

TEST REPORT

Of

Brass Ball Valve

Model/ Type/ Machine Type

TM-300003

TM 300 Series



TEST REPORT

EN 13828

**Building valves -Manually operated copper alloy and stainless
steel ball valves for potable water supply in buildings
-Tests and requirements**

Report

Report reference No.: CPD2016030058001

Tested by (+ signature).....: Peter Liu

Approved by (+ signature): Kelvin Chen

Date of issue: 2016.03.10

Testing laboratory

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Haizhu District, Guangzhou, China

Testing location: Same as above

Client

Name: TUBOMART ENTERPRISE CO., LTD

Address.....: Rm B2, 4th/F North, 9 Jiangong Road, Lijing Building,High-tech
Industry Zone, Guangzhou, China.

Manufacturer

Name: TUBOMART ENTERPRISE CO., LTD

Address.....: Rm B2, 4th/F North, 9 Jiangong Road, Lijing Building,High-tech
Industry Zone, Guangzhou, China.

Test specification

Standard: EN 13828: 2003

Test procedure: CPD

Non-standard test method: N.A.

Test item Description: Brass Ball Valve

Trademark: TUBOMART

Model and/or type reference: TM-300003; TM 300 Series.

Manufacturer: TUBOMART ENTERPRISE CO., LTD

Rating(s): /

Test case verdicts Test case does not apply to the test object : N(A.) Test item does meet the requirement: P(ass) Test item does not meet the requirement ...: F(ail)
Testing Date of receipt of test item: 2016.03.01 Date(s) of performance of test: 2016.02.22 to 2016.03.10
Copy of marking plate
Description and illustration of the sample: The samples' status is good.
Remarks: This report covers the following Brass Ball Valve: TM-300003; TM 300 Series. They have the similar constructions. Difference: size Throughout this report a comma is used as the decimal separator

EN 13828			
Cl.	Requirement – Test	Result	Verdict

4	Designation		P
	The designation of a ball valve comprises:		P
	-its type and material;	Straight pattern ball valve of brass	P
	- its nominal size (DN);	DN15	P
	- its bore, whether full or reduced;	Full	P
	- its end connections;	threads	P
	-its acoustic group;	/	N
	- number of this standard, i.e. EN 13828	EN 13828	P

5	Design requirements		P
5.1	Materials		P
	selection of materials is the responsibility of the manufacturer		P
	provided the complete valve satisfies the requirements of this standard		P
	materials and coatings used shall not contaminate or change the drinking water, when in normal or accidental contact up to a temperature of 90 °C		P
	manufacturer shall state in his technical and sales literature which materials and coatings are used		P
	The materials, in particular copper alloys, for which recommendations or international standards exist, shall comply with them. These references shall be stated		P
5.1.1	Body and ball materials		P
5.1.1.1	Copper alloys	CW617N	P
5.1.1.2	Dezincification resistant copper alloy		N
	Copper-zinc alloys containing more than 10 % zinc are subject to dezincification when submitted to water capable of dezincification		N
	In the countries where the use of products made of dezincification resistant materials is required, the products have to guarantee a dezincification depth less than 200 µm in any direction, they have to be tested in accordance with EN ISO 6509 and have to be marked in compliance with the indication in clause 8		N
5.1.1.3	Stainless steels		N

