عنوان مقاله:

Multifunctional Properties of Metal Fibers Reinforced Polymer Composites – A Review

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خلاصه مقاله:

The advent of metal fibers has led to the development of different fiber-reinforced composite systems via different manufacturing methodologies. Utilizing metal fibers as a single reinforcement can create completely new materials with unique physical structures and a synergistic effect on many properties. Steel, aluminum, titanium, and copper are examples of metal fibers used in industries such as aerospace, marine, automotive, and structural applications. Moreover, the possibility of combining various material systems (metal fibers - traditional fibers) to create hybrid composites allows for unlimited variation in cost and performance. In general, metals are available in the form of sheets as metal fiber metal laminate (FML), or as metal fibers in the form of fine wires, and mesh fibers. Investigation of fine wires and mesh fibers is still limited in the literature compared to the sheet metal form. Therefore, this work focuses on reviewing the processing techniques, properties, and applications of fine wires and mesh metals. In this paper, the application, methods of production, and several types and forms of metal fiber were described in detail. Moreover, the properties and applications of metal fibers reinforced polymer composite materials have been reviewed. The application of metalized fibers and the hybridization of metal fibers with synthetic and natural fibers reinforced polymer composites are also reviewed. To conclude, the potential of fine wires and mesh fiber forms, which are partially explored, seems to have excellent mechanical, thermal, and other material properties. Steel fiber is the most common metal fiber used due to its cost-effectiveness, availability in different forms, and high performance despite its heavy weight.

کلمات کلیدی:

Metal Fibers, Steel Fibers, Hybrid composites, fine wires, mesh form