A Composite Material Made from Wastes of Glass, Polymers and Industrial Rubber as a Waste Management Initiative in Urban and Sub-Urban Areas in Kenya

Varsani, Mitesh
Ontiriah, Bilhah

This project explores how wastes of glass, rubber and plastic polymers can be combined together to obtain a composite material that is resistant to squeezing, tearing or fragility. Wastes, such as plastic, glass & rubber make up about 65% of wastes in urban and suburban areas in Kenya. The wastes were collected, cut, shredded & ground. The polymer and rubber pieces were heated and melted mixture combined with the cullet(crushed glass); this was done in different ratios of 3:1:2, 3:2:2 and 3:2:1 with the exception of the general sample containing a ratio of 1:1:1. Preceding cooling, it was then poured into metallic molds of different shapes & sizes suitable for the type of test that will be performed. After forty-five minutes of cooling at 25°c, the plastic was removed. The samples of different shapes were then subjected to different tests i.e. tensile test, compressive test, flexural test, impact test and coefficient of friction test. The ratio of plastic to glass to rubber of 3:1:2 gave us a material that is resistant to squeezing, tearing or fragility. This study showed that only certain ratios of the materials could be used to produce a durable long lasting. In our research, we concluded that the composite we made using wastes of plastic, glass and rubber had the properties of an efficient infrastructural material which could be used as a waste management initiative in urban and suburban Kenya.

Awards Won:
Fourth Award of $500
U.S. Agency for International Development: USAID Global Development Innovation Second Place Award of $2000