

MEASURING ABSORBED HUMIDITY IN A COMPOSITE MATERIAL



Main Technological Area —> Materials | Sensors

Keyword —> hygroscopic | humidity | honeycomb structure | polymer | composite

DESCRIPTION

Usually, plastic and composite materials are used in situations of exposure to atmospheric agents (like moisture or water) or other chemical substances; this can cause a rapid variation of the mechanical properties. To contrast these effects it is necessary to empower polymers using stabilizing substances. However, sometimes it is necessary to keep under control the results of the action of atmospheric agents in operating conditions, without dismounting any structures and put them in a lab. For this purpose, the patented solution provides a way for the measurement of the internal humidity of composite material.



Figure 1 – A composite structure

The process involves the positioning of an ambient humidity sensor in a cavity created between different plies of composite material, without compromising the mechanical characteristics of the final structure.

INNOVATIONS/ADVANTAGES

- a) Certification process of the structures under conditions more advantageous than performing in-lab measurements
- b) Scalability of the solution for covering a more extended structure
- c) Simplification, hence savings, in certification process of the structures

FIELDS OF APPLICATION

<i>Aerostructures</i>	Materials for aeronautical components
<i>Building Automation</i>	Composite floors/walls/foundation drainage system
<i>Automotive</i>	Car parts
<i>Railways</i>	Non-structural parts
<i>Environmental sensing</i>	Outdoor and garden structures, walls, tents

PATENT INFORMATION

Priority Date – 09/10/2012

Granted worldwide patents
EUROPE/RUSSIA/USA/CANADA/JAPAN

Pending patent applications:
BRAZIL

EPO National Extensions:
IT/DE/ES/GB/FR

Leonardo internal code
LDO-A497