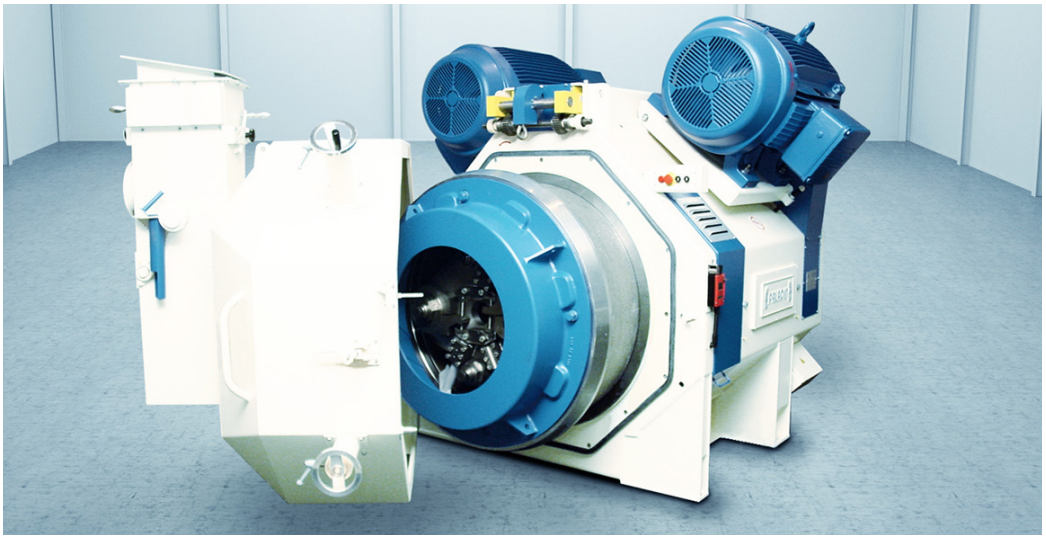
ANDRITZ Brings Optimal Sustainability to Refrigerator Foam Recycling



Paladin 2000-BM pellet mills are specifically engineered to improve the recycling process of refrigerator insulation materials

Customer Story
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Paladin pellet mill uses heat treatment to entrap CFCs and deliver re-usable foam by product

THE CHALLENGE

- PU foams used in older refrigerators often contain CFC gases
- These foams need to be recycled, but in such a way that the CFC gasses are entrapped and collected, to prevent atmospheric pollution

THE SOLUTION

- ANDRITZ Paladin 2000-BM, equipped with a Forced-Feeding Screw

THE RESULT

- All gasses are collected using a heat treatment process
- The recovered foam can be used in a variety of onward processes, from cement additives to heat and power generation

INTRODUCTION

Immark, part of the Thommen Group, is a market leader in the recycling and disposal of electronic waste in Switzerland.

Founded in 1986, its core competence lies in the recycling of end-of-life electronic devices, but it also offers recycling of composite materials and fractions, as well as services such as collection and logistics solutions, data destruction, and more. Thanks to its state-of-the-art facilities, it achieves a recycling rate of up to 95%.

In a recent project it looked to source equipment suitable for recycling refrigerator insulation, particularly older closed-cell polyurethane (PU) foam that still contains Chlorofluorocarbons (CFC).

Although CFCs were banned by the Montreal Protocol, significant amounts still remain, trapped within insulating foam, where they were used as blowing agents. It is estimated that quantities are typically hundreds of milligrams per gram of foam, depending on foam type, age, and manufacturing.

CHALLENGE

Immark faces a major environmental challenge when it came to recycling refrigerator foam, as it could not allow any CFCs to escape into the atmosphere due to the well-documented adverse environmental impact. Although CFCs slowly diffuse over time, when foam is crushed and/or shredded – a traditional method for recycling – gasses are released far more quickly, and in greater volumes.

SOLUTION

The solution to this challenge was delivered by ANDRITZ in the form of two Paladin 2000-BM pellet mills, which are specifically engineered to improve the recycling process of refrigerator insulation materials.

Immark's first experience of the technology was a visit to a reference application at a Waste Electrical and Electronic Equipment recycling (WEEE) plant in Dordrecht in the Netherlands, where it witnessed firsthand the efficiency and efficacy of a Paladin 2000-BM equipped with a Forced-Feeding Screw. This visit proved instrumental in demonstrating the practical application and potential of the Paladin technology in a real-world setting.

The Paladin 2000-BM uses a novel heat-treatment process that sees the foam materials pushed through a die. During this process the materials can reach temperatures of 130-140 °C, at which point the CFC gasses outgas. They are sucked out of the chamber using an aspiration system and pass through a condenser, where they are collected and disposed of.

The CFC-free foam byproduct, now in the form of powders or pellets, can then be used in a number of sustainable applications, including co-mixing with cement, which reduces carbon emissions during production, and as a combustible material for energy generation.

According to Joseph Diks, Global Application Manager for Waste and Industrial Applications, at ANDRITZ: "Our Paladin 2000-BM was instrumental in this process, providing a scalable and efficient solution for transforming harmful waste into valuable resources. By converting these foams into usable materials, we are not only preventing harmful CFCs from reaching the atmosphere, but also contributing to the circular economy, offering a dual benefit of waste reduction and energy recovery."

RESULTS

ANDRITZ's Paladin pellet mill range, with its universal adaptability, ensures maximum reliability under various operational demands, catering specifically to customer needs and requirements.

"In tackling fridge recycling," Diks explains, "we are focused on supporting environmental conservation and exploring new ways to reuse recycled materials. Our collaboration with Immark and its system integrator represents an important step in our continued effort to deliver advanced, eco-friendly technologies across industries."

CONTACT INFORMATION

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