航空学报
ACTA AERONAUTICA ET ASTRONAUTICA SINICA
ISSN 1000-6893
CN 11-1929/V

航空学报 » 1982, Vol. 3 » Issue (4) :21-27 DOI:

裂纹检测概率曲线的统计测定

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STATISTICAL DETERMINATION OF A FLAW DETECTION PROBABILITY CURVE

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摘要 | 参考文献 | 相关文章

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摘要 本文提出了一种估计裂纹检测概率曲线的试验方法和数据处理方法。给出的估计检测概率置信下限的公式精确、简单,并附有实例。文中还提出了估计裂纹检测概率曲线的工程简化方法。

关键词：

Abstract： The reliability prediction and damage tolerance analysis of aircraft struc-ures based on the principles of fracture mechanics require the knowledge of the ability of flaw detection. A statistical method for determining the flaw detection probability curve is developed and a test technique for obtaining independent flaw detection data is described in this paper. Based on these data and a formula proposed in this paper, the confidence lower limit of the flaw detection probability with the given confidence level for an arbitrary size of a sample and for an arbitrary value of the detection probability can be calculated merely with the help of the table of F-distribution. The presented formula occurs exact and simple in comparison with other approximate formulas proposed by some authors.As an example, the flaw detection probability curve with 95% confidence is given, which comes from the results of inspecting corner flaws at holes in 50 specimens. The specimens were made of steel 45 and the magnetic-particle technique was applied for non-distructive inspection.Finally, the simplified method for determining the flaw detection probability curve is also discussed.

Keywords：

Received 1981-10-01;

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林富甲;黄玉珊. 裂纹检测概率曲线的统计测定[J]. 航空学报, 1982, 3(4): 21-27.

Lin Fujia;Huang Yushan. STATISTICAL DETERMINATION OF A FLAW DETECTION PROBABILITY CURVE[J]. Acta Aeronautica et Astronautica Sinica, 1982, 3(4): 21-27.