

Methodology of Experimental Analysis of Long-term Monitoring of Sandwich Composite Structure by Fibre-optic Strain Gauges

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The aim of this article is proposition of new methodology of experimental analysis of long-term monitoring of sandwich composite structures. The sandwich composite structures are, due to its properties like stiffness, high impact strength, corrosion resistance, low thermal conductivity and low acoustic conductivity and, commonly used in civil engineering in recent years. This type of structure is composed of two main parts (face sheet and core) having different material and mechanical properties. Sudden change of these properties causes interlaminar stress in structure. A good knowledge about behaviour of sandwich composite structure is important for efficient manufacture techniques, long-term prediction of structure behaviour and for economics. The experimental part has been focused on obtaining the experimental results of deformation between layers of sandwich composite structure during long-term monitoring. The long-gauge optical fibres SOFO® SMARTape Compact have been used for long-term monitoring of sandwich composite structures. Long-gauge optical fibres were placed between the foam core and an outer layer of the composite structure during manufacturing. Test specimens were loaded in three-point bending test.

Keywords: Deformation, Sandwich composite structure, Long-term monitoring, Fibre-optic strain gauge, Three-point bending test

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