

REDUCING HAUL-AWAY COSTS IN METALWORKING OPERATIONS

Lower Metal Scrap and Fluid Haul-Away Expenses with Automated Systems

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Introduction

Costs to haul away and dispose of metal scrap and spent cutting fluids erode the bottom line of metalworking operations. Several factors outside the control of metalworking shops contribute to the costs, which continue to increase:

- Pass-through costs to meet local, state, and federal hazardous waste treatment regulations
- Rising fuel costs
- Driver shortages
- Higher travel times due to increased traffic
- Increased transportation maintenance, equipment, licensing, and insurance costs¹

Most of the contributing factors are variable and difficult to predict. This unpredictability makes forecasting and budgeting a challenge. Fortunately, there are several practices metalworking shops can adopt to reduce the re-occurring costs associated with hauling away metal scrap and fluids.

In this white paper, we will:

1. Identify several aspects of metalworking that commonly contribute to high haul-away costs
2. Explain how automated solutions improve the efficiency of metal scrap and used fluid management

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The Challenges

When it comes to hauling away metal scrap and spent fluids, there are five primary conditions that factor into the final cost:

1. Total volume and weight of metal waste
2. Inefficient use of space inside containers used to transport metal scrap
3. Total volume of cutting fluid waste
4. Wastewater treatment pass-through costs from industrial waste disposal service companies
5. Transportation fees to cover labor, mileage, fuel, etc.

There is little that metalworking operations can do to control costs associated with the logistics of waste removal. However, many metal scrap and fluid haul-away costs are formed long before a contract hauler pulls up to the shop. Here are three of the most common instances of higher-than-necessary haul-away costs that originate within the metalworking process.



High Volume of Metal Scrap

Unprocessed metal scrap comes in many forms: bushy material, die-cast scrap, metal chips, turnings, and swarf. The unwieldy shapes and sizes of the metal scrap combine to produce a mass of material that is typically low density, high volume, or (if coated with cutting fluid) heavy. The larger the volume of metal waste is, the more metal scrap there is to haul. The more volume there is to haul, the higher the costs will be.



Wasted Container Space

Optimizing the use of space in containers is important for both a metalworking company and its metal scrap recycler. Unprocessed scrap metal is usually extremely asymmetrical and doesn't lend itself to orderly placement within a container, resulting in pockets of unused space. Furthermore, some load-out systems do not distribute the scrap evenly within the container. In either scenario, inefficient use of container space results in lower returns and more pick-ups from the hauler.



High Volume of Cutting Fluid Waste

Used metalworking fluids and oils are regulated under the Resource Conservation and Recovery Act². Diluted metalworking fluid mixtures contain about 5 to 20 percent fluid concentrate and 80 to 95 percent water by volume³. When fluid becomes contaminated with tramp oils, metal fines, and bacteria, proper hazardous waste disposal procedures that meet local, state, and federal standards must be met. The more stringent your area's regulations, the higher the disposal costs are likely to be, with some costs estimated at \$1,100 to dispose of 150 gallons of coolant.

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Solutions

To determine how much your metalworking operation is spending to haul away and dispose of metal scrap and fluids, track expenses each month and run a monthly report to review:

- The time and labor required to prepare metalworking waste for shipment
- The expenses charged by the hauler

To reduce haul-away costs, metalworking operations need to:

- Separate metal scrap from fluid and decrease the total volume of metal scrap
- Optimize container filling procedures
- Reduce cutting fluid waste by recycling and reusing

Metal scrap processing and fluid filtration systems significantly lower haul-away costs through lower metal scrap and/or fluid waste volumes. By producing dry and more compact metal scrap, metal scrap processing systems also enable shops to garner a higher value for their metal scrap. Furthermore, fluid filtration will extend the life of cutting fluids—reducing new cutting fluid purchases up to 75%.

When it comes to transporting metal scrap, making the most of the space inside containers will reduce the total number of haul-away trips. Metal-scrap load-out systems designed to reach hard-to-fill areas of containers are able to utilize the most space inside containers through even distribution of the metal scrap. This yields a higher volume of metal scrap that is hauled away per trip, which results in fewer trips overall.

APPLICATION	HAUL-AWAY CHALLENGE	BEFORE INSTALLATION OF AN AUTOMATED SYSTEM	AFTER INSTALLATION OF AN AUTOMATED SYSTEM
Aerospace Component Manufacturer A	Weight of Scrap	500,000 lbs	439,875 lbs
Automotive Stamping Manufacturer	Scrap Load-Out Efficiency	25,000 lbs	40,000 lbs
Aerospace Component Manufacturer B	Discarded Coolant	4,500 Liters Discarded/Week	1,500 Liters Discarded/Week

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Actual haul-away cost savings will depend on each application's unique needs. Nevertheless, there are many modular and centralized systems available to serve the needs of small shops and large manufacturers.



Turning & Chip Processing Systems

Reduce small to medium volumes of turnings and bushy wads to flowable metal chips and separate chips from fluid for increased value of machining scrap and cutting fluid. Systems are proven to reduce metal scrap volume by as much as 90%.



Briquetters

Compress loose turnings and swarf into near-solid dry pucks that are easy to re-melt, transport, and store. Because 99% of all hazardous and non-hazardous fluid is removed, the risk of fire is significantly reduced.



Wringers & Centrifuges

Heavy-duty chip and fluid separation system creates dry chips and reclaims up to 99% of cutting fluid using more than 600G's of centrifugal force. Significantly reduces haul-away costs and increases scrap value.



Vertical Axis Crushers

Reduce metal turnings and bulky wads into shovel-grade chips for an overall reduction of scrap volume that is 6:1. System is proven to reduce scrap volume up to 90%.



Metal Turnings Shredders

Reduce turnings volumes up to 4 times at the source by shredding metal turnings into flowable chips. Shredders create small shovel-grade chips and increase value of metal scrap.



Horizontal Axis Crusher

Achieve continuous low volume metal scrap reduction at the source, proven to reduce metal turning volume up to 12 times, resulting in lower transportation costs.



Horizontal Screw Press

Remove liquid from filter cake to reduce volume and lower material disposal costs.



Centralized Coolant Recycling System

Reduces waste fluids up to 90% by removing tramp oils and suspended solids from contaminated coolant, controlling bacteria, and adjusting fluid concentration for fluid recovery.



Shuttle Conveyor Load-out Systems

Automates final load-out of stamping scrap, die scrap, and machining scrap into large trailers or railcars to maximum container fill. In-feed conveyor, and continuous back and forth operation provide even distribution into larger scrap containers.

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Conclusion

There are many financial advantages to creating efficiencies in haul-away procedures. Metalworking operations that take steps to lower their haul-away costs through automated metal scrap processing, fluid filtration, and load-out systems will reduce their overhead expenses. They will also decrease their exposure to rising transportation costs, setting a foundation for more predictable budget forecasting. Finally, shops will also boost their bottom line through increased metal scrap value and extended fluid life.



About the Author

Mike Hook is the Sales & Marketing Director for PRAB and has more than 15 years of mechanical design and application experience. PRAB is a leading manufacturer of engineered conveyors and equipment for processing turnings, chips, and metalworking fluids. PRAB also designs and builds industrial wastewater recycling systems.

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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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