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Rethinking Regrind

Repurposing Resin at AGS Technology

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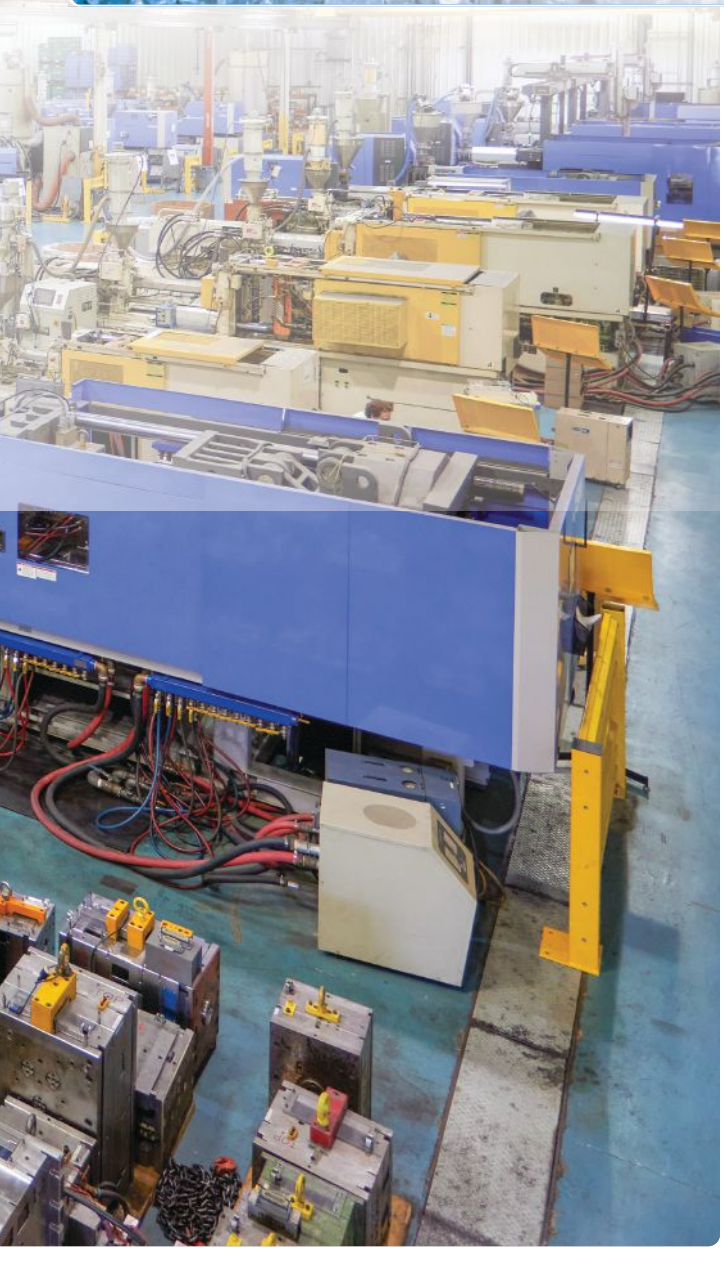
Skipping the Pellet for Efficient Recycling in Molded Engineering Plastics Applications

AGS Technology leverages deep experience in molding with recycled engineering materials for automotive and heavy equipment parts.

AGS Technology's injection molding operation with various molds in foreground. Source: AGS Technology

AGS Technology has increasingly found itself aligned with market needs for functional plastic molded products in automotive and heavy equipment applications. The company's unique approach entails processing reprocessed engineering materials into new parts with no superfluous steps. It is not a new approach — AGS has been doing this for decades — but in the past five years the company has seen its sales climb as customers increasingly trust the consistency, value and sustainability of molding parts this way.

According to Chris Racelis, co-founder and president at AGS, the company has seen increased competition for engineering materials like nylons and glass-filled polypropylene. "The policies that OEMs (original equipment manufacturers, such as vehicle brands) have put in place



have begun to trickle down to all sorts of commodities, and that includes plastics," Racelis says.

SCRAPPING THE BLAME GAME

Racelis founded AGS with George Staniulis in 1995. The two formerly worked in sales for a compounder in the Chicago area. Their experiences selling compounds with recycled materials left them frustrated. Even after gaining the confidence of the OEM, any problem in producing the molded product was viewed as a compounding problem by the molder and a molding problem by the compounder. "It ended up always being a finger-pointing contest, to the point where it was painful for all three parties to get this recycled material into the application," Chris Racelis says. Racelis and Staniulis decided to leverage their materials experience to start a molding operation, and AGS Technology was born.

