

DEVELOPING A MATHEMATICAL MODEL OF AIRCRAFT HONEYCOMB SANDWICHES

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A vibrational model of a three-layer honeycomb sandwich with partial skin peeling has been developed. The impact of peeling amount on the natural frequency of vibration and the amplitude-frequency characteristic has been analysed. Comparative analysis of design values and experimentally obtained results has been made.

Honeycomb sandwiches, multilayer panels, peeling, vibration theory, technical condition control.

References

1. Tits, S. N. Analysis of AN-124 "Ruslan" airframe operate reliability / S. N. Tits // Propulsion control and aircraft navigation: transactions of the XII All-Russian scientific-and-technical seminar. – Samara, 2006 – pp. 405-406.
2. Tits, S. N. State and problems of practical application of methods of non-destructive airframe control / S. N. Tits, A. N. Koptev, F. Ye. Lyashko // Izvestiya (news) of Samara scientific center of the Russian Academy of Sciences / Samara scientific center of the Russian Academy of Sciences. – 2007. – Special issue – pp. 164-168.
3. Kim, Kh. Yu. Analysis of the impact of peeling in a three-layer honeycomb sandwich on its natural vibration frequencies and amplitude-frequency characteristics. // Kh. Yu. Kim, V. Khveng // Composite structures. – 2002. – Issue 55. – pp. 51-62.
4. Kim, Kh. Yu. Vibrational method of detecting damages in composite structures // Kh. Yu. Kim // Acoustics and vibration. – 2003. – Issue 259. – pp. 1131-1146.
5. Yendogur, V. V. Honeycomb sandwiches. Choice of parameters and designing / A. I. Yendogur, M. V. Vainberg, K. M. Ierusalimsky. – Moscow: "Mashinostroyeniye, 1986 – 200 pp.
6. Allen, H. G. Analysis and design of three-layer structures / H. G. Allen. – Pergamon Press. – Oxford, 1969. – 154 pp.

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