Mould sooting & CO2 blasting

Copenhagen 2005-05-31

Rüdiger Eichler
AGA Gas AB

Segments, Applications & Type of Gases

Container
- Perfume & Whiskey
- Pharma
- Beer & Soft drinks
- Food

Flat
- Rolled
- Float

Special
- Fiber optics
- Laboratory
- Optical glass
- Silica
- Ampoules
- Marbles
- Ornamets
- Opthalmic

TV Screen
- Panel
- Funnel

Lighting
- Tubes
- Bulbs

Art & Table ware
- Handmade
- Automatic

Fibers
- Reinforcement
- Isolation

Frits & Mosaic
Windows
Mineral wool

O2
- Reheating
- Melting
- Polishing
- Fusing

H2
- Crack off
- Edge melting
- Polishing
- Fusing
- Piercing
- Inerting

N2
- Inerting

CO2
- Blasting

C2H2
- Sooting

He

Ar

Special
- Atmospheres
- Analysis (Lab)
- Isolation
- Special

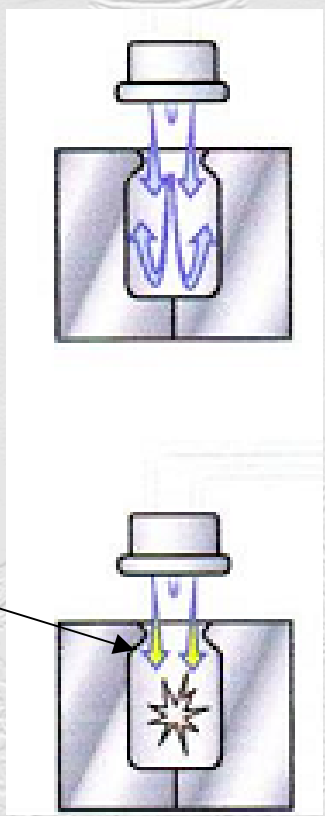
Mould sooting

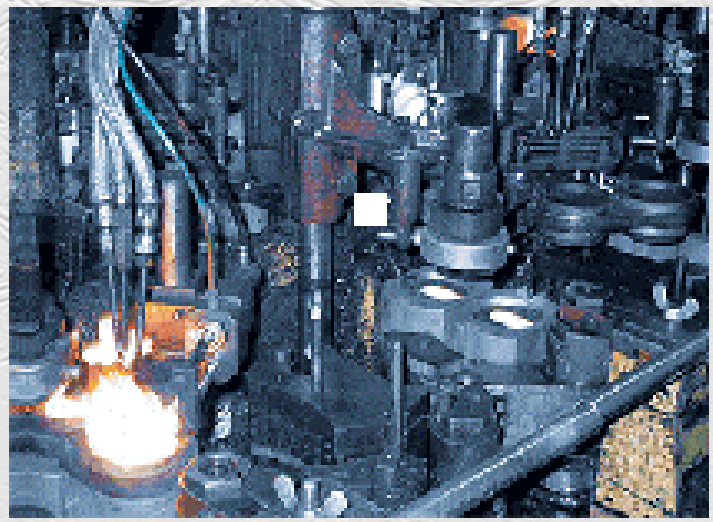
What is mould sooting?

- Coating of a surface by a thin layer of soot
  - by cracking of acetylene in eg. a pilot flame.
  - Prevents sticking, reduces friction, reduces heat transfer
  - Clean barrier between glass and mould/tool&product
- Customer advantages:
  - Increased yield. No pollution of glass article after oil lubrication, oil swabbing
  - Reduces cold waves (vaddror), less polishing..
  - Longer life-time of blank moulds.
  - No environmental hazard due to oil vapours.
  - Increased quality of glass surface

