

### **Test methods to meet FDA requirements for recycled plastics in food contact applications**

**The problem:** Recycled plastics can vary from prime resins in a number of ways. However, for high-end consumers of recycled materials, the expectation for their performance and quality is not much different than for prime resins. Therefore rigorous testing protocols are required to ensure quality and consistency of supply. Brand owners and processors continue to push the boundaries, driving recycled materials into higher-end applications such as food contact and durable goods like electronics and automobiles.

As for food contact, FDA's concerns with the use of recycled plastic materials in food-contact articles are: 1) that contaminants from the post-consumer material may appear in the final food-contact product made from the recycled material, 2) that recycled post-consumer material not regulated for food-contact use may be incorporated into food-contact packaging, and 3) that adjuvants in the recycled plastic may not comply with the regulations for food-contact use. Currently, to address these concerns, FDA considers each proposed use of recycled plastic on a case-by-case basis and issues informal advice as to whether the recycling process is expected to produce plastic suitable for food-contact applications.

**The challenge:** In its guidance document, FDA lays out specific recommendations on contaminant testing that may need to be performed to validate secondary and tertiary recycling processes. This guidance is focused on the ability of a recycling process to remove contaminants from plastic containers or packaging that may have been used by consumers to store hazardous substances.

To show that the recycling process is capable of removing potential contaminants, FDA recommends testing of the virgin polymer by exposing it to surrogate contaminants. These surrogate contaminants are intended to represent the common gamut of chemicals that may be accessible to the consumer – this spectrum includes a volatile polar organic substance, a volatile non-polar organic substance, a non-volatile polar organic substance, a non-volatile non-polar organic substance, and a heavy metal salt. After the virgin polymer sample is exposed to the surrogate contaminants, the “challenged” polymer is run through the manufacturer’s recycling process. If the polymer does not absorb meaningful concentrations of the contaminant after processing, the efficacy and safety of the recycling process can be said to be established. If the surrogate testing shows that the recycling process is not capable of removing the contaminants, several alternatives are available. These options may include migration testing that simulates the actual use conditions for the recycled materials, blending the recycled material with virgin polymer to dilute the level of the contaminants, limiting the end uses, or using the recycled materials with a functional barrier to prevent migration of the contaminants to the food.

#### **How STRIDE can help**

Undoubtedly, the detection of contaminants and migrating chemicals requires both experience and astute problem-solving skills. STRIDE’s scientists have been successfully applying their expertise in this area for many years. Many of STRIDE’s seasoned experts are polymer chemists or analytical chemists with polymer analysis experience.

**Contact us to learn more at [research@stride2future.org](mailto:research@stride2future.org)**