

ABSTRACT

This project is a technology development program conducted by the 3M Mexico Company, the main objective is to create the technology basis needed for developing and manufacturing elastic films and laminates in Mexico.

The current work form part of a major program which was also supported by the Mexican Science and Technology Council (CONACYT). This major program was winner in a national examination in the year 2003; the 3M Company provided 58% and CONACYT 42% of the total budget.

Due to several factors like installed manufacturing technology, supplying, unit cost, patents and in some cases toxicology issues of the raw materials commonly used in the production of elastic films and laminates (i.e. Styrene Block Copolymers, PVC, etc); the two big challenges in this work are:

1. Develop elastic products using novelty alternate raw materials
2. The product constructions to be developed (both elastic films and laminates), must be suitable to be manufactured using the current manufacturing facilities of the 3M Mexico Company.

The main needs to conduct this technology development work are the two points above mentioned.

The particular goals of this program are:

- a) Research of elastomeric materials currently available in the market, analysis of the information and preliminary materials selection.
 - b) Study of their elastic properties.
 - c) Practical study of the effect on the elastic properties when a non-woven material is incorporated to an elastic film.
 - d) Based on the knowledge generated with the points aforementioned, a robust and scientific proposal will be defined to development elastic films and laminates (avoiding the use of both conventional materials and manufacturing technologies with price, supplying, toxicology and patents issues).
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Elastic properties of different elastic films made of amorphous and semi-crystalline elastomers were evaluated; as well as their laminates with non-woven materials. The characterization was made using techniques of dynamic-mechanical analysis, strain and deformation cycles, elastic recovery and permanent set analysis. The characterizations were conducted on single layer films which were produced using a single screw extruder and cast film station.
