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WBS TEST & ACCEPTANCE CRITERIA
PD.JCS

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Date of issue: May 1997

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TEST CODE SHEET

1. TYPE OF TEST(S)

Accelerated ageing.

2. BYELAW REQUIREMENT FOR FITTINGS

Byelaw 52

Every water fitting shall be constructed of materials, the nature, the strength and thickness of which will prevent, so far as is reasonably practicable, damage from - (a) any external load; (b) vibration, stress

Byelaw 92

Every expansion cistern and every cold water combined feed and expansion cistern connected to a primary circuit shall be (a) able to accommodate any expansion water from the primary circuit to which it is connected; and (b) installed so that on ordinary operation the water level is not less than 25mm below the overflowing level of the warning pipe connected to it.

3. BRITISH STANDARDS OR WATER SPECIFICATION, DEEMED TO SATISFY BYELAW REQUIREMENTS

(See Water Supply Byelaw Guide)

3.1 Fittings with 'kitemarks' which are deemed to satisfy the requirements of byelaws are listed in the directory.

4. TEST PROCEDURE

Note Unless stated otherwise the temperature of the test fluid shall be $20 \pm 10^\circ\text{C}$.

4.1 Tests applicable to the following: fittings-

CISTERNS, plastics

- cold water storage and feed and expansion, with lid
- feed and expansion, with or without lid.

(A) COLD WATER STORAGE CISTERNS (POLYOLEFIN, OLEFIN COPOLYMER) AND CISTERN COVERS

- which may be subject to hot water for limited periods (eg vent pipe return on secondary system) (Derived from BS 4213 and BS 7491 : Part 1 & 2)

TEST METHOD

Hot Water Test

1. The test installation shall be as shown in Figures 1 and 2 and shall be in a controlled environment where the air temperature at the cistern water level, 100mm from the side of the cistern, shall be $38 \pm 3^\circ\text{C}$.
2. Install the cistern in accordance with the manufacturer's instructions and laboratory setting-up procedure IGN 1-50-70.
3. Do not apply any insulation to the copper cylinder, the cistern or any of the pipework.
4. The heat input shall be provided by a 3kW heater complying with BS 3456 : Section 2.21 of 760mm length. No thermostat or cut-off device shall be provided in order that runaway conditions can prevail.
5. Fill the installation with cold water to the water line and switch on the heater for a continuous period of 500 +1 -0 hours.

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6. At the end of this time switch off the heater and allow a period of 24 ± 1 hours to elapse to permit cooling of the installation.
7. Examine the cistern to ensure that the acceptance criteria have been met.

NOTE 1

It is recommended that provision is made for a means of containing any spillage from a ruptured cistern, and in addition, for shutting off both the cold water supply and the power input.

NOTE 2

All pipe work should be supported in accordance with good plumbing practice and with the cistern manufacturer's instructions.

NOTE 3

It is recommended that a means of restricting the dispersal of steam is used. This may be done by fitting a suitable covering, provided it does not restrain the sides of the cistern during the test, or by covering the surface of the water by plastics balls or other suitable means.

NOTE 4

The actual positions of the connections to the cisterns may be varied slightly from those indicated in Figures 1 and 2 in order to accommodate design features of the cisterns.

5. ACCEPTANCE CRITERIA

The cistern shall be considered to have failed if:

1. At any time there is an overflow from the top edge of the cistern or any other visible signs of leakage;
2. During the test, the function and operation of the float operated valve is impaired to the distortion of the cistern;
3. After the conclusion of the heating cycle and when the water has been left to cool for 24 ± 1 hours, and where applicable, the lid recommended by the manufacturer cannot be replaced in its correct position.

NB A lid is not necessarily required for a cistern used solely for primary circuit feed and expansion purposes.

(B) GRP CLASS "B" CISTERNS OR CISTERNS STORING NON-POTABLE WATER FOR USE AS A COMBINED FEED AND EXPANSION TO A PRIMARY CIRCUIT OR AN EXPANSION CISTERN

TEST METHOD

1. The cistern shall be installed in accordance with the manufacturer's instructions and laboratory setting-up procedure IGN 1-50-70.
2. It shall be connected into a circuit such that it is used as an expansion cistern for a directly heated cylinder of nominal capacity of 25 gallons heated by an immersion heater of not less than 3kW rated output uncontrolled by any thermostat or cut-off device.
3. No insulation shall be applied to any part of the circuit.
4. The test shall be undertaken in a controlled environment where the air temperature is $38 \pm 3^\circ\text{C}$ just outside the cistern under test.

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5. The cistern shall be provided with a float operated valve of metal, with a copper float, both capable of meeting the appropriate WBS acceptance criteria, and a warning pipe.
6. The float operated valve shall be adjusted to fill the cistern to the normal operating level in accordance with Byelaw 92(b), the cylinder heater switched on and the cistern subjected to the expansion water from the cylinder for a continuous period of 500 ± 24 hours.

