



Industrie Service

CERTIFICATE

(Certificate of conformity with technical requirements in:)
API STANDARD 607 EIGHTH EDITION, OCTOBER 2022

Certificate No.: 296723

Ref. Test report No.: 296722

Name and postal address of manufacturer: **Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.**
No.988, Yuexiu Road, Fenhui 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 SÜD inspector according to requirements of API STANDARD 607 EIGHTH EDITION, OCTOBER 2022. The testing results of valves meet the requirements of API STANDARD 607 EIGHTH EDITION, OCTOBER 2022.

1. Description of Test Valve:

Type of Test Valve	NPS4 Class150 Ball Valve
Description of Test Valve	Ball Valve
Valve Size (NPS)	4"
Pressure Rating (Class)	Class 150
Valve Body Material	ASTM A351 CF3M

2. Qualified Range of Valves :

Type	Ball Valves
Description of Valves	Ball Valves
Qualified Sizes (NPS) (according to API 607 Table 3)	4",5",6",8"
Qualified Pressure Ratings(Class) (according to API 607 Table 4)	Class 150, Class 300
Qualified Valve Material	According to API 607 7.2
Remark: the technical data of tested valves see back of this certificate appendix 1.	

This certificate is issued according to API STANDARD 607 EIGHTH EDITION, OCTOBER 2022, based upon the result of testing report on above mentioned test valve. The additional valve qualification shall be limited on similar valves of same basic design and construction as the test valves and of the same nonmetallic materials as the test valve in the seat-to-closure member seal, seat-to-body seal, stem seal, and body joint seal according to API STANDARD 607 EIGHTH EDITION, OCTOBER 2022, Paragraph 7.

Shanghai, August 30, 2023
(Place, date)

Chen
Guilin Chen

TÜV SÜD Industrie Service GmbH

Westendstr.199
80686 München Germany



Industrie Service

Appendix 1:

Certificate No.: 296723

Ref. Test report No.: 296722

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

Technical Data of Valve

1. Type of Test Valve: NPS4 Class150 Ball Valve

2. Description of Test Valve: Ball Valve

3. Details of Valve:

Valves Size (NPS) Material Part Name	4"
Body	ASTM A351 CF3M
Bonnet	ASTM A351 CF3M
Ball	ASTM A182 F316
Seat Insert	PCTFE
Stem	ASTM A182 FXM-19
Stem Packing	Graphite
Gland	ASTM A351 CF3M
Gasket	316+Graphite
Nut	ASTM A194 8
Bolt	ASTM A320 B8-2
Design Assembly Drawing No.:	SSBBJ-4S1F-LT-F-D Ver. 4.0

Chen



Shanghai, August 30, 2023
(Place, date)

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

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Test Report

(Fire test for valves according to API STANDARD 607 API STANDARD 607 EIGHTH EDITION, OCTOBER 2022.)

Certificate No. : 296723
Test Report No.: 296722

Applicant / Manufacturer: Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.
No.988, Yuexiu Road, Fenu 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 21, 2023

Description of valves: NPS4 CLASS 150 Ball Valve

Size: 4"

Pressure Rating: Class 150

Drawing No.: SSBBJ-4S1F-LT-F-D Ver. A1

Test Witnessed By: CHEN Guilin / TÜV SÜD Inspector

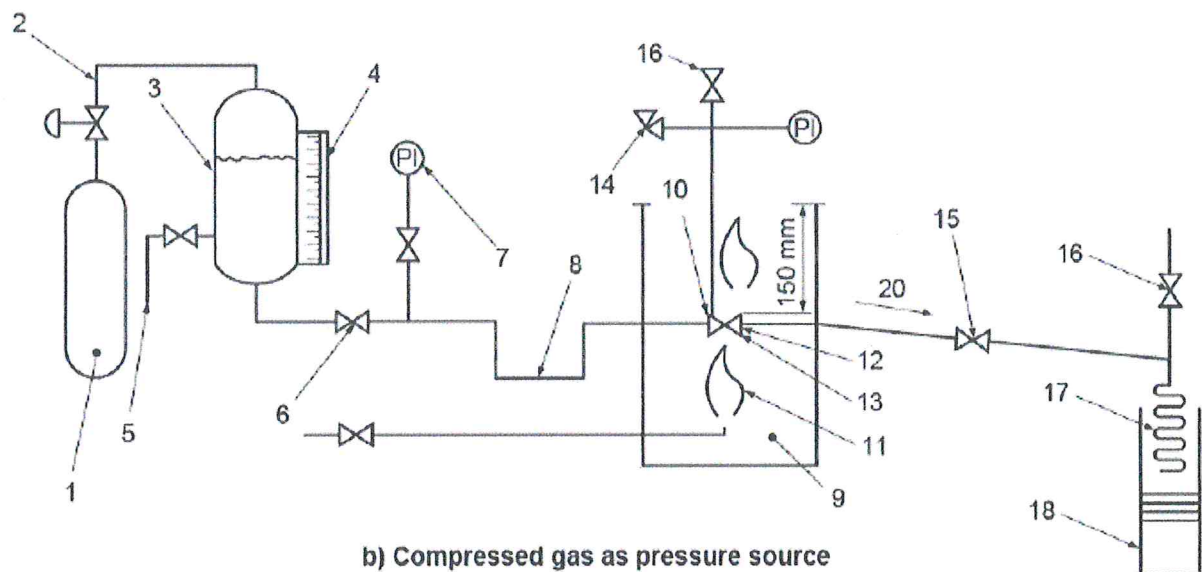
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Inspection and Tests

