

Applicant / Manufacturer : BMT Co., Ltd.
17, Sinsojaesandan 2-ro, Jangan-eup, Gijang-gun, Busan, 46031 South Korea

Date and place of test : July 02 ~ 30, 2024 at the Manufacturer's Premises in Busan, Korea

Kind of test : Fugitive Emissions test

Test valve : **Instrument Valves (Ball / Needle type) & Instrument Fitting (SUPERLOK fitting)**
- 1/2" size Ball Valve (SBVF360 series - 1 Unit)
- 1/2" size Needle Valve (SINV series - 1 Unit)
- 3/4", 1" LOK Fitting (SUPERLOK fitting - 1 Unit)

Test standard : ISO 15848-1 : Industrial valves , Measurement, test and qualification procedures for fugitive emissions, part 1, 2015

Drawing No. : Drawing No.
1/2" size Ball Valve : SBVF3603-S8-SLE-240805-01
1/2" size Needle Valve : SINV4-S8-SLE-270805-02
3/4", 1" Lok Fitting : SRU-8-4-SLE-250805-03

Test Result

1. Fugitive Emissions Test : 1/2" size Ball Valve (SBVF360 series)
The Fugitive Emissions test was performed in accordance with STD on 1/2" size Ball Valve (SBVF360 series) with the following conditions, and the result was satisfactory within operating time.
 - Test pressure control unit : Air actuator
 - Test pressure : 455 Bar
 - Stroke Time : 30 Seconds
 - Test medium : Helium,
 - Test temperature : -50°C ~ 150°C
 - Total Number cycles : 205 Cycle
 - Stem Measured leak rate : Class BH ($\leq 1.78 \text{ E-06}$)
 - Body Measured leakage : $\leq 50 \text{ ppmv}$

Note) *Details are as attached test report (BMT-TRV240805-01)

2. Fugitive Emissions Test : 1/2" size Needle Valve (SINV series)
The Fugitive Emissions test was performed in accordance with STD on 1/2" size Needle Valve (SINV series) with the following conditions, and the result was satisfactory within operating time.
 - Test pressure control unit : Air actuator
 - Test pressure : 378 Bar



BMT CO., LTD

Fugitive Emissions Type Test Report (SBVF360 Serise)

According to ISO 15848-1

Date : 2024.08.05

DOC. NO. : BMT-TR240805-01

Instrument Valve For SBVF360 Ball Valve Serise

Tested by

이재민

Date : 24.08.05

Approved by

이재민

Date : 24.08.05

Witnessed by



Date : 2024 .08. 05



Fugitive Emissions Type Test Report (SBVF360 Serise)

BMT CO., LTD

According to ISO 15848-1

PAGE 2 OF 5

Date 2024.08.05

DOC NO. BMT-TRV240805-01

STEP	Pressure (Bar)	Temperature (°C)	Cycle Test	Leakage (Max)		Date	Operating Torque(N.m)	
				Stem Seal	Body Seal		Open	Close
[Step 1] Preliminary tests at the room temperature	455 Bar	21.9°C	-	1.2 E-06	1.3 E-06	24.07.02	Open Close	8.3 7.1
[Step 2] Mechanical cycle test at the room temperature	455 Bar	21.1°C	50 Cycle	1.3 E-06	N/A	24.07.05	N/A	
[Step 3] Static test at the selected test low temperature	455 Bar	-50°C	-	1.3 E-06	N/A	24.07.09	N/A	
[Step 4] Mechanical cycle test at the selected test low temperature	455 Bar	-50°C	50 Cycle	1.2 E-06	N/A	24.07.12	N/A	
[Step5] Intermediate static test at the max temperature	455 Bar	150°C	-	1.2 E-06	N/A	24.07.16	N/A	
[Step6] Mechanical cycle test at the max temperature	455 Bar	150°C	50 Cycle	1.2 E-06	N/A	24.07.19	N/A	
[Step 7] Static test at the selected test low temperature	455 Bar	-50°C	-	1.3 E-06	N/A	24.07.23	N/A	
[Step 8] Mechanical cycle test at the selected test low temperature	455 Bar	-50°C	50 Cycle	1.3 E-06	N/A	24.07.26	N/A	
[Step 9] Final test at the room temperature	455 Bar	24.6°C	5 Cycle	1.3 E-06	1.3 E-06	24.07.30	Open Close	6.1 4.7

