AEROSPACE STANDARD

AS478™	REV. R

Issued 1960-05
Reaffirmed 2015-04
Revised 2021-01

Superseding AS478P

Identification Marking Methods

RATIONALE

This revision adds a new method identification for Permanent Ink Marking and makes some general editorial revisions and clarification.

1. SCOPE

This standard provides the following:

a. Definition of terms pertaining to marking.

b. Symbols for marking location.

c. Requirements and restrictions for permanent markings.

d. Types of marking methods.

e. Rules for designating marking methods.

f. Table listing marking methods.

1.1 Purpose

To define and control marking methods, and to provide a method for specifying desired marking methods on aerospace engineering drawings of parts and assemblies.

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.

SAE Executive Standards Committee Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2021 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

For more information on this standard, visit
https://www.sae.org/standards/content/AS478R/

Documents Document Sharing Hub

Full document details: SAE AS478R

2.1.1 U.S. Government Publications

Copies of these documents are available online at https://quicksearch.dla.mil.

MIL-HDBK-57 Listing of Fastener Manufacturers' Identification Symbols

H4/H8 Commercial and Government Entity (CAGE) Codes

2.1.2 ANSI Accredited Publications

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

ANSI INCITS 17 Character Set for Optical Character Recognition (OCR-A)

ANSI INCITS 93M Character Positioning for Optical Character Recognition (OCR)

2.2 Definitions

For the purpose of this standard, the following definitions shall apply:

2.2.1 CONTRACTOR

Any individual, company, partnership, association, or corporation holding a contract or letter of intent to supply items for which this standard is specified.

2.2.2 IDENTIFICATION

Any marking applied to an item or its package for the purpose of engineering, manufacturing, or inspection control.

Examples are:

a. Item number

b. Vendor number

c. Manufacturer's identification

d. Inspection symbols

2.2.2.1 MANUFACTURER'S IDENTIFICATION

The actual manufacturer's name, registered trademark, or the identification symbol listed in MIL-HDBK-57, or the CAGE code identification established in Cataloging Handbooks H4/H8, or as otherwise specified.

2.2.3 ITEM

An article, used in this standard to relate to a part, assembly, or equipment.

2.2.4 PACKAGE

The smallest enclosure into which an item(s) is placed for protection during storage or shipment.

2.2.5 PERMANENT MARKING

Marking which will ensure identification during the normal service life of the item. Methods of permanent marking are listed in 4.1.

Documents
Document Sharing Hub

Full document details: SAE AS478R

2.2.6 TEMPORARY MARKING

Marking which will ensure identification during ordinary handling and storage of items prior to assembly and use. Under certain service conditions these markings may exhibit the characteristics of permanent markings. Temporary marking methods are listed in 4.2.

2.2.7 OPTICAL CHARACTER RECOGNITION

An automatic data entry system that utilizes predefined human readable shaped alphanumeric character fonts which can be read by automatic scanning equipment.

3. GENERAL REQUIREMENTS

Items shall be marked in accordance with this standard unless otherwise specified on the item drawing. The method of marking shall be designated as shown in 6.1.

3.1 Marking Location

Location of marking on items shall be in accordance with the following as applicable:

3.1.1 General

The symbol as shown in Figure 1, or a local note, indicates general location for marking.

Figure 1 - Symbol for general location for marking

3.1.2 Pad

The symbol as shown in Figure 2, or a local note, indicates pad location for marking.

Figure 2 - Symbol for pad location for marking

3.1.3 Integral

The symbol as shown in Figure 3, or a local note, indicates pad location for integral marking (cast, forged, or molded).

Figure 3 - Symbol for location for integral marking (cast, forged, or molded)

3.1.4 Specific

The symbol as shown in Figure 4, or a local note, indicates a specified area within which markings must be confined.

Figure 4 - Symbol for specified area within which markings must be confined

Documents
Document Sharing Hub
Full document details: SAE AS478R

3.1.5 Multiple

Where two or more locations for marking are specified, markings shall be grouped so that as few of the locations as practicable are used.

