崔海坡,温卫东,张阿龙.不同冲击能量对层合板损伤及剩余强度的影响[J].航空动力学报,2015,30(10):2331~2337

# 不同冲击能量对层合板损伤及剩余强度的影响

# Influence of different impact energies on damage and residual strength of laminates

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**中文关键词:** 冲击能量 三维逐渐损伤 复合材料层合板 剩余强度 门槛值

**英文关键词:** impact energy three-dimensional progressive damage composite laminates residual strength threshold value

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**中文摘要:**

基于三维逐渐损伤理论和全程分析方法,对复合材料层合板在冲击载荷及冲击后静载荷下的损伤过程进行分析,重点研究不同冲击能量对两种不同铺层参数、不同几何尺寸的T300/BMP-316复合材料层合板的损伤产生与扩展过程以及剩余强度的影响规律.结果表明:复合材料层合板存在可使其剩余强度急剧下降的冲击能门槛值.对于T300/BMP-316复合材料层合板而言,其冲击能量的门槛值介于5.0 ~ 5.5J之间;在冲击过程中,冲头下落速度具有一定的波动性,且不同铺层参数将影响冲击后复合材料层合板表面的凹痕深度.

**英文摘要:**

The damage processes of composite laminates under impact loading and static loading after impact were analyzed based on the three-dimensional (3-D) progressive damage theory and whole-process analysis method. The influence rules of impact energy on the damage and residual strength of T300/BMP-316 composite laminates with different layer parameters and dimensions were researched. Results show that there is a threshold of impact energy for the composite laminates. The residual strength of composite laminates will decrease rapidly if impact energy exceeds the threshold value. The threshold value of impact energy for T300/BMP-316 composite laminates is between 5.0J and 5.5J. During the impact process, the dropping velocity of impactor is fluctuating, and layer parameters can influence the dent depth of the surface of composite laminates.

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