TEST CODE SHEET

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**1. TYPE OF TEST(S)**

Dimension - lifting effort.

**2. BYELAW REQUIREMENT FOR FITTINGS**

Byelaw 42

Every float operated valve ..... shall ..... (e) have a float which ..... (ii) has a lifting effort such that when not more than half immersed, the valve is capable of drop tight closure .....

**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**

4.1 Tests applicable to the following fittings-

**FLOATS FOR FLOAT OPERATED VALVES**, all applications
- Plastic
- Copper

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**(A) FLOATS (PLASTICS) FOR FLOAT OPERATED VALVES** (Derived from BS 2456, Section 3.1 Appendix B).

TEST METHOD

Lifting effort test. Plastic floats, both spherical and no spherical shall be tested by the method specified below;

The lifting effort developed by plastic floats whether spherical or non-spherical, shall be calculated using the following formula;

$$E_L = 9.8 \left( \frac{V.10^{-6}}{2} - M \right)$$

where

$E_L$ is the lifting effort, measured in newton:
V is the volume of the float, excluding any part of the boss which projects outside the surface, measured in cubic millimetres:
M is the mass of the float, including the boss in kilograms, after passing the hot water test in 4.1.

NOTE The factor $10^{-6}$ converts the half-volume of the float to the mass in kilograms of an equal volume of water. The factor 9.8 converts mass in kilograms to force in newtons.

## 5. ACCEPTANCE CRITERIA

Plastic floats shall have a lifting effort of not less than that shown in Table 1 for the appropriate BS type reference.

Table 1. Minimum lifting efforts

| 1. | 2. | 3. |
|---|---|---|
| BS type reference | Diameter of float if spherical, subject to a tolerance of ± 2.5mm | Minimum lifting efforts |
| | mm | N |
| 102S | 102 | 2 |
| 102NS | - | 2 |
| 114S | 114 | 2.9 |
| 114NS | - | 2.9 |
| 127S | 127 | 4.2 |
| 127NS | - | 4.2 |
| 152S | 152 | 7.1 |
| 152NS | - | 7.1 |

Key to column 1
(a) the number corresponds to the diameter of the float in millimetres:
(b) the letter 'S' refers to a spherical float:
(c) the letters 'NS' refer to a non-spherical float

## (B) FLOATS FOR BALLVALVES (COPPER) (Derived from BS 1968, Section 2, and Appendix)

TEST METHOD

Lifting effort test. Spherical copper floats shall be tested by the method specified below.

The lifting effort developed by spherical copper floats is calculated as follows;

Diameter of spherical floats - The average outside diameter of the shell measured at two axes at right angles to each other and clear of the jointing seam.

Volume- The volume of water in cubic inches, taken to the nearest cubic inch, displaced when the shell (float with no boss) is completely immersed.

Free-floating volume- The volume of water in cubic inches, taken to the nearest inch, displaced when the shell (float with no boss) is resting in water.

Useful volume - Half the volume less the free-floating volume taken to the nearest cubic inch.

Lifting Effort - The useful volume converted into weight in pounds at the rate of 0.036 lb per cubic inch.

TABLE 1. SPHERICAL COPPER FLOATS

| Nominal outside diameter of float | Volume of sphere | Class A | | | | Class B | | | | Class C | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Weight of shell (min) | Free-floating volume | Useful volume | Lifting effort | Weight of shell (min) | Free-floating volume | Useful volume | Lifting effort | Weight of shell (min) | Free-floating volume | Useful volume | Lifting effort |
| in. | cu.in | lb | cu.in | cu.in | lb | lb | cu.in | cu.in | lb | lb | cu.in | cu.in | lb |
| 4½ | 48 | 0.25 | 7 | 17 | 0.61 | 0.25 | 7 | 17 | 0.61 | 0.39 | 11 | 13 | 0.46 |
| 5 | 65 | 0.328 | 9 | 23 | 0.84 | 0.328 | 9 | 23 | 0.84 | 0.515 | 14 | 18 | 0.65 |
| 6 | 113 | 0.476 | 13 | 43 | 1.56 | 0.476 | 13 | 43 | 1.56 | 0.843 | 23 | 33 | 1.19 |
| 7 | 180 | 1.074 | 30 | 60 | 2.16 | 1.074 | 30 | 60 | 2.16 | 1.187 | 33 | 57 | 2.05 |
| 8 | 268 | 1.425 | 40 | 94 | 3.38 | 1.425 | 40 | 94 | 3.38 | 1.875 | 52 | 82 | 2.95 |
| 9 | 382 | 1.782 | 50 | 141 | 5.07 | 1.782 | 50 | 141 | 5.07 | 2.06 | 57 | 134 | 4.82 |
| 10 | 524 | 2.197 | 61 | 201 | 7.23 | 2.197 | 61 | 201 | 7.23 | 3.62 | 100 | 162 | 5.83 |
| 11 | 697 | 2.755 | 77 | 271 | 9.75 | 2.755 | 77 | 271 | 9.75 | 4.21 | 117 | 231 | 8.31 |
| 12 | 905 | 3.207 | 89 | 363 | 13.06 | 3.207 | 89 | 363 | 13.06 | 4.85 | 135 | 317 | 11.41 |

NOTE The lifting effort figures are calculated for the minimum weight of shell in each class.

## 5. ACCEPTANCE CRITERIA

Spherical copper floats shall have a lifting effort of not less than that shown in Table 1 for the appropriate nominal outside diameter of float.