National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Interface Engineering in Aluminium/Glass fiber/polymer Fiber Metal Laminates through surface pretreatment and matrix modification approaches
Speaker	: Pankaj Kumar (Rollno : 523mm1003)
Supervisor	: Bankim Chandra Ray
Venue	: Seminar Room (MM Dept.)
Date and Time	: 22 Aug 2025 (9:30 AM)
Abstract	: This study focuses on the development of an Inter-penerating polymer network-based fiber metal laminate (FML) reinforced with glass fibers, and aluminum sheets. The laminates were fabricated using the hand lay-up technique, mechanically pre-treatment (MA_N) and Chemically pre-treatment (CE_N) hybrid compositesPrior to laminate making aluminum sheet were pre-treated by mechanically as well as chemical methods. This pre-treatment was carried out in order to improve the interfacial bonding with the polymer. Mechanically pre-treatment was done manually over the surface of aluminum sheets using emery paper. The FML prepared using this mechanically abraded aluminum sheets were turn as (MA_N) in the subsequent step the mechanically abraded aluminum sheets were further chemically etched in a aqueous solution of sodium hydroxide pellet (N_aOH), followed by another aqueous solution of ferric nitrate nonahydrate ($Fe(NO_3)_3.9H_2O$), sulphuric acid (H_2SO_4). The FML fabricated using this chemically treated aluminum sheet along with glass fiber & Interpenerating polymer network termed as (CE_N). The surface morphology of the mechanically and chemically etched aluminum sheets was conducted using Scanning Electron Microscopy (SEM), Atomic force microscopy (AFM) & Drop Shape analyzer. Flexural & Short beam shear test were performed in order to evaluate the respective mechanically performance of the fabricated FMLs. (CE_N) FML exhibited 16.6 % improved inter laminar shear strength (ILSS) with respect to (MA_N) FML. Fron flexural test it was observed that the flexural strength, modulus & strain at peak no significant difference.