

# APPLICATION REVIEW

## Automotive Powertrain Manufacturer Sees Results BEFORE Installation of PRAB Wringer and Conveyor Through PRAB's 'Prove It Before You Use It' Approach



ABOVE: This PRAB Wringer and Screw Conveyor is representative of the system that enabled a powertrain manufacturer to separate oil from its stamping scrap.

A global manufacturer of powertrain systems for the auto industry needed to improve fluid recovery as part of its steel stamping scrap process at its facility in the Northeastern United States. As a tier one supplier to major automotive manufacturers, and with an estimated 70% of the vehicles on the road utilizing one of their systems, the company has

a demanding production process to uphold. The ability to recover valuable stamping oil from its steel stamping scrap would provide the manufacturer the ability to reduce future stamping oil expenses, reduce haul-away and disposal costs, and improve the value of its stamping scrap.

**PRAB**

a **MG**Global company



As an existing PRAB customer, the powertrain company was aware of the benefits a PRAB automated solution could bring to its operation. But like most companies that are weighing the benefits of new capital expenditures, the company wanted to quantify the return on investment a new metal scrap processing system would bring prior to purchase and installation of the new equipment. How much fluid would a PRAB system be able to recover? What additional value would a fluid separation system bring? PRAB was able to provide the automotive parts manufacturer with quantifiable answers up-front through its "Prove It Before You Use It" approach to equipment testing.

## The Situation

The powertrain manufacturer's steel stamping process was producing a scrap mixture containing a 50-50 mix of small steel chips and shells, which were coated in stamping oil. The company needed a system inside its plant that could accommodate 4,000 pounds of material per hour, could be fed by chip carts, would dry the stamping scrap mixture and enable the manufacturer to recover the stamping oil coating the material.

To solve this challenge, PRAB started the process of quoting a liquid/solid separation system that included a diagonal shaft wringer fed by a screw conveyor. To demonstrate the scrap processing system's capabilities and potential ROI to the customer, PRAB conducted application-specific testing and reporting of the proposed system at its Michigan-based headquarters prior to submitting its final proposal to the powertrain manufacturer.

As part of this value-added service, a PRAB application engineer simulated the powertrain manufacturer's process for separating its oil from its metal scrap at the PRAB facility utilizing the metal scrap processing equipment that would be installed at the manufacturer's plant. During the test, the PRAB engineer dumped two 55-gallon barrels of small stamping scrap material provided by the powertrain manufacturer into PRAB's

conveyor in-feed hopper. The material moved up the system's conveyor and discharged into the PRAB Diagonal Shaft Wringer. The wringer dried the chips and shells and discharged them back into the customer-supplied barrel. The PRAB application engineer documented the following results of the testing:



## Test Results

Volume Reduction—Average Bulk Density:	150 lbs./ft <sup>3</sup>
Average Incoming Moisture (% of Total Weight Before Wringer)	2.67%
Average Outgoing Moisture (% of Total Weight After Wringer):	0.89%
Fluid Recovery:	Approximately 10 gallons (contained in two 5-gallon buckets)
Throughput Rate:	4,000 lbs./hr
Decibel Meter Reading:	73 dB (peak reading, which is within a low noise level range)

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In addition, a major metal recycling company provided an estimate of the projected return on investment for the powertrain supplier's dry metal scrap:

### Current Unprocessed Scrap Value

Quantity sold (over 52 weeks):	1,293,504 lbs.
Moisture content:	18% oil
Average price per pound:	\$.43
<b>Dollar amount paid:</b>	<b>\$556,206</b>

### Projected Return with PRAB System

Quantity Sold:	1,099,458 lbs.
Moisture content:	2% oil
Average price per pound:	\$.55
<b>Dollar amount paid:</b>	<b>\$604,702</b>

**NET GAIN: \$48,496**

## The Outcome

After reviewing the testing documentation provided by PRAB, the powertrain manufacturer accepted PRAB's proposed solution. Installed in February 2019, the new metal scrap processing system enables the company to transfer small oil-covered chips and shells from their chip carts into a screw conveyor, which elevates and meter-feeds the metal scrap

into a diagonal shaft chip wringer. Using more than 600 G's of centrifugal force, the wringer separates the oil from the chips and shells. A settling tank captures the reclaimed oil for recycling.

Then, the wringer unloads the processed metal scrap into a discharge conveyor that safely diffuses and vents the generated airflow, and elevates and discharges the wrung material into a swivel chute. This chute enables the manufacturer to achieve more even distribution of fill into the scrap container. The system shuts off when a sensor on the discharge chute indicates a full condition in the discharge container. Further, the system is equipped with a sensor in the in-feed hopper to indicate an empty condition, signaling the system to stop until material is loaded into the hopper and an operator initiates a system start-up procedure.



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The installation of the PRAB Wringer/Centrifuge system achieved the following results for the powertrain manufacturer:

- Enabled the recovery of up to 98% of the stamping oil for recycling or reuse
- Lowered haul-away and disposal costs

In addition to meticulously testing its equipment to prove its performance capabilities for every unique metalworking application, PRAB provides a Performantee® for every system it supplies, guaranteeing the equipment will achieve the specific results for which it is designed. PRAB's "Prove It Before You Use It" approach to testing, combined with its performance guarantee, reflects its commitment to customers before, during, and after the installation of one of its automation systems. This level of partnership has proven to enhance operations for the powertrain supplier, who has plans to utilize PRAB for future automated equipment improvements.

### Application Information

Material Handled:	Steel stamping scrap
Fluid:	Stamping oil
Chip Configuration:	50% chips, 50% shells
Bulk Density:	150 lbs./ft <sup>3</sup>
Volume of Material:	4,000 lbs./hr
System to Be Fed By:	Chip carts
System Location:	Inside plant

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## PRAB Chip Wringer System Summary

### System Feed Screw Conveyor

- Receives chips from chip carts, elevates and meter-feeds material into wringer
- Includes 1 cubic yard capacity receiving hopper

### Diagonal Shaft Chip Wringer: Model 24CD

- Uses centrifugal force to separate oil from metal chips
- Gravity-discharges processed scrap into discharge conveyor

### Settling Tank

- Captures reclaimed oil for recycling
- Requires infrequent clean-out of fines by operator
- Includes a pneumatic pump to transfer the captured fluid to a holding tank or a separate filtration system

### Discharge Screw

- Receives chips from the wringer's discharge chute
- Safely diffuses and vents the generated airflow
- Elevates and discharges the wrung material into a scrap container

### Powered Swivel Chute

- Provides more even filling of scrap container
- Powered operation
- Manual control (from remote operator panel) for line-of-sight operation

### Control Panel

- NEMA 12 cabinet engineered and constructed to control all items in the system with motor-starters, over-loads, contactors, fuses, featuring A-B HMI and PLC
- Includes Panduit VeriSafe Absence of Voltage tester
- High visibility stack light
- Pre-wired

### System Start-Up and Training

- A fully trained PRAB service technician on-site after the installation is completed to start-up and fine-tune the system and train personnel in the proper operation and maintenance of PRAB equipment

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## 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](http://prab.com).

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To improve your metal scrap & fluid value **contact us** today

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