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	suitable stainless steels (more than 16 % chromium) are given in Table 2		N
5.1.1.4	Body and ball materials		P
	ball shall be of solid material with cylindrical bore		P
5.2	End connections		P
	Examples of end connections are defined in Table 3		P
	Compression ends for use with plastic pipes are described in EN 1254-3		N
	Valves with threaded connections shall have flats on the body which when used for fitting shall accommodate commercially available tools		N
	Other end connections are permitted provided they comply with an international standard		N
	For different connection threads the nominal size (DN) is dependent on the smallest connection thread.		N
5.3	Operation		P
	Ball valves shall close in a clockwise direction		P
	rotation of the ball from open to close position shall be 90°		P
	operating devices shall be designed to be easily operated by hand		P
5.3.1	Operating devices		P
	ball valve is operated by applying a manual or mechanical force to the operating device	"T" type handle	P
	If the operating device is detachable, then the end of the operating stem shall be marked, so the open and closed position are indicated.		N
	Ball valves with a nominal diameter bigger than DN 25 shall be furnished with a gear handle if required by national regulations. The operating device shall complete a turn of at least 270° to close the ball valve from a completely open position		N
5.4	Stops		P
	On valves the end positions "open" and "close" shall be identified and limited by fixed, non adjustable stops		P
	manual operating device shall be designed so that it is:		P
	- perpendicular to the direction of the flow for the "close" position;		P

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	- parallel to the direction of the flow for the "open" position		N
	When the actuating mechanism is a gear handle or handwheel the open and closed positions shall be clearly indicated on the actuating mechanism		N
5.5	Ball bore		P
	Tolerances for the minimum bore diameter for full bore valve and reduced bore valve shall be maximum $\pm 1\%$		P
5.5.1	Full bore		P
	A valve is designated as full bore when the diameter of the bore of the ball of all parts of the valve is as given in Table 4	15	P
5.5.2	Reduced bore		N
	A valve is designated as reduced bore when the diameter of the bore of the ball is as given in Table 5.		N
6	Performance requirements		P
6.1	Operating torque		P
	The measured operating torque shall not exceed the values given in Table 7		P
	torque required for the preliminary cycle shall not be greater than 1,5 times for valves up to DN 15 and 2,5 times for DN 20 up to DN 100 of the values given in Table 7		P
6.2	Stop resistance		P
	The valve shall be tested in accordance with 7.3. There shall be no visual deformation, cracking or failure		P
6.3	Leak-tightness		P
	The valve shall be leak-tight		P
	The valve shall be considered leak-tight if it meets the tests detailed in 7.4		P
6.4	Angular seal		P
	With the valve in the fully closed position, the angular distance between the port in the closure member and both the inlet port and outlet port in the valve body, shall be at least values according to Table 6 when measured according to 7.7 (see Figure 3)		P
7	Test methods		P

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	The tests described are type tests (laboratory tests) and not quality control tests carried out during manufacture		P
	Tests 7.1 to 7.6 shall be carried out in the sequence of this standard on the same ball valve		P
	All tests shall be carried out with cold water of $(20 \pm 5) ^\circ\text{C}$		P
7.1	Operating torque test		P
	Before starting the test, one preliminary cycle shall be carried out. The valve shall then be left for 24 h at ambient temperature		P
	The operating torque of the valve is measured continuously from the fully open position to the fully closed position and then back to the fully open position while it is subjected to the static PN 10	6Nm	P
	During the test the speed of the rotation shall be 5 ± 1 cycles per minute		P
7.2	Torque and bending test		P
7.2.1	General		P
	Hold the ball valve in a rigid fixture as shown in Figure 4		P
	a) All tests shall be carried out with connections to the valves (whatever their end fitting configurations) which are capable of withstanding the required torque values and bending moments (according to Table 8 and Table 9);		P
	b) if the inlet and outlet connection are not on a common axis, the torque tests shall be repeated with the connections reversed;		N
	c) ensure that the bending and torsional moments can be attained with an accuracy of 5,0 % of the specified values;		P
	d) if the valve has different inlet and outlet connection, the larger connection shall be used for pipe 1 (see Figure 4 and Figure 5);		N
	e) the pipes for the testing of connections shall conform to ISO 65, medium series, and have a length of 1 m;		P
	f) for valves with end fittings which are especially designed for use only with flexible connections, only tests on torque MT1, and bending moment MF1, are carried out		N
7.2.2	Sequence of torsion and bending moment tests for valves		P

