

Efficient Resource Recovery with Portable Industrial Vacuum Technology

Customer Overview

The customer's rolled products division is a major supplier of flat-rolled aluminum used in a broad range of applications—from aerospace airframes and automotive body panels to heat exchangers, beverage cans, and industrial plate. In its Lancaster, PA facility, the customer operates advanced smelting mills that recycle aluminum scrap into usable rolled products through both cold and hot rolling processes.

Project Overview

Air Dynamics Industrial Systems Corporation partnered with a leading aluminum flat-rolled products manufacturer to address a critical maintenance and energy-efficiency challenge in their Lancaster, PA smelting facility. The project focused on streamlining the removal of dust-laden silica ball media from Bloom Engineering's heat recovery boxes to reduce downtime, improve worker safety, and restore energy savings.



Customer's smelting operation.



Customer's aluminum sheet, plate and extrusion factory.

The Challenge

To improve energy efficiency in their aluminum smelting operations, the customer uses silica ball media in heat recovery boxes located on their smelting mills. These silica balls contribute to a 20% reduction in energy costs during the aluminum smelting process.

However, over time, the boxes become clogged with dust and particulate buildup, drastically reducing its efficiency. With four boxes per mill, cleaning was labor-intensive and time-consuming. The previous method—shoveling the media into 5-gallon buckets by hand—not only caused extended downtime but also exposed workers to dust hazards and the risk of manual lifting injuries.

[WATCH VIDEO HERE](#)

The Solution

Super PLĒCO™ Portable Industrial Vacuum System

Air Dynamics conducted a test of the Super PLĒCO™ to demonstrate vacuum speed in the cleaning process and reduce manual labor. The customer was impressed by the system's performance and ease of use.

Key System Highlights:

- **Power:** 25 HP / 18.6 kW
- **Voltage:** 460V / 60Hz / 3 Phase
- **Material Conveyance Rate:** Up to 160 lb/min
- **Dual Use - Housekeeping and material conveyance:**

Simultaneous operators for housekeeping

- 4 operators (1.5" hose)
- 2 operators (2.0" hose)

Material conveying only

- 1 operator (3.0" or 4.0" hose)

Filtration: HEPA-grade, suitable for fine particulate like silica dust

Design: Rugged, continuous-duty industrial vacuum built for long-term plant service



Demonstration shows a full media barrel of silica balls, emptied in less than two minutes using Air Dynamic's Super PLĒCO™.

The Results

Significant Downtime Reduction

- The Super PLĒCO™ cut media swap time dramatically, returning the mill to full operational efficiency in less than a day instead of several days.

Improved Worker Safety

- The system eliminated manual handling of alumina and silica dust and significantly reduced dust exposure, protecting personnel and improving environmental conditions.

High Throughput, Minimal Labor

- With multiple hose connection options, the Super PLĒCO™ supports multi-operator use for housekeeping, maximizing throughput and efficiency with minimal labor input.

Energy Efficiency Restored

- By restoring proper airflow and thermal conductivity in the heat recovery boxes, the system helped the customer regain its 20% energy savings per mill.

Conclusion

Through the deployment of Air Dynamics' Super PLĒCO™ system, the customer transitioned from a labor-intensive and inefficient housekeeping method to a safe, reliable, and cost-effective solution that aligns with their operational and sustainability goals.

Is your plant facing a similar challenge?

Contact Air Dynamics today to learn how our vacuum systems can improve your process efficiency and safety.



Air Dynamics' Super PLĒCO™