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Cold Jet dry ice cleaning increases productivity at Electrolux refrigerator plant

The Electrolux refrigerator factory located in Nyiregyhaza, Hungary, was built in 2004 as a greenfield investment. It produces combination refrigerator/freezers (combi-bottom) and also one door refrigerators and freezers.

During the manufacturing process, insulator foam is injected between the inner liner and the shell to ensure thermal insulation. If there is any minor leakage between the coupling parts, the foam fills the holes and can leave foam remnants on the surface of the product. Because **Electrolux Nyiregyhaza** products are for home and professional use, it was crucial that the products are 100 % clean of any dirt, debris and insulator foam.

In the past, Electrolux Nyiregyhaza used chemicals and hand-tools to remove the contaminants from the surface of the refrigerator shells, as well as to clean the foaming equipment and jigs during production. These methods were time and labour intensive and sacrificed the quality of the product. They were also very slow because they were done manually. The hand-tools had safety risks and would likely lead to scratching the surface of the shell. If the product was scratched, it would be discarded as scrap and could no longer be used in production. This was costing the company a significant amount of money each year. The company needed a solution that would provide a good clean and eliminate the possibility of damaging the product or injuring workers.

[image_0]

Lean manufacturing was also important to the plant. **László Koncsek** is the Lean specialist and his Lean manufacturing programme includes 5S, Productive Maintenance and Autonomous Maintenance requirements. The cleaning solution needed to coincide with these efforts. “The other driving factors in choosing the right cleaning solution were speed, whether it was user-friendly and overall quality and cost,” said Koncsek. “We are producing on production lines and do not want to slow production to stop and clean. We also have to train 15+ people to use the machine, so it is important for it to be easy to operate.”

Koncsek and the plant manager consulted with the **Electrolux** plant in Italy and discovered that they successfully use **Cold Jet** dry ice cleaning as their solution. The solution had been working very well for them and they recommended it to be given a try. Dry ice cleaning uses recycled CO_2 in the form of solid dry ice particles that are transported by high-velocity airflow to remove contaminantes from surfaces. The dry ice particles are accelerated through high-velocity nozzles onto the surface being cleaned. The combination of the kinetic and thermal gradient effects breaks the bond between the foam and the surface of the refrigerator. The dry ice particles sublimate on impact, transitioning from a solid to a gas, leaving no secondary waste behind.

Dry ice cleaning is a non-abrasive, non-flammable, and non-conductive cleaning method. It is environmentally-friendly and contains no secondary contaminants such as solvents or grit media. It allows items to be cleaned in place without time-consuming disassembly. It can be used to remove production residues, release agents, contaminants, paints, oils, and biofilms and for many general cleaning applications.

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Electrolux Nyiregyhaza purchased three Cold Jet **i^3 MicroClean** dry ice cleaning machines and one **i^3 Ice Press.** The i^3 MicroClean features Cold Jet’s patented shaved dry ice technology. According to the manufacturer, it is an environmentally responsible system that enables cleaning delicate surfaces and complex cavities and crevices that other machines can not reach – without surface abrasion, disassembly or harmful secondary waste. With an Ice Press, they can create a consistent high-quality dry ice block from pellets, nuggets or even scrap dry ice in less than 3 min, whenever they need it.

“The Cold Jet i^3 MicroClean systems reduce scrap, maintenance and time costs, improve productivity, align with our environmental initiatives and reduce overall risk,” said Koncsek. “The i^3 MicroClean systems are more efficient with relation to the quality of the clean, and the speed has improved our business.” Production teams clean on an as-needed basis and like that the machine is portable and can easily be moved around to use in multiple areas. “When we saw how successful and mobile it was, we decided to also use it to clean the tools and equipment in addition to refrigerator shells,” said Koncsek. “We can incorporate dry ice into many facets of the company.”

The Electrolux Nyiregyhaza plant has already calculated its return on investment and found that it has been able to recuperate the cost of the machines based on scrap savings alone. The Cold Jet dry ice cleaning machines have proven to be a value-add investment for the company. In addition to the Hungary location, Electrolux has Cold Jet dry ice cleaning machines in Australia, Thailand, Italy, Egypt, and the USA. In the US, they use the MicroClean to deflash polyurethane foam.

Electrolux Group is a global leader in home and professional use appliances, selling more than 50 million products to customers in 150 markets each year. Electrolux kitchen products account for almost two-thirds of the group’s sales and are well-represented

among the most energy-efficient alternatives, says the company.

Adresse:
http://www.gupta-verlag.com/general/news/technology/14190/cold-jet-dry-ice-cleaning-increases-productivity-at-electrolux-refrigerat