

## Resins for High Performances composites matrix

Category: Materials

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### Abstract:

In collaboration with Astrium / Airbus, the University of Reims Champagne-Ardennes has developed a new solution which improves of the toughness of vinylester thermosetting resins, polymerized under ionizing radiation. This technology is of interest for structural materials in aerospace, transport and chemical applications.

### Description:

The technology is a high performance vinylester resin made up of acrylate monomers, high-Tg thermoplastic polymer and reactive solvent.

The use of a high-Tg thermoplastic polymer (polyethersulfone) into the formulation enables to get vinylester resins with enhanced mechanical and thermal properties (see graphs below).

The resin polymerisation is achieved by UV or Electron Beam.

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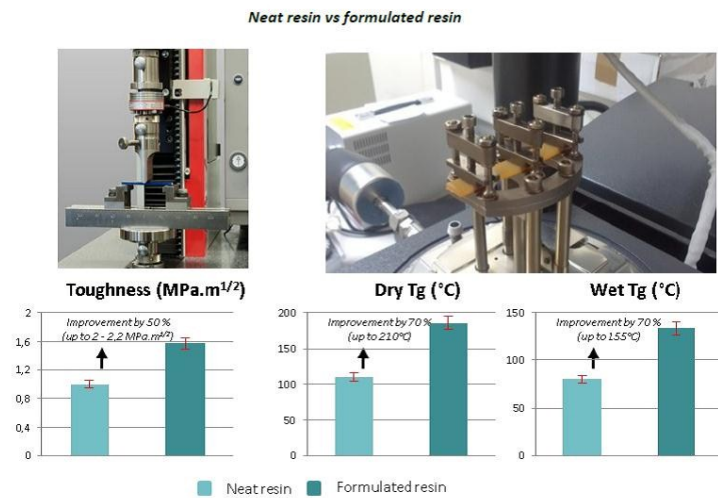
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### Innovations and advantages of the offer:

- Low energy need due to ionizing radiation (in comparison with thermal mean)
- Thermoplastic polymers improve the material's ability to store the energy accumulated during a shock through the interconnected nodular morphology given by this formulation.
- This monofunctional diluent makes our thermoplastic polymer compatible with an acrylate network.

## Further Information:



- High toughness resins and high performances injection
- These products are polymerized under an electron beam
- Resins compatible with RTM processes.
- High Glass Temperature
- Good mechanical performance with temperature and ageing

## Application:

- Matrix elaboration for composite materials in aerospace applications.
- Adhesive materials to assemble composite pieces: automobile, armament
- Fabrication of large-parts: wind turbine blade, holding tank...
- Faster production, and production cost reduction for large series.

## Space Heritage:

These technologies arise from a collaboration between the University Reims Champagne Ardenne and Astrium within the framework of a thesis. They are used by Astrium to make composite structure (Gossamer) in satellites.

## Broker comments:

N/A

This technology description was downloaded from [www.esa-tec.eu](http://www.esa-tec.eu)