1. Conformity of Equipment

The test equipment was verified by TÜV SÜD inspector according to requirements of API STANDARD 607 EIGHTH EDITION, OCTOBER 2022. Para.5.3 and found satisfactory. The detail arrangement of the fire-test equipment is shown below:

Figure 1. Typical Fire-Test System Using Compressed Gas as the Pressure Source



Key

- | | | |
|--|--|------------------------------|
| 1. Pressure source | 10. Test valve mounted horizontally with stem in horizontal position | 19. Check valve |
| 2. Pressure regulator and relief | 11. Fuel gas supply and burner | 20. Slope |
| 3. Vessel for water | 12. Calorimeter cubes | 21. Clearance: 150 mm (6in.) |
| 4. Calibrated sight gauge | 13. Flame environment and body thermocouples | |
| 5. Water supply | 14. Pressure gauge and relief valve | |
| 6. Shut-off valve | 15. Shut-off valve | |
| 7. Pressure gauge | 16. Vent valve | |
| 8. Piping arranged to provide vapor trap | 17. Condenser | |
| 9. Enclosure for test | 18. Container | |

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2. Calibration of measurement and test instrument

The measurement and test instrument have been properly calibrated such as pressure gauges, thermocouples, etc.

3. Technical Data of Test Valve:

a) Description of test valve

Type of Test Valves	NPS4 Class150 Ball Valve
Description of Valves	Ball Valve
Pressure Class	Class 150
Valve Size	4"
Flange Connection	ASME B16.5
Designed Standard	API 6D/ BS 6364/ MSEC SPE77/200

b) Details of technical data on test valve

Part Name	Materials
Body	ASTM A351 CF3M
Bonnet	ASTM A351 CF3M
Ball	ASTM A182 F316
Seat Insert	PCTFE
Stem	ASTM A182 FXM-19
Stem Packing	Graphite
Gland	ASTM A351 CF3M
Gasket	316+Graphite
Nut	ASTM A194 8
Bolt	ASTM A320 B8-2
Design Assembly Drawing No.:	SSBBJ-4S1F-LT-F-D Ver. A1

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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. SSBBJ-4S1F-LT-F-D Ver. A1 and results found satisfactory. The mark was verified on valve as following:

<u>ATW</u>	<u>4"</u>	<u>150</u>	<u>CF3M</u>
Manufacturer` Brand	Size	Class	Material

5. Document Review:

The chemical and mechanical test report of castings was reviewed and found satisfactory. Also the inspection report of shell test, hydro seat test and air seat 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 607. Two thermocouples (part 13) are installed to measure flame temperature, one is located under valve body, another is located under valve stem, both within 25mm. Two calorimeters (part 12) are positioned to the same place as the thermocouples do.
- 6.2 The test system including test valve (part 10) 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 2.8 MPa 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 2.8 MPa. No leakage was found on system and test valve.

7. Fire Test:

The fire test was conducted according to API STANDARD 607 EIGHTH EDITION, OCTOBER 2022 Section 5. The pressure of the system upstream was kept 0.2 MPa, then the fire ignited. The flame temperature reached 750°C within 2 minutes after ignition. The test pressure and temperature were maintained at 0.2 MPa during the fire test. The temperature and pressure were recorded continuously by the operators. The system and test valve was cooled below 100 °C within 5 minutes by shower nozzles after 30 minutes fire test. The loss of water weight in vessel was measured by weighing scale and water in calibrated container (part 18) were read and recorded. The test result is shown as below:

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Test result of fire test

Item	API 607 Required Value	Actual Value
Test Pressure (MPa)	0.2 MPa	0.197-0.205 MPa
Test Temperature	750 - 1000 °C	803.4 – 901.6°C
Through-valve leakage according to API 607 table 1	≤ 400 ml / minute	5.9 ml / minute
Total weight of water through valve seat during cooling down period	0 ml	
Total time from fire test to cooling down	35 Minutes	
External Leakage	≤ 100 ml / minute	1.8 ml / minute
Conclusion: the test result is satisfactory according to API 607.		

