

PRAB APPLICATION REVIEW

Automotive Die Casting Plant Significantly Reduces Downtime with More Robust Conveyors and a Custom Diverter



A die casting plant that manufactures all aspects of automotive transmissions, from die cast parts through final assembly, needed to reduce downtime associated with re-melting scrap material created during the casting process. The plant's scrap output was as much as 20,000 lbs./hour, and the scrap sizes ranged from 1/4" pieces to 70-lb. transmission housings.

The plant utilized competing conveying equipment to transfer the material back to three re-melt furnaces for recycling and reuse. A bottleneck occurred when the furnaces that were not in operation could not be bypassed in an expedient manner. One scenario required a bypass to be manually welded into place, causing 3-4 hours of downtime for each bypass.

The equipment was lacking in the robustness required by an industry that's known for being very hard on equipment. The plant also needed several custom conveying and bypass options that no other company was willing or able to provide:

- The ability to bypass the entire elevating conveyor and re-route the scrap onto an existing reversing conveyor.
- A bypass system on the discharge end of the elevating conveyor that included a shaker conveyor to directly feed a live-well at the side of an adjacent melt furnace.
- A secondary bypass to allow all scrap to fill large bins, when all three melt furnaces were down for maintenance.

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PRAB'S CUSTOM SOLUTION OFFERED ALL OF THE REQUIRED BYPASS OPTIONS

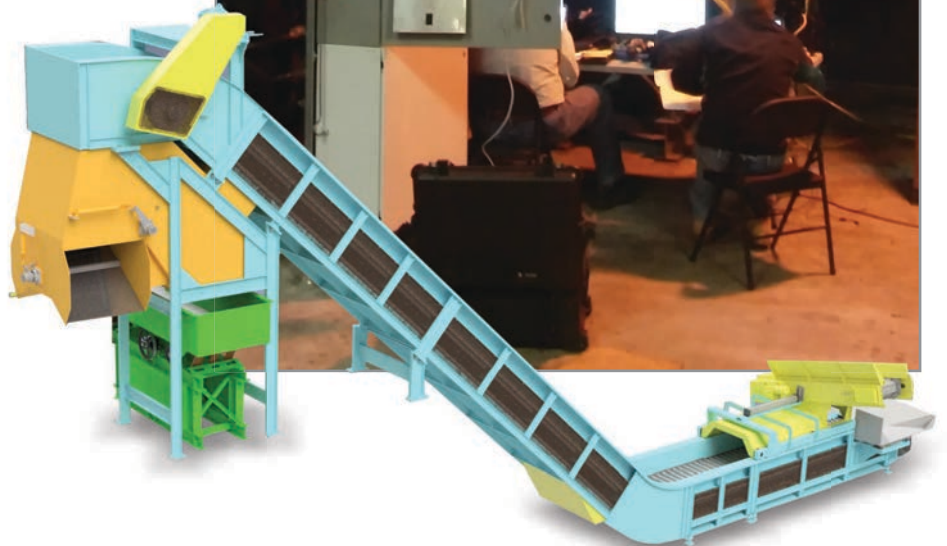
PRAB was prepared to deliver all of the requested conveying solutions, and do so within existing space constraints. The customer provided 3D drawings/renderings of the facility (created by a secondary company) where the new system would be installed. PRAB engineers also took physical measurements to ensure accuracy and clear obstructions. The goal was to develop a custom frame/belt design to meet the customer's strength requirements. Space constraints within the existing pit area, as well as height limitations caused by an overhead trolley system, proved challenging.

In collaboration with the customer, PRAB experts designed and discussed multiple layouts and equipment configurations before reaching a final decision on a custom solution that would fit in the allotted space and offer all of the required bypass options. The new system included a 6"-pitch closed-frame conveyor on a pneumatic rail system that would:

- **Allow** the conveyor to be moved into a position to allow bypass of the main elevating conveyor.
- **Collect** material from two shaker conveyors.
- **Discharge** into an existing reversible belt conveyor.

PRAB also designed a custom pneumatic double-actuating bypass chute that allowed discharged material to travel to three different locations:

- **Location A** allowed the discharged material to feed into an existing elevating conveyor that feeds an existing stack-furnace to the South.
- **Location B** allowed the discharged material to feed into a PRAB-supplied heavy-duty oscillating conveyor that feeds directly into a live-well on a holding furnace to the North.
- **Location C** allowed the discharged material to feed directly into a large container when both adjacent furnaces required maintenance, allowing the die cast lines to continue to provide product.



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THE PRAB SYSTEM BROUGHT MULTIPLE BENEFITS TO THE PLANT'S OPERATION



Other customized components of interest in this PRAB system included:

- A special vibrating chute designed at the infeed of the open-frame conveyor to assist in the removal of carry-over on the customer's existing reversible belt conveyor.
- All safety guards made of clear Polycarbonate panels to allow easy viewing of the interior belting.
- Angled bottom covers on the lower horizontal portion of the open-frame conveyor that allowed carry-over material to exit the system without heavy collections at the tail assembly.
- A head-mounted belt take-up, as the tail assembly is very difficult to access in a confined space.
- PRAB-managed controls programming and installation of the entire system (in partnership with a union-contracted machinery installer that was local to the customer and one of the plant's preferred service providers).

By combining new equipment with replacements for existing equipment, the system brought multiple benefits to the plant's operation. The PRAB conveyors were more durable and reliable than the competing units that were previously used to move material, and the system allowed the customer to create three different bypass scenarios depending on which of the three re-melt furnaces was currently in operation.

REDUCED OPERATIONAL DOWNTIME

BYPASS 1
Procedure went from
3-4 hrs → 2 min



BYPASS 2
Procedure went from
45 min → 10 sec

Another concern the system minimized was related to routine maintenance, which is often overlooked in industrial applications in favor of more pressing plant emergencies. By building automated systems into the equipment that provided real-time monitoring for predictive maintenance, PRAB was able to reduce or eliminate challenges associated with unplanned downtime.

About PRAB

PRAB is a leading engineer and manufacturer of conveyors and chip and fluid management systems. Its customized solutions automate metal handling, reduce labor costs, reclaim and recycle expensive cutting fluids/coolants and maximize return on recycling metals. With its 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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