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Cl.	Requirement – Test	Result	Verdict
7.2.2.1	Torque		N
	This test is only applicable to ball valves with internal threads on both sides. The torque shall be applied in both directions		N
	The stress MT_1 represents the installation stress		N
	The stress MT_2 represents the stress to which the valve may be submitted during service		N
	The valve shall be under nominal pressure for these tests		N
7.2.2.1.1	Torque MT_1		N
	a) Screw pipe 1 with a torque, not exceeding the required torque indicated in Table 8, into the valve. Clamp pipe 1 at a distance equal to or greater than 2 DN from the valve;		N
	b) screw pipe 2 with a torque, not exceeding the required torque indicated in Table 8, into the valve. Ensure that the joint is leak-tight.		N
	c) support pipe 2 such that no bending moment is applied to the valve;		N
	d) apply the required torque (MT_1) to pipe 2 for 10 s (see Table 8);		N
	e) the torque shall be applied progressively and smoothly without undue delay. The torque given in Table 8 shall not be exceeded;		N
	f) with the stress removed, check the valve for external and internal leak-tightness (see 7.4.1) and visually for any deformation;		N
	g) check the operating torque as in 6.1		N
7.2.2.1.2	Torque MT_2		N
	a) Apply MT_2 (see Table 8) for 900 s to the same valve as for the torsion test MT_1		N
	b) during this time the internal and external leak-tightness and operating torque are measured		N
7.2.2.2	Bending		P
	The stress MF_1 represents the installation stress.		P
	The stress MF_2 represents the stress to which the valve may be submitted during service		P
7.2.2.2.1	Bending moment MF_1 at the axis of the closure member		P

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	a) Use the same valve and the same arrangement as for the torque test;		P
	b) apply force F_1 for 10 s at 1 m from the axis of the closure member so that the bending moment MF_1 is produced;	105Nm	P
	c) with the stress removed, measure the external and internal leak-tightness according to 6.3 and the operating torque according to 6.1		P
7.2.2.2.2	Bending moment MF_2 at the axis of the closure member		P
	a) Apply MF_2 (see Table 9) for 900 s to the same valve as for the bending moment test MF_1 ;	53Nm	P
	b) during this time the internal and external leak-tightness and operating torque are measured		P
7.3	Stops and spindle — Mechanical resistance test		P
	The force required to overcome the stops shall be at least 2,5 times the measured operating torque of the valve under test and shall not exceed the values given in Table 7	15Nm	P
	Apply this force for 60 s to the on/off operation device		P
	After the torque is removed, check the valve visually for any deformation, cracking or failure of the mechanism		P
7.4	Hydraulic tests		P
7.4.1	Leak-tightness test		P
7.4.1.1	Principle		P
	This test shall verify the leak-tightness of the ball (internal tightness) and the ball valve assembly (external tightness) under cold water pressure		P
7.4.1.2	Test		P
	Install the ball valve in a test rig capable of maintaining the static pressures indicated in Table 10		P
	For test 1, close the ball using a torque which is not greater than the values in Table 7		P
	Subject the ball valve to the pressures indicated in Table 10 for $\left(60 \pm \frac{5}{5}\right)$ s		P
7.4.1.3	Requirement		P

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Cl.	Requirement – Test	Result	Verdict
	The ball valve shall be leaktight at the pressures indicated in Table 10		P
7.4.2	Hydraulic strength		P
7.4.2.1	Principle		P
	This test shall verify that the ball valve withstands a cold water hydraulic pressure		P
7.4.2.2	Test		P
	Install the valve in a test rig, capable of maintaining the static pressures indicated in Table 11		P
	Subject the ball valve, with the ball open and the outlet closed to a pressure of $(2,5 + 0,1) \text{ MPa } ((25 + 1) \text{ bar})$ for $\left(10^{+1}_{-0}\right) \text{ min}$		P
	Leaking at spindle sealing and end connection is allowed		P
7.4.2.3	Requirement		P
	The ball valve shall show no permanent deformation, rupture or breakage at the pressure indicated in Table 11		P
7.5	Acoustic tests and requirements		P
	This test applies only to ball valves DN 8 to DN 32 inclusive		P
7.5.1	Principle		P
	This test shall classify ball valves by acoustic groups (I, II or not classified)		P
7.5.2	Test		P
	The mounting and operating conditions shall comply with the specifications laid down in EN ISO 3822-3		P
	The test shall be carried out as described in EN ISO 3822-1 and EN ISO 3822-3		P
	The sound pressure level L_{ap} in dB (A) shall be determined at a flow pressure of 0,3 MPa (3 bar) and the flow rate indicated in Table 12		P
7.5.3	Requirements		P
	The requirements are indicated in Table 13		P
7.6	Endurance test		P
7.6.1	Principle		P
	The manual actuator of the valve shall withstand a series of operating cycles as specified in Table 14		P