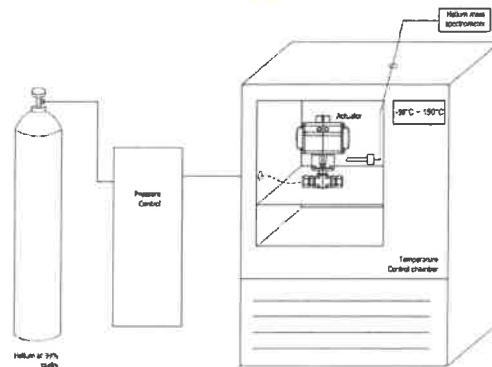
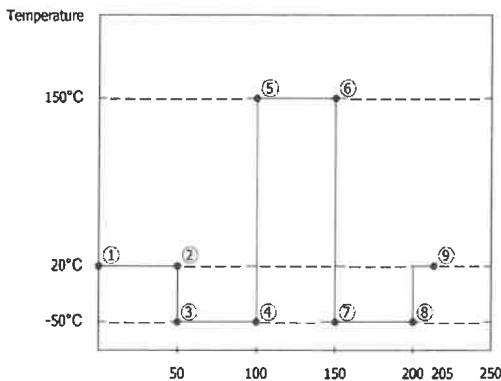
Remark

Stem sealling leak rate mesurement : sniffing method

Body sealling leak rate mesurement : sniffing method

1. Mechanical-cycle classes for isolating valves

2. Test set-up





BMT CO., LTD

Fugitive Emissions Type Test Report (SBVF360 Serie)

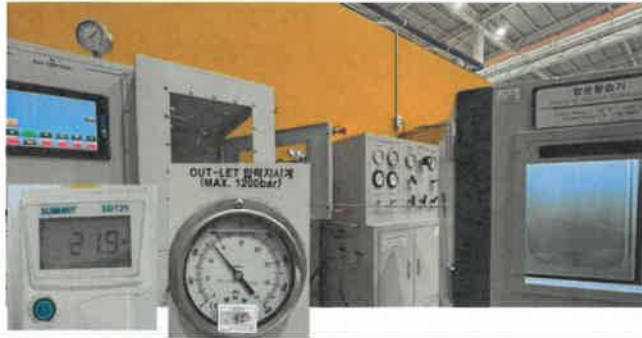
According to ISO 15848-1

PAGE 3 OF 5

Date 2024.08.05

DOC NO. BMT-TRV240805-01

[Step 1] Preliminary tests at the room temperature



Test Pressure : 455 Bar, Temperature : 21.9℃



Leakage Stem Seal: 1.2 E-06



Leakage Body Seal: 1.3 E-06



Operating Torque(N.m): Open: 8.3, Close: 7.1

[Step 2] Mechanical cycle test at the room temperature



Test Pressure : 455 Bar, Temperature : 21.1℃, Cycle Test : 50 Cycle



Leakage Stem Seal: 1.3 E-06

[Step 3] Static test at the selected test low temperature



Test Pressure : 455 Bar, Temperature : -50℃



Leakage Stem Seal: 1.3 E-06





BMT CO., LTD

Fugitive Emissions Type Test Report (SBVF360 Serise)

