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Industrie Service

CERTIFICATE

(Certificate of conformity with technical requirements in:)

API SPEC 6FA Third Edition, April 1999

Certificate No.:253309 Rev.1

Ref. Test report No.:253308 Rev.1

Name and postal address of manufacturer: Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.
No.988, Yuexiu Road, Fenhu Economic Development Zone, PC: 215200, Suzhou City, Jiangsu Province, P. R. China

We hereby certify that the fire test on below valves have been conducted at the laboratory designated by manufacturer and witnessed by TÜV inspector according to requirements of API SPEC 6FA Third Edition, April 1999, Reaffirmed, September 2011. The testing results of valves meet the requirements of API SPEC 6FA.

1. Description of Test Valve :

Type of Test Valve	AB-2-T22-1500-RJ-01-C-16-W-C Ball Valve
Description of Valve	Ball Valve
Valve Size (NPS)	2"
Pressure Rating (ANSI Class)	Class 1500
Valve Body Material	ASTM A105

2. Qualified Range of Valves :

Type	Ball Valves
Description of Valves	Ball Valves
Qualified Sizes (NPS) *(according to API 6FA Table 2)*	2", 2½ ",3",4"
Qualified Pressure Ratings (Class) *(according to API 6FA Table 3)*	1500;2500
Qualified Marking *(according to API 6FA Para.7)*	Qualified valves shall be permanently marked: **6FA**
Remark: the technical data of test valve see back of this certificate appendix 1.	

This certificate is issued according to API SPEC 6FA Third Edition, April 1999, Reaffirmed, September 2011, based upon the result of testing report on above mentioned test valve. The additional valves qualification shall be limited on similar valves of same basic design as the test valve and same nonmetallic materials as the test valve in the seat-to-closure member seal, seat-to-body seal, stem seal, and body joint and seal according to API SPEC 6FA Third Edition, April 1999, Reaffirmed, September 2011, Para.4.8.

Chen Guilin

TÜV SÜD Industrie Service GmbH

Shanghai, July 21, 2022
(Place, date)

Guilin Chen
TÜV SÜD Industrie Service GmbH
Westendstr.199
80686 München Germany

Industrie Service

Appendix 1:

Certificate No.:253309 Rev.1

Ref. Test report No.:253308 Rev.1

Name and postal address of manufacturer: **Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.**
No.988, Yuexiu Road, Fenhu Economic Development Zone, PC: 215200, Suzhou City, Jiangsu Province, P. R. China

Technical Data of Valve

1. Type of Test Valve: AB-2-T22-1500-RJ-01-C-16-W-C Ball Valve

2. Description of Test Valve: Ball Valve

3. Details of Valve:

Valves Size (NPS) / Material / Part Name	2"
Valve Body	ASTM A105
Valve Bonnet	ASTM A105
Ball	ASTM A182 F316
Seat assembly	ASTM A182 F316+RPTFE
Valve Stem	ASTM A564 630
Packing Ring	Flexible Graphite
Pressure Ring	ASTM A376 316
Nut	ASTM A194 2H
Bolt	ASTM A193 B7
Gasket	ASTM A276 316+Flexilble Graphite
Yoke	Q235
Cladding Graphite Ring	Ni+Flexilble Graphite
Stuffing Box	ASTM A105
Bottom	ASTM A564 630
Couping	ASTM A182 F6a
Key	45 Steel
Design Drawing No.:	10020600 VER.1.0

Shanghai, July 21, 2022
(Place, date)

Guilin Chen
TÜV SÜD Industrie Service GmbH

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Test Report

(Fire test for valves according to API SPEC 6FA, Third edition, April 1999)

Certificate No.:253309 Rev.1
Test Report No.:253308 Rev.1

Applicant / Manufacturer: Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.
No.988, Yuexiu Road, Fenhu Economic Development Zone,
PC: 215200, Suzhou City, Jiangsu Province, P. R. China

Inspection body: TÜV SÜD Industrie Service GmbH
Floor 3-13, No.151, Heng Tong Road, Shanghai, P. R. China

Lab of test: Hefei General Machinery & Electrical Products Inspection Institute

Test Date: August 25, 2017

Description of valves: AB-2-T22-1500-RJ-01-C-16-W-C Ball Valve
Size: 2"
Pressure Rating: Class 1500
Drawing No.: 10020600 VER. 1.0

Test Witnessed By: CHEN Guilin / TÜV SÜD Inspector

TÜV SÜD Industrie Service GmbH
Shanghai Office
Floor 3-13, No.151, Heng Tong Road,
Shanghai 200070 P.R.China

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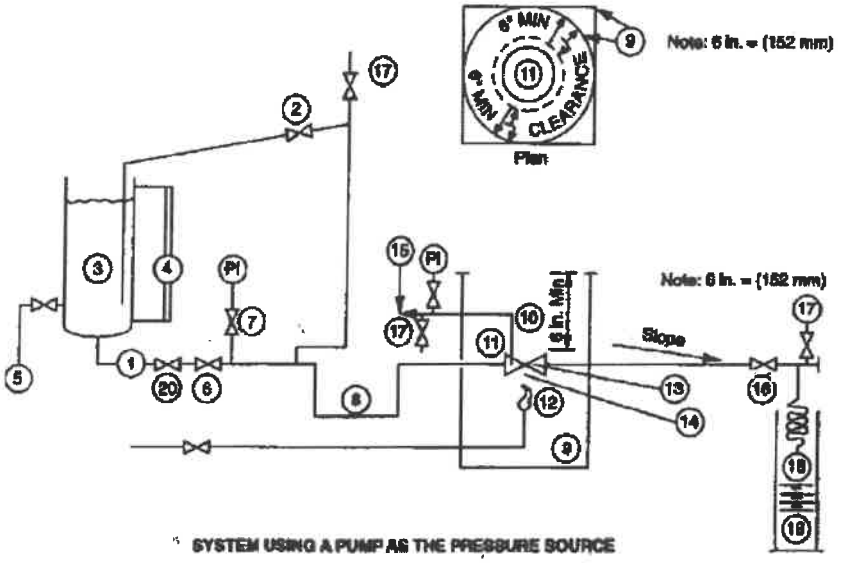
Inspection and Tests

1. Conformity of Equipment

The test equipment was verified by TÜV SÜD inspector according to requirements of API SPEC 6FA Section 2 and Para 3.1 and found satisfactory. The detail arrangement of the fire-test equipment is shown below:

Figure 1 Typical Fire-Test System Using a Pump as the Pressure Source



Legend

1.Pressure source
2.Pressure regulator and relief
3.Vessel for water
4.Calibrated sigh gauge
5.Water supply
6.Shutoff Valve
7.Pressure gauge
8.Piping arranged to provide vapor trap
9.Enclosure for test –horizontal clearance between any part of the valve and the closure shell shall be 6 in. (152mm) above
10.Minimum height of enclosure shall be 6 in.(152mm) above the top of the valve
11.Test valve mounted horizontally with stem in horizontal position
12.Fuel gas supply to burners
13.Calorimeter-1½ " in. cubes
14.Flame temperature thermcouples
15.Pressure gauge and relief valve connected to center cavity of valve
16.Shutoff valve
17. Vent valve
18. Condenser
19. Calibrated container.
20.Check valve

2. Calibration of measurement and test instrument

The measurement and test instrument have been properly calibrated such as pressure gauge, thermo-couples, etc.

3. Technical Data of Test Valve:

a)Description of test valve

Type of Test Valves	AB-2-T22-1500-RJ-01-C-16-W-C Ball Valve
Description of Valves	Ball Valve
Pressure Class , Lb	Class 1500
Valve Size, NPS	2"
Face to Face	ASME B16.10
Designed Standard	API 6D

b)Details of technical data on test valve

Part Name	Materials
Valve Body	ASTM A105
Valve Bonnet	ASTM A105
Ball	ASTM A182 F316
Seat assembly	ASTM A182 F316+RPTFE
Valve Stem	ASTM A564 630
Packing Ring	Flexible Graphite
Pressure Ring	ASTM A376 316
Nut	ASTM A194 2H
Bolt	ASTM A193 B7
Gasket	ASTM A276 316+Flexilble Graphite
Yoke	Q235
Cladding Graphite Ring	Ni+Flexilble Graphite
Stuffing Box	ASTM A105
Bottom	ASTM A564 630
Couping	ASTM A182 F6a
Key	45 Steel
Design Drawing No.:	10020600 VER.1.0

