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Spring-back of Thick Uni-Directional Carbon Fibre Reinforced Composite Laminate for Aircraft Structure Application (Conference Paper)

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Abstract

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The springback phenomena of CFRP after curing process through autoclave manufacturing method results on the out of tolerance for its utilisation in aerospace industry. This paper relates to the measurements of springback for Uni-directional flat laminate as a first steps to the springback study for the real aircraft composite laminate structures. A flat laminate with dimension of 300 mm x 300 mm, 400 mm x 400 mm and 500mm x 500 mm with different number of ply; 20, 24 and 28 are manufactured. The choice of dimension and number of lay-up corresponds to the dimension and lay-up of rib structure. After process, the springbacks are measured using 3D scanner (optical-based three-dimensional) with an accuracy of 42 micrometers to obtain an accurate measurement. The analysis of the effect of dimension and number of ply to the magnitude of springback are presented within the range of specimen studied in this work. © Published under licence by IOP Publishing Ltd.

Indexed keywords

Engineering controlled terms: Aerospace engineering, Aerospace industry, Aircraft manufacture, Airframes, Carbon fibers, Fiber reinforced plastics

Compendex keywords: Accurate measurement, Aircraft structure, Carbon fibre reinforced composites, Curing process, Manufacturing methods, Measurements of, Real aircraft, Rib structure

Engineering main heading: Laminated composites

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Publisher: Institute of Physics Publishing

References (18)

1 Olivier, P.A.

A note upon the development of residual curing strains in carbon/epoxy laminates. Study by thermomechanical analysis

(2006) *Composites Part A: Applied Science and Manufacturing*, 37 (4), pp. 602-616. Cited 30 times.
doi: 10.1016/j.compositesa.2005.05.006

View at Publisher

2 Wisnom, M.R., Gigliotti, M., Ersoy, N., Campbell, M., Potter, K.D.

Mechanisms generating residual stresses and distortion during manufacture of polymer-matrix composite structures

(2006) *Composites Part A: Applied Science and Manufacturing*, 37 (4), pp. 522-529. Cited 145 times.
doi: 10.1016/j.compositesa.2005.05.019

View at Publisher

3 Twigg, G., Poursartip, A., Fernlund, G.

An experimental method for quantifying tool-part shear interaction during composites processing

(2003) *Composites Science and Technology*, 63 (13), pp. 1985-2002. Cited 74 times.
http://www.journals.elsevier.com/composites-science-and-technology/
doi: 10.1016/S0266-3538(03)00172-6

View at Publisher

4 Twigg, G., Poursartip, A., Fernlund, G.

Tool-part interaction in composites processing. Part I: Experimental investigation and analytical model

(2004) *Composites Part A: Applied Science and Manufacturing*, 35 (1), pp. 121-133. Cited 106 times.
doi: 10.1016/S1359-835X(03)00131-3

View at Publisher

5 Darrow Jr., D.A., Smith, L.V.

Isolating components of processing induced warpage in laminated composites

(2002) *Journal of Composite Materials*, 36 (21), pp. 2407-2419. Cited 63 times.
doi: 10.1177/0021998302036021784

View at Publisher

6 Tarsha-Kurdi, K.E., Olivier, P.

Thermoviscoelastic analysis of residual curing stresses and the influence of autoclave pressure on these stresses in carbon/epoxy laminates

(2002) *Composites Science and Technology*, 62 (4), pp. 559-565. Cited 40 times.
doi: 10.1016/S0266-3538(01)00148-8

View at Publisher