**SPECIFICATION FOR BALL VALVES**

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**SPECIFICATION FOR uPVC BALL VALVES**

1. **General**

A **ball valve** is a valve that opens by turning a handle attached to a ball inside the valve. The ball has a hole, or port, through the middle so that when the port is in line with both ends of the valve, flow will occur (valve is in open position). When the valve is closed, the hole is perpendicular to the ends of the valve, and flow is blocked. The handle or lever will be inline with the port position letting you "see" the open position of the valve.



* 1. Ball valves shall comprise of a body on which head cap, handle, stem & ball assembly etc. with seat & stem O-ring mounted.
	2. Ball valves shall provide leak free tight closure (complete– stop) of water flow through the valve in the closed position.
	3. During operation seat & stem & ball assembly is moved causing the water to flowing through the valve.
	4. All components shall be of “water works” standard and shall be of a well proven robust design and manufacture and shall be suitable for drinking water.
	5. All non-metallic materials shall be listed in current “water fittings and materials directory” and shall be suitable for drinking water.
1. **Specification**

**2.1 General**

1. Body parts shall be uPVC& shall conform to EN 1452-1
2. **Appearance**

 When viewed without magnification, the internal and external surfaces of valves and ancillaries shall be smooth, clean and free from scoring, cavities and other surface defects to an extent that would prevent conformity to this standard. Each end shall be square to its axis.

1. **Colour**

 The colour of injection- moulded valve bodies and ancillaries in PVC-U shall be grey throughout the wall. The colour of ancillaries made from pipe shall be grey, blue or cream throughout the wall. For above-ground application, cream ancillaries shall not be used.

1. **Opacity**

The wall of the valve shall be opaque and shall not transmit more than 0.2% of visible light when measured in accordance with EN 578. This requirement does not apply to cream ancillaries

1. **Nominal dimensions**

 The nominal diameter(s), of a valve and ancillaries shall correspond to, and be designated by, the nominal outside diameter(s) of the pipe(s) for which they are designed.

1. **Chemical Characteristics**

The chemical characteristics shall conform to those required for pipes by EN 1452- 2:1999

**2.2** **Applicable Standards**

The Ball valves shall comply with BS EN 1452-4:2000 in every respect unless otherwise stated in the specifications.

* 1. **Markings on the body**

Ball valves shall be legibly and indelibly marked with the following, by embossing or engraving integrally during the process of manufacturing and shall comply with ASTM F 1970

1. Trade name of the product / Identification mark
2. BS or other equivalent standards
3. The nominal size and direction of flow
4. Nominal pressure and the temperature for which the pressure is applicable
5. Material designation

**2.3.1 Additional Marking**

Valves conforming to this standard, which conform also to other standard(s) may be additionally marked with minimum required marking in accordance with relevant standards. Documentary proof shall be provided for third party certificates.

**2.4 Size**

Sizes of the valves shall be as stated in the Bill of Quantities

**2.5 Valve Components**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Item** | **Material Type** | **Description** |
| 01 | Body | uPVC | Unplasticized Polyvinyl Chloride |
| 02 | Ball & stem | uPVC | Unplasticized Polyvinyl Chloride |
| 03 | Sealing Seat | PTEE | Poly Tetra Fluoro Ethylene (Teflon) |
| 04 | Handle |  ABS  | Acrylonitrile-Butadiene–Styrene Copolymer |
| 05 | Handle cap |  ABS  | Acrylonitrile-Butadiene–Styrene Copolymer |
| 06 | O ring |  EPDM | EPT Rubber - Elastomeric product Ethylene Propylene Dyene Monomer |

 Composition of materials will be tested to verify the requirements in standards.

* 1. **Construction of valve**
1. Body, head and ball and stem

Injection molded and other methods of manufacture mentioned in the relevant standards of this specification are acceptable, if they satisfy other conditions included in the specifications.

2. Geometrical Characteristics

Dimension shall be accordance with Pr EN 496 as specified in BS EN 1452-4-2000.

1. Threads

Inlet & outlet threads shall be female BS pipe parallel threads of the nominal size as the valve and in compliance with BS 21.

1. Seat

Seat shall be of PTEE and shall conform to relevant BS or equivalent water work standards.

1. O- rings

Shall be of EPDM and shall conform to BS EN 681-1; 1996 or ISO 4633; 2002.

* 1. **Testing**

**List of Tests**

The list of tests carried out on the samples submitted with the offer and samples drawn from the delivered lots shall be in accordance with relevant BS or other standards.

**2.7.1 Seat Test**

Every Ball Valve in the closed position shall show no leakage when subjected to an internal hydrostatic pressure of 15 bar.

 **2.7.2 Body Test**

In the open position and with the outlet sealed, shall be capable of withstanding without leakage an internally applied hydrostatic pressure of 15 bar.

Extracts from EN 1452-4: 1999, Table 10-Endurance properties and Table 12- Conditions for seat and packing test is shown elsewhere in this specification.

**2.8** List of tests and standards requirements are as follows.

|  |  |  |
| --- | --- | --- |
| No | Test | Requirement in Standards |
| 1 | Appearance | The valve shall be homogeneous throughout and free of visible crack, holes, foreign inclusions or other defects as specified in ASTM D 2466-06 |
| 2 | Dimension | Sealing Threads gauge correctly to BS ISO 7.1, Thread length and other dimensions & tolerance is compliant to ASTM D 2466 - 06 |
| 3 | 1000 Hrs Sustained Pressure Test | The test temperature between 15°C and 25°C with tolerance of ± 2C°, 1000 Hrs, No Leaking or crack in compliance with ASTM F 1970 |
| 4 | Sealing Test | 1.5 x PN, temperature between 15°C and 25°C with tolerance of ± 2C°, Sustained for 15 Seconds, No leaking. |

**2.9** Full details of the vales should be given in schedule of particulars.

**2.10** Some of the salient features of the specifications are summarized above to furnish a quick reference. The tenderers are under obligations to refer the whole or relevant parts of the standards specified in their entirety prior to perfecting their tender documents, and will be deemed to have done so during the tendering stage.

**Extracts from EN 1452-4 : 1999**

**Table 10-Endurance properties**

|  |  |  |  |
| --- | --- | --- | --- |
| **Characteristic** | **Requirement 1)** | **Test parameters** | **Test method** |
| parameter | value |
| Endurance | No leakage orfracture duringtest period | Fluid insideinternal pressure flow velocity Tightening of gland packageAmbient temperature Number of test piecesDuration | WaterEqual to PN1 m/sAllowed (15 ±5) ºC to(25± 5) ºCShall conform to ENV 1452-7 1000 cycles | EN 28659 |
| 1) Directly after this endurance test the test pieces shall be tested in accordance with seat and packing test |

**Table 12- Conditions for seat and packing test**

|  |  |  |  |
| --- | --- | --- | --- |
| **Characteristic** | **Requirement** | **Test parameters** | **Test method** |
| Parameter | Value |
| Seat Leak tightness: valve closedPackingLeak tightness: valve open | No leakage during the test period | Fluid insideFluid out sideInternal pressureConditioning periodAmbient temperature Test period | WaterAir1.5 x [PN]1)1h(15 ± 5)º C to (25 ± 5) º C 1 min | Method Bof EN917:1997 |
| 1) Maximum test pressure ([PN] +5) bar. |