OEM Tech Brief

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Environmental OEM Solutions:

Die Casting's Environmental Advantage over Plastics

Chicago White Metal Casting
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When it comes to plastics, we are getting close to the brink of disaster thanks to overproduction. An estimated 90.5% of all plastics produced since 1950 are still in existence today. On the other hand, over 95% of the aluminum die castings produced in North America are made of post-consumer recycled aluminum.

Before 2018, China handled the recycling of almost half of the world's materials. In 2016 alone, the US exported 16 million tons of plastic, paper, and metals to China. 30% of these mixed recyclables were contaminated and wound up polluting China's countryside and oceans. In 2018, China initiated "Operation National Sword," which banned the import of most plastics and other materials that were not up to more stringent standards – a threshold barely 1% of items can clear.

The US resorted to exporting its plastic waste to other countries, shipping 68,000 containers to Vietnam, Malaysia, and Thailand. When these countries started to institute bans on imported plastic waste due to over polluting, the US diverted its recycling to countries like Cambodia, Bangladesh, Kenya, and Senegal – countries with cheap labor and relaxed environmental rules.

The US currently sends over 1 million metric tons of plastic waste abroad each year, often to countries already overwhelmed by it. Without Chinese markets for plastic – and some types of cardboard, paper, and glass – the US recycling industry was upended. It has become cheaper for waste management companies in the US to bury plastic waste rather than recycle it.

Why are we overproducing so much plastic?

Simply put, oil and natural gas prices have plummeted, which makes it cheaper to produce "virgin" plastic, rather than recycle old plastic. Recycling used plastics is a labor-intensive process, which makes it very expensive. Shifting economics now works against recycling in much of the world.

Facts about Plastic:

9% of produced plastic has been recycled

Globally, only 9% of the plastic we've ever produced has been recycled. The other 91% has wound up in landfills, incinerated, or scattered throughout the environment.

Microplastics

A new study found that there could be as many as 8-14 million tons of microplastics on the ocean floor. Microplastics are 5mm or less in diameter and are mostly the result of larger plastic items breaking apart into smaller pieces.

Consuming Plastic

The average American consumes at least a teaspoon of plastic each week through food – roughly the amount of a credit card.

Facts about Die Casting:

Easily Recyclable

The alloys used in die casting are easily recyclable with no loss of properties. Aluminum, the most commonly used metal in die casting, is recycled with a cost-effective, energy-efficient, and robust infrastructure that has been in place for over 70 years. All of the alloys used by CWM are produced from 100% recycled raw materials.

Not Hazardous

Die casting materials are not hazardous waste and pose no problems in handling or reprocessing.

Less Waste

Die casting produces less waste and lowers the overall energy consumption. Some die cast metals – like aluminum, zinc, or magnesium – possess excellent recycling potential. In fact, more than 85% of the aluminum used in a car is currently reclaimed and recycled – much of the plastic in a scrapped vehicle is treated as "fluff" and sent to a waste dump.

Comparing Die Casting and Injection Molding

Die casting and injection molding are both high-speed production processes. In both cases, products are made by injecting a material into a die. These dies are typically made of steel and are capable of producing tremendous part quantities. Complex, thin-walled parts with a high level of reproducibility are made by both processes as well. Even with all of these similarities, die casting has several significant advantages over injection molding. The advantages of die casting include:

- **Higher strength and stiffness**
- **Higher resistance to the effects of elevated temperature and Ultraviolet Radiation**
- **Reduced carbon footprint**

What's next?

It's up to us to make sustainable changes to protect our environment. Solutions are possible, whether it's through innovation or reduction. At CWM, for example, we launched a new recycling initiative to help reduce our carbon footprint. This includes big picture efforts – like tracking materials even after they leave the facility to make sure they're being recycled – to smaller initiatives like speaking with suppliers to see if they can provide recyclable products throughout the office. This resulted in CWM eliminating plastic bottles (cans and cartons only), changing coffee stirrers from plastic to wood, and replacing foam coffee cups with biodegradable ones.

Please consider die casting metal for your next application.

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