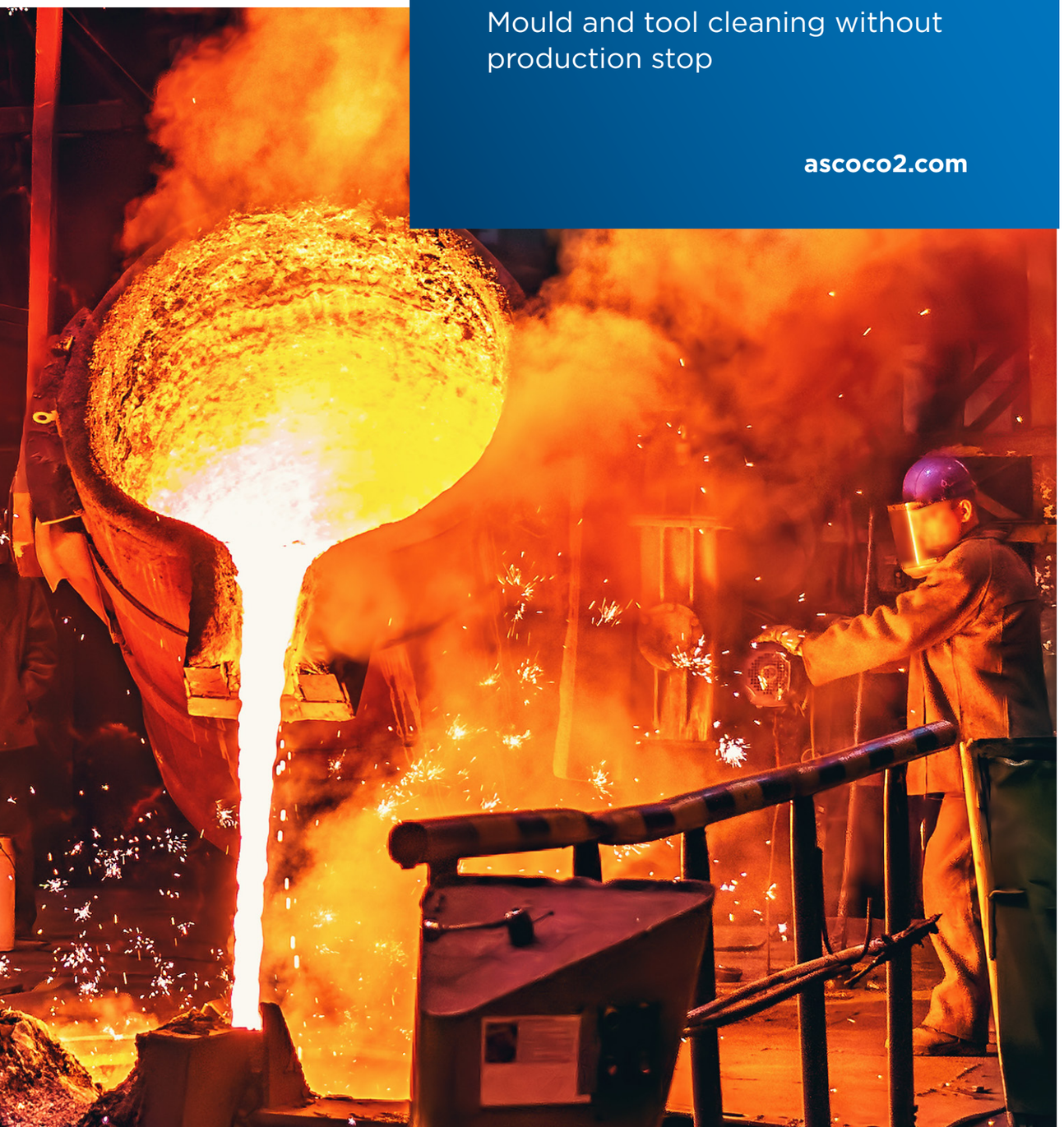
ASCO
All about $CO_2$

# Dry Ice Blasting in Foundries

## Mould and tool cleaning without production stop

**ascoco2.com**



As in many industrial sectors, mould and tool cleaning is of utmost importance for foundries. Optimum cleaning of the moulds and core boxes is particularly important, as this not only increases quality, but also optimizes productivity and costs.

ASCO has successfully developed an innovative cleaning process which is perfectly suited for the foundry industry.

