



AEROSPACE RECOMMENDED PRACTICE

MAP4296

Issued 1993-06
Reaffirmed 2015-08

Drawing Interpretations, Standard Machining Practice,
Tube Fittings and Connectors, Fluid Systems, Metric

RATIONALE

MAP4296 has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

This SAE Metric Aerospace Recommended Practice (MAP) establishes the drawing interpretations, standard machining practice for tube fittings and connectors used in metric fluid systems.

1.1 Product Classification:

This MAP is intended to interpret and clarify engineering drawing requirements relating to the manufacture and inspection of fluid tube fittings and connectors. Because it is impractical to define every minute detail of the part on the face of the drawing, this document describes general machining tolerances that fall under the heading of, "good shop practice". This document serves as a supplement to engineering drawings when referenced on applicable documents.

2. REFERENCES:

2.1 Applicable Documents:

The following publications form a part of this specification to the extent specified herein. The latest issue of all SAE Technical Reports shall apply.

- 2.1.1 ANSI/ASME Publications: Available from the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10019.

ANSI/ASME B46.1 Surface Texture
ANSI Y14.5M Dimensioning and Tolerancing

3. TECHNICAL REQUIREMENTS:

3.1 General:

- 3.1.1 Conflict in Requirements: Where a conflict exists between the requirements of this document and the applicable part drawing, the part drawing shall take precedence.

SAE Technical Standards Board 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 © 2015 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
http://www.sae.org

SAE WEB ADDRESS:

Full document details: SAE MAP4296

SAE values your input. To provide feedback
on this Technical Report, please visit
<http://www.sae.org/technical/standards/MAP4296>

Documents

Document Sharing Hub

- 3.1.2 Burrs and Sharp Edges: Finished parts are to have all burrs and slivers removed. Break edges 0.08 to 0.38 mm unless otherwise noted.
- 3.1.3 Dimensioning and Tolerancing: The rules, principles and methods of dimensioning and tolerancing used to define the required configuration are contained in ANSI Y14.5M.
- 3.1.4 Titanium: When machining and cleaning titanium or titanium alloys, cutting fluids and compounds must not contain chlorides or fluorides.

3.2 Tolerances:

3.2.1 Concentricity: See 3.2.5.

3.2.2 Angularity:

- 3.2.2.1 Shapes: Angularity between the legs of shape fittings such as tees, elbows, and crosses shall be as shown in Figure 1.