4. Visual and dimensional Check on Valve Specimen:

The specimen valve was chosen at random by the manufacturer in its workshop and submitted to the laboratory. The visual and dimensional check was performed according to drawing No. 10020600 VER.1.0 and results found satisfactory. The mark was verified on valve as following:

ATV	2"	1500	A105
Manufacturer` Brand	Size	Class	Material

5. Document Review:

The chemical and mechanical test report of forgings was reviewed and found satisfactory. Also the inspection report of strength test, seal test and pneumatic test were reviewed and found satisfactory.

6. Preparation before testing:

6.1 The thermocouples and calorimeters were installed properly according to Figure 1,2,3,4 in API 6FA. Two thermocouples (part 14) are installed to measure flame temperature, one is located under valve body, another is located under valve stem, both within 1". Two calorimeters (part 13) are positioned to the same place as the thermocouples do.

6.2 The test system including test valve (part 11) was cleaned through by water before testing. All air was purged from test valve and testing system by water.

6.3 The test system was pressurized to 18.6 MPa (test pressure) after the test valve and system upstream of valve have been completely full of water and system downstream of the test valve have been completely empty of water. The system and test valve were carefully checked for leakage when the test pressure was held at 18.6 MPa. No leakage was found on system and test valve.

7. Fire Test:

7.1. Fire test with high pressure

The fire test was conducted according to API 6FA Section 3. The flame temperature reached 761℃ within 2 minutes after ignition. The test pressure and temperature were maintained during the fire test. The temperature and pressure were recorded continuously by the operators. The system and test valve was cooled down at 30℃ within 5 minutes by natural after 30 minutes fire test. The loss of water weight in vessel was measured by weighing scale and water in calibrated container (part 19) were read and recorded.

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Test Report No.:253308 Rev.1

Test result of fire test with high pressure

Item	API 6FA Required Value	Actual Value
Test Pressure (MPa)	18.6 MPa	18.54– 18.65 MPa
Test Temperature	761 - 980℃	817.1 - 908.4℃
Through-valve leakage according to API 6FA Para.4.1	≤ 400 ml / in. / min	1.3 ml / in. / min
Total weight of water through valve seat during cooling down period	40 ml	
Total time from fire test to cooling down	35 Minutes	
External Leakage	≤ 100 ml / in. / min	1.0 ml / in. / min
Conclusion: the test result is satisfactory according to API 6FA.		

8. Operational Test:

The test valve was cooled at 30 ℃ within 5 minutes after complete the fire test. The operational test was conducted according to API 6FA Para. 4.5. Open the test valve against the high test pressure differential. The test valve was moved to a partly open position close to the shutoff valve. Vent the piping and test valve body cavity to remove air or steam.

Then measured and recorded external leakage for a period of five minutes after valve was in the open position at high test pressure. The test result was recorded on below:

Test result of operational test

Item	API 6FA Required Value	Actual Value
Test Pressure (MPa)	18.6 MPa	18.6 MPa
Test Time	5 minutes	
External Leakage	≤ 200 ml / in. / min	1.2 ml / in. / min
Conclusion: the test result is satisfactory according to API 6FA.		

The undersigned, hereby declare that I have checked test valve and witnessed the fire test on the test valve according to API SPEC 6FA Third Edition, April 1999, Reaffirmed, September 2011. The test result is satisfactory.

TÜV SÜD Industrie Service GmbH

Chen Guilin

Date: July 21, 2022

Chen Guilin

Annexes:

1) Copy of Drawing No. 10020600 VER.1.0;
2) Copy of Test Record of Fire Test No. 2017FM669A.