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### **Bitumen modification with scrap rubber from used tires**

#### **Summary**

Each year Poland disposes a lot of passenger and track tires. There are over one million tons of waste rubber in Poland and each year approximately additional 1200 tons need disposal. Only a limited number of waste tires is used for resource and energy recovery. Tire disposal presents a series of the problems. The most important of them there are potential health and environmental problems.

The purpose of this work is to discuss the use of the scrap rubber to improve the properties of bituminous binders and to describe the effects of these improvements on binder characteristics.

Crumb rubber is produced from whole used tires with mechanical granulation equipment. The best gradations for scrap rubber is with sieve size below 1mm.

There are two main systems for preparing rubber modified asphalts. In this project wet type of rubber modified asphalt mixture have been used.

A laboratory study was performed to evaluate the properties of the rubber modified bitumens. For the investigation of the rheological, ageing and homogeneous properties, measurements of force - ductility characteristics, penetration, softening point, Fraass brittle temperature, Haake viscosity, homogeneity by means of transmission and fluorescence microscopy were carried out.

The mixtures included Polish bitumen and rubber granulate from the whole used tires offer better resistance to permanent deformation, fatigue, ageing and improved rheological properties than pure bitumens.

Emphasis has been placed on bitumen - rubber applications to surfacing materials for very heavily trafficked pavements.