Dry Ice Cleaning

New opportunities with FerroČrtalič d.o.o.
Who is FerroČrtalič d.o.o. today?

On the two sites of Novo mesto (1.000 m² covered) and Dolenjske Toplice (2.000 m² covered) now 25 people are working with FerroCrtalic International, currently in three departments.

Their concern is the design and the manufacturing of various products as well as the worldwide distribution of those, their delivery, commissioning and servicing.

The department **FerroMobile®** is manufacturing welded steel structures and diverse components as per customer's request and drawings, i.e. for the car and motorhome industry or for pharmaceutical plants.

Under the registered trademark **FerroECOBlast®** are done the production and the sales of the complete range of all kind of sandblasting machines and installations, including all relevant peripherical equipments and accessories, such as air compressors, filtering and abrasive recovery systems, airless painting equipments and complete painting rooms.

The department **JBlast®** is ensuring the full after sales services, for all products (maintenance and repair services).
• 40 years of experience on industrial sandblasting and painting applications

• We manage whole Central Europe with our surface treatment equipment and technology

• Our team successfully connecting Western technology with Eastern markets

NEW TECHNOLOGY
DRY ICE BLASTING
Dry Ice Cleaning

- Dry ice blasting
  - Clean, no mess
  - Effective
  - Safe
  - Environmentally friendly
  - Customers love it!
What is Dry Ice?

- Frozen carbon dioxide -78.5°C
- CO₂ comprises approx 0.03% of the atmosphere
- By-product of ammonia, alcohol/brewing and hydrogen reformers
- Also natural wells
- No new carbon dioxide created for dry ice usage
Dry Ice Properties

• Triple point
  – CO$_2$ coexists as liquid, gas and solid

• At normal pressure/temp, changes directly from solid to gas – no liquid phase
Dry Ice

- No liquid phase, hence ‘dry’ ice
- The solid simply disappears harmlessly as gas
  - Chill/freeze without wetting
  - Clean without solid or liquid waste
Dry Ice Equipment

• PE45 Pelletiser
  – To make your own dry ice when and where you want

• RE45 Recovery Unit
  – To halve the cost of dry ice

• BL45 Blaster
  – High quality, economical cleaning equipment
Dry Ice Pelletiser

- Liquid CO2 vaporizes to snow
- Snow pressed to ice
- Pellets extruded (1.7-9.0 mm diameter)
Recovery Unit

- Normally 50% of vaporized liquid CO2 is lost to atmosphere
- Recovery Unit recycles 98% of flash-off
- Dry ice at half price
Dry Ice Cleaning

• Frozen Carbon Dioxide (-78.5 °C)
• Blasting medium to replace
  – Sand, grit or other abrasives
  – High-pressure water
  – Solvents & hazardous chemicals
Dry Ice Problems

• Make your own dry ice
  – Economy
  – Convenience
  – Quality
Dry Ice Cleaning

- ‘Sublimes’ directly from solid to gas
- No blasting medium to be cleaned up, only the contaminate
- Reduce waste disposal cost
- Fast return to use of cleaned equipment
- Clean without dismantling
Dry Ice Cleaning

• Non-abrasive
  – No damage to substrate
  – Use on sensitive mechanical equipment

• Not electrically conductive
  – Use safely on motors, electrical equipment

• No wet hygiene hazard
  – No water/moisture to encourage microbiological growth
Dry Ice Blasting

- Particles accelerated to supersonic speed
- Compressed air 7-14 bar
Dry Ice Blasting

- Pellets sublimate on impact
- Gas expands nearly 800 times
- Rapid heat transfer
- Impact energy dissipation
Dry Ice Blasting

- Thermodynamic effects
  - Embrittles coating
  - Contaminate is ‘fracked’
    - layer cracks and allows expanding gas to ‘push’ contaminate off surface
  - Differential coefficient of freezing of dissimilar materials
    - weakens adhesive bond
Dry Ice Blasting Examples

- Pioneers new applications
- Tests innovations
- Provides practical feedback
- E.g. Fire damage at Castle
Dry Ice Blasting - No Water
Adhesive Applicator

FerroECOBlast®
EUROPE
Gluing Line component
Ink Line
Ink line Coupling
Print Machinery Cleaned On-site
Sensitive print machinery cleaned safely & quickly
Delicate equipment cleaned
Cleaning of painting room

Glass cleaning

Floor

Door
Cleaning of grease
Cleaning in pharmaceutical company

INOX cleaning
INOX valve
Cleaning of rubber contaminated tools directly on the machine
Cleaning mechanical parts of milk production line
Cleaning mechanical parts of milk production line
Cleaning mechanical parts of milk production line
Cleaning mechanical parts of milk production line
Low cost Pelletiser & Recovery

- Produce as much dry ice as you need
  - Where and when you want it
- No waiting on dry ice delivery
- No sublimation from factory to your site
- High quality, fresh ice means better, quicker cleaning
- Dry ice at half price
Selected Dry Ice Applications

- Automotive Deburring, robot, moulds
- Chemical Reactor, extrusion rollers, dies
- Plastics Deburring, moulds
- Food Bakeplate, oven, tank, conveyors, moulds, packaging equipment
- Glass Moulds
- Metalworking Mould (release agent), de-rust, welding slag
- Rubber Moulds
- Printing Print machine
- Power Generation Alternator interior, Radioactive decontamination
- Paper Hot melt equipment
- Vehicles Cars, trains, subassemblies, aircraft, ships
- Fire Damage Restoration Timber, electrical
- Electrical Machine maintenance
- Machine refurbishment
- Production line
- Carbon removal
- Glue removal
- Rust removal