Smart Notes

What challenges arise with the use of recycled PVC?

PVC (polyvinyl chloride) is a widely used plastic material in the manufacturing of various products such as window profiles, pipes, and other extruded products. PVC compounders and companies engaged in PVC profile extrusion are facing increasing pressure to recycle their polymer waste due to environmental concerns and regulations.

To accommodate these demands, PVC compounders find they must increase the use of stabilizers in their formulations to allow for additional extrusion steps. The increased use of stabilizers can change the processing behavior of the overall compounds, making it more challenging for manufacturers to maintain consistent product quality. Additionally, the use of recycled PVC (re-ground material) can also change the processing behavior and properties of the final product.

To ensure consistent product quality while incorporating formula changes, comprehensive testing of many different formulations is necessary. Processing behavior must be characterized and process parameters such as fusion behavior, compound stability and melt viscosity must be determined. Specimens must also be tested for mechanical properties such as tensile strength and elongation.

In summary, PVC compounders and companies engaged in PVC profile extrusion are facing increased pressure to recycle their polymer waste, which requires them to increase the stabilization of their formulations and to use more recycled PVC. These changes can affect the processing behavior and properties of the final product, making it more challenging to maintain consistent product quality.

The Thermo Scientific™ HAAKE™ PolyLab™ OS Torque Rheometer System is the ideal tool to address these challenges. This flexible torque rheometer system can be equipped with laboratory mixers and single- or twin-screw extruders.

With the laboratory mixer, a user can determine the fusion and degradation behavior of PVC dry blends and pellets. With an extruder attachment it is possible to simulate the production process and create product samples that can be used for mechanical testing. In combination with rheological dies, PolyLab extruders can be used to perform viscosity measurements on PVC melts.

For the extrusion of rigid PVC compounds, counter-rotating twin-screw extruders are used because they can provide the shear and pressure necessary to form a homogenous melt. Additionally, the extruders ensure a short and defined residence time, which is needed to avoid material degradation. All these attributes of the PolyLab system help address challenges that may arise when manufacturers use recycled PVC.

WATCH VIDEO

See how the HAAKE PolyLab OS Torque Rheometer System supports the development of next generation materials.

HAAKE PolyLab OS Torque Rheometer with counter-rotating Twin-Screw Extruder

Learn more about Thermo Scientific Torque Rheometer Systems at **thermofisher.com/torquerheometer**