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Amendment 1 - February 1993
Amendment 2 - September '94

Under Revision see DR 94304

Superseded by AS 4032-1995

AS 4032—1992

Australian Standard®

Thermostatic mixing valves—Materials, design and performance requirements

STANDARDS AUSTRALIA

This Australian Standard was prepared by Committee WS/26, Thermostatic Mixing Valves. It was approved on behalf of the Council of Standards Australia on 15 April 1992 and published on 15 June 1992.

The following interests are represented on Committee WS/26:

AUSTAP

Australian Consumers Association

Australian Valve Manufacturers Association

Committee Plumbing Products Authorization

Department of Consumer Affairs, N.S.W.

Department of Planning and Housing, Vic

Engineering and Water Supply Department, S.A.

Hunter Water Board

Institute of Hospital Engineering, Australia

Public Works Department, N.S.W.

Water Authority of Western Australia

This Standard was issued in draft form for comment as DR 91069.

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STANDARDS AUSTRALIA

Amendment No. 2
to
AS 4032—1992
Thermostatic mixing valves—Materials, design and performance requirements

REVISED TEXT

The 1992 edition of AS 4032 is amended as follows; the amendments should be inserted in the appropriate places.

SUMMARY: This Amendment applies to Appendix I (Amendment No. 1), Contents, Clauses 1.4.3, 4.6, 4.8, 4.9 and 5.4 and Figure N1.

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Amendment No. 1 Appendix I

Delete existing Appendix and *substitute* the following:

APPENDIX I

ENDURANCE OF THERMOSTATIC ELEMENT/SENSOR AND OPERATING MECHANISM TEST

(Normative)

I1 SCOPE This Appendix sets out the method for endurance testing of the thermostatic element/sensor and operating mechanism of each test thermostatic mixing valve to perform in simulated operational conditions and be capable of responding to a sudden shut-off of the cold water supply, within specified temperature limits, to be 'fail safe'.

I2 PRINCIPLE The valve under test, mounted in accordance with the manufacturer's installation instructions, is held in a test rig and the entrapped air bled off. With the upper limit of the temperature control set at 38 ±2°C, the valve under test shall be subjected to specified pressures, temperatures and discharge flow rates of hot water and cold water to the respective inlets and mixed water from the outlet for not less than 50 000 cycles. At intervals of 5000 ±100 cycles, the cold water supply to the valve under test is shut off completely to simulate a fail-safe condition, i.e. test the integrity and anti-scald responsiveness of the thermostatic element/sensor.

I3 APPARATUS The following apparatus is required:

(a) Test rig for endurance of thermostatic element/sensor and operating mechanism test. A typical test rig is shown in Appendix N.

(b) Apparatus and pipework as specified in Appendices L and M.

(c) A device or apparatus (cyclic actuator) capable of operating the temperature/flow control mechanism of the valve under test. The operating unit shall incorporate a counter and interruption mechanism to operate the solenoid valve (3) on the cold water supply at specified intervals and periods of time.

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(d) Independent hot and cold water supplies with—

(i) a temperature range for the respective water supplies to the upper tolerance limits as specified in the testing procedure; and

(ii) a pressure range for the respective water supplies to the upper tolerance limits as specified in the testing procedure.

The pressures and temperatures of the hot and cold water supplies to the test rig shall be independently controllable and be capable of delivering hot and cold water within the tolerances stated for the duration of the test being conducted.

I4 PROCEDURE (See Appendix N) The procedure shall be as follows:

(a) Mount the valve under test (15), orientated in accordance with the manufacturer's installation instructions in the test rig. The valve under test shall not be removed from the test rig for the duration of the test unless it is essential for the purpose of repairs to the test rig.

(b) Connect the controllable cold water supply to valve (1) and the controllable hot water supply to valve (4).

(c) Set the temperature control of the valve under test (15) to a position which ensures that there is a flow of water through both inlets. Purge air from test rig pipework and valve under test. Seal off additional outlets, if applicable.

(d) With the flow control mechanism fully open, regulate the discharge flow rate from the valve under test to 10 ±1 L/min.

(e) Adjust the temperature of the hot water supply to 55 + 2, −0°C and cold water supply to 15 ±5°C.

(f) Adjust the temperature control of the valve under test so that the discharged mixed water is 38 ±2°C. This becomes the upper temperature limit, set temperature, for the endurance test and shall be fixed into the cyclic actuator device/apparatus. The actual temperature is to be recorded.

(g) For an operating mechanism—

(i) with separate temperature and flow controls—

(A) engage the cyclic actuator to move the temperature control from the set temperature (upper limit) to the cold zone of the valve, the inlet temperature of the cold water (lower limit) and return, the retention time being at the upper and lower limits for nominal sizes—

(1) equal to or less than DN 20, 5 + 2, −0 s; or

(2) greater than DN 20, 10 ±2 s; and

(B) simultaneously engage the cyclic actuator to move the flow control mechanism (where fitted) from fully closed to the pre-set flow rate as nominated in Step (d); or

(ii) with combined temperature and flow control, engage the cyclic actuator to move the control mechanism from fully closed to the pre-set flow rate as nominated in Step (d).

(h) The action of Step (g)(i) or Step (g)(ii), as appropriate, constitutes one cycle. The endurance test on the thermostatic element/sensor and operating mechanism shall be performed for not less than 50 000 cycles and shall include not less than 10 fail-safe tests. A counter shall record each cycle and fail-safe test.

(i) For the fail-safe test, at intervals of 5000 ±100 cycles, activate the solenoid valve (3) to completely shut off the cold water supply. At 30 + 30, −0 s before initiating the shut-off sequence, the discharge flow rate of 10 ±1 L/min to the valve under test shall be increased as given in Table I1. Record the actual flow rate.

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TABLE I1

MIXED WATER—FLOW RATES

Nominal size DN		Flow rate L/m
	≤15	11 ±1
>15	≤20	14 ±1
>20	≤25	19 ±1
>25	≤32	24 ±1

Maintain the cold water shut off period for 5 + 3, –0 min and record the leakage rate.

(j) Observe and record throughout the test the temperature and flow rate of the mixed water from the valve under test and for the periods of—

(i) 2 + 1, –0 min before each cold water shut-off, record—

(A) the flow rate; and

(B) the temperature; and

(ii) 2 + 1, –0 min after each cold water shut-off, record—

(A) the flow rate (leakage); and

(B) the temperature peaks in excess of 40°C and their duration in seconds times 10^{-1}.

In the event of failure of the test rig, the reading on the counter shall be recorded and the test recommenced when the repairs have been made with the existing cycles recorded in credit.

I5 REPORT The report shall include the following information for each test valve:

(a) The manufacturer, model, designation, and number.

(b) Whether a combined or separate temperature control.

(c) Any failures of the apparatus or interruptions during the test. The counter reading and corrective measures taken.

(d) The applied number of operation cycles.

(e) The initial test operating temperatures and dynamic pressures.

(f) For the mixed water during the period—

(i) before each cold water shut-off (see Paragraph G4(j)(i)), the recorded—

(A) flow rate; and

(B) temperature; and

(ii) after each cold water shut-off (see Paragraph G4(j)(ii)), the recorded—

(A) flow rate (leakage); and

(B) temperature peaks in excess of 40°C and their duration.

(g) Any observed leakage from or failures to the components or body of the test valve.

(h) Reference to this test method, i.e. AS 4032, Appendix I.

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Clause 4.6, *delete* entry and *substitute*: