

IN THE WORKS: MAGNETIC PLASTIC

Harnessing the power of magnetic currents has long been an effective way to separate and recover scrap metals. Now, researchers are looking at ways to use this same power to improve scrap plastic sorting methods.

Scrap plastic comes in the form of production or processing scrap and from post-consumer streams.

Production scrap can often be components or assemblies consisting of more than one type of plastic bonded together. Because no automated method of grinding and segregating the different types of plastics exists, these components often must be landfilled.

Post-consumer waste contains several types of plastic, which are most frequently automatically separated and should not be incinerated because of the presence of PVC.

Eriez Magnetics of Erie, Pa., has tested and is starting to commercialize two wet gravity processes. Corona and tribo-electrostatic separators can be used for very specific separations, such as the separation of PE and PP.

For automated separation of production scrap consisting of one or more types of plastics, Eriez determined it was necessary to re-engineer the plastic to be separated. A distinctive feature of Eriez' new process consists of manipulating the magnetic susceptibility of plastic polymers with additives.

Magnetic separation, an efficient, high-capacity process well suited for separation of granular material, is based on the ability to attract a particular material exhibiting a magnetic susceptibility and physically segregate it from particles that are nonmagnetic or that have different susceptibility. Magnetic susceptibility is an innate property of a material and is the most important parameter when addressing the characteristics of magnetic separation.

Plastic polymers do not exhibit a natural magnetic susceptibility. Therefore, Eriez engineered a procedure for adjusting the magnetic susceptibility of a polymer. By adding less than 0.5 percent of an inexpensive component to the plastic, Eriez can impart enough magnetic susceptibility to the plastic to make it recoverable using Eriez' high-intensity, permanent magnetic separators.

As a result, an automated process can be established to separate one or more plastics from each other with zero labor cost. Applications for this technology include the separation of ABS from PE, PUR from PP and TPE from any base material.

If less than 0.5 percent of the additive is used at the time of production, PVCs could be rendered slightly magnetic and separated from post-consumer waste streams. This would allow the waste to be incinerated for energy recovery rather than disposal to a landfill.

—Submitted by Richard Merwin, chairman of Eriez Magnetics, Erie, Pa.

