

Low surface energy rubber materials

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Introduction:

Soft, low surface energy rubbers based on siloxane polymers are used for making belts in copy machines and printers, where non-sticking properties are required. However, in the environment present inside the printer, their performance is limited.

Required properties:

- Low surface energy
- Low hardness (~30 Shore A)
- Good thermal stability
- Low compression set
- Very low affinity to aliphatic compounds
- Corona discharge resistance

Aim of the project:

The goal of the project is to obtain a rubber with a best set of required properties, by investigating different polymers known for their low surface energy; optimizing existing and developing new polymers for this purpose.

Suitable materials:



- Silicone rubbers – good surface properties, but high affinity to aliphatic compounds.



- Fluoroelastomers – excellent surface, thermal and chemical properties, but prone to tribocharging due to the contact with the paper.

Approach:

- Developing a suitable analysis technique for the measurement of the surface properties.
- Investigating the properties of commercially available polymers with low surface energy.
- Finding a correlation between chemical structure and desired properties.
- Design and synthesis of elastomers with appropriate characteristics.

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