**The ASCO dry ice blasting technology offers the following advantages:**

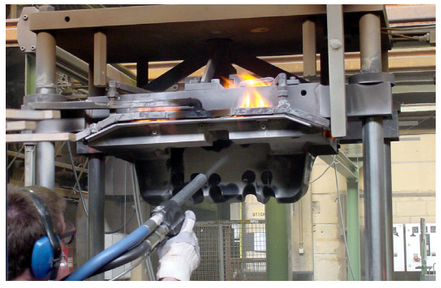
| | |
|---|---|
| **POWERFUL & GENTLE** | The hardness of dry ice pellets can be compared to the hardness of chalk. As a result, the surface structure of the cleaning surface is not damaged or changed in any way. Dry ice blasting is a gentle yet effective cleaning method. Unlike steel brushes or scrapers, dry ice blasting does not damage materials. ASCO's unique nozzle technology with sophisticated aerodynamic flow behavior ensures optimum blasting result. |
| **COST SAVING** | Downtime of the objects or machines to be cleaned, interruptions of production and expensive disposal of hazardous waste are eliminated. |
| **TIME SAVING** | Cleaning of machines, tools, moulds, conveyors, etc. can be performed during the ongoing production process. Since this cleaning technology is dry and non-abrasive, it can be applied directly onto the object to be cleaned. This way, downtime can be reduced to a minimum. Cooling or, conversely, heating of tools is not necessary, This saves valuable time. |
| **ENVIRONMENT FRIENDLY** | The pellets immediately change to a gaseous state on impact. Only the removed contamination remains. There is no need to dispose of the cleaning media. This reduces waste dramatically! No sewage - or cleaning and filtration of wastewater. No contamination by hazardous additives, chemicals etc. No remains of the cleaning media. Dry ice is basically non-toxic. |
| **SAFETY** | Cleaning with dry ice is a dry and non-conductive cleaning process. By eliminating the use of sulvents and hazardous chemicals the dry ice cleaning technology is safe for people and environment. The equipment is light, mobile, low in maintenance, reliable and easy to operate. |
| **OPTIMIZATION** | **Advantages of combi-blasting:** After prolonged dry ice blasting when removing coating in the mould, microparticles of the coating are compressed into the surface of the moulds, which leads to a smooth surface. On this smooth surface, the coating no longer holds, which makes abrasive cleaning of the mould necessary. This can be achieved with the **ASCOJET 1708 Combi Blaster** by supporting dry ice blasting at the push of a button with minimal use of abrasive additive. |

## How is this blasting method used?

The ASCO Dry Ice Blasting Technology offers the possibility of cleaning dismantled moulds in cabins or of performing the cleaning operation directly on the mounted hot moulds. Many gravity die casting foundries use the second option to avoid expensive production stops and to attain higher quality thanks to more frequent cleaning. The moulds are not damaged, because the blasting material is non-abrasive.

In practice, cleaning is nowadays done more often to completely avoid aluminum residues on the moulds surface. For instance, manufacturers of high quality aluminum rims clean the moulds at every shift change using dry ice blasting. The cleaning process can be carried out directly on the mould (which has a temperature of up to 350 ° C) without noticeably reducing the temperature of the mould. After 20 to 30 minutes, production can be restarted.

With traditional blasting using sand or glass beads, the cleaning process is delayed for as long as possible, which often leads to aluminum residue on the moulds surface. The time required for the removal of the moulds and the subsequent cleaning then amounts to several hours.

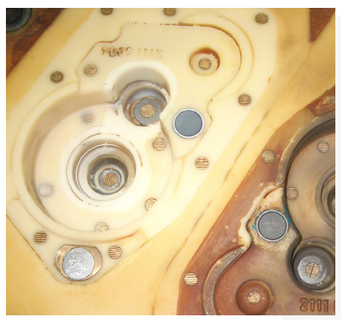


Cleaning of a hot ingot mould

Core box cleaning in a grey cast iron foundry

Cleaning of built-in hot ingot moulds

Cleaning of built-in hot ingot moulds



With the **ASCO Dry Ice Blasting Process** the cleaning of the core boxes (coldbox and hotbox) is easier and faster**.**

The cleaning time of several hours is reduced to a few minutes.

## Our competence - your advantage

- ASCO is one of the first suppliers of dry ice blasting technology for foundries. Decades of experience and foundry visits have taught us, rarely are the applications identical. Over time the geometries of the moulds have become more and more complex and intricate. The binders of the sand grains and the coatings were partly changed from organic to inorganic. To this day our learning process follows the foundry technology.

- Foundries have always provided the impetus for the development of our blasting technology. Tough operating conditions require solid blasting technology. The modular and maintenance-friendly design of **ASCOJET blasting units** allows for maintenance and wear repairs to be carried out by the in-house technicians in the foundries. This saves money and prevents unnecessary downtime.