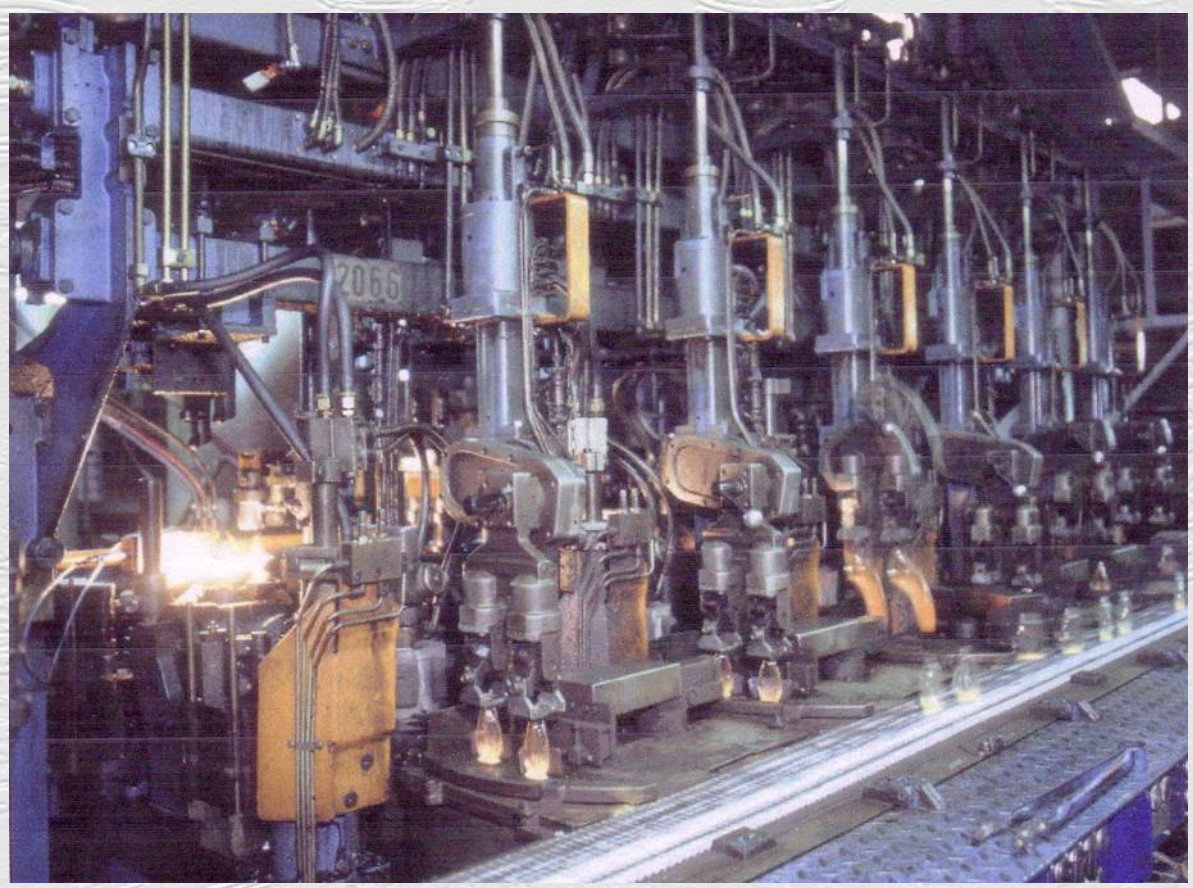
Flush and Coating phase

Flush phase





Mould sooting in an IS-machine



Areas of use

- Glas forming moulds
- Aluminium die forming press tool
- Copperbar casting
- Conveyor belt of metal powder heat treatment

- Any other case where a carbon layer coating of a surface can improve a process.

CO_2 - blasting

Cleaning with dry ice pellets

Applications for the industry

What is dry ice?

