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Attestation of TA-LUFT VDI2440

Industrie Service

Attestation No.:278943 Rev.1

Ref. report No. :278942 Rev.1

Manufacturer : Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.

Postal address of manufacturer : No. 988, Yuexiu Road, Fenhu Economic Development Zone, PC: 215200, Suzhou City, Jiangsu Province, P.R. China

Tested Product Description:

Item	ADBJ-24TEB1BW-L780-A1-X1-S03-N074 Butterfly Valve
Valve size (DN)	24"
Pressure rating	Class150
Stem size	Φ70 mm
Body/bonnet material	ASTM A351 CF3M
Seal material	Graphite
Valve assembly drawing no.	ADBJ-24TEB1BW-L780-A1-X1-S03-N074 Rev.A1

Test Condition:

Testing principles are according to Technical Instructions on Air Quality Control-TA Luft (July 2002) and VDI guideline 2440 (November 2000) and the key test conditions have been specified according to the following information:

Test Fluid	Helium		
Test Temperature(℃)	-196℃	Room Temperature	200℃
Test Pressure(bar):	19	19	13.7
No. of Switching Cycles	205		
Specific Leakage Rate λ mbar•l/(s•m)	$\lambda \leq 10^{-4}$		

Hereby, It is certified that the tested valve of the above mentioned company have been tested and the test results are accepted according to above mentioned specification. Details could be taken from the associated report with the No.:278942 Rev.1

TÜV SÜD Industrie Service GmbH

Guilin Chen

Shanghai, July 9, 2022
(Place, date)

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TÜV SÜD Industrie Service GmbH
Shanghai Office

Inspection-No.: 278942 Rev.1

Industrie Service

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REPORT OF THIRD PARTY INSPECTION

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

Contact Person: Ms. Wang Chunjing

Manufacturer Name: 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 Place: Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.Test Laboratory

Contact Person: Ms. Wang Chunjing

Inspection Date: 2021-07-12~23

Inspector: Chen Guilin

Quality System Status: Acceptable

Order Number: 7482351137

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Industrie Service

Inspection-No.: 278942 Rev.1

1. Witness revelant tests

Nature Of Inspection:

This is to report that we, TÜV SÜD Industry Service GmbH Shanghai Office on 2021-07-12~23 at the request of Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd. conducted the following inspection:

1. Witness relevant tests

1.1 General Information

Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd. commissioned us to witness valve fugitive emission test according to TA-LUFT 2002, Sec. 5.2.6.3 & 5.2.6.4, guideline VDI 2440 Nov.2000, Sec. 3.3.1.3 & 3.3.1.4 to verify whether the test result can meet the specific leakage rate according to the German Clean Air Act(ã≤10-4 mbar•l/(s•m)) and for the test valve the leakage is ≤2.20x10^{-5} mbar.l/s.

1.2Tested Product Description:

The test samples have been chosen and the details of test samples can be seen in the following information. Details of the test sample can be seen in the annex.

Item	ADBJ-24TEB1BW-L780-A1-X1-S03-N074 Butterfly Valve
Valve size	24"
Pressure rating	Class150
Stem size	Φ70 mm
Body/bonnet material	ASTM A351 CF3M
Seal material	Graphite
Valve assembly drawing no.	ADBJ-24TEB1BW-L780-A1-X1-S03-N074 Rev.A1

1.3Test Condition:

The test has been referred to the method of ISO15848-2015 annex A and carried out according to the requirements of the customer. The key test conditions have been specified according to the following information:

Test Fluid	Helium		
Test Temperature(℃)	Room Temperature	-196`	200℃
Test Pressure(bar):	19	19	13.7
No. of Switching Cycles	205		

1.4Visual and dimensional check of the test valve:

The test 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.: ADBJ-24TEB1BW-L780-A1-X1-S03-N074 Rev.A1 and results found satisfactory.

1.5Preparation of the test valve

Before the fugitive emission test, the test valve was hydrostatic tested under 28bar, the test showed no visible leakage or deformation. Then the valve was cleaned and dried.

1.6Calibration of test instrument

The test instrument was turned on, warmed up according to the requirements of the equipment manufacturer and calibrated with the standard.

1.7Fugitive emission test and measurement

The test valve was mounted on a test rig with the stem positioned vertical. And the fugitive emission test is carried out according to above mentioned requirements.

1.7.1Preliminary tests at room temperature

The valve was pressurized with test fluid Helium to 19bar according to manufacturer's requirements in the partly opened position, the temperature is measured and recorded as room temperature.
The test results are as follows and details can be seen in the annex:

Test results of preliminary tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	1.8×10^{-7}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.2 Mechanical cycle test at the room temperature

A total of 50 mechanical cycles was performed on the test valve while it was kept pressurized under a differential pressure of 19bar according to the manufacturer's requirements at room temperature. The pressure should be improved and kept at 19bar to measure the leakage, and then the leakage from the stem seal is measured with following results and details can be seen in the annex:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	4.3×10^{-7}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.3 Static test at the selected test temperature

The test valve was cooled till to -196℃. The test valve was kept pressurized with 19bar according to manufacturer's requirements at the temperature between -196 and -206℃. The leakage from the stem seal were measured with following results:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	8.6×10^{-7}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.4 Mechanical cycle test at the selected temperature

A total of 50 mechanical cycles was performed on the test valve while it was kept pressurized with 19bar according to manufacturer's requirements at the temperature between -196 and -206℃. The leakage from the stem seal was measured with following results:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	1.8×10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.5 Intermediate static test at the room temperature