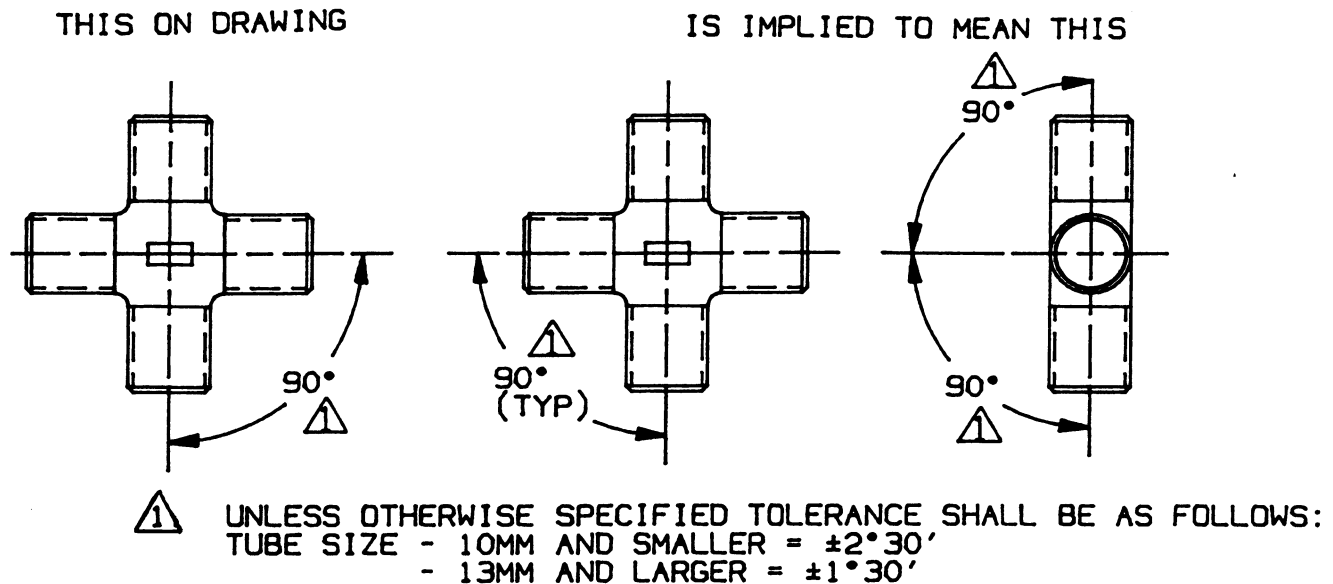


FIGURE 1 - Angularity Tolerance Between Legs of Shape Fittings

3.2.3 Drilled Holes:

- 3.2.3.1 Tolerance: For drilled holes without a specified size limit, the tolerances noted in Table 1 shall apply.

TABLE 1 - Hole Size Tolerance

Hole Diameter (mm)	Tolerance (mm)
0.34 thru 3.17	+0.10/-0.02
3.20 thru 6.35	+0.13/-0.02
6.40 thru 12.70	+0.15/-0.02
12.75 thru 19.05	+0.20/-0.02
19.10 thru 25.40	+0.25/-0.02
25.50 thru 50.80	+0.30/-0.02

- 3.2.3.2 Pilot Drill Size and Depth: The pilot drill size for a reamed or bored hole is generally not specified on the engineering drawing. Unless otherwise noted, the drilled hole may be smaller than the finished machined hole by not more than 0.8 mm. The depth of the reamed or bored hole shall be within 0.8 mm of the drilled hole depth. See Figure 2.

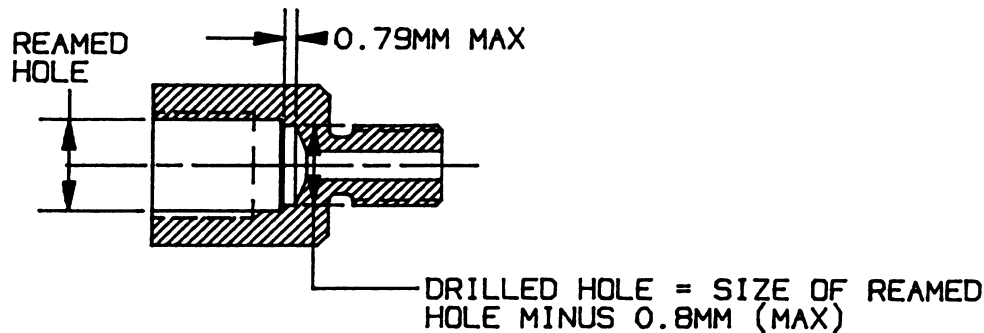


FIGURE 2 - Pilot Hole Size and Depth

- 3.2.3.3 Drill Point: For conventional twist drills, the drill point included angle shall be 90° minimum.
- 3.2.3.4 Runout: The angular runout from true center for fluid passage holes shall be as shown in Figures 3 and 4. The allowable drill runout is in addition to the angle tolerance specified on the drawing.

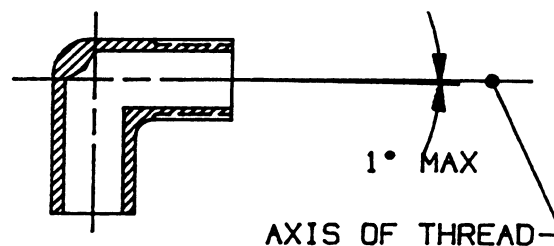


FIGURE 3 - Fluid Passage Hole Runout of Shape Fittings