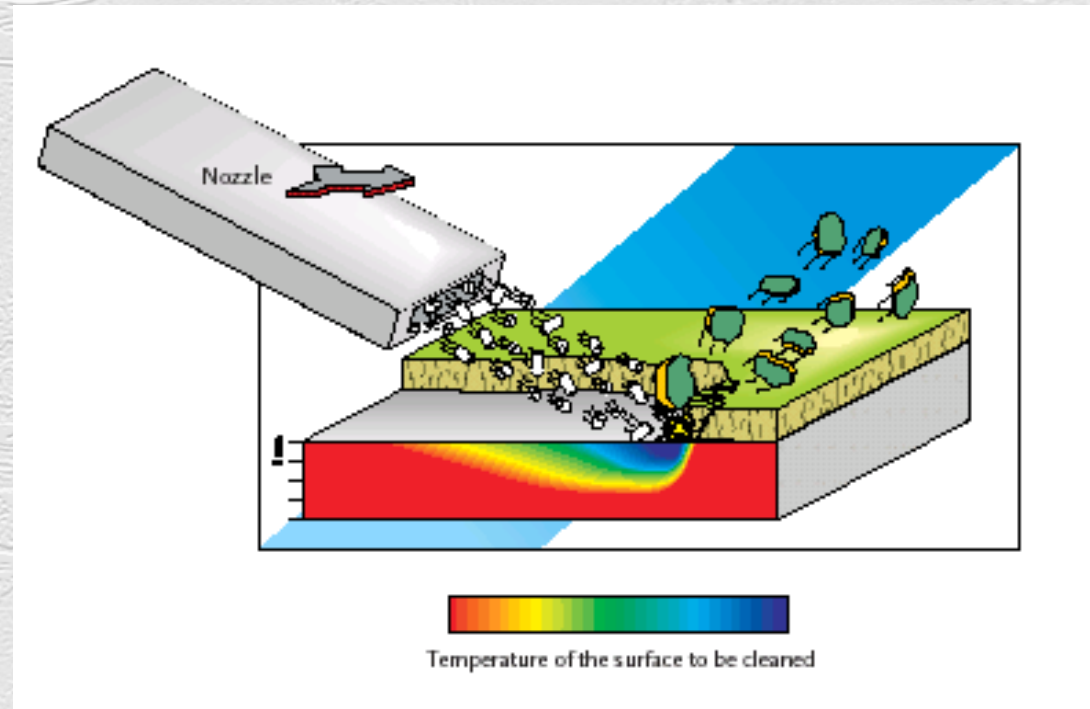
Dry ice blasting

- A solid form of CO2
- At -78°C
- Sublimates, from solid to gas
- E.g. in 3 mm pellets size
- As hard as lime

How the blasting works

Dry ice blasting

1. Impact
2. Explosive sublimation, 500 times expansion
3. Thermal effekt, Tensions in boundary layer between contaminant and substrate



Advantadges

Dry ice blasting

- Saves time, no blasting media recidues
- Saves waste costs and waste handling
- Cleans areas of difficult access, also electronics
- Environmentally friendly.
- Can replace solvents, water, oils are soluble in CO2
- Reduced risk of equipent damage during cleaning

Disadvantages

Dry ice blasting

- Balsting => High noise level
- CO2-pellets is a perishable product
- Can form static electricity. Not to be used in areas of explosive gas mixtures or powders

