Logistics Solution Closes the Loop on Aluminum Recycling

A unique supply chain developed by Ford Motor Company—along with aluminum supplier Novelis and third-party logistics provider Penske Logistics—allows the automaker to recoup some aluminum costs by selling scrap back to its suppliers, and then reusing it.

The cost savings allow Ford to manufacture its new F-150 pickup truck using lightweight aluminum instead of steel for its body panels. The truck is 700 pounds lighter than standard models, and more fuel efficient to meet government requirements.

"This strategy enables Ford to deliver quality, fuel-efficient, and smartly designed vehicles that are affordable to the masses," says Kelli Felker, manufacturing and labor communications manager at Ford.

Penske Logistics and Novelis customized unique universal trailers to serve a closed-loop aluminum supply chain that feeds the stamping needs of Ford's production of the F-150 and new Super Duty trucks.

Penske crafted a custom logistics solution to provide trucking and logistics service non-stop. The loop starts when Penske Logistics picks up freshly recycled aluminum coil from the Novelis aluminum recycling plant in Oswego, N.Y., and delivers it to Ford's Dearborn, Mich., stamping plant, which provides parts to build F-150 pickup trucks at Ford's Dearborn and Kansas City assembly plants. "We build the Super Duty truck in our Louisville plant, and the F-150 pickup in Dearborn and Kansas City," Felker says.

"Our trucking operation runs 24/7 and we make frequent deliveries around the clock to ensure the continuous flow of aluminum coil and scrap to both Ford and Novelis," explains Jeff Bullard, senior vice president of operations, central region with Penske Logistics. "The looping process ensures quality control and continuous high-volume production."

To support the operation, some 200 Penske Logistics drivers live near Ford's Dearborn stamping plant and the Oswego recycling plant.

This pool of drivers takes turns hauling their loads until they meet at a fixed, centralized point where they swap trucks, return to their respective cities, and go home at night after the shift ends.

"It's about 430 miles from Oswego to Dearborn, so that relay point allows the driver to get there and back in one day," say Bullard. "This process also helps with retention, because it provides drivers with a better quality of life."

Penske Logistics uses electronic logs to track driver hours and comply with Hours of Service regulations. "In the event a driver runs out of hours, we have procedures in place to ensure that the driver takes the required rest break and that the load reaches its intended destination," explains Bullard.

To provide Ford with the recycled aluminum the automaker needs, Novelis and Penske Logistics developed customized semi-trucks and unique universal trailers that haul both the aluminum coils and the scrap.

"Everything from the truck all the way through to the trailer and its tarping system on top was specifically engineered for this closed-loop recycling program," Bullard says. "None of it is standard. We have been in production and prototyping since 2012 to build a universal trailer and tarp system that would be applicable to Ford's operation."

Meanwhile, the custom equipment that Penske Logistics uses for driving and delivery allows for specialized hauling and heavier loads. "We have roughly 200 trailers and 50 tractors in service," he adds.

Going Green

Not only does Ford's recycling program save money, it also ensures a more sustainable supply chain, by putting a lighter and more eco-friendly pickup truck on the road.

As attention to sustainability grows, so does the popularity of aluminum because it is infinitely recyclable, avoids 95 percent of greenhouse gas emissions, and uses less energy and water, according to Automotive Science Group.

"We've broken the material up into a 5000 series, which is a magnesium-aluminum-containing alloy, and a 6000 series alloy, which is made of a little more copper," says Sil Colalancia, director of recycling for Novelis North America. "Ford uses these alloys to make various parts of its vehicles."

These parts include structural pieces as well as add-on components such as car doors, hoods, cargo beds, roofs, and tailgates.

With a 330-pound weight savings over the 2016 model, the 2017 Super Duty is

second only to the F-150 pickup in the amount of aluminum built into a vehicle to date.

"Light weighting is aligned with our sustainability strategy to improve fuel economy and reduce emissions," Felker says.

The 2015 Ford F-150 truck was the first pickup with a body and cargo bed made of aluminum. Previously, the F-150 was made of steel.

Opting for aluminum over steel in new automobile construction is the best way to reduce energy consumption and carbon emissions, according to Oak Ridge National Lab.

"We saved as much as 700 pounds through the use of advanced materials on the 2015 F-150 compared with the 2014 F-150," says Felker.

Ford will begin rolling out 2017 Super Duty trucks later in 2016.

Ford's 2017 Raptor truck, produced with aluminum alloy, weighs approximately 500 pounds less than previous models.

"We reinvested additional weight savings everywhere it counts, including in a heavier-duty fully boxed frame, axles, suspension, and towing hardware, as well as stronger components that support better towing and payload capability," Felker says.

Novelis provides aluminum products for more than 180 vehicle models on the road today. Over the past five years, the aluminum rolling and recycling company has invested more than $400 million in infrastructure improvements in Oswego and is an example of how sustainable manufacturing practices can work well together with excellent supply chain processes.

—Juliette Fairley