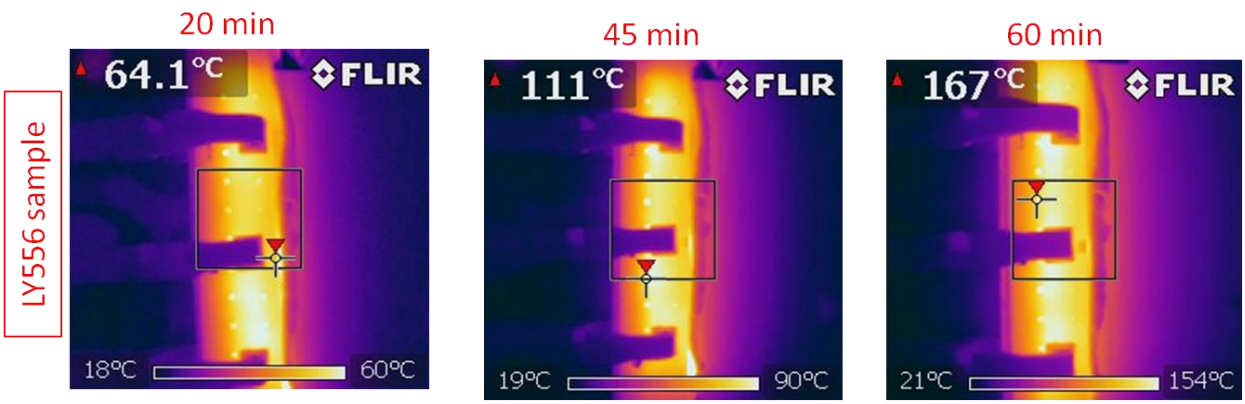
RESISTIVE CURING OF POLYMERS AND COMPOSITE MATERIALS

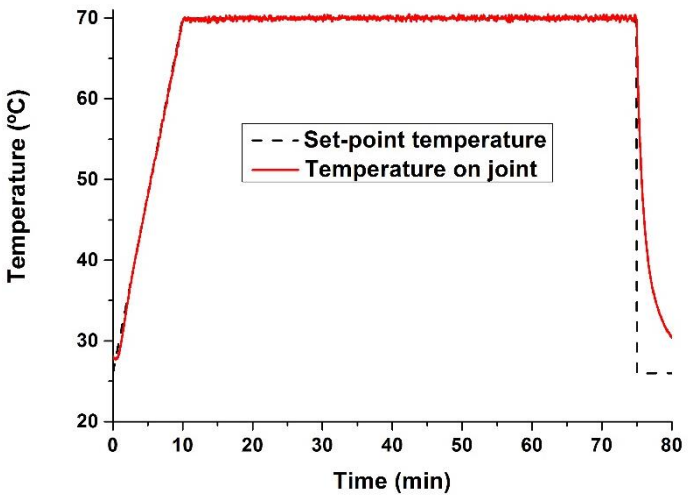
Context

There is an increasing interest in the use of resistive (Joule) heating to process polymeric materials as a technology to enable rapid manufacturing, more energetically efficient fabrication, and reduced cost for repairs.
Resistive processing of polymer has direct application for adhesive bonding and for the repair of structural composites, for example.



Technology description

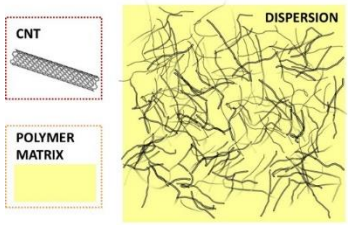
The technology offered is based on resistive heating of polymer formulations with a very small fraction of conductive nanocarbon materials. Processing of the polymer can be carried out with conventional power supplies, either with AC or DC. Heating rates as high 740° C/min can be achieved.



Technology advantages

Some of the benefits of this technology include:

- Reduction in power/energy used to cure thermosets
- Reduction in curing time
- Suitable for repair of structural elements with minimum intervention
- The conductive filler reduces polymer "bleeding" when used as an adhesive.



Dispersion by simple calendering (widely used in industry)

Supplementary data

Application: Fabrication of polymers and composite materials

Intellectual property rights: P201730828 Patent application in Spain. Priority date 22/06/2017

Transfer Opportunity: License of technology

Reference: B. Mas, J. P. Fernández-Blázquez, J. Duval, H. Bunyan, J. J. Vilatela; Thermoset curing through Joule heating of nanocarbons for composite manufacture, repair and soldering; Carbon; 2013, 63, 523–529;

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