



AEROSPACE RECOMMENDED PRACTICE

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Superseding ARP5637

Design and Maintenance Considerations for Aircraft Exterior Lighting Plastic Lenses

RATIONALE

This document is to provide a design guide for plastic exterior lenses along with maintenance considerations. The most recent update is to provide additional references and more technical considerations in the design and maintenance of this type of exterior lighting system.

ARP5637A has been reaffirmed to comply with the SAE Five-Year Review policy.

TABLE OF CONTENTS

1.	SCOPE.....	2
1.1	Purpose	2
2.	REFERENCES.....	2
2.1	Applicable Documents	2
2.1.1	SAE Publications.....	2
2.1.2	U.S. Military Specifications and Standards	2
2.1.2	RTCA Publications	2
2.2	Definitions	2
3.	PLASTIC LENSES	3
3.1	The Desire for Plastic Lenses	3
3.2	Plastic Lens Issues	3
3.3	Design Guidance.....	4
4.	MAINTENANCE	5
4.1	Purpose	5
4.2	Action Required.....	5
4.3	Inspection Interval	5
4.4	Inspection	5
4.5	Maintenance Action.....	6
5.	NOTES	6
5.1	Revision Indicator.....	6
Figure 1	Plastic lens light transmission loss for wing tip exterior light assembly	4

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1. SCOPE

The information in this document is intended to apply to commercial jet transport category airplanes that incorporate plastic (polycarbonate or acrylic) lenses on exterior light assemblies, or are being considered for such an application as opposed to glass lens designs. Exterior lighting applications include position light assemblies, anticollision light assemblies, and landing light assemblies. However, much of the material provided herein is general in nature and is directly applicable to many aircraft categories including, but not limited to, helicopters, general aviation aircraft, and military aircraft.

1.1 Purpose

The purpose of this document is to provide guidance pertaining to the use of plastic (polycarbonate or acrylic) lenses on commercial jet transport aircraft to aircraft designers, regulatory certification agents, and maintenance personnel. It is not intended to serve as design instructions for the creation of plastic or acrylic lenses. This document identifies significant performance aspects of plastic exterior light lenses that should be carefully managed for each lens application. Additionally, this document provides basic inspection and maintenance procedures for plastic exterior light lenses.

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.

AIR5689 Light Transmitting Glass Covers for Exterior Aircraft Lighting

2.1.2 U.S. Military Specifications and Standards

Copies of these documents are available at <http://quicksearch.dla.mil>.

MIL-DTL-7989 Cover, Light-Transmitting for Aeronautical Lights, General Specification

MIL-STD-810 Environmental Engineering Considerations and Laboratory Tests

2.1.2 RTCA Publications

Available from RTCA, Inc., 1150 18th Street, NW, Suite 910, Washington, DC 20036, Tel: 202-833-9339, www.rtca.org.

RTCA DO-160 Environmental Conditions and Test Procedures for Airborne Equipment

2.2 Definitions

APPEARANCE: The aspect of visual experience by which things are recognized.

CLARITY: The characteristic of a transparent body whereby distinct high-contrast images or high-contrast objects are easily (or) readily observable through the body.

CRAZING: Network of apparent fine cracks on or beneath the surface of materials such as in transparent plastics, glazed ceramics, glass, or clear coatings.

TRANSLUCENT: Transmitting light diffusely, but not permitting a clear view of objects beyond the specimen and not in contact with it.