According to ISO 15848-1

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Date 2024.08.05

DOC NO. BMT-TRV240805-01

[Step 4] Mechanical cycle test at the selected test low temperature



Test Pressure : 455 Bar, Temperature : -50℃, Cycle Test : +50 Cycle



Leakage Stem Seal: 1.2 E-06

[Step5] Intermediate static test at the max temperature



Test Pressure : 455 Bar, Temperature : 150℃



Leakage Stem Seal: 1.2 E-06

[Step 6] Mechanical cycle test at the max temperature

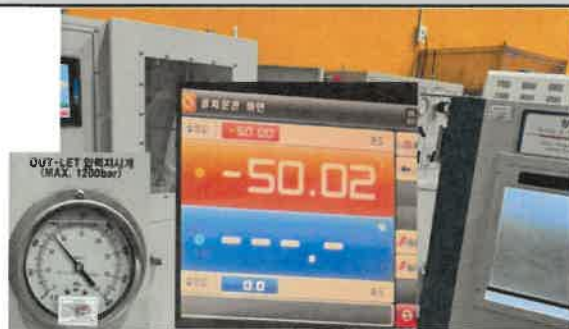


Test Pressure : 455 Bar, Temperature : 150℃, Cycle Test : +50 Cycle



Leakage Stem Seal: 1.2 E-06

[Step 7] Static test at the selected test low temperature



Test Pressure : 455 Bar, Temperature : -50℃



Leakage Stem Seal: 1.3 E-06



BMT CO., LTD

Fugitive Emissions Type Test Report (SBVF360 Serie)

According to ISO 15848-1

PAGE 5 OF 5

Date 2024.08.05

DOC NO. BMT-TRV240805-01

[Step8] Mechanical cycle test at the selected test low temperature



Test Pressure : 455 Bar, Temperature : -50 °C, Cycle Test : +50 Cycle



Leakage Stem Seal: 1.3 E-06

[Step9] Final test at the room temperature



Test Pressure : 455 Bar, Temperature : 24.6 °C



Leakage Stem Seal: 1.3 E-06



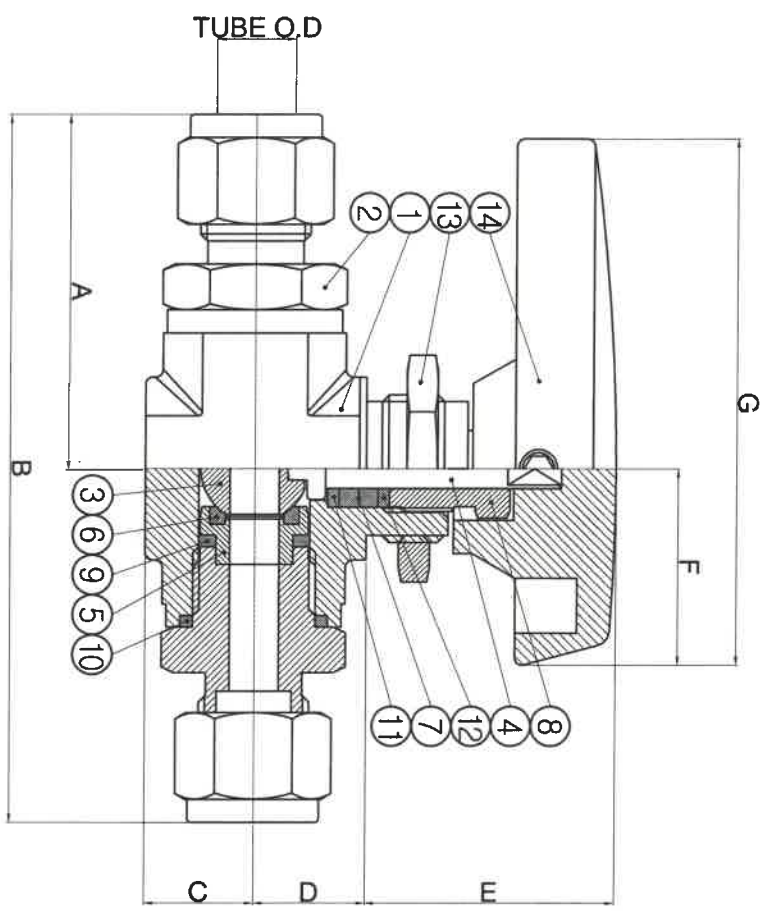
Leakage body Seal: 1.3 E-06



Operating Torque(N.m): Open: 6.1, Close: 4.7



NO.	DESCRIPTION	MATERIAL	QTY	REMARK
1	BODY	SS316	1	
2	END CONNECTOR	SS316	2	
3	BALL	SS316	1	
4	STEM	SS316	1	
5	SEAL RETAINER	SS316	2	
6	BALL SEAT	PCTFE	2	
7	PACKING	PTFE	2	
8	PACKING BOLT	SS316	1	
9	O-RING	VITON	2	
10	CONNECTOR SEAL	PTFE	2	
11	PACKING SUPPORT	PEEK	1	
12	STEM WASