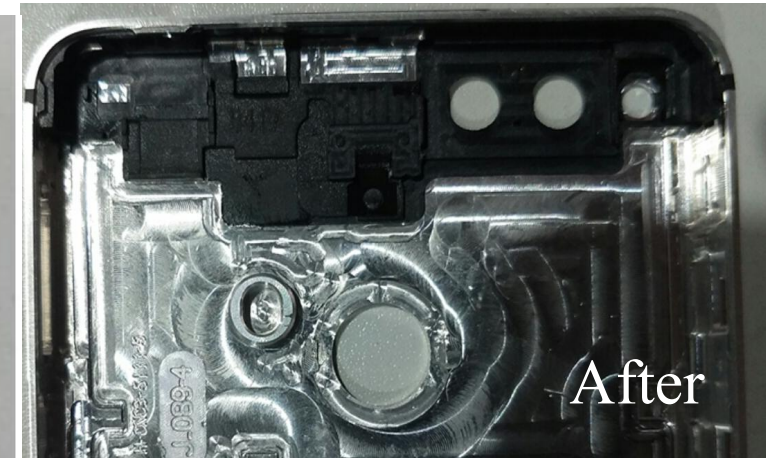
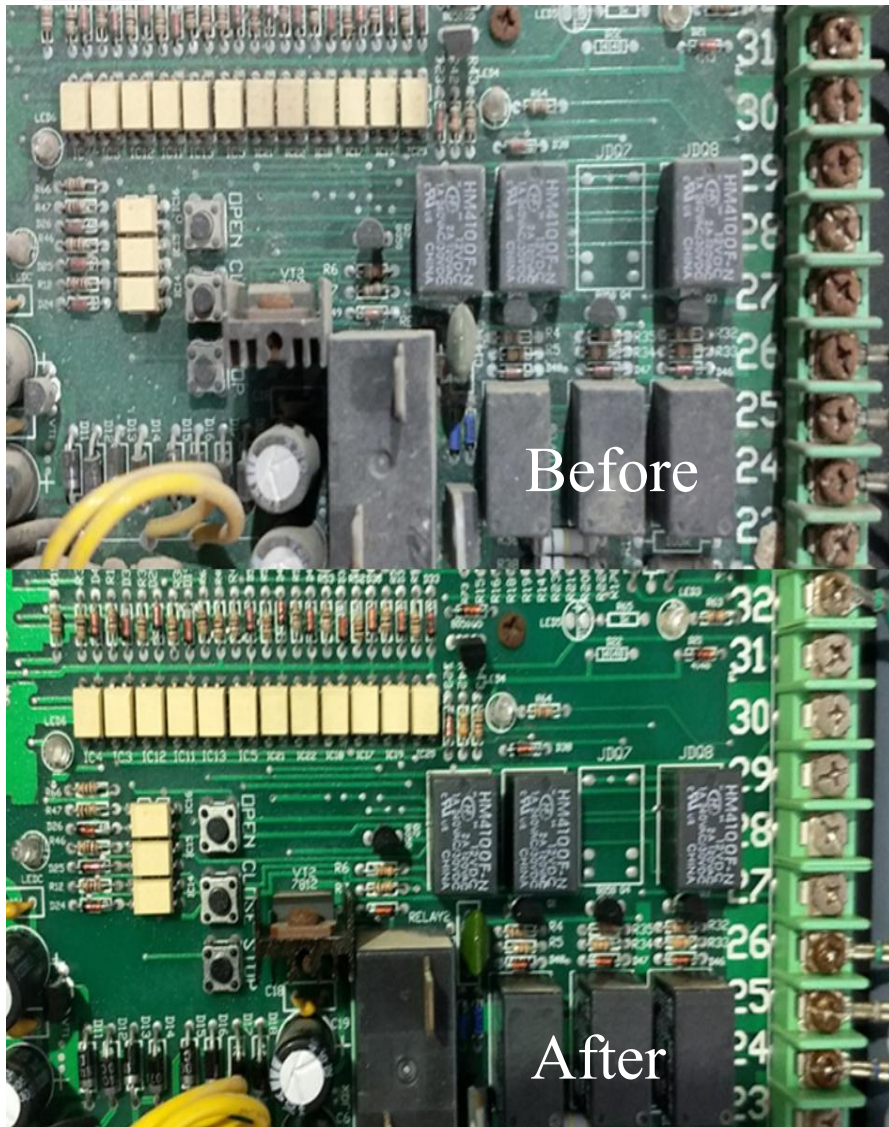


Variety	∅ 3mm dry ice pellets
Pressure	≥0.5Mpa
Object	Tire mold of tire on the vulcanizer
Dirt Type	Rubber residue
Advantage	☒ Cleaning on-site; ☒ No abrasion; ☒ No corrosion; ☒ No waste; ☒ No hazard to human body; ☒ No conduction electricity; ☒ Fire proofing
Note	Widly used by almost all famous brand Tire-manufacture company

Dry Ice cleaning application

- Electronic products

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Variety	Ø 0.3-0.8mm dry ice particles
Pressure	≥0.2Mpa
Object	Circuit board; etc.
Dirt Type	Resin; Injecting molding burrs; grease; dirt; residue; etc.
Advantage	☒ Cleaning on-site; ☒ No abrasion; ☒ No corrosion; ☒ No waste; ☒ No hazard to human body; ☒ No conduction electricity; ☒ Fire proofing
Note	Widly used by almost all famous brand auto-manufacture company

Dry Ice cleaning application

- Home appliance industry

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Variety	∅ 3mm dry ice pellets;	∅ 0.3-0.8mm dry ice particles
Pressure	≥0.5Mpa	≥0.2Mpa
Object	Home appliance shell mold	Refrigerator; mobile phone
Dirt Type	residue; rust; dirt; glue; adhesive; etc.	Overflowed polystyrene foam; Injecting molding burrs; dirt; etc.
Advantage	✓ Cleaning on-site; ✓ No abrasion; ✓ No corrosion; ✓ No waste; ✓ No hazard to human body; ✓ No conduction electricity; ✓ Fire proofing	
Note	Widly used for famous brand home appliance company, especially on assembly flow line.	

Dry Ice cleaning application

- Auto engine

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Before



After



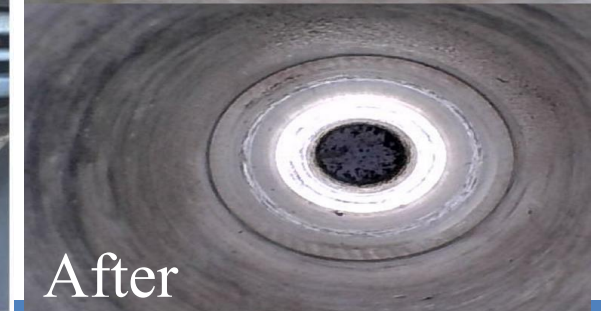
Before



After



Before



After

Variety	∅ 0.3-0.8mm dry ice particles
Pressure	≥0.2Mpa
Object	Auto engine; circuit; generator; piston cylinder; etc.
Dirt Type	Dirt; oil residue; dust; carbon deposit; etc.
Advantage	☒ Cleaning on-site; ☒ No abrasion; ☒ No corrosion; ☒ No waste; ☒ No hazard to human body; ☒ No conduction electricity; ☒ Fire proofing
Note	Effectively used for cleaning the auto engine & cylinder, not only extend the life of the vehicle but also prevent the car incident of spontaneous combustion.

Dry Ice cleaning application

- Food industry



Variety	∅ 3mm dry ice pellets
Pressure	≥0.8Mpa
Object	Tire mold of baked wheaten food; container; conveyor; etc.
Dirt Type	Ignition residue
Advantage	☒ Cleaning on-site; ☒ No abrasion; ☒ No corrosion; ☒ No waste; ☒ No hazard to human body; ☒ No conduction electricity; ☒ Fire proofing
Note	No waste & hazard to human body is one of the major concerns in food industry.