8. Low Test:

The test valve was cooled below 100 °C within 5 minutes after complete the fire test. The low pressure test was conducted according to API STANDARD 607 EIGHTH EDITION, OCTOBER 2022 Para. 6.4 and 5.6.15. The test result was recorded as below:

Test result of low pressure test

Item	API 607 Required Value	Actual Value
Test Pressure (MPa)	0.2 MPa	0.2 MPa
Test Temperature	30 °C	
Test Time	5 minutes	
External Leakage	≤ 160 ml / minute	1.2 ml / minute
Conclusion: the test result is satisfactory according to API 607.		

After completing the static leakage tests, close the shut-off valve, operate the test valve against the low test pressure at 0.2 MPa to the fully open position and then to the fully closed position. Open the shut-off valve). Allow the system to stabilize for a five-minute period, and once completed, record in the test report the through-seat leakage over a five-minute time period.

Test result of low pressure test

Item	API 607 Required Value	Actual Value
Test Pressure (MPa)	0.2 MPa	0.2 MPa
Test Temperature	30 °C	
Test Time	5 minutes	
External Leakage	≤ 160 ml / minute	3.2 ml / minute
Conclusion: the test result is satisfactory according to API 607.		

9. Operational Test:

The test valve was cooled below 100 °C within 5 minutes after complete the fire test. The operational test was conducted according to API STANDARD 607 EIGHTH EDITION, OCTOBER 2022 Para. 6.6 and 5.6.17. The upstream pressure was increased to 1.5 MPa then the test valve was fully opened against the high test pressure differential to vent the piping and test valve body cavity to remove air or steam. The

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downstream shutoff valve was then closed and the system pressure was increased to and maintained at 1.5 MPa. 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 as below:

Test result of operational test

Item	API 607 Required Value	Actual Value
Test Pressure (MPa)	1.5 MPa	1.5 MPa
Test Temperature	30 °C	
Test Time	5 minutes	
External Leakage	≤ 100 ml / minute	3.6 ml / minute
Conclusion: the test result is satisfactory according to API 607.		

The undersigned, hereby declare that I have checked test valve and witnessed the fire test on the test valve according to API STANDARD 607 EIGHTH EDITION, OCTOBER 2022. The test result is satisfactory.

