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Strength criterion for choosing envelope materials of non-rigid airship

Cheng Qin and X U Zhongxin

East China Electronic Engineering Research Institute, China

For non-rigid airships, envelop is a pressure vessel for floating gas and also the structural member for external loadings. Generally, the weight of envelop takes up a large proportion of total weight of the airship. As for the strength, stiffness and weight requirement of envelop, appropriate choice for envelop material is the key factor of airship design. Envelop material is one type of multi-layer compound materials, and can be cut into slices and hot sealed in airship manufacture process. The strength of fabricated airship envelop is somewhat different from that of raw material. In the paper, theoretical and experimental statistic methods were adopted to analyze the strength criterion for choosing envelope materials.

13071403@qq.com