Parametric analysis of composite material in comparison with mild steel by experimental testing

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The aim of this work is to perform parametric analysis of the composite material in comparison with mild steel by experimental testing. These analyses are useful for studying the behavior of composite material in comparison with mild steel. We have studied different combination of composite materials theoretically. Theoretical results show that the polymer matrix composite can give better results when comparing with mild steel. For making composite specimen E-glass fibre with polyester resin has used. The specimen has made by hand layup method. Following tests such as tensile, compression and hardness tests were conducted on both mild steel and composite specimen. The tensile strength of composite has found 258 MPa but it fails under compressive load. The Rockwell hardness of composite as found 56 kg. The failure of specimen under tension and compression has analyzed by scanning electron microscope (SEM). Tensile strength and Rockwell hardness of mild steel are 250 MPa, and 71 respectively.

Figure 1 shows the stress strain curve of composite material and mild steel in which tensile strength of composite specimen is slightly greater than mild steel. While the

Figure 2 and Figure 3 show that the failure is due to improper bonding of mixture, random fibre orientation and porosity.

Figure 2: SEM image of tensile test specimen

Figure 3: SEM image compression test specimen

References

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Figure 1: Stress-strain curve between mild steel and composite material