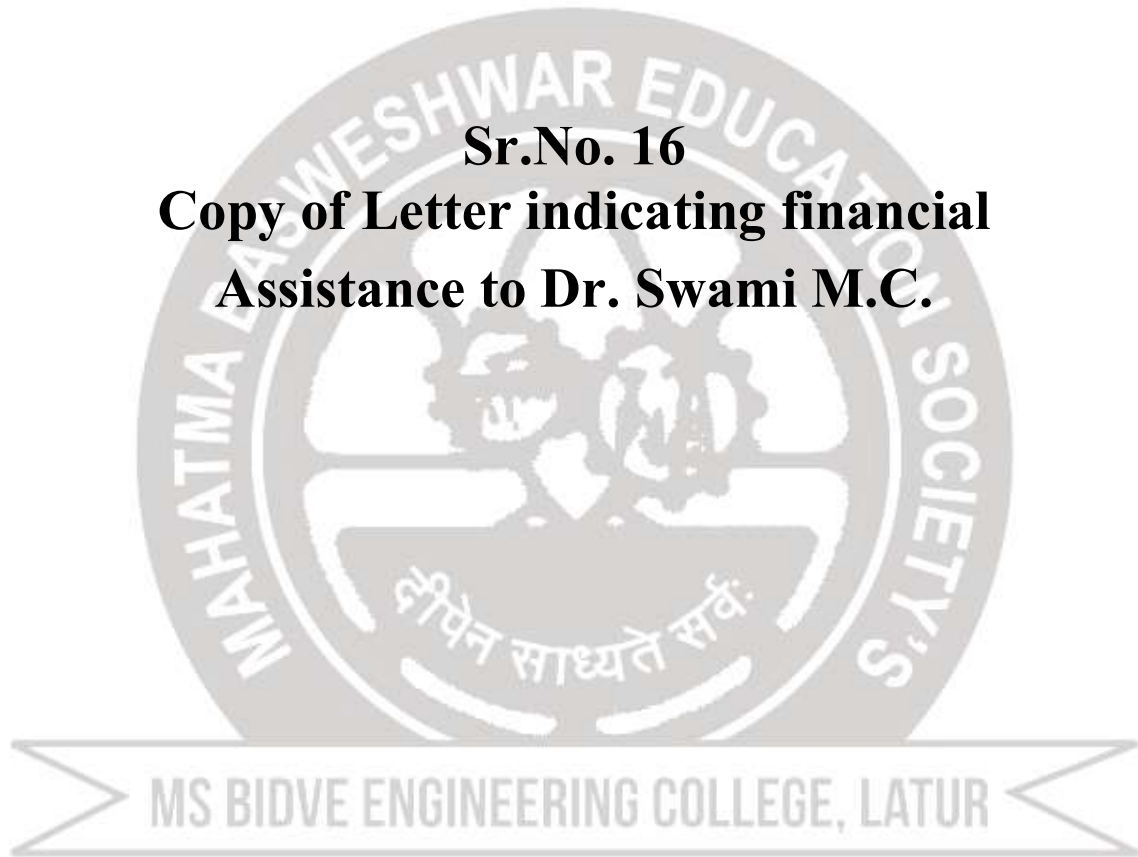


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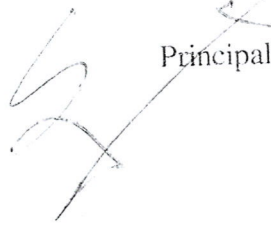
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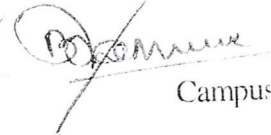
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Published paper in Material today Proceeding journal "Effect of Sea water on mech. properties of WFRP with TiO ₂ & size filler" Publication fee paid Rs. 7500/- As per college policy 50% amount	3750/- /		
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tensile
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Effect Of Sea Water On Mechanical Properties Of Glass Fiber Reinforced Polymer With Silicon Dioxide & Silicon Oil Fillers

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ABSTRACT

This paper deals the effect of sea water on moisture absorption behavior, tensile and flexural properties of the composite. The composite laminates are prepared using Glass fiber/Vinyl ester mixed with SiO_2 and Silicon oil filler by hand layup method as per ASTM standard. Prepared specimens are cut, sized, weighed then samples immersed in sea water for 56 days. The composite specimens were removed from the artificial seawater for every week dated, weighted & recorded to study the moisture absorption behavior. After 56 days aged specimens are tested for Mechanical Properties. The filler Silicon Dioxide and Silicon Oil act as a toughening modifier for vinyl ester resin. The composite with filler SiO_2 and Silicon oil gives better result than the unfilled composites after ageing.

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1. Introduction

The composites are used in aerospace, shipping, textile industries due to their lightweight, better mechanical properties, good wear, and corrosion resistance. The use of Glass fiber reinforced polymer (GFRP) get increases day by day in the shipping industry because of less water absorption & good corrosion resistance properties.

Asmaashawky Kalil studied water absorption behavior for epoxy resin. He has investigated diffusivity behavior and diffusion coefficient for epoxy composite reinforced with metal (Al, Cu, Fe) and metal oxide (Al_2O_3 , Fe_2O_3 , and CuO_2 (with different weight percentages (5.5, 0, 15, 20 and 25%). The results show that the relative mass gain is decreased [1]. B. Amarababu, V Pandu Rangadu, et.al studied the mineral wollastonite Particulate filled vinyl ester resin composites. Coupling agent 1% methoxymethyl silane sprayed onto the wollastonite particulates powder before it dispersed in vinyl ester composite. The results show that when the filler has coated with a coupling agent, the coupling agent provided better adhesion, bonding between the filler and matrix. Higher filler content increases the formation of agglomerations increases

difficulties of achieving the uniform dispersion of filler in composites increases the water and chemical absorption of the composite. Then coupling agent is sprayed on filler material it will reduce hydrophilic nature, as the particle will be coated or protected by silane layer that will key for reducing water and chemical absorption [2]. Afshar, Alkhader Investigate the individual and synergistic damaging effects of UV radiation and moisture on the flexural properties of carbon fiber vinyl ester composites. Results show that marine environment induced damage can significantly reduce the flexural strength of carbon fiber/vinylester laminas [3]. Ravichandran kumar, Kothandaraman B, to improve the flexural properties with a slight decrease in the mechanical strength and modulus of elastic where the impact strength is very important this is the main aim behind modifying the thermoset resin by rubber. The amine terminated silicone with the epoxy resin is used as a toughening element or modifier. The addition of silicone improves the fiber resin interaction due to that water absorption resistance gets increased. Due to the addition of silicone also the mechanical properties like tensile strength, flexural strength gets increased slightly [4]. K. Kalyan Krishna, J Sai santhan, studied glass epoxy composite material with combined Titanium and carbon filler with different weight ratio. AS per ASTM standard the impact, flexural and tensile tests are performed. The composite with filler gives better mechanical and can be used for substitute for existing materials

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