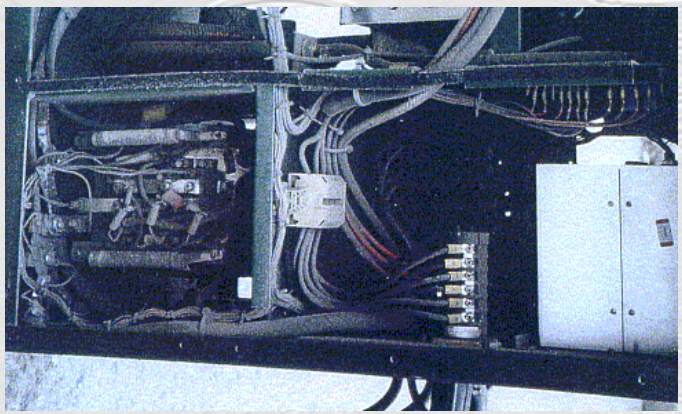
This is needed

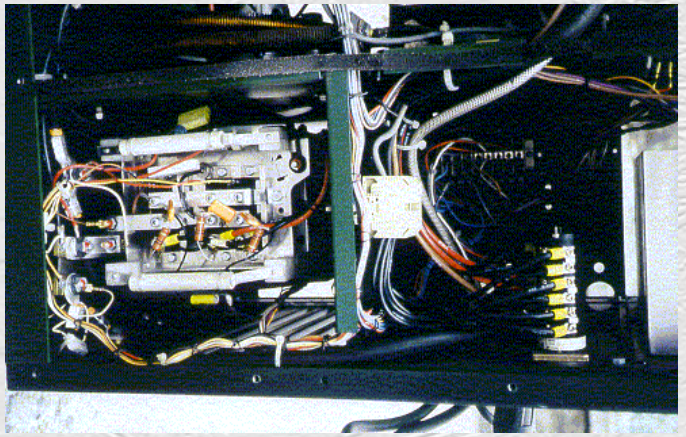
Dry ice blasting

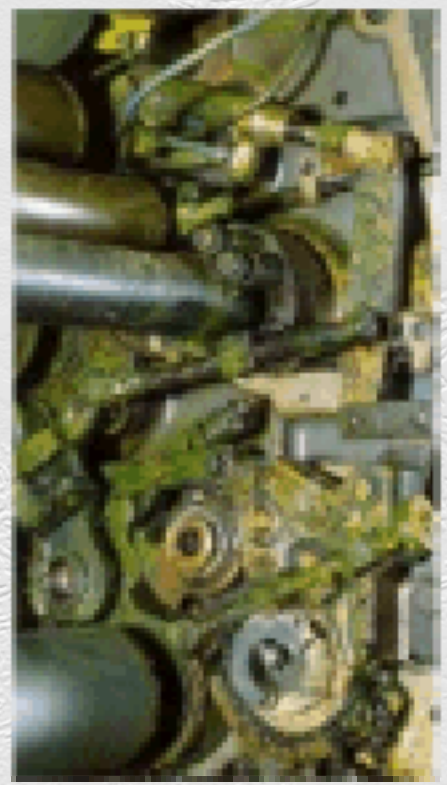
- Blasting machiene, cost between 90 tsek och 190 tsek.
- Pressurized air 5-10 bar and 5-10 m^3/min
- Pellets, 80-100 kg/h ca: 10 kr/kg
- At some applications the balsting is complementet with a mild abrasive.
- Service can be purchased

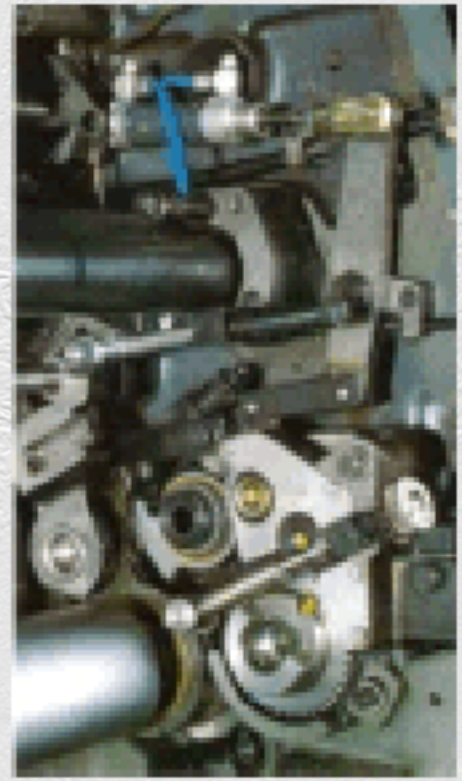
Before and after cleaning

Dry ice blasting









Possible use

Dry ice blasting

- Cleaning of tools, machines, equipment etc.
  - Mould cleaning
  - IS-machine & forming machine cleaning
  - Floor cleaning
  - Flow train cleaning
  - Engine cleaning
  - Electrical cabinet cleaning
  - Machinery for glass and mineral wool production

End