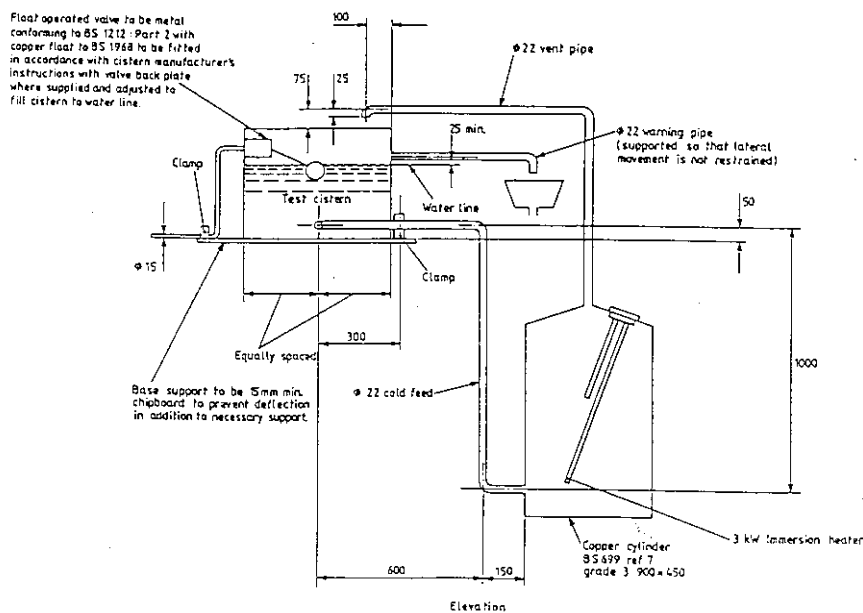
5. **ACCEPTANCE CRITERIA**

The cistern shall be considered to have failed if:-

1. At any time there is an overflow from the top edge of the cistern or any other visible signs of leakage;
2. During the test, the function and operation of the float operated valve is impaired by the distortion of the cistern;
3. After the conclusion of the heating cycle and when the water has been left to cool for 120 ± 15 minutes, and where applicable, the lid recommended by the manufacturer cannot be replaced in its correct position.

NB A lid is not necessarily required for a cistern used solely for primary circuit feed and expansion purposes.

FIGURE 1



NOTE. Vent pipe to discharge 100 mm from sides of cistern but not over float operated valve or float. If a lid is fitted cut a hole to permit any discharge, from the vent pipe, to enter the cistern.

All dimensions are in millimetres.

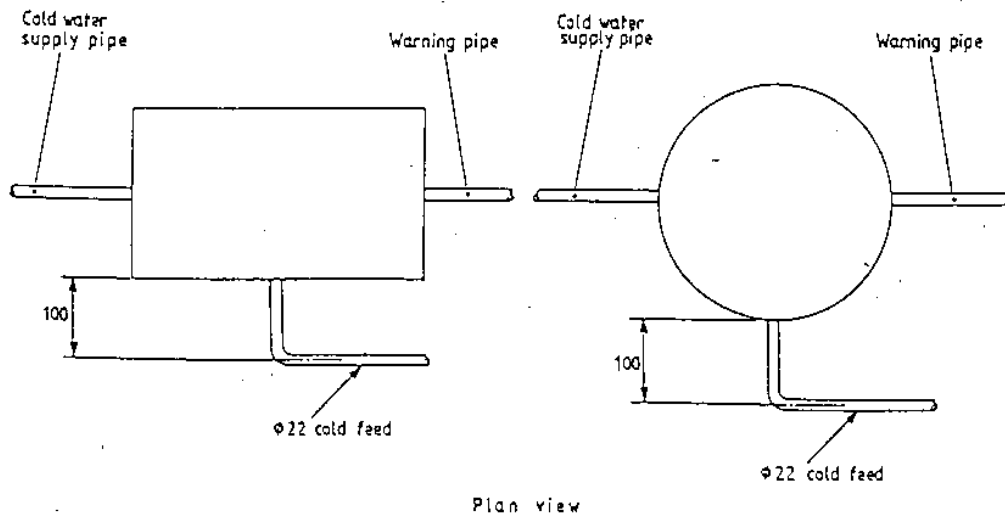
Typical installation for hot water test: elevation

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FIGURE 2



(a) Rectangular cisterns

(b) Cylindrical cisterns

All dimensions are in millimetres.

NOTE: 22 mm connections to cistern are to be supported by suitable flange/plate 1800 mm² (minimum) support area.

Typical installation for hot water test: plan view