

MANTA

New nanostructured materials for application in the transport industry

IMAST members involved:

- CNR - Institute for Composite and Biomedical Materials (IMCB)
- University of Naples “Federico II” Department of Engineering of Materials and Production (DIMP)

Partners:

- CRF S.c.p.A - FIAT Research Center
- Consorzio CETMA

The aim of the project was to increase the knowledge of complex **phenomena** occurring at interface **between polymeric matrices and nanofillers** in order to develop novel **multi-functional nanomaterials** to be used in **structural applications**. This goal was pursued studying the influence of nanoparticles surface characteristics on nanocomposites properties and investigating the effects of preparation process on nanopatterned structures of fillers at nanoscale.

In the **Aeronautical** sector, **nano-reinforced matrices with multi-functional properties** were realized in order to **improve damping** and **impact properties** by using thermoplastic polyurethane (TPU) filled with multiwalled carbon nanotube (MWCNTs).

For **Automotive** sector **ferromagnetic hot-melt adhesives** were developed by adding nickel nanoparticles into thermoplastic matrix (PP) in order to increase **the electromagnetic heating efficiency**:

- ❑ **faster cure than conventional techniques (reduction in adhesive cure time)**
- ❑ **selective heating**

Moreover, **thermoplastic (PES, PEN)/expanded graphite composite foams** have been developed, for automotive semi-structural applications, in order to reduce weight.

