

APPLICATION REVIEW

Drag Chain Conveyor

Aluminum Foundry Automates Transfer Process with a Dependable, Heavy-Duty, Single Strand Top Carry Drag Chain Conveyor

The Challenge

Manually shoveling sand to fill cope and drag boxes (casting flask) for sand casting is a physically demanding process for mold makers, who on average shovel 20 tons of casting sand weighing 100 lbs. per cubic foot into 70-80 molds per day. This demanding operating condition creates a high level of physical strain on the mold maker's body. The result of this strain was a multi-million-dollar-per-year workers compensation obligation for an aluminum foundry. The financial impact not only hit the company's bottom line but slowed overall worker efficiency. Company leaders knew that keeping workers safe and healthy was not only important for their people and profits but also for their customers. They knew if they could improve productivity through process improvements, they could reduce lead times and improve customer satisfaction, which in turn would continue to grow their business. After many searches on Google and conversations with various material-handling companies, foundry management discovered Hapman.

Effectively and reliably moving foundry sand is a challenge. The sand carries a high-moisture content and does not move easily when conveyed. Initially the foundry tried a Helix® Flexible Screw Conveyor; however, even with modifications and flow aids, the right combination of auger type and speed could not be achieved to move the sand. After numerous discussions, site visits and extensive material testing, it was clear the solution to this material-handling challenge would be a conveyor engineered to fit the exact requirements of the application.

Manual Labor Eliminated

The result of the testing and trials was a Single Strand Top Carry Drag Chain Conveyor with integral hopper. The engineered material-handling assembly allowed front-end loaders to empty foundry sand into the hopper as the drag conveyor reliably metered the sand into the molds. This process eliminated the need for the slow, back-breaking process of manually shoveling sand into molds.

Project Summary

CHALLENGE:

- Effectively and reliably moving foundry sand
- Minimized ergonomic risk factors

BUSINESS RESULTS

- Increased production capacity
- Lowered disability insurance costs and reduced claims
- 30% increase in productivity results for all stakeholders
 - Increased business
- Shorter turn-around times



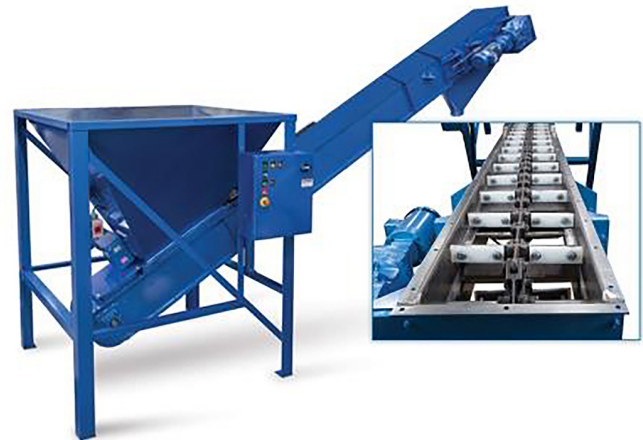
Manually shoveling sand to fill cope and drag boxes is physically demanding for mold makers.

The redesigned mold-filling process begins as prepared moist foundry sand is introduced into the hopper by a small skid steer loader. The dense material is screened as it enters the hopper to eliminate aluminum tramp metals or larger pieces from entering the process. To provide consistent material flow to the conveyor, the hopper is constructed with an electro-polished stainless steel finish, a pin-style agitator, and a vibrator to keep material from bridging. The drag chain moves the sand in a consistent, metered flow to the discharge point where the mold maker controls the filling of the casting flask.

The Hapman Drag Chain Conveyor features a design that offers minimal maintenance requirements and abrasion-resistant construction. The Hapman drag chain is engineered in a CrMn alloy and drop-forged construction. The chain is machined, carburized and case-hardened for strength and durability. The bolted UHMW polyurethane flight design reduces the possibility of sand sticking on the flights while also resisting wear and providing a quiet operation.

Increased Production, Lower Operating Costs

The foundry started with one Hapman Drag Chain Conveyor and was so pleased with its performance that it added 14 more. Now all of the foundry's mold-filling lines feature a Hapman Drag Chain Conveyor system. This has increased production capacity by more than 30 percent and resulted in a 100-percent return on investment in less than 6 months. Automating the foundry sand transfer process also significantly lowered ergonomic risk factors and eliminated the daily physical strain on mold makers, which has significantly decreased costs. Because the foundry is now able to take on more jobs and deliver shorter turnaround times, overall business has increased considerably. The Drag Chain Conveyor, along with all Hapman equipment, comes with an exclusive Performantee®, a true performance guarantee that ensures the equipment achieves the specific results it was designed and manufactured to deliver.



Drag Chain Conveyor engineered to efficiently and reliably move and meter the foundry sand into casting flasks.



Hapman's Drag Chain Conveyor

ABOUT HAPMAN

For 70 years, Hapman has provided manufacturing plants around the world with the most technologically advanced powder and bulk handling equipment and systems, offering custom engineered equipment and systems for chemical, food, pharmaceutical, plastics, building, minerals, and other industries. For more information on Hapman, visit hapman.com

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