MWS Friedrichshafen GmbH / Cold Jet GmbH

FOUNDRY CORE BOX CASE STUDY

RELIABLE AND GENTLE CORE BOX CLEANING WITH DRY ICE

COMPANY
MWS Friedrichshafen GmbH

APPLICATION
Removal of cold-box binder from the core boxes

COLD JET SYSTEM
Aero 40 Foundry Edition

BENEFITS
• Patented Sure Flow System prevents clogging and freezing of the dry ice while cleaning.
• Reduction of noise at one workstation from 93 dB(A) to 82 dB(A), led to wearing only one kind of ear protection instead of wearing earplugs and earmuffs at the same time.
• Reduces compressed air from 6 to 4 bar, resulting into a better and more efficient clean.

“The Flexible, Single-Hose System and the 360 Degree Turning Radius of the Aero 40 Provided a Significant Improvement When Compared to Handling Our Previous System.”

THE SITUATION

MWS is an aluminum casting and CNC machining specialist that was created from a merger between well-established manufacturing companies. With six locations across Germany, Austria and Slovakia, MWS manufactures complex, precise, ready-to-install products in all standard aluminum alloys. The selection of cast aluminum products ranges from highly complex, manually manufactured, made-to-order items to products produced in fully automated manufacturing lines.

Key customer groups include European car manufacturers, the motorcycle and railcar industries and mechanical engineering companies. MWS Friedrichshafen GmbH specializes in aluminum sand casting and is authorized and approved by almost all German car manufacturers as a supplier. One main concern of MWS Friedrichshafen is keeping their core boxes clean. It is crucial in keeping up both quality and integrity.

“Reliable removal of residues of the cold-box binder from the core boxes is of fundamental importance,” said Heiko Gläsle, Foundry Manager at MWS Friedrichshafen. “Therefore, we clean the boxes at regular intervals.”

Cleaning core boxes is often done with dry ice due to the very complex geometries that require a precise and consistent clean that only dry ice can provide. The company has used dry ice cleaning technology for 12 years because of the many benefits of dry ice, including that it is non-abrasive to the delicate core boxes and it provides no secondary waste in the process, thus no disposal costs.

When compared to manual cleaning methods that require cooldown, disassembly, unproductive hours of messy hand cleaning or bead blast cleaning and then reassembly, dry ice saves time and money in production costs and downtime. In addition, alternative cleaning methods are not fully effective and often result in damage to the part or equipment. Dry ice cleaning offers significant improvement in cleaning times (up to 60%) as well as reduction of damage to equipment and resulting scrap product. As dry ice blast cleaning allows a non-conductive, in-place method to clean parts, even touch-up cleanings are safe and easy.
THE SOLUTION

“The Cold Jet employee arrived with a fully equipped van, so that we could configure and test a blast cleaning system that fitted our requirements,” said Fischer. “The foundry staff had the opportunity to pull the trigger themselves.”

MWS Friedrichshafen chose Cold Jet’s Aero 40 dry ice cleaning machine as their solution. In contrast to their previous system, the Aero 40 transports the dry ice and compressed air with a flexible, burst-proof single-hose system to the applicator with an integrated ground wire that protects the employee against electronic discharge/shock during blasting and also prevents against a short circuit.

The Aero 40 also features Cold Jet’s patented SureFlow system, which consists of an isolated, insulated hopper, radial feeder, advanced agitation technology, aerodynamic fittings and burst-proof blast hose – which prevents clogging and pellet sublimation and ensures uninterrupted cleaning performance.

“The flexible, single-hose system and the 360 degree turning radius of the Aero 40 provided a significant improvement when compared to handling our previous system,” said Fischer. “We also no longer had dry ice freezing in the supply line or applicator with the Aero 40.”

MWS Friedrichshafen utilized a wide Cold Jet nozzle for cleaning. Compared to conventional round nozzles, the 25 millimeter wide swath of the Cold Jet nozzle provided better – and thus substantially more – coverage for the surface being cleaned. For delicate and hard-to-reach areas, Cold Jet’s revolutionary line of variable nozzles, with patented MERN technology and patent-pending variable fragmenting technology gives you the power to control aggression in the supersonic flow region of the nozzle - providing a full range of performance with maximum effectiveness. Cold Jet’s design significantly improves reliability because fragmenting occurs downstream for clog-free operation.

The Aero 40 also reduced the problem with high noise volumes due to the multilayer insulation and the reduced volume flow rate of the nozzle.

“We measured the noise level of the old and new unit at 2 workstations,” said Gläsle. “Directly at the site of dry ice blasting at one of our core support centers, the noise level with the Cold Jet system was reduced from 104 to 95 dB(A). At the adjacent workstation near the casting robot, the noise level decreased during blasting from 93 dB(A) to 82 dB(A). Simultaneously at this workstation, we no longer needed to wear earplugs and earmuffs when using the dry ice cleaning equipment, only one ear protection was sufficient.”

Another advantage of the Aero 40 is that the dry ice and air supply can be controlled individually. The dry ice flow rate from 0 to 1,8 kg per minute can be adjusted. The
compressed air flow volume is adaptable to the blasting task in a range from 1.4 to 6.1 cubic meters per minute.

“Due to these possibilities, we were able to significantly reduce our dry ice and compressed air consumption from 6 to 4 bar and tune the system exactly to our requirements,” said Gläsle. “Cold Jet’s Aero 40 machine has greatly increased our efficiency with core box cleaning.”

AERO FOUNDRY EDITION

A major issue for the foundry and forging industries is the downtime caused when cleaning permanent aluminum molds, core boxes and vents, die cast machines and tooling, shell core molds, semi-solid castings and conveyors. Cold Jet has developed an all new Foundry Edition – a comprehensive application solution that addresses all the needs for the foundry industry.

The Foundry Edition systems are full pressure dry ice cleaning systems packaged with accessories that will provide the best clean for your environment. They are Performance Class machines utilizing our advanced SureFlow pellet technology, featuring an isolated, insulated hopper with advanced agitation, internal pressure regulator, full pressure dosing system, stainless steel rotor and are equipped with foundry-friendly accessories. They guarantee the best pellet integrity, maximum cleaning aggression and the most reliable blast stream on the market.

Additional features and accessories include an upgraded stainless steel rotor for improved durability; a high performance applicator with sealed electrical switches, tough outer shell, designed water release channels and dual triggers to protect against moisture, grit and drop damage; a urebrade blast hose with fire sleeve to protect from high temperatures and ensure continued blast flow; Sureflow quick disconnect fittings that are ultra-light and aerodynamic to ensure full particle flow and maximum performance; a low noise foundry nozzle that is axisymmetric to allow you to clean at a distance from the contaminant without sacrificing pellet integrity; and a protective machine cover to provide a barrier around the machine to shield the feeder system from foreign contaminants and further protect your investment.

Dry ice cleaning with the Cold Jet Aero Foundry Series offers significant improvement in cleaning times (up to 60%) as well as reduction of damage to equipment and resulting scrap product.