

Manufacturing Benefits

The unique morphology and chemistry of thermal black can be translated into unique rubber compound properties. Thermal blacks were once used extensively as low cost rubber compound extenders in order to reduce the pound volume cost of the product. This function has been largely replaced by other less expensive filler systems. Today thermal black is used as a functional filler in a wide range of rubber products to help these products meet highly demanding performance specifications. Thermal blacks also impart significant processing advantages:

Short Mixing Times

The large particle size, and, thus, low surface area, of thermal black facilitates fast incorporation of the black into the polymer stock. In many low-viscosity elastomers, powder grades of thermal black such as THERMAX N991 and N908 are used due to their ease of incorporation.

Cool Processing

Lack of interaction between thermal black particles and elastomer chains prevents heat build-up and allows for lower batch temperatures.

Less Polymer Breakdown

Thermal black reduces the nerve of the polymer and does not increase the viscosity to any large degree. Lower shear forces result, which are less likely to destroy the long chain molecules.

Reduced Power Consumption

Since thermal black does not greatly increase the viscosity of the compound, less energy is consumed during mixing.

Long Mixer Life

Reduced power consumption and cooler internal mixer temperatures will prolong the life of a mixer that runs predominantly thermal black compounds, as opposed to furnace compounds. The graphitic layer plane surface of thermal is essentially non-abrasive. Furnace blacks, by contrast, are considered abrasive.

Flowability

Compounds containing thermal black flow more readily into intricate molds due to low compound viscosity.

Good Extrusion Characteristics

Thermal black use in extrusion compounds provides for fast extrusion rates, low die swell and excellent dimensional control, due to its low reinforcing characteristics.