

## **ABSTRACT OF THE PROJECT ON GRAFT COPOLYMERIZATION OF MMA ONTO COIR FIBER FOR QUALITY IMPROVEMENT**

CCRI has completed a research project on "Graft copolymerization of MMA onto coir fiber for quality improvement". The objective of the study is

- ❖ To improve the properties of the Coir fibre by graft copolymerization with Methyl Methacrylate and to study the performance of grafted coir fibre in end products and for the scaling up of the study in coir yarn
- ❖ To modify the mechanical, weathering, and chemical resistance properties of coir fibre by graft copolymerization with MMA.
- ❖ To develop a low temperature, cost effective grafting technique for coir fibre.
- ❖ To study the performance of grafted coir fibre in end products such as coir yarn and Geotextiles.

As part of the project grafting of MMA has conducted on to coir fibre. Low temperature Graft Copolymerization of MMA on to coir fibre was done at an optimum temperature of 50°C. Percent of grafting increases with the increase in each of the reaction parameters, such as monomer concentrations, initiator concentrations, catalyst concentrations, polymerization time and temperature up to a limited extent and then decreases. During graft copolymerization keeping all other variables constant, better graft yield were obtained at 50°C, 2.30 hr, 25% monomer, 0.75% initiator, 0.75% catalyst. The polymer grafted on to coir fibre improves magnificently the tensile strength. FTIR, SEM and TGA measurements characterized the extent of grafting. Surface modification of Coir fibre through graft copolymerization has been confirmed by FTIR, SEM, XRD and TGA. Thermal stability of MMA graft copolymerized fibres has been found that higher than that of untreated Coir fibre. Enhancement in physical properties of MMA grafted Coir fibre has also been observed. By Grafting with MMA the physical as well as chemical properties of coir can be improved to greater extend. By grafting with MMA the chemical resistance, weathering resistance and longevity of coir can be improved to a greater extend. The longevity of coir geotextiles can be improved by grafting with MMA. Studies are still continuing for the long term evaluation of coir geotextiles. All these properties of surface modified fibres could help in their applications especially in the synthesis of natural fibre reinforced composites for their better end use. The enhancement in thermal resistance, chemical resistance, hydrophobic nature, decreased density, high strength could be useful in further developments of high engineering composites.