The test valve returned to the room temperature naturally, without artificial cooling/heating. After the temperature was stabilized at room temperature. Then the stem seal leakage under 19bar according to manufacturer's requirements was measured using the same method as mentioned above, with following test result:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	8.6×10^{-7}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.6 Repeat of mechanical cycle test at the room temperature

A total of 50 mechanical cycles was performed on the test valve while it was kept pressurized with 19bar according to manufacturer's requirements at room temperature. The leakage from the stem seal was measured with following results:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	1.1×10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.7 Repeat of static test at the selected test temperature

The test valve was cooled till to -196℃. The test valve was kept pressurized with 19bar according to manufacturer's requirements at the temperature between -196 and -206℃. The leakage from the stem seal were measured with following results:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	3.8×10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.8 Repeat of Mechanical cycle test at the selected temperature

A total of 50 mechanical cycles was performed on the test valve while it was kept pressurized with 19baraccording to manufacturer's requirements at the temperature between -196 and -206℃. The leakage from the stem seal was measured with following results:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	5.6×10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.9 Intermediate static test at the room temperature

The test valve returned to the room temperature naturally, without artificial cooling/heating. After the temperature was stabilized at room temperature, The leakage from the stem seal was measured with following results while it was kept pressurized with 19bar:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	6.3×10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.10Final test at the room temperature

A total of 5 mechanical cycles was performed on the test valve while it was kept pressurized with 19bar. The leakage from the stem seal under 19bar according to manufacturer's requirements was measured with following results:

Test results of final tests at room temperature (test 6)

Item	Required Value	Actual Value

Stem leakage (mbar.l/s)	≤2.20x10^{-5}	4.2x10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.11Preliminary tests at room temperature

The valve was pressurized with test fluid Helium to 19bar according to manufacturer's requirements in the partly opened position, the temperature is measured and recorded as room temperature.
The test results are as follows and details can be seen in the annex:

Test results of preliminary tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	≤2.20x10^{-5}	4.2x10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.12 Mechanical cycle test at the room temperature

A total of 50 mechanical cycles was performed on the test valve while it was kept pressurized under a differential pressure of 19bar according to the manufacturer's requirements at room temperature. The pressure should be improved and kept at 19bar to measure the leakage, and then the leakage from the stem seal is measured with following results and details can be seen in the annex:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	≤2.20x10^{-5}	1.0x10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.13 Static test at the selected test temperature

The test valve was heated till to 200℃. The test valve was kept pressurized with 13.7bar according to manufacturer's requirements at the temperature between 190 and 210℃. The leakage from the stem seal were measured with following results:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	≤2.20x10^{-5}	2.1x10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.14 Mechanical cycle test at the selected temperature

A total of 50 mechanical cycles was performed on the test valve while it was kept pressurized with 13.7bar according to manufacturer's requirements at the temperature between 190 and 210℃. The leakage from the stem seal was measured with following results:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	≤2.20x10^{-5}	2.7x10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.15 Intermediate static test at the room temperature

The test valve returned to the room temperature naturally, without artificial cooling/heating. After the temperature was stabilized at room temperature. Then the stem seal leakage under 19bar according to manufacturer's requirements was measured using the same method as mentioned above, with following test result:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	≤2.20x10^{-5}	2.8x10^{-6}

The test results meet the requirements of VDI2440 Nov.2000.

1.7.16 Repeat of mechanical cycle test at the room temperature

A total of 50 mechanical cycles was performed on the test valve while it was kept pressurized with 19bar according to manufacturer's requirements at room temperature. The leakage from the stem seal was measured with following results:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	3.2×10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.17 Repeat of static test at the selected test temperature

The test valve was heated till to 200℃. The test valve was kept pressurized with 13.7bar according to manufacturer's requirements at the temperature between -196 and -206℃. The leakage from the stem seal were measured with following results:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	6.3×10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.18 Repeat of Mechanical cycle test at the selected temperature

A total of 50 mechanical cycles was performed on the test valve while it was kept pressurized with 13.7bar according to manufacturer's requirements at the temperature between 190 and 210℃. The leakage from the stem seal was measured with following results:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	9.3×10^{-6}
The test results meet the requirements of VDI2440 Nov.2000. The stem has been adjusted once time		

1.7.19 Intermediate static test at the room temperature

The test valve returned to the room temperature naturally, without artificial cooling/heating. After the temperature was stabilized at room temperature, The leakage from the stem seal was measured with following results while it was kept pressurized with 19bar:

Test results of final tests

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	2.8×10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.20Final test at the room temperature

A total of 5 mechanical cycles was performed on the test valve while it was kept pressurized with 19bar. The leakage from the stem seal under 19bar according to manufacturer's requirements was measured with following results:

Test results of final tests at room temperature (test 6)

Item	Required Value	Actual Value
Stem leakage (mbar.l/s)	$\leq 2.20 \times 10^{-5}$	3.4×10^{-6}
The test results meet the requirements of VDI2440 Nov.2000.		

1.7.12 Post test examination

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After all the above tests completed, the test valve was disassembled and all sealing components visually examined. It is found that no notable wear and any other significant observations.

We, hereby declare that the inspector has checked test valve and witnessed the fugitive emission test on the tested valve. The test results are as mentioned in this report.

Annex:
Annex 1: Copy of Drawing No.: ADBJ-24TEB1BW-L780-A1-X1-S03-N074 Rev.A1;
Annex 2: Test Report of Fugitive Emission Test No. ATW-DCDRZ-01;

Chen Guilin

Inspected by: Chen Guilin

Date of issue: July 9, 2022