

Evaluation of Octosol A-18(E) & Sodium Silico Fluoride (SSF) as Shrinkage Reduction Agents in the Continuous Natural Latex Foam Sheet Manufacturing Process

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Natural rubber latex foam sheet, which is made directly from centrifuged latex with 60 % dry rubber content and used for production of mat, mattresses or pillows. Shrinkage issue that occurs during the manufacturing process of Natural Latex Foam Sheets is a major issue which leads to greater wastages and economic losses. Shrinkage occurs during the gelling or curing period and may shrink as much as 50% in volume. However shrinkage cannot be prevent entirely and can be reduced only to an economically acceptable level. There is a possibility of using a foam stabilizer like Octosol A-18(E) to reduce the shrinkage while maintaining the expected physio-mechanical properties. Therefore, a study was conducted to find the best Octosol A-18(E) and Sodium Silico Fluoride combination which can reduce the shrinkage issue. Latex Foam was prepared and each of the sample was incorporated with Octosol A-18(E) at 0.05 phr,0.10 phr,0.15 phr,0.20 phr,0.25 phr levels and Sodium Silico Fluoride at 5.14 phr,6.14 phr,7.14 phr,8.14 phr levels. The developed twenty different foams were replicated three times and these foam were compared with a reference foam prepared without adding Octosol A-18(E) and the physio-mechanical properties were evaluated according to the ISO procedures. At 0.25 phr Octosol A-18(E) level Latex foam shows the lowest shrinkage but at that level another problem arise the "blooming" of the foam. "Blooming" of the foam can lead to the loose skin defect. However shrinkage, density and hardness decreases with increasing Octosol A-18(E) and Sodium Silica Fluoride levels than the reference sample. However compression set values decreased till 0.20 phr Octosol A-18(E) level and increased thereafter. Further this study also revealed that the effect of Sodium Silico Fluoride level on Shrinkage can be submerge by elevated Octosol A-18(E) levels. Also the results indicate that, up to 0.20 phr Octosol A-18(E) level and 5.14 phr Sodium Silico Fluoride level, most of the required properties of the foam could be maintained but the Octosol A-18(E) 0.15 phr level and Sodium Silico Fluoride level 5.14 phr level can consider as the best combination.

Keywords: Octosol A-18(E), Sodium Silico Fluoride, Shrinkage, Blooming, Physio-mechanical properties