Technology Offer

Title:

Direct bonding of elastomer layers to fibre-reinforced plastic parts in one integrated production process (Ref: 10 DE 1486 3GQD)

(Open)

Abstract:

A German producer of rubber compounds developed and patented a method by which rubber can be integrated into fibre composite materials without the need for any addtional processing or bonding agents. Rubber layers significantly improve the physico-mechanical properties of the composite parts. Industrial partners are sought for joint development and testing of new applications. Technical cooperation in development, supply of raw materials and transfer of knowledge in how to use it is offered.

Description:

FRP (fibre reinforced plastics) are being used in an increasing number of industrial fields. A material with a particularly high growth rate in the market is CFRP (carbon fibre reinforced plastic) as it is increasingly applied where low weight and high rigidity are of the essence. CFRP has however some disadvantages, as the material is brittle and tends to shatter. It also tends to vibrate easily and is uncomfortably cold to the touch.

The company, specialising in technical rubber compounds has developed a method by which rubber can be integrated into fibre composite materials without the need for any additional processing or bonding agents. A rubber film is thereby draped directly together with prepregs or a similar composite into the mould where it is bound to e.g. prepreg layers during the curing process.

With this method, an innovative material combining fibres, resin and rubber can be produced. While the fibres give the product the necessary stability, the resin keeps the fibres in the desired shape and the rubber optimises its properties for the intended use of the respective components.

The raw material is supplied in the form of a thin rubber foil for direct integration into the production process of the user. There is no need for bonding agents and the component is cured in a single process. The compounds can be integrated by various methods, including autoclaving, pressing and resin infusion methods such as RTM or VAP. Suitable matrix resins include epoxy, polyester, vinyl ester, phenolic and cyanuric ester resins.

The rubber compound can be adjusted to various hardnesses, mechanical properties, processing conditions (viscosity, curing time and temperature) and colours.

Improvements that can be achieved by the new method:

- Haptic properties and friction
- Impact protection
- Fracture behaviour
- Vibration damping
- Integration of flexible sections
- Smooth and abration-proof surfaces

Cooperation offered:

Technical cooperation for new applications and for joint further development, supply of tailored raw material and transfer of knowledge in how to use it in the production process, is offered to manufacturers of composite parts that want to improve their existing products or to develop new products.

Application fields are all industrial sectors where FRP and CFRP parts are used, e.g. automotive, aerospace, building equipment and appliances, machine building, robotics, sports and leisure equipment etc.

Innovations and advantages of the offer

Compared to joining rubber layers to composite parts in a seperate step (e.g. by gluing), the new one-step method is faster, less labour intensive, less expensive and gives better results.

No need for investment in additional machinery, the raw material can be processed on existing FRP/CFRP composite production facilities.

- Component protection (against impact, scratches)
- Improvement of crash properties
- Reduction of risk of shattering
- Optimisation of component acoustics
- Improvement of component elasticity (elastification)
- Improvement of haptic properties
- Increase of surface friction
- Vibration damping
- Use as core material

Other Profile Details

Organisation:	Bayern Innovativ Bayerische Gesellschaft für Innovation und Wissenstra
Network Partner:	Bavaria2Europe
Country:	Germany
Entry Date:	Tue, March 02, 2010
Validation Date:	
Deadline:	Sat, January 29, 2011

List of Keywords

Technology

- Joining techniques (riveting, screw driving, gluing)
- Moulding, injection moulding, extrusion, sintering
- Composite materials
- Rubber

Market

- Wind energy
- Automobile parts
- Other Consumer Related (not elsewhere classified)
- Fibre-reinforced (plastic) composites
- Other industrial equipment and machinery

Further Information (Technical Details Concerning the Profile)

The material is most commonly supplied in the form of a rubber film of minimum 0.5 mm in thickness and maximum 1200 mm in width on a separating carrier foil. The material can be cut and processed similar to prepreg. To vulcanise rubber compounds, the material must be processed the right temperature and pressure for a certain period of time. During vulcanisation, the pressure should be above the water vapour pressure at the respective vulcanisation temperature. The compound SAA1052/70 for example must be processed at a temperature of 120°C for 64 minutes at a pressure of minimum 2 bar to proper vulcanise. At 130°C, the vulcanisation time is 20 minutes at a pressure of minimum 2.7 bar.

Current Stage of Development

Already on the market

Exploitation of RTD Results

Private Research

Intellectual Property Rights

Patent(s) applied for but not yet granted *Comments*

Organisation / Company

Type: Industry

Size: 250-500

Collaboration Type

- Joint Venture Agreement
- License Agreement
- Joint further development
- Transfer of knowledge in new raw materials
- New way to use an existing production line
- Change in the partner sought's currently used technologies (installations, process, facilities)
- Assembly
- Engineering
- Technical consultancy

Comments
- Type of partner sought:

Industry

- Specific area of activity of the partner:

Manufacturer of composite parts (FRP/CFRP)

- Task to be performed by the partner sought:

Definition of requirements, purchase of raw material, implementation into own production process, testing and feedback on results

Targeted Countries

ALL

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