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## **ASTM D6866: Measuring the Biobased Content of Biopolymers**

ASTM D6866 is a standard method that can determine the renewable percentage of a material. The method, which is an industrial application of radiocarbon dating, can measure the biobased content of carbon-containing solids, liquids, and gases.

Adopted in 2004, the ASTM D6866 was developed for the United States Department of Agriculture. The enactment of the Farm Security and Rural Investment Act of 2002 meant that federal procurement agencies had to buy products with the highest biobased content. There was a need for a standard that could measure the biobased content of commercial and industrial products in order to eliminate misleading claims. Radiocarbon dating proved to be an accurate method for this purpose. Today, the USDA requires companies who wish to join their BioPreferred Program to submit ASTM D6866 product certification.

### **How Does ASTM D6866 Measure Biobased Content?**

ASTM D6866 measures the Carbon 14 (radiocarbon) content of a material. Materials from renewable sources have a well-characterized amount of Carbon 14 whereas those from fossil sources have no Carbon 14. Thus, ASTM D6866 results directly correlate to the percentage of the material that came from renewable sources.

Plastics that are 100% petroleum-based have no Carbon 14 and therefore 0% biobased content. The ASTM D6866 results of bioplastics, on the other hand, will not be 0% but will depend on the amount of the raw materials that came from renewable sources.

### **ASTM D6866 Testing for Biopolymers**

Biopolymers are polymers produced by living organisms; the most common being cellulose. When polylactic acid or polyethylene produced from crops are used as raw materials for plastics, the resulting products are considered to be biobased and are called bioplastics.

Bioplastics are not easily distinguished from plastics made from fossil sources. Thus, there is a need for a tool that can verify whether they come from renewable sources (biomass) or from fossil sources (petroleum). Through ASTM D6866, the percentage of a material that come from renewable sources can be known.

## **Beta Analytic – ASTM D6866 Service Provider**

ISO 17025 accredited Beta Analytic Inc. in Miami, Florida, is the world's largest professional radiocarbon dating services provider. Beta was part of the ASTM Subcommittee that authored ASTM D6866. The company supports initiatives that promote the use of materials made from renewable sources and provides the tools for manufacturers to certify the biobased content of their products.