Indigenous development of NBR+PVC Rubber blend for Aviation Industry

Muhammad Shaheryar Khan[1], Muhammad Sohail[1], Syed Junaid Mahmood[2]
[1]Department of Materials Engineering, NED University of Engineering and Technology, Karachi, Pakistan
[2]Pakistan Council of Scientific and Industrial Research, Pakistan
Corresponding Email: msohailhanif@neduet.edu.pk

Abstract— Rubber seals are important part in aviation industry. In the present study, the NBR rubber is blended with PVC along with other ingredients to make high oil absorbent rubbers for Aviation purposes. The desired properties and testing requirements set for aviation industry are achieved by careful selection of ingredients. The blend is based on NBR with PVC as secondary component for the making of blend and other agents use for vulcanizing and enhancing capability of oil absorbance. The aim was to develop such compatible blend which can be oil resistant in various types of petroleum products and other is to retaining the its original shape and length. Carbon Black containing mesh size 200 microns for enhancing hardness. Zinc Oxide white powder found locally is used for improving flow during the vulcanizing. Dioctyl Phthalate, a mixing synthesize oil, is used for mixing all the chemicals during compounding. The yellow Sulfur powder is used to cure the rubber and compact the chemicals into a rubber product (Vulucnization). Tetramethyl Thiuram Disulfide is an accelerator which can be found in a white powder form and it helps in vulcanizing the rubber during molding. Benzothiazyl Disulfide (MBTS) accelerator for rubber is a general purpose accelerator for sulfur cures. The properties of Hardness (SHORE-A), Tensile, Elongation, Permanent Set, Compression Set, Aging Co-efficient, Weight Change, Volume change and Low Temp Brittleness Cracking were tested for different blends. Finally, the properties set by the aviation industry were met finally and the composition is presented.

Keywords—NBR/PVC Blends, Permanent Set, Rubber Seals, Compounding, Brittleness Cracking, Oil Absorbance