The Effect of Recycled Micronized Rubber Powder Filler on the Tensile and Tear Properties of Rubber

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A previous year's work studied the effect of micronized rubber powder (MRP) on the abrasion resistance of a rubber compound. To further evaluate the impact of MRP usage on a nitrile rubber, this year MRP was added to nitrile rubber and the resulting rubber compound’s tensile strength, and tear resistance were tested. The hypothesis was that if MRP is incorporated in a rubber compound, then the compound’s tensile strength and tear resistance will change. The null hypothesis was that the properties would not change. Three different types of MRP were tested at four concentration levels. Samples were formed, cured, and tested using an Instron load frame. For tensile samples it was determined that the addition of MRP resulted in a statistically significant change in the peak stress at failure for all except one sample. For tear samples incorporating 105µm nitrile MRP, it was concluded that there was a statistically significant difference in the total failure energy at all concentrations when compared to the control. By using MRP as a partial replacement for new rubber, less oil and electrical resources will be required for new rubber production and less landfill resources will be required for old tire disposal. Recycling them into new product will eliminate the need for these environmentally detrimental activities