Dry Ice cleaning application

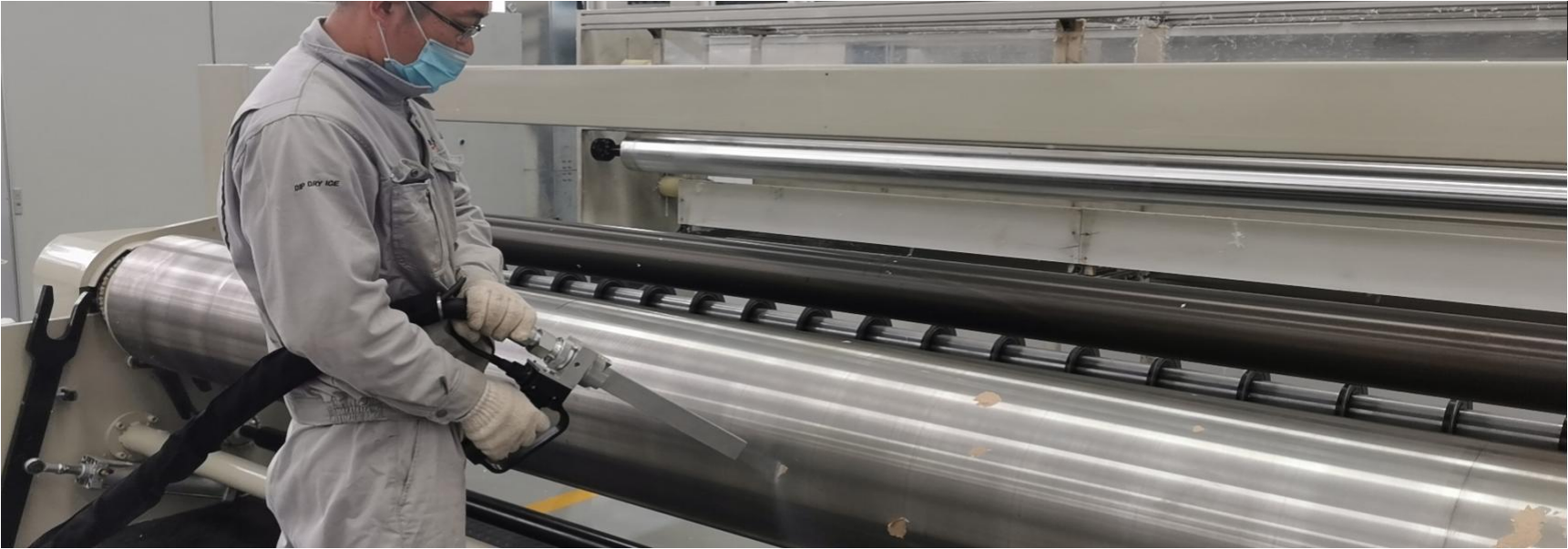
- Textile & Printing industry



清洗前



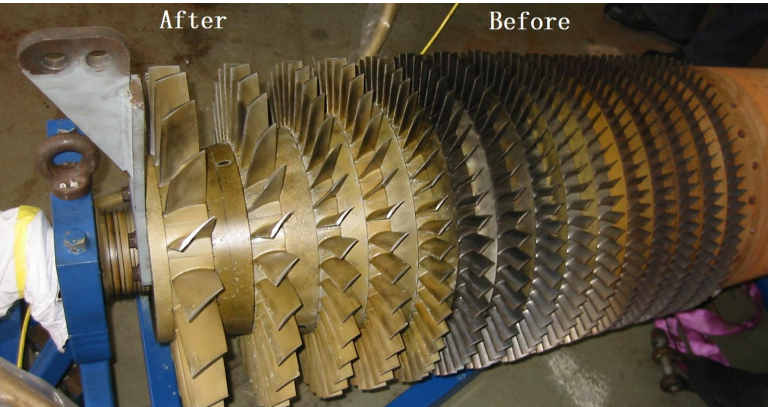
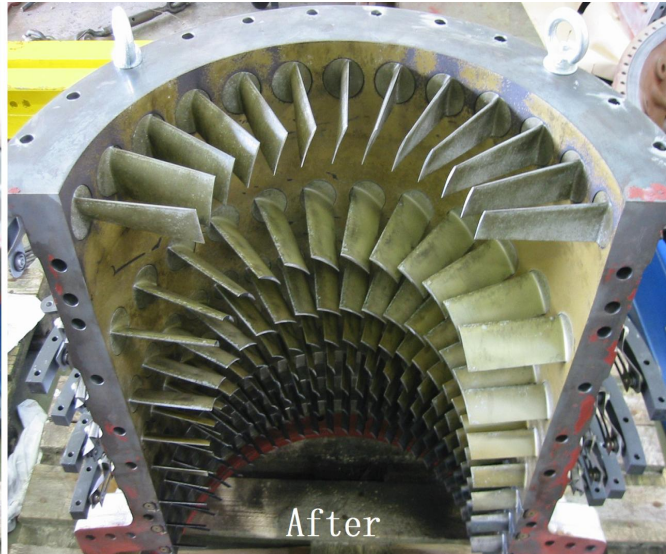
清洗后



Variety	∅ 3mm dry ice pellets
Pressure	≥0.5Mpa
Object	Roller; printing equipment; etc.
Dirt Type	Ink redidue; Ignition residue; etc
Advantage	☒ Cleaning on-site; ☒ No abrasion; ☒ No corrosion; ☒ No waste; ☒ No hazard to human body; ☒ No conduction electricity; ☒ Fire proofing
Note	Cleaning on-site is one of the major concerns in textile & printing industry.

Dry Ice cleaning application

- Aero



Variety	∅ 3mm dry ice pellets
Pressure	≥0.5Mpa
Object	Engine; radome; aircraft skin; composite material surface; etc.
Dirt Type	Carbon deposite; aging paint; etc
Advantage	☒ Cleaning on-site; ☒ No abrasion; ☒ No corrosion; ☒ No waste; ☒ No hazard to human body; ☒ No conduction electricity; ☒ Fire proofing
Note	Cleaning on-site is one of the major concerns in aero maintain industry.

Dry Ice cleaning application

- Railway

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Variety	Ø 3mm dry ice pellets
Pressure	≥0.5Mpa
Object	Train maintain; railway facilities maintain; steering engine; electricity components; etc.
Dirt Type	Carbon deposit; residue; painting; bitumen; rust; dirt; glue; adhesive; etc.
Advantage	☒ Cleaning on-site; ☒ No abrasion; ☒ No corrosion; ☒ No waste; ☒ No hazard to human body; ☒ No conduction electricity; ☒ Fire proofing
Note	Cleaning on-site is one of the major concerns in railway maintain industry.