3.2 Permanent Markings

Permanent markings are permitted on finished items only when specified on the engineering drawing from which the item is manufactured.

3.2.1 Items which require more than one identification number, such as item number, serial number, etc., shall have each number on a separate line; or consecutive identification numbers on the same line shall be separated by no less than two spaces. The separation or division of the digits of an identification number will not be objectionable provided the digits are in sequence and cannot be misread.

3.2.2 Permanent marking for the general categories of items shall normally be between 0.060 inch and 0.160 inch (1.5 mm and 4 mm) in height. In special cases when governed by size or configuration, 0.016 inch (0.4 mm) minimum or 0.250 inch (6.35 mm) maximum height is permissible, or as otherwise specified in this standard or on the item drawing. When integral marking is used, the height should not exceed 0.500 inch (12.7 mm) nominal character size.

3.2.3 Permanent marking is not recommended on contacting surfaces, nor on surfaces which are in motion with respect to the mating surface during operation of the items. However, when permanent markings must be placed on such surfaces, all raised metal and burrs shall be removed in accordance with the requirements given on the item drawing.

3.2.4 Permanent markings shall not be applied on surfaces which have been chemically processed, painted, or plated unless the marking will be legible and the minimum requirements of the surface treatment process are maintained or restored.

3.2.5 Permanent markings shall not be nearer than 0.031 inch (0.78 mm) to any corner, fillet, or edge unless specifically designated. Where a specific marking location, as designated and dimensioned, does not provide enough area for 0.031 inch (0.78 mm) distance to any edge, corner, or fillet, the markings shall be centered upon the area without breaking over an edge or encroaching into corners or fillets. When parts are machined from previously marked hexagon bar stock, the 0.031 inch (0.78 mm) edge restriction is waived, provided the marking is legible.

3.2.6 Precautions

Stress concentrations resulting from improper applications of marking methods may cause item distortion or failure. Marking methods, such as methods 4 or 6 in Table 1, may produce secondary effects which are detrimental to item reliability and must be properly evaluated to the item design. Items distorted or otherwise damaged by marking shall be subject to rejection. Permanent markings not in compliance with the limits given in this standard may be the basis for rejection of the items by the purchaser.

3.2.7 Legibility

Identification marking shall be legible and make full use of the available marking area. Characters shall be block form capital letters and Arabic numerals without serifs, such as “Gothic” or “Futura.” Lower case letters may be used when required for metric unit symbols. Other characters shall be of similar appearance. Condensed letters and smeared letters shall be cause for rejection. Processes performed after marking which may reduce legibility (such as vapor or grit blasting, tumbling, etching, etc.) shall be controlled to prevent loss of legibility. Normally all characters shall be legible without magnification. However, where space or surface condition limits the size of characters that may be used, legibility with 3X magnification maximum is permissible when authorized.

3.2.8 Optical Character Recognition (OCR)

Marking requirements for the standard OCR-A character set are specified in ANSI INCITS 17. The OCR-A marking character’s height, width, spacing and positioning requirements are specified in Table 2. See 6.1.1 for an example of designating OCR font marking method.

AVA Documents
Document Sharing Hub
Full document details: SAE AS478R

4. MARKING METHODS

4.1 Permanent Markings

Permanent markings shall not affect the function or serviceability of the item.

4.1.1 Integral

Characters are produced by casting, forging, or molding into or onto the item.

4.1.2 Metal Stamp

Characters are produced by forcible displacement of material.

4.1.2.1 Hammer

Characters are produced individually or in groups by impact force applied mechanically or by hand.

4.1.2.2 Press

Characters are produced individually or in groups with a controlled force applied without impact.

4.1.2.3 Roll

Characters are produced by a rotating motion of either the item or the tool, or both, when in contact with each other under a controlled force.

4.1.2.4 Vibro Peen, Manual

Characters are produced by a hand guided rapidly vibrating tool having a pointed tip making indentations on the item to produce the characters.

Documents
Document Sharing Hub
Full document details: SAE AS478R