Lighten Up: Choose Plastics Over Metals

"I'm convinced that our wonderful industry has an environmental value proposition that trumps anything the metals folks can put on the table." — Kevin Short, IAPD President

by Mark Shriver

In the January Environmental Corner article, we discussed how and why plastics are one of the most sustainable materials when selected properly and used responsibly. We broadly talked about the sustainability of plastics and how this versatile material has helped shape our modern world. We also explored how we can "advocate locally" and respond to the often myopic public perception of plastics.

Consider this: Any material used in manufacturing will have an impact on the environment. Trees are cut down for lumber and paper. Metals are mined from the earth. A great amount of energy is required to create glass. The story we need to promote regarding plastics is that, when taking into account a complete lifecycle analysis, plastics outperform and outlast other materials and, therefore, can be the most environmentally friendly choice.

For example, let's take a look at the total environmental impact of steel. Making steel is not a tidy, discrete operation. It is massive, energy consuming and environmentally hostile. The process starts in enormous mines that are dirty, dangerous and forever scar the landscape. The heavy ores and coal are then sent for processing that result in the manufacturing of steel and other metals. This results in air, land and water pollutants that include cyanide, cadmium, chromium, oil, grease, dust and slag. And this does not take into consideration the pollution generated from the massive amounts of energy required for production and transportation.

Possibly one of the greatest environmental differentiators between plastics and metal is the weight of these products. Steel's harmful environmental footprint includes its weight and cost of transport. The United States produces 80 million metric tons of steel annually, yet imports almost 30 million metric tons, mostly from China (ISSB International Steel Statistics Bureau). In addition, according to Reuters, we export 13.7 million tons. So, nearly half of the steel used in the United States is imported. The fuel spent moving that amount of metal into and out of the country is enormous and must be considered in the product's overall negative environmental effect. In comparison, plastic weighs many times less, is much easier to handle and less costly to ship, saving energy and other natural resources as well as reducing plastics' environmental footprint.

In addition to being more sustainable to ship and manufacture, there are a number of other attributes of plastic that cause manufacturers and inventors in all industries to choose plastics over metals. For example, the strength-to-weight ratio advantage of plastics has inspired auto manufacturers and aerospace companies to replace metal parts with those made of plastics as they strive for improved fuel efficiency and greenhouse gas reduction from their vehicles. When it comes to finishes, traditional materials must be painted, coated, etched, ground or labeled, giving off harmful volatile organic compounds (VOCs). Plastics can be manufactured with beautiful, complete finishes that are scratch resistant and impervious to rust and corrosives. The acoustical insulation properties of plastics and their ability to resist vibration make them a natural selection when used to reduce noise pollution, and their thermal insulation properties help to reduce energy loss in buildings, refrigeration and clothing.

The environmental advantages continue when taking into account the superior life expectancy of plastics. For example, the Utah State University (USU) Buried Structures Laboratory recently published a comprehensive study on PVC pipe excavations, testing and lifecycle analysis. It found that PVC water pipe longevity is in excess of 100 years. Think about it. That's more than 100 years of safe, healthy drinking water delivered by plastics. In addition, a previous study from USU on water main breaks showed PVC pipe to have the lowest rate of main breaks of all the pipe materials they examined, which included ductile iron, cast iron, steel, concrete and asbestos cement.

As IAPD members, it's up to us to correct the mistaken perception of plastics' environmental impact by sharing the scientific facts, through the media, legislators and regulators. Our goal is to have factual, scientific-based regulations, legislation and educated consumers of plastics.

The next time you're talking to someone who is promoting metal, tell them to lighten up and learn the facts about plastics.

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