

MSE 401

Composite Materials

By

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Classification of composite material

- ✚ **Metal Matrix Composites (MMCs):** Mixtures of ceramics and metals, for example cemented carbides and other cermets like Aluminum or magnesium reinforced by strong, high stiffness fibers
- ✚ **Ceramic Matrix Composites (CMCs):** common composite matrix i.e. Aluminum oxide and silicon carbide are materials that can be imbedded with fibers for improved properties, especially in high temperature applications
- ✚ **Polymer Matrix Composites (PMCs):** Thermosetting resins are the most widely used polymers in PMCs. And Epoxy and polyester are commonly mixed with fiber reinforcement.

Importance of Composites

- ✦ Composites can be very strong and stiff, yet very light in weight, so strength-to-weight ratios and stiffness-to-weight are several times greater than steel or aluminum
- ✦ Fatigue properties are generally better than for common engineering metals.
- ✦ Toughness is often greater than most of the metals
- ✦ Composites can be designed that do not corrode like steel
- ✦ Possible to achieve combinations of properties not attainable with metals, ceramics, or polymers alone