SAE The Engineering Resource For Advancing Mobility

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METRIC AEROSPACE STANDARD

MA 2004

Issued July 30, 1981
Revised

THERMAL SHOCK TESTING OF FLUID SYSTEM PIPING AND FITTINGS

1. SCOPE:

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

2. REFERENCES:

MA 2001 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 paragraph 5 of this standard.

4. PROCEDURE:

4.1 TEST SET-UP:

The test assemblies shall be mounted in a test fixture similar to Figure 1, capable of providing the required fluid and ambient temperatures and system pressures for system classifications such as specified in MA 2001.

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.

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 two hours. At the end of this period, while still at temperature, the hot test fluid shall be released and replaced within 20 seconds with test fluid at the minimum specified temperature. Within 20 additional seconds the fluid pressure shall be raised to the proof pressure specified for the system and this pressure maintained for one minute and then released for an additional one minute. The assemblies shall be under continuous observation during the two pressurization periods to determine any leakage.

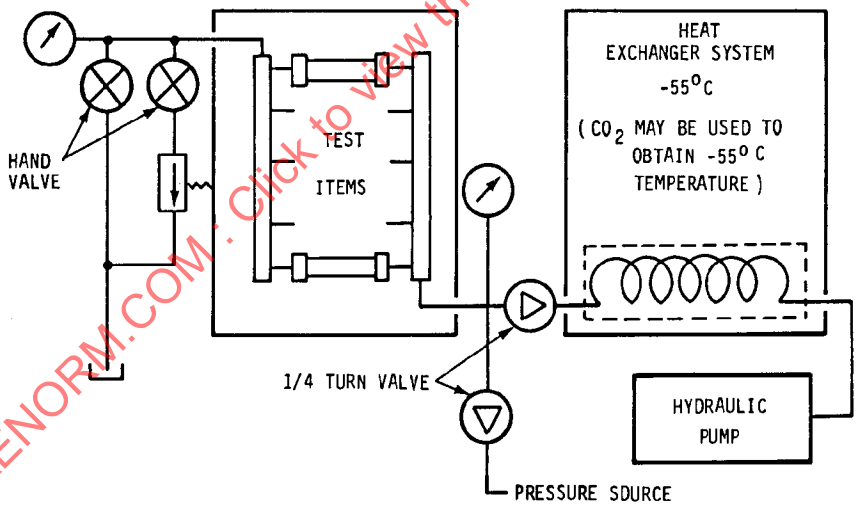
This metric Aerospace Standard is the equivalent of ISO/TC 20/DIS 6773. Revisions of this document shall be coordinated with ISO/TC20/SC 10

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 two 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 seconds 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 Paragraphs 5.1 and 5.2 above shall be repeated three times to complete the requirements of the thermal shock test.



THERMAL SHOCK TEST SCHEMATIC

Figure 1