



Ref : MA00292

Functionalized Composite

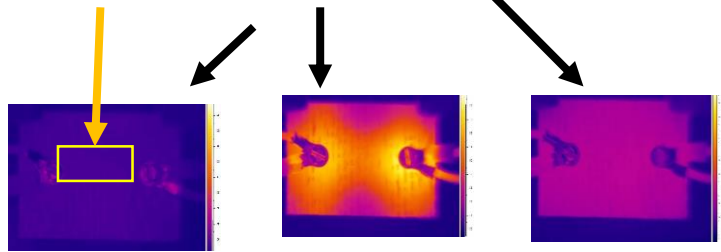
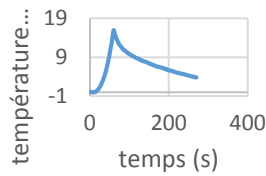


Figure 1: Temperature influence into PA composite

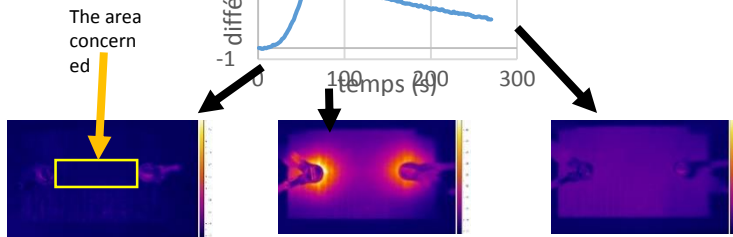
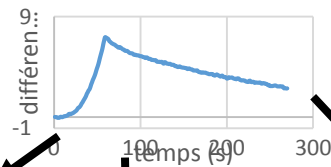


Figure 2: Temperature influence into Boosted PA composite

MARKET CHALLENGES

The airplanes are mainly composed of composite. A key weakness of these composite materials are the lack of functionalities in terms of conductivity or magnetic properties or optimal heat distribution. In order to meet the increasing demand of smart composite material, the current solution is to insert a nano materials inside the composite structure. This technology gives them the necessary properties for specific uses.

There is therefore a need be an alternative solution.

SUGGESTED APPLICATIONS

This solution can be usefully applied in every fields that needed a functionalized composite.

- Aerospace industry (wing spars)
- Sport area (squash, tennis and badminton racquets, sport kite spars)
- Navy (hull, deck...)

DEVELOPMENT STATUS

In the figure below, two different composites are subjected to high temperature.

The figure 1 summarizes the behavior of the composite materials. This composite materials is made from polyamide matrix (PA) and carbon-fiber reinforcement. We observe a heat distribution throughout the surface area of material composite.

The figures 2 also summarizes the behavior of other composite materials. This new composite material is made from polyamide matrix wherein the Nano charge of carbon black has been introduced with 8% of portion and carbon-fiber reinforcement. We observe that the heat distribution is limited to application zone.

The introduction of Nano charge in PA matrix allows to improve their properties and make it an insulating composite.

INNOVATIVE SOLUTION

The present invention also allows to meet the demand. The proposed solution is a process leading to the manufacturing of functionalized composites. The functionalization can be partial or complete in order to adapt themselves to the customer's needs.

The composite materials is made from multi layers of thermoplastic films wherein the nano charges are introduced and reinforced by fibers films. The amount of nano charges could be distributed differently throughout the thermoplastic films. This assembly contributes to obtain gradient properties.

COMPETITIVE ADVANTAGES

- Gradient properties
- Functionalization adapted to the customer's needs.
- Patent application filed in France.
- The research team's expertise in the development of composite material.

IP RIGHTS

Patent application filed in France

