



AEROSPACE RECOMMENDED PRACTICE

ARP6287™

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Environmental Degradation of Composite Materials

RATIONALE

This Aerospace Recommended Practice (ARP) specifies the basic requirements and principles to be used during the material qualification process of composite materials used in ULDs, considering the effects of environmental degradation.

INTRODUCTION

Throughout this ARP, the minimum essential criteria are identified by use of the key word “shall.” Recommended criteria are identified by use of the key word “should,” and, while not mandatory, considered to be of primary importance when qualification of a composite material with respect to environmental degradation.

Deviation from recommended criteria should only occur after careful consideration, extensive testing, and thorough service evaluations have shown alternate methods to be satisfactory.

Nothing in this ARP shall in any way cancel or reduce the status of the specifications which determine airworthiness, industry compliance, ground handling, or any other characteristics of the ULDs.

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1. SCOPE

1.1 Purpose

In accordance with § 4.11 of AS36100, materials used in the construction of pallets, nets, and containers shall take into account the effects of environmental conditions, such as temperature, humidity, and UV degradation, expected in service.

In accordance with (E)TSO-C90, the applicant shall consider environmental degradation due to aging, ultra-violet (UV) exposure, weathering, etc., for any materials used in the construction of pallets, nets, and containers.

The purpose of this Aerospace Recommended Practice (ARP) is to provide guidelines for the basic requirements to be considered regarding environmental degradation effects when qualifying composite materials in the design to fulfill the (E)TSO-C90 Minimum Performance Standard.

Material qualification is the verifying of a materials attributes and characterizations, which are typically determined through testing.

Material variances related to raw materials and manufacturing processes are not part of this Aerospace Recommended Practice (ARP), nor is damage tolerance. However, these variances cannot be neglected, as all variances shall be considered when deciding the test factors for environmental effects.

1.2 Field of Application

This Aerospace Recommended Practice (ARP) is intended to be used in the qualification process of composite materials used in ULDs with regards to environmental degradation.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AS36100 Air Cargo Unit Load Devices - Performance Requirements and Test Parameters

CMH-17 Composite Material Handbook

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D5229 Standard Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials

ASTM D1003 Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics