Effect of Repeated Autoclave on Hardness and Tensile Strength of Polypropylene/Natural Rubber Developed for Rubber Dam Clamp

This study investigated the potential use of a polypropylene (PP) and natural rubber (NR) blend as an alternative material for rubber dam clamps, as essential dental tools used to keep teeth dry and clean during procedures. Different PP/NR blend ratios were prepared and tested for their hardness and tensile strength, and the results were compared to those of a widely used commercial clamp, SoftClamp™.

The results showed that as more natural rubber was added, the material became softer and weaker. However, the blends with lower NR content (PP/NR ratios of 100/0, 90/10, and 80/20) still exhibited acceptable hardness levels, ranging from 75-82% of SoftClamp™. These selected blends were then further tested by subjecting them to 1, 5, and 10 cycles of autoclave sterilization, a standard process in dental clinics. After these cycles, there were no significant changes in the hardness or strength of the materials, indicating that the blends could withstand repeated sterilization without degrading. The findings suggest that with the proper composition, PP/NR blends could be a durable and potentially cost-effective material for producing reusable dental clamps.

The associated SDG goals are: Good health and well-being (3) and Responsible consumption and production (12)

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Reference:

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