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7.6.2	Test installation		P
	An automatic test rig that ensures that the closing torque remains constant and is not effected by the influence of the moment of inertia of the equipment during test		P
	Equipment related forces that act horizontally or vertically onto the headwork and might result in abnormal wear ought to be eliminated. A frictionless connection to the operating spindle shall be ensured		P
7.6.3	Test		P
7.6.3.1	Conditions		P
	Apply a closing torque according to Table 7. With the ball valve in the closed position adjust the static pressure to between 0,2 MPa and 0,4 MPa (2 bar and 4 bar). With the ball valve in the open position adjust the flow rate to between 0,066 l/s and 0,1 l/s (4 l/min and 6 l/min) by a regulation valve downstream of the valve under test		P
7.6.3.2	Procedure		P
	1) Open the valve completely and mount the valve to the test rig;		P
	2) close the valve with a speed of the ball 5 rev./min. and stop the movement without submitting the stops to a torque exceeding the appropriate value given in Table 7;		P
	3) hold the valve 5 s in closed position;		P
	4) open the valve with a speed and torque as given in point 2;		P
	5) hold the valve 5 s in open position;		P
	6) repeat the procedure given in points 1 to 5 for 50 % of the number of cycles given in Table 14;		P
	7) store the valve for one week at ambient temperature in open position;		P
	8) mount the valve in closed position to the test rig and apply water of 65 °C;		P
	9) repeat the procedure given in points 1 to 5 for 50 % of the number of cycles given in Table 14 at a water temperature of 65 °C;		P
	10) store the valve for one week at ambient temperature in closed position;		P
	11) the valve shall comply with 7.6.3.3		P
	The test is applied to ball valves as delivered		P

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7.6.3.3	Acceptance criteria		P
	1) If leakage or malfunction occurs test shall be stopped;		N
	2) 1 week after concluding the tests, stored in open position at ambient temperature, the valve shall comply with the leak tightness test (7.4.1) and operating torque test (7.1)		P
7.7	Angular seal		P
	Mount the complete valve on a test rig which is capable of measuring the angle of rotation of the actuator		P
	Connect the inlet of the valve to a compressed air supply of 6 bar pressure through a bubble indicator (or similar flow measuring device). The air flow through the valve is limited to a value between 1 l/h and 5 l/h by means of a flow restrictor connected to the outlet of the valve		P
	Slowly open the valve until the flow measuring device indicates flow, then slowly close the valve until the flow measuring device indicates no flow. Measure the angle between the closed position and the "no flow" position. The measured values shall be in accordance with 6.4		P
	For sizes DN 65, 80, 100 the test is carried out at 6 bar pressure with water instead of air		N

8	Marking		P
	Ball valves shall be marked in a durable way with the following:		P
	- manufacturer's name or mark;		P
	- nominal size (DN ...) for full bore;		P
	- nominal size (DN ... R) for reduced bore (for instance DN 15 R);		N
	- arrow indicating normal direction of flow if it is necessary;		P
	- date of manufacture (at least the year), maybe in code;		N
	- DR for dezincification resistant alloy;		N
	- acoustic group, if classified, group I or II;		N
	- PN 10		N

Photo of Sample

