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Flexural behavior of open-cell aluminum foam sandwich under three-point bending (Article)

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Abstract

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Aluminum foam sandwich (AFS) panels are one of an advanced material that has various advantages such as lightweight, excellent stiffness to weight ratio and high-energy absorption. Due to their advantages, many researchers' shows an interest in aluminum foam material for expanding the use of foam structure. However, there is still a gap need to be filling in order to develop reliable data on mechanical behavior of AFS with different parameters and analysis method approach. There are two types of aluminum foam that is open-cell and closed-cell foam . Few researchers were focusing on open-cell aluminum foam . Moreover, open-cell metal foam had some advantages compared to closed-cell due to the cost and weight matters. Thus, this research is focusing on aluminum foam sandwich using open-cell aluminum foam core with grade 6101 attached to aluminum sheets skin tested under three point bending . The effect Skin to core ratio investigated on AFS specimens analyzed by constructing load-displacement curves and observing the failure modes of AFS. Design of experiment of three levels skin sheet thickness (0.2mm, 0.4mm, and 0.6mm) and two levels core thickness (3.2mm and 6.35mm). a full factorial of six runs were performed with three time repetition. The results show that when skin to core ratio increase, force that AFS panels can withstand also increase with increasing core thickness © BEIESP.

SciVal Topic Prominence

Topic: Foams | Energy absorption | Aluminium foam

Prominence percentile: 98.126

Chemistry database information

Substances

Al

Author keywords

Aluminum foam sandwich | Flexural behavior | Open-Cell | Three-point bending

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References (12)

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1 Styles, M., Compston, P., Kalyanasundaram, S.
Flexural Behavior of Aluminium Foam/Composite Structures. Sandwich Structures 7: Advancing with Sandwich Structures and Materials
(2005) Springer Netherlands, pp. 487-496.

2 Crupi, V., Epasto, G., Guglielmino, E.
Comparison of aluminium sandwiches for lightweight ship structures: Honeycomb vs. foam
(2013) Marine Structures, 30, pp. 74-96. Cited 61 times.
doi: 10.1016/j.marstruc.2012.11.002
View at Publisher

3 Banhart, J., Schmoll, C., Neumann, U.
Light-weight aluminium foam structures for ships. In Proceedings of the Conference on Materials
(1998) Oceanic Environment, pp. 55-63. Cited 29 times.

4 Styles, M., Compston, P., Kalyanasundaram, S.
The effect of core thickness on the flexural behaviour of aluminium foam sandwich structures
(2007) Composite Structures, 80 (4), pp. 532-538. Cited 79 times.
doi: 10.1016/j.compstruct.2006.07.002
View at Publisher

5 Crupi, V., Montanini, R.
Aluminium foam sandwiches collapse modes under static and dynamic three-point bending
(2007) International Journal of Impact Engineering, 34 (3), pp. 509-521. Cited 107 times.
doi: 10.1016/j.ijimpeng.2005.10.001
View at Publisher

6 Triantafillou, T.C., Gibson, L.J.
Failure mode maps for foam core sandwich beams
(1987) Materials Science and Engineering, 95 (C), pp. 37-53. Cited 140 times.
doi: 10.1016/0025-5416(87)90496-4
View at Publisher

7 McCormack, T.M., Miller, R., Kesler, O., Gibson, L.J.
Failure of sandwich beams with metallic foam cores
(2001) International Journal of Solids and Structures, 38 (28-29), pp. 4901-4920. Cited 168 times.
doi: 10.1016/S0020-7683(00)00327-9
View at Publisher

8 Li, Z., Zheng, Z., Yu, J., Qian, C., Lu, F.
Deformation and failure mechanisms of sandwich beams under three-point bending at elevated temperatures

(2014) Composite Structures, 111 (1), pp. 285-290. Cited 30 times.
www.elsevier.com/inca/publications/store/4/0/5/9/2/8
doi: 10.1016/j.compstruct.2014.01.005

View at Publisher

9 D'Urso, G., Maccarini, G.
The formability of aluminum foam sandwich panels

(2012) International Journal of Material Forming, 5 (3), pp. 243-257. Cited 14 times.
doi: 10.1007/s12289-011-1036-9

View at Publisher

10 Jing, L., Wang, Z., Ning, J., Zhao, L.
The dynamic response of sandwich beams with open-cell metal foam cores

(2011) Composites Part B: Engineering, 42 (1), pp. 1-10. Cited 65 times.
doi: 10.1016/j.compositesb.2010.09.024

View at Publisher

11 Kabir, K., Vodenitcharova, T., Hoffman, M.
Response of aluminium foam-cored sandwich panels to bending load

(2014) Composites Part B: Engineering, 64, pp. 24-32. Cited 26 times.
doi: 10.1016/j.compositesb.2014.04.003

View at Publisher

12 Pollien, A., Conde, Y., Pambaguian, L., Mortensen, A.
Graded open-cell aluminium foam core sandwich beams

(2005) Materials Science and Engineering A, 404 (1-2), pp. 9-18. Cited 89 times.
doi: 10.1016/j.msea.2005.05.096

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