TÜV SÜD Industrie Service GmbH



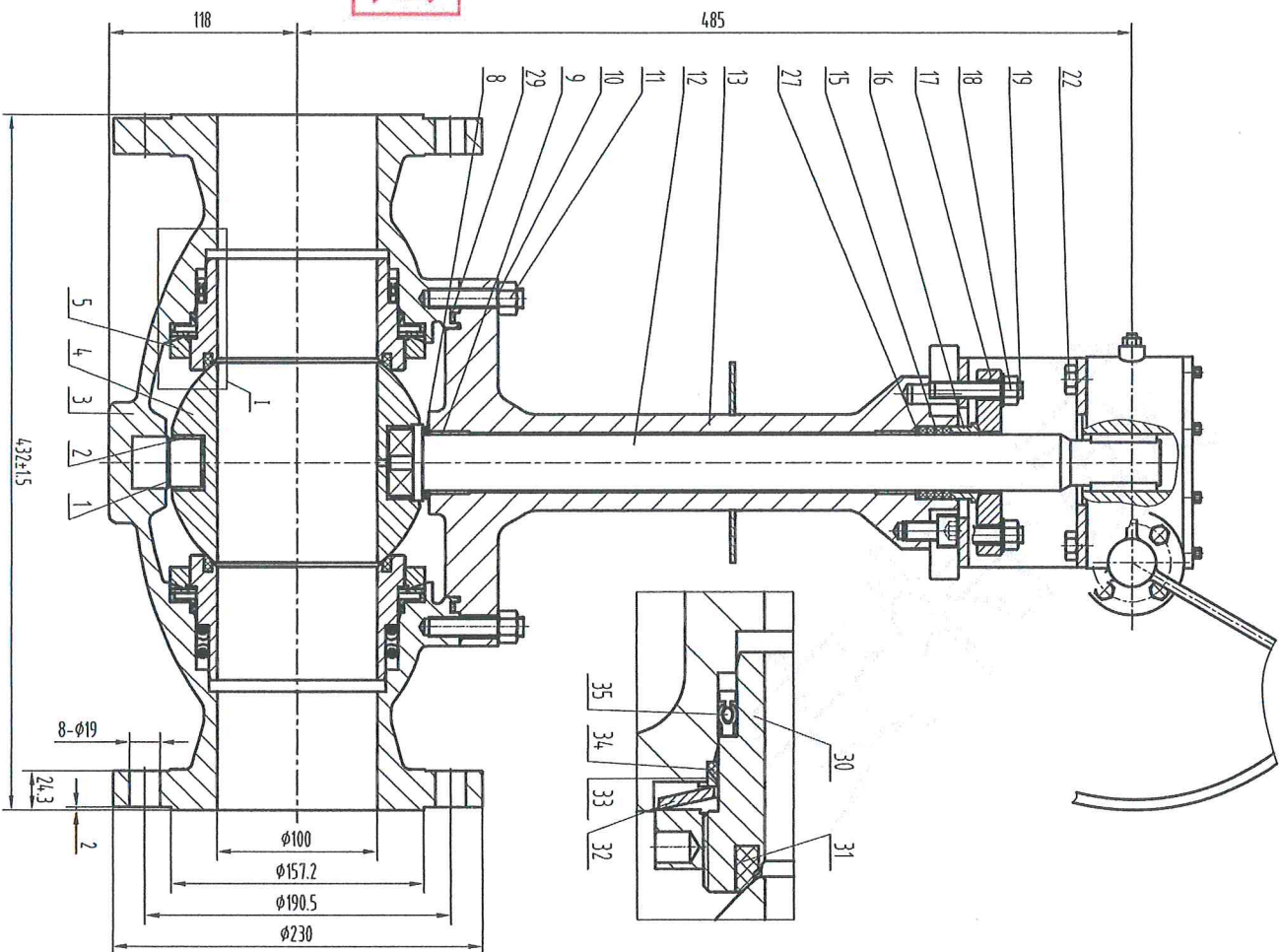
CHEN Guilin

Date: August 30, 2023

Annexes:

- 1) Copy of Drawing No. SSBBJ-4S1F-LT-F-D Ver. A1;
- 2) Copy of Test Record of Fire Test No. 2023FM861.

受控



标准		35	Lip Seal-115x125x10	Egiloy+M111	2
设计标准	API 6D/BS 6364/MSECT SPEC 17/200	34	SEAT FIRE SAFE SEAL-4S1F	GRAPHITE	2
INSPECTION AND TEST	BS6364/API598	33	Metal ring-4S1F	A276 316	2
FACE TO FACE DIMENSION	ASME B 16.10 CLASS150	32	SPRING-4S1F	Inconel X750	2
CONNECTION DIMENSION	ASME B 16.5	31	SEAT INSERT-4S1F	PTFE	2
FIRE TEST	API 607	30	SEAT RETAINER-4S1F	A182 F316	2
DESIGN TEMPERATURE	-196°C ~120°C	29	GASKET-174x186x3.2	316+GRAPHITE	1
NORMAL TEMPERATURE TEST		27	PACKING GASKET-4S1F	A276 316	1
NPS	4"	22	SCREW-GB/T6170-M12x20	A320 B8-2	8
CLASS	150	19	STUD-GB/T901-M10x55	A320 B8-2	2
SHELL TEST PRESSURE	AIR 3.0 MPa	18	NUT-GB/T6175-M10	A194 8	2
SEAL TEST PRESSURE-HIGH	AIR 2.2 MPa	17	GLAND-4S1F	A351 CF3M	1
SEAL TEST PRESSURE-LOW	AIR 0.6 MPa	16	RETAINER-4S1F	A276 316	1
CRYOGENIC TEST		15	STEM PACKING-35x45x5	GRAPHITE	4
CRYOGENIC OPERATION TEST	2.0MPa	13	BONNET-4S1F	A351 CF3M	1
MAXIMUM ALLOWABLE LEAKAGE OF VALVE SEAT (BS6364)	2.0MPa	12	STEM-4S1F	A182 FXM-19	1
REFRIGERANT	LIQUID NITROGEN (-196°C)	11	NUT-GB/T6175-M12	A194 8	12
TEST MEDIUM	HELIUM	10	STUD-GB/T901-M12x55	A320 B8-2	12
APPLICABLE MEDIUM	CRYOGENIC MEDIUM	9	BEARING-35x39x25	316+Cu+PTFE	2
		8	THRUST WASHER-36x45x2	316+QPQ	2
		5	PRETENSIONING NUT-4S1F	A276 316	2
		4	BALL-4S1F	A182 F316	1
		3	BODY-4S1F	A351 CF3M	1
		2	BEARING-30x34x20	316+Cu+PTFE	1
		1	DOWN AXLE-4S1F	A182 F316	1
		NO.	BOM DESCRIPTION	MATERIAL	QTY.

by *Chen Smith*

dated *2023-8-21*

☒ reviewed

☐ witnessed

TUV SUD Industrie Service GmbH

Suzhou Antiwear Valves Co.,Ltd.

SSBBJ-4S1F-LT-F-D

