HOW THE CORRECT CONVEYOR OPTIMIZES FOUNDRY AND DIE CASTING PRODUCTION

Assess Conveyor Design, Construction, and Capabilities to Improve Efficiency, Decrease Maintenance, and Lower Labor Costs

By Bob Anspaugh, Conveyor Sales Engineer, PRAB

Introduction

There is much that foundries and die casting operations can gain by improving metal scrap handling processes. Adding or updating conveyors is shown to reduce cycle times, raise productivity, decrease downtime, and improve workplace safety. However, not all conveyors are engineered to deliver equal performance. Conveyor design, construction, and capabilities factor into the conveyor's effectiveness and total cost of ownership.

This white paper will address:

- The most common metal scrap handling challenges facing metal casting operations
- How the correct conveyor will reduce downtime, lower expenses, improve safety, and provide a long service life

5801 East N Avenue, Kalamazoo, MI 49048
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Challenges and Solutions

Challenge #1: Unplanned Downtime

Equipment failures, emergency repairs, and routine maintenance can consistently cause conveyor downtime. When a conveyor is down, productivity drops.

Solutions

Without question, automated material handling equipment improves productivity. In fact, using the right conveyor for the application criteria has been shown to increase productivity by up to 60%. Reliable, consistent operation is the key.

Above all, conveyors must be engineered to avoid unplanned downtime. Ensuring a positive discharge of material is critical to preventing carryover. Some conveyors are more susceptible to carryover because of how the belt is constructed. Oscillating conveyors, though, generally have no carryover. The ScrapVeyor II™ from PRAB also eliminates carryover by utilizing a drag flight to pull material toward the discharge point. The flights pivot out of the way to dislodge any stuck materials.

Challenge #2: Energy and Water Costs

Conveyors that are not engineered to be efficient with energy resources generate higher expenses.

Solutions

Conveyors can lower energy costs if they have the necessary capabilities. For example, furnace feeders that continuously meter-feed die scrap into the melting furnace contribute to greater energy efficiency because additional energy is not required to heat the furnace for individual melting cycles. Quench conveyors are another example. When chillers are installed on these conveyors, operators have greater control of water consumption expenses. Finally, adding new or updated controls and automation systems to monitor conveyor performance can produce actionable data that will enable further optimization of energy use. For example, conveyor controls can be programed to monitor energy spikes, wasted hours of energy use, and more.

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Challenge #3: Workplace Hazards

Health and safety hazards at foundry and die casting facilities increase worker compensation costs, raise employee absenteeism, and weaken employee retention.

Solutions

Adding conveyors to eliminate manual processes for moving metal inherently improves workplace safety. Forklift traffic is reduced, production becomes more ergonomic, and in the case of a furnace feeder, operators are kept a safe distance away from the high temperatures of melting furnaces. Operations that implemented conveyors have seen reductions in workplace accidents by up to 25%.

Among conveyors commonly used in foundry and die casting processes, there are additional factors to consider. Quench conveyors, which quickly cool parts and metal scrap, can produce mist that diminishes air quality in the plant. Alternatively, casting coolers run air at low speeds to cool hot die castings via single or multiple cooling zones, though they may not be practical in all applications.

Challenge #4: Poor Build Quality Diminishes Service Life

Conveyors used in foundry and die casting applications take a lot of abuse. When they aren't constructed to deliver decades of reliable operation, total cost of ownership increases. Furthermore, when supply chain challenges cause shipments of replacement parts to be delayed, or skilled labor shortages result in a lack of available technicians, downtime escalates.