- Foundries also provided the impetus for the development of a new typus of blasting units that are unique on the market. If required our **ASCOJET 1708 Combi Blaster** mixes a fine abrasive medium with the dry ice. The abrasive container is integrated into the machine, no separate containers for the abrasive medium or hoppers that are temporarily attached to the machine are required. Thus, the full mobility of the blasting machine is maintained.

- Foundries face a mould cleaning challenge that cannot be solved by dry ice blasting alone: Pure dry ice blasting compresses the finest coating particles into the micro-openings of the mould surface. In the long run, this leads to a smoothing of the surface so that the coating no longer adheres. This is where abrasive support is needed. Our **ASCOJET 1708 Combi Blaster** can do this at the push of a button and with the minimum use of abrasive blasting media.

- In addition to the intensive exchange with employees in foundries, we are also in close contact with manufacturers of coatings. The aim of an intensive exchange of experience and subsequent blasting tests is to provide the user in the foundry with an optimum combination of coating buildup and ASCO cleaning process. In the case of a multi-stage coating build-up, for example, it was also possible to carry out a «coating repair» thanks to the coloring, in that the working coating could be removed without damaging the base coating underneath.

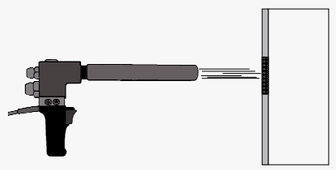
**Conclusion:** Are you looking for a competent partner for the optimal cleaning solution of moulds and core boxes?
Benefit from our decades of experience in the foundry industry. We will be happy to help you to find a tailor-made solution for your application.

## The Process

Dry ice is produced from liquid $CO_2$ . Inside an ASCO dry ice pelletizer, the liquid carbon dioxide is expanded under controlled conditions to form dry ice snow (approx. -79 °C) is pressed into pellets by a corresponding extruder plate.

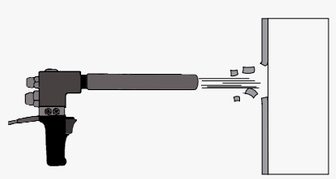
The dry ice pellets are filled into the ASCO dry ice blasting unit and conveyed to the blasting gun. Here the pelets are accelerated with compressed air to a speed of up to 300 m/s and hit the moulds to be cleaned. The impact of the pellets creates a punctual thermal shock and kinetic energy which removes the contamination. The pellets immediately change to a gaseous state on impact, leaving a clean and dry surface. Only the removed contamination remains, and no abrasive needs to be disposed of. Since the pellets only have a hardness of less than 2 Mohs, the surface quality is maintained. Likewise, thermal shock has no adverse effect on the surface structure of the moulds.

## Cleaning Method



**The thermo shock**
As a result of the sudden and intense temperature shock on the surface, the coating or impurity contracts.

**The cracking**
As a result of the contraction the coating cracks and the material becomes brittle due to the cold.



**The cleaning**
The dry ice pellets hit the surface with great speed and remove the detached coating and clean the surface material

**ASCOJET 1208**
The Small Industrial

**ASCOJET 1701**
The Industrial Allrounder

**ASCOJET 1708 Combi blaster**
The Flexible Abrasive

**ASCO $CO_2$ Detectors**
For your safety

**Dry Ice Box AT126**
Storage of Dry Ice Pellets

**Dry Ice Pelletizer P15i**
Production Capacity
150 kg/hr for 3 mm Pellets

## The complete solution

As leading provider of complete dry ice blasting solutions, ASCO's aim is to find tailormade solutions for individual customer requirements. The extensive ASCO product and service range consists of:

- → Dry ice blasting units
- → Dry ice pelletizers
- → Dry ice containers
- → $CO_2$ gas detectors
- → Wide range of accessories
- → Specially developed guns or nozzles
- → Automated cleaning solutions
- → High quality dry ice
- → Building up your in-house dry ice production

**ASCO not only introduces you to the ASCO dry ice blasting technology but helps also with integrating dry ice cleaning into the production process and continually optimizing it.**

In case of an increased demand for dry ice we will be pleased to offer you an economical calculation for your inhouse dry ice production to optimize on cost and quality. Our product range contains dry ice pelletizers with production capacities from 150 to 750 kg/hr.

The **ASCO CAREFREE rental solutions** enable you to have your own dry ice production **without investment costs**! Ask us!

T +41 71 466 80 80 info@ascoco2.com ascoco2.com