

A METHOD FOR RECYCLING SCRAPS OF PREPREG MATERIALS

Main Technological Area —→ Materials

Keyword —→ Recycling | prepreg | near-isotropic | energy saving | Polystyrene | Acrylonitrile | Styrene

A method for converting scraps from a prepreg material with continuous (unidirectional and woven) fibres into a recycled material which is also prepreg, but has broken fibres of sufficient length to maintain high mechanical properties with near-isotropic characteristics. The patented process defines a production method for this new recycled material and identifies a set of applications, allowing also the optimal management of environmental and energy saving issues.



Figure 1 – Possible uses of scraps from machined prepreg material

TECHNICAL SPECIFICATIONS

The process involves the emulsification at room temperature, and without any chemical reaction, of the particles of composite material, properly powdered, in a thermoplastic matrix (whether EPS - *Expanded Polystyrene* or ABS - *Acrylonitrile-Butadiene-Styrene*) in gel form. This matrix is obtained by emulsifying waste products (supermarket packaging, bumpers, etc.).

When the gel has condensed in the dry state, the thermoplastic resin arranges itself around the particles trapping them firmly in a three-dimensional reticulate. This reticulate remains stable even during subsequent processing of the material.

INNOVATION/ADVANTAGES

- Reduction of disposal costs: 70% of the waste itself is not polymerized and must be disposed of as special waste, with costs ten times higher than normal waste.
- Reduction of the environmental impact: the method avoid to bury large volumes of carbon resin which have a low biodegradability.
- Re-use or sale of the resulting material, whose peculiar characteristics allow stratification, forming and polymerization using the conventional technology of classic prepreg materials, whether having reduced mechanics resistances.

FIELDS OF APPLICATION

<i>Aerostructures</i>	Materials for aeronautical components of secondary structure
<i>Manufacturing tools</i>	Materials for rolling and polymerization tools
<i>Automotive</i>	Car parts
<i>Railways</i>	Non-structural parts
<i>Sporting Goods</i>	Bicycles, skis, tennis rackets

PATENT INFORMATION

Priority Date - 24/07/2008**Priority Code** - WO2008IT00500**IPC Codes** – B29B 17/00 | B29C 70/50**Active worldwide applications**Italy - IT1407966; filing date: 22/12/2011; grant date: 23/05/2014EPO - EP2197643B1; filing date: 18/03/2010; grant date: 01/06/2011

National Extensions: Italy - Germany - France – United Kingdom – Spain

Australia - AU2008359845; filing date: 05/03/2010; grant date: 17/11/2011USA - US8298359; filing date: 22/02/2010; grant date: 30/10/2012Japan - JP 5253510; filing date: 1/03/2010; grant date: 31/07/2013**Leonardo internal code**

LDO-A442