

# Composite Raw Materials

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**In news :** Recently, HAL and Mishra Dhatu Nigam Limited (MIDHANI) have signed a Memorandum of Understanding (MoU) for development and production of composite raw materials during the Aero India 2021 in Bengaluru on February 04, 2021.

## A brief note on the MoU

- This is the first time that such an MoU has been signed for composite raw material
- this is the major step forward in the area of composite materials. The HAL is not only taking care of frontline aircraft production but also raw materials.
- There is no equivalent proven Indian approved/qualified supplier for various types of prepregs (carbon, aramid, glass types, etc) for the aircraft applications.
- This creates dependency on foreign Original Equipment Manufacturers (OEMs).
- Aligned with “Atma Nirbhar Bharat” initiative, efforts need to be made to develop and manufacture such prepregs in India through collaboration

## What is Composite raw material?

It is a combination of two materials with different physical and chemical properties. These constituent materials have notably dissimilar chemical or physical properties and are merged to create a material with properties unlike the individual elements.

## Why are they important?

- When they are combined they create a material which is specialised to do a certain job, for instance to become stronger, lighter or resistant to electricity.
- They can also improve strength and stiffness.

- They improve the properties of their base materials and are applicable in many situations.

## **Types**

Typical engineered composite materials include:

- Reinforced concrete and masonry
- Composite wood such as plywood
- Reinforced plastics, such as fibre-reinforced polymer or fiberglass
- Ceramic matrix composites (composite ceramic and metal matrices)
- Metal matrix composites
- and other advanced composite materials

## **Usage of the the Composite raw material**

- The usage of composites in aerospace is going to exist and increase, particularly for fighter aircraft/helicopters because of its inherent advantages over metallic raw materials.
- In addition, similar requirements exist for other aerospace and defence programmes, including those of Indian Space Research Organisation (ISRO), Defence Research Development Organisation (DRDO) and National Aerospace Laboratories (NAL).
- Composites raw materials, mainly in the form of prepregs used in platforms like Light Combat Aircraft (LCA), Advanced Light Helicopter (ALH), Light Combat Helicopter (LCH) and Light Utility Helicopter (LUH) are currently imported.

## **Mishra Dhatu Nigam Limited(MIDHANI)**

- Mishra Dhatu Nigam Limited (MIDHANI) was established in 1973 under the Ministry of Defence as Government of India Enterprise.
- The production unit of MIDHANI, located at Kanchanbagh,

Hyderabad, was commissioned in 1982.

- MIDHANI has been set up with a view to achieve self-reliance in production and supply of various super alloys, special steels, materials to Defence, other Strategic Sectors for Nuclear, aeronautical and Space applications.
- The guiding factors for setting up of MIDHANI were the demand for Defence oriented technologies, which come under the national priorities.
- Presently, more than seventy percent of MIDHANI's products (value wise) cater to strategic customers viz. Ordnance Factory Board (OFB), Defence Research & Development Organisation (DRDO), Indian Space Research Organisation (ISRO), Hindustan Aeronautics Ltd. (HAL), and Department of Atomic Energy (DAE) etc. In addition, MIDHANI also supplies special alloys and products to commercial sector including Larsen & Toubro, BHEL, Titanium equipment etc