



AEROSPACE STANDARD

MA2004**REV. A**

Issued 1981-07
Revised 1989-01
Reaffirmed 2015-08

Superseding MA2004

Thermal Shock Testing of Fluid System Piping and Fittings
Equivalent to ISO 6773

RATIONALE

MA2004A has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

This standard provides an environmental performance test method for thermal shock testing of fluid system piping and fittings, excluded hose and hose assemblies.

2. REFERENCES:

MA2001 - ISO 6771 Aerospace Fluid Systems and Components - Pressure and Temperature Classification

3. REQUIREMENT:

The test assemblies shall not leak or burst during temperature and pressure cycling procedures described in section 5 of this standard. Visual evidence of wettness or droplets of test fluid is leakage.

4. PROCEDURE:

4.1 Test Set-Up:

The test assemblies shall be mounted in a test fixture similar to Fig. 1, capable of providing the required fluid and ambient temperatures and system pressures for system classifications such as specified in MA2001 - ISO 6771.

4.2 Test Fluid:

The test fluid shall be system fluid or a hydraulic fluid which is compatible with the item being tested and the specified system pressure and temperature.

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 MA2004A

SAE values your input. To provide feedback
on this Technical Report, please visit
<http://www.sae.org/technical/standards/MA2004A>

Documents

Document Sharing Hub

5. TEST CONDITIONS:

5.1 Hot Test Chamber Testing:

The test assemblies shall be mounted in a temperature chamber, connected to a pressure source and filled with the specified test fluid. The assemblies shall then be pressurized to the nominal system operating pressure and the temperature in the test chamber raised to the maximum required for the system. The temperature shall be held for a minimum of 2 hours. Provisions should be made to bleed off excess pressure due to increased temperature during these two hours. At the end of this period, while still at temperature, the hot test fluid shall be released and replaced within 20 s with test fluid at the minimum specified temperature. Within an additional 20 s, the fluid pressure shall be raised to the proof pressure specified for the system and this pressure maintained for 1 min and then released to atmospheric pressure for an additional 1 minute. Then repeat the 1-min proof pressure test. The assemblies shall be under continuous observation during the two 1-min pressurization periods to determine any leakage.

5.2 Cold Test Chamber Testing:

Following a cooling period to room temperature, the system pressure is to be re-applied and the chamber temperature lowered to the minimum specified. This temperature is to be held for a minimum of 2 hours. At the end of this period while still at low temperature, the cold fluid shall be released and replaced with test fluid at the maximum system temperature within 20 seconds. Within an additional 20 s, the pressure shall be raised to the proof pressure specified for the system, and this pressure maintained for one minute. The specimens shall be closely observed to determine any leakage.

5.3 Test Schedule:

The procedures described in 5.1 and 5.2 above shall be performed a total of three times to complete the requirements of the thermal shock test.