

## **Best Practices in Scrap Tires & Rubber Recycling**

## **Bulk Density**

## Material: Recycled Rubber from Tires, Industrial Scrap Rubber, and Post-Consumer Scrap Rubber Products

**Issue:** Control of particle size and density is important from storage, shipping, and purchasing (in quantity) points of view. As particle size decreases, bulk density increases. ASTM D5603-94 cites method D297 section 16 for determining specific gravity. This method works well for single piece and chunks of rubber but does not work well for crumbs with higher surface area.

**Best Practice:** This best practice advocates use of bulk density rather than specific gravity for recycled rubber particulates. There is no such ASTM specification for crumbs. However, ASTM 1513 which is for carbon black pour density can be used for this purpose. The method calls for filling a cylindrical container, 624-cm<sup>3</sup> capacity, with carbon black up to the rim and weighing it. Knowing the mass and volume, bulk density can be calculated. Here, moisture content is very important; high moisture content may give erroneous bulk density values. Bulk density should be expressed as Kg/m<sup>3</sup> or lbs/ft<sup>3</sup>. Expected bulk density of current recycled rubber product is in the range of 28-34 lbs/ft<sup>3</sup>.

**Implementation:** Bulk density should be included in the material specification sheet of recycled rubber crumbs. Actual specification for a material should be determined at the vendor's plant site and agreed upon between vendor and the customer. Vendor should describe the technique used for determining the bulk density. Also, information on moisture content should be provided by the vendor.

**Benefits:** Benefits include good quality control and uniform and standard material availability in the market.

**Application Sites:** All quality control and other testing laboratories, processors, plant sites, and end-users' plants.

**Contact:** For more information about this Best Practice, contact the CWC at (206) 443-7746, email info@cwc.org.

## References:

- 1. ASTM D1513.
- 2. Baranwal, Krishna C., Akron Rubber Development Laboratory, Akron, OH.
- 3. Smith, Fernley, President, ETA, Port Clinton, OH.

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