With no one to point fingers or be pointed at, the new company took a pragmatic approach. The company developed its skill with using less-than-perfect materials to make parts perfectly matched to the performance demands of their applications. Building interior, non-safety structural elements and components like wire guides and filter components, AGS found a strike zone of applications with properties that can be hit with recycled materials.

SCRAP TO MOLDED PRODUCT WITH NO EXTRA STEPS

AGS Technology's International Automotive Task Force (IATF)-certified quality systems enable its place in the parts supply market, where the cost of reprocessing is smaller, proportionally, than it would be in other markets. That cost of reprocessing is kept low by using regrind to produce Injectoblend, a recycled material ready for molding without the need for extrusion and pelletization. "Our goal is to remove any unnecessary cost from the process," Staniulis says.

The process begins with receiving and identifying the material at the lot level. Gaylords are marked with lot number and composition, but this information is not assumed to be accurate. Staniulis invokes a Reaganism to describe the mindset: "Trust, but verify." Fines and metals are removed and the material is classified with a vibrating screener. At this stage, the company has a clean material, but it may not be uniform throughout the lot. So the material is blended, 6,000 pounds at a time, in double cone blenders. With this uniform, clean material, AGS conducts testing to establish the properties. A dedicated injection molding machine is used for the purpose of making test samples, of either the ASTM standard dimensions or ISO (depending on what standard is preferred by the customer).

> ***"This is possible. We've been doing it for 30 years. Why is what we do so rare?"***

The AGS laboratory has equipment for measuring the mechanical properties as well as a plastometer for determining the melt index and a differential scanning calorimeter (DSC) for investigating any discrepancy in the melt that might be due to a mixing of material types.

Finally, the clean, homogeneous, demetallized and tested material enters the molding operation. AGS primarily uses JSW molding machines, eight of which are outfitted with iMFLUX technology. The iMFLUX is a molding control system which adapts the filling process to manage variability and produce consistent parts. Along with custom screws for the purpose, this technology enables AGS' time-tested practice of molding granules directly into parts, eliminating the cost and also the heat history of extrusion. A robotic pick-and-place system with optics inspects each part, automatically rerouting any rejects to a bin of runner material for regrinding and another cycle. Even material reground ►

Black nylon regrind as received by AGS Technology. Source: Matt Stonecash

An injection molded sample is tested for tensile properties at AGS. Source: AGS Technology

at AGS is not assumed to be good, but rather goes through the same verification steps as purchased scrap.

SHIFTING PERCEPTIONS OF RECYCLATE USE

AGS has been around long enough to see attitudes toward recycled content change, and change again. "When we started the company, you had to have everyday low prices, you had to be at the bottom for people to take the perceived risk of using recycled material," Chris Racelis says.

According to Steve Racelis, commercial manager at AGS, "It seems like everyone wants to use recycled, but as you get closer, there are more people in the decision tree, and it only takes one to kill it. When they see the on-time deliveries and that the PPMs are nearly perfect, they really seem to get it," he says. A new customer might start with an order for a part in a smaller application, then expand as their confidence builds. According to AGS, sales have doubled in the past five years.

Policies that OEMs have put in place have begun to trickle down to all sorts of commodities, and that includes plastics.

Ultimately, however, customers of AGS are still cost sensitive. In the past, a brand might want to minimize cost of a molded part but avoid any negative associations with recycling, Today, recycled content has a positive connotation, but the price is still a factor. And more and more customers are finding that AGS can consistently meet their quality requirements while providing recycled content that end consumers and, therefore, brands increasingly seem to care about.

There are some limitations. AGS does not make appearance parts such as trim for interior surfaces. Color matching is usually not possible; even for black parts, there are limitations. AGS also does not do critical safety parts. They do not want to be part of the braking system, for instance. But that leaves many interior components, parts of the air conditioning system, cable brackets (especially for electric vehicles), all the pieces that give the interior surfaces their shape, though not the exposed surfaces themselves. All of these are areas that could be used with AGS recycled molded parts, even up to 100%.

In the near future, recycled content may be a must-have, especially for those OEMs and suppliers that do business in Europe. The European Parliament is expected to adopt an updated end-of-life vehicle regulation, which requires that new cars contain plastic which is 20% (by weight) recycled.

Some OEMs have already incorporated requirements for recycled content in their specifications. For suppliers that may soon find themselves scrambling to meet the deadlines, Steve Racelis says there is a clear answer: "We know you're nervous about 100%, we know you've been told to stop doing 0%, let us help you in between. This is possible, we have been doing it for 30 years."

Although movements toward more recycling have come in waves over the years, the current momentum seems different. "In about the last 10 years, sustainability has become important to people; they are making choices based on carbon footprint or recycled content. So companies, in turn, are making policies based on it. And I don't see that going away," Chris Racelis says. PT