Solutions

Conveyors engineered to minimize or streamline routine maintenance have lower life cycle costs and contribute to higher throughput. The following conveyor features contribute to longer service life:

- Heavy-duty, abrasion-resistant construction materials and high-quality welds
- Design features that provide reinforcement and/or reduce impact, such as special supports and belt-reinforcing impact plates
- Belt-tracking enhancements, such as track and wear bars, that promote precise belt tracking and longer belt life
- Conveyors that utilize a single chain instead of two, such as the PRAB ScrapVeyor II™, result in fewer moving parts to maintain
- Auto lube systems that automatically grease bearings improve bearing performance and eliminate maintenance required for manual greasing
- If manual greasing is required, the lubrication points should be easy to access
- Overload protection to prevent an excessive payload from overtaxing the conveyor motor

Furnace feeders that meter-feed die scrap into the melting furnace contribute to greater energy efficiency

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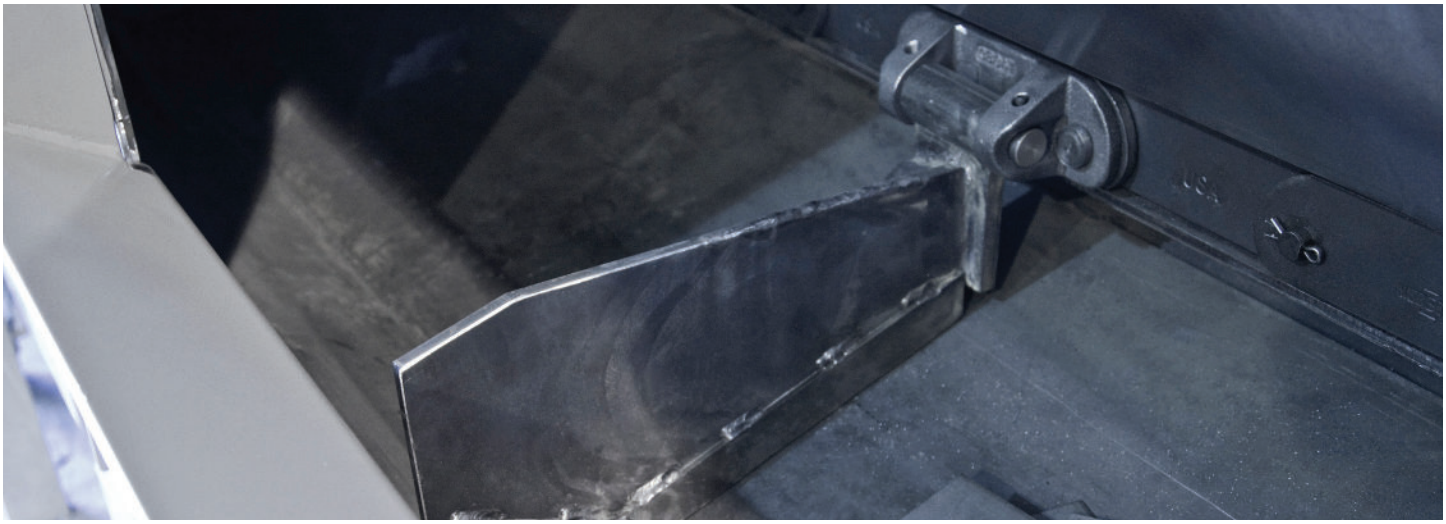

Conclusion

As the die casting market grows, metal casters need to dial in every aspect of production to remain competitive. Conveyors may not seem to merit intensive research, but a conveyor that is not optimized for die casting applications will ultimately lead to inefficient processes, increased maintenance, and higher labor costs. By choosing a conveyor that eliminates carryover, minimizes belt maintenance, doesn't waste energy resources, reduces health and safety hazards, and is constructed to provide a long service life, die casting operations can increase uptime.

About the Author

Bob Anspaugh is a Conveyor Sales Engineer for PRAB and has 15 years of application engineering experience.

About PRAB

PRAB is a leading engineer and manufacturer of conveyors, chip and fluid management systems, and industrial water and wastewater treatment equipment. Our customized solutions automate metal handling, reduce labor costs, reclaim and recycle expensive cutting fluids/coolants, and maximize return on recycling metals. With our expertise, honed by more than 4,500 installations for the world's leading OEMs and suppliers, PRAB continuously improves material handling, housekeeping, and compliance to environmental rules and regulations within the automotive, aerospace, medical, electronics, defense, off-road, and energy markets. For more information about PRAB, visit **prab.com**.

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