



AEROSPACE RECOMMENDED PRACTICE

ARP8996™

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Comprehensibility Testing for Pictogram-Based Aircraft Signs and Placards

RATIONALE

Standards are in place to describe test methods for pictograms on markings, signs, and placards in public areas. This document is intended to give guidance for the consistent definition of test and acceptance procedures that aim at proving comprehensibility of pictogram-based markings, illuminated signs, and placards for aircraft.

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1. SCOPE

This SAE Aerospace Recommended Practice (ARP) applies to comprehensibility testing of aircraft markings, signs, and placards that are intended to provide information to passengers, crew, or ground personnel exclusively through pictorial symbols (pictograms).

Markings, signs, and placards where text is complemented by pictograms are not in the scope of this document. In case text and pictograms are used in a redundant manner, comprehension testing is not required.

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.

ARP503	Emergency Evacuation Illumination
ARP577	Emergency, Instruction, and Information Placards - Internal and External
ARP711	Illuminated Signs

2.1.2 FAA Publications

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov.

AC 25-17A	Transport Airplane Cabin Interiors Crashworthiness Handbook
DOT/FAA/AM-08/20	Effective Presentation Media for Passenger Safety I: Comprehension of Briefing Card Pictorials and Pictograms

2.1.3 AIA Publications

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, www.aia-aerospace.org.

AIA TARC 82-89	Standards for Symbolology and Graphic Signage Aboard Commercial Aircraft
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2.1.4 ANSI Accredited Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ANSI Z535	American National Standard: Product Safety Signs and Labels
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2.1.5 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ISO 3864 Graphical Symbols - Safety Colours and Safety Signs

ISO 9186:2007 Graphical Symbols: Test Methods for Judged Comprehensibility and for Comprehension

NOTE: This ARP refers to the 2007 issue of the ISO 9186 standard, even if more recent issues are already in place. The reason for that is that the 2007 issue allows a finer differentiation of degrees of comprehension than newer issues.

2.1.6 ICAO Publications

Available from International Civil Aviation Organization, 999 University Street, Montreal, Quebec H3C 5H7, Canada, Tel: +1 514-954-8219, <http://www.icao.int/>.

ICAO DOC 10086 Manual on Information and Instructions for Passenger Safety

2.1.7 Other Publications

General Aviation Manufacturers Association (GAMA) Publication No. 15 - Symbolic Messages

2.2 Definitions

ACCEPTANCE TEST: Test that is required to obtain acceptance of a pictogram by an airworthiness authority.

BACKGROUND COLOR: Color of the canvas on which the graphic elements of a pictogram are drawn.

ENGINEERING TEST: Test that is conducted under the responsibility of a design organization to prove comprehensibility of a pictogram.

EXPERT JUDGMENT: Judgment by subject matter expert based on expertise appropriate for the required assessment.

FOREGROUND COLOR: Color that is used for graphic elements of a pictogram.

INSTALLATION APPROVAL: Airworthiness authority approval of a placard installation at a certain location.

MANUFACTURER: Aircraft manufacturer or manufacturer of aircraft components.

PICTOGRAM ACCEPTANCE: Airworthiness authority acceptance that allows the use of a pictogram to convey regulatory agency required messages.

PICTOGRAM VALIDATION: Process of proving that a pictogram is adequately comprehensible for its target group.

PICTOGRAM: Symbol that conveys its meaning through a simplified pictorial representation of an object or operation.

PLACARD: Printed sheet, providing information through text or pictorial symbols.

SIGN: Illuminated indication, providing information through text or pictorial symbols.

SUBJECT MATTER EXPERT: Person with knowledge of the skills and terminology of a target group with specific training or education.

TEST ASSISTANT: Person responsible for briefing of test persons and collection of data by means of electronic or paper questionnaire in compliance with the test plan.

TEST PERSON: Person stating their individual comprehension of a pictogram by completing the corresponding electronic or paper questionnaire.

2.3 Mandatory and Recommending Words

SHALL: Indicates a mandatory criterion.

SHOULD: Indicates a criterion for which an alternative, including noncompliance, may be applied if it is documented and justified.

2.4 Abbreviations

AC	Advisory Circular
AIA	Aerospace Industries Association
ANSI	American National Standards Institute
ARP	Aerospace Recommended Practice
DOT	U.S. Department of Transportation
EASA	European Union Aviation Safety Agency
FAA	Federal Aviation Administration
ICAO	International Civil Aviation Organization
ISO	International Organization for Standardization
PoD	Point of Decision

3. BACKGROUND AND MOTIVATION

Markings, signs, and placards are used on aircraft to provide relevant information to the crew, passengers, and ground personnel like maintenance, catering, or cleaning staff. They convey their information either through lettered text or through pictorial symbols (pictograms). In a global industry like aviation, pictograms have the advantage of overcoming language barriers.

A validated procedure for testing pictorial symbols regarding their comprehensibility is described in ISO 9186:2007. That procedure has been developed for comprehensibility testing of pictograms providing information to the public. On aircraft, however, there are markings, signs, and placards that are aimed at specialized target populations like flight and cabin crew, maintenance staff, and ground personnel. The characteristics of these groups are distinct special knowledge and a specific technical terminology. These particularities have to be considered when evaluating the understanding of a pictogram by representatives of those groups. Therefore, this document is intended to complement ISO 9186:2007 by giving guidance on how to best apply the comprehensibility test procedure described therein to tests of pictograms that are intended to be used on aircraft.

4. IDENTIFICATION OF VALIDATION NEEDS

4.1 The Iterative Design and Validation Process

Pictograms often undergo several design iterations during development in order to obtain the best design that has the greatest chance of being understood by the general population. The intended audience and the message to be conveyed by the pictogram generally define the validation requirements. The sections of this chapter provide guidance for the design and validation process. This process starts once a thorough review of existing pictograms reveals the need for a new one to be designed, since none of the existing pictograms can provide the required function.

The overall design and validation process is shown in Figure 1.