

EFFECT OF DIFFERENT TYPES OF FILLERS ON PROPERTIES OF NATURAL RUBBER LATEX FOAM

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ABSTRACT

Natural rubber latex foam is a cellular rubber, which is made directly from centrifuged latex with 60 % dry rubber content and it gives a cushioning effect for a wide range of applications like mattresses, pillows, cushions, upholstery, carpet backing and shoe arches. If there is a possibility of replacing a certain amount of natural rubber latex in these products, while maintaining the expected physico mechanical properties by incorporating another low cost material (filler). Therefore, a study was conducted to develop different natural rubber (NR) latex foam by incorporating five types of commercially available mineral fillers in five different loading levels.

Latex foam rubber was prepared by incorporation of talc, dolomite, calcite, 50:50 blend of dolomite and calcite and china clay as filler materials. Each of these fillers was incorporated in NR latex foam at 5 phr, 10 phr, 15 phr, 20 phr and 25 phr loading levels by using a Hobart type planetary mixer. The developed twenty five different foams were replicated three times and they were arranged in Complete Random Design. These foam were compared with a reference foam prepared without adding any fillers for their physico mechanical properties, viz indentation hardness index, compression set, tensile strength and density properties.

Compression set and indentation hardness index of the compound which contains 5 phr of calcite were comparable with the reference foam. Compound having 10 phr of talc showed equal degree of density, indentation hardness index and tensile strength, when it compared with the reference. Furthermore, tensile strength, indentation hardness index of the foam containing 10 phr of dolomite were similar with the reference whereas, tensile strength, compression set and indentation hardness index were comparable with the reference when the 50:50 blend of dolomite and calcite filler loading at 5 phr. Further, this study revealed that, the compression set and the tensile strength were comparable with the reference when the china clay loading was at 20 phr. Also the results indicate that, upto 20 phr filler loading level, most of the required properties of the foam could be maintained at optimum levels in all filler types.

Key words – Fillers, Loading levels, Natural rubber latex foam, Physico–mechanical properties