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TEST & ACCEPTANCE CRITERIA

Issue No: 3
Date of Issue: March 1998

TEST CODE SHEET

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1. TYPE OF TEST(S)

Porosity.

2. BYELAW REQUIREMENT FOR FITTINGS

Byelaw 52

Every water fitting shall be constructed of materials.....whichwill prevent, so far as is reasonably practicable, damage from.....

(c) internal water pressure

Byelaw 53

Every water fitting which

(a) is installed below ground; or

(e) is in any other position which is inaccessible, or to which access is difficult; shall be -

(i) Constructed to withstand without bursting, buckling, fracture or leaking an internal hydraulic pressure twice that to which it would normally be subject.....

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

(See Water Supply Byelaws Guide)

- BS1972 Clause 8.1.1 and Appendix G.1
- BS3505 Clause 6.4 (incorporated in IGN-4 - 31 - 04)
- BS4991 Clause 6.3 and Appendix D
- BS6572 Clause 5.2.1 and Appendix C.2
- BS6730 Clause 5.2.1 and Appendix E.2

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:-

- TUBES** - plastics - cold water use only - below ground use only.
- plastics - cold water use only - above ground use only.
- plastics - reinforced - flexible hose.
- rubber - flexible hose.

(A) NON-BS FITTINGS

TEST METHOD

Fittings for cold water use below ground or in inaccessible positions shall be subjected to a hydraulic pressure of twice the claimed maximum operating pressure.

Fittings for cold water use above ground and in accessible positions shall be subjected to a hydraulic pressure of 1.5 times the maximum operating pressure.

In either case the pressure shall be applied with water at ambient temperature (but not to exceed 20°C) for a period of not less than 2 minutes.

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(B) BS FITTINGS

TEST METHOD

As detailed in extracts from relevant BS's given below.

(i) BS 1972 Polythene pipe (type 32) for above ground use for cold water services

Clause 8.1.1 General test. When tested by the method described in G.1 the pipes shall show no signs of localised swelling, leakage or weeping. Appendix G.1 General test.....pipe shall be subjected to a pressure of twice the working pressure as given.....(see below). The pressure shall be applied at room temperature and shall be maintained for not less than 2 minutes.

- Class B 6.1 Kgf/cm² (0.60 MN/m² : 200ft. hd. : 86.7 lbf/in²) (WBS - 6 bar)
- Class C 9.1 Kgf/cm² (0.89 MN/m² : 300ft. hd. : 130 lbf/in²) (WBS - 9 bar)
- Class D 12.2 Kgf/cm² (1.20 MN/m² : 400ft. hd. : 173 lbf/in²) (WBS - 12 bar)

(WBS ± 0.5 bar)

(ii) BS 3505 UPVC (PVC-U) pressure pipes for cold potable water

Clause 6.4 short term hydrostatic pressure resistance at 20°C. When tested at a temperature of 20°C in accordance with BS 4728 the 1 hour failure pressure shall be not less than.....

- Class of pipe 9 bar (Class C) - min 1 hour failure pressure 32.4 bar.
- Class of pipe 12 bar (Class D) - min 1 hour failure pressure 43.2 bar.
- Class of pipe 15 bar (Class E) - min 1 hour failure pressure 54.0 bar.

BS 4991 Propylene copolymer pressure pipe

(iii) Clause 6.3 Hydrostatic pressure resistance.....when tested by the method described in appendix Dthe pipe shall withstand the appropriate minimum internal hydrostatic pressure given.....(see below).....for at least 1 hour without failure.

- Pipe Class A - min. internal hydrostatic test pressure 10.8 bar.
- Pipe Class B - min. internal hydrostatic test pressure 21.6 bar.
- Pipe Class C - min. internal hydrostatic test pressure 32.4 bar.
- Pipe Class D - min. internal hydrostatic test pressure 43.2 bar.
- Pipe Class E - min. internal hydrostatic test pressure 54.0 bar.

Appendix D Short-term hydrostatic test.....

- D.1 Test specimen. Each test specimen shall be a piece of pipe with a free length between fittings equal to 10 times the outside diameter of the pipe, subject to a minimum of 250mm and a maximum of 750mm.
- D.2 Apparatus.....shall consist of a thermostatically controlled bath maintained at 20 ± 1°C and equipment that permits the application of a controlled internal hydrostatic pressure to the specimens to an accuracy of ± 2%.
- D.3 Procedure. Connect the specimen to the apparatus and apply the appropriate hydrostatic pressure specified in 6.3. Ensure that the specified pressure is achieved within 30 seconds to 40 seconds and maintain it to an accuracy of ± 2% throughout the test. Maintain the specimen at a temperature of 20 ± 1°C throughout the test.

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(iv) **BS 6572 Blue polyethylene pipes up to nominal size 63 for below ground use for potable water**

Clause 5.2.1 Hydrostatic pressure resistance at 20°C. The pipe shall withstand a pressure equivalent to a circumferential stress of 12.0 Mpa for 1 hour at 20 ± 1.0°C when tested in accordance with the method described in BS 4728, using the type of end caps shown in figure 1 of BS 4728.....and one test piece. The test piece shall comprise a pipe with a free length between and caps up to 250mm minimum and shall be conditioned in accordance with C.2.

Appendix C.2 Hydrostatic testing.....test pieces for hydrostatic tests involving liquid immersion shall be conditioned for not less than 1 hour in liquid maintained at the temperature required for testing.

(v) **BS 6730 Black polyethylene pipes up to nominal size 63 for above ground use for cold potable water**

Clause 5.2.1 Hydrostatic pressure resistance at 20°C. The pipe shall withstand a pressure equivalent to a circumferential stress of 12.0 Mpa for 1 hour at 20 ± 1.0°C when tested in accordance with the method described in BS 4728, using the type of end caps shown in figure 1 of BS 4728.....and one test piece. The test piece shall comprise a pipe with a free length between and caps up to 250mm minimum and shall be conditioned in accordance with E.2.

Appendix E.2 Hydrostatic testingtest pieces for hydrostatic tests involving liquid immersion shall be conditioned for not less than 1 hour in liquid maintained at the temperature required for testing.

5 ACCEPTANCE CRITERIA

NON-BS FITTINGS

There shall be no visible indication of weeping, leakage or localised swelling during the above test(s).

All fittings shall be capable of being identified for particular applications by suitable marking under TCS 6000.1.

BS FITTINGS

In accordance with the various requirements of the British Standards, there shall be no visible indication of weeping, leakage, localised swelling (or failure at a pressure lower than that specified where applicable) during the appropriate tests.

All fittings shall be capable of being identified for particular applications by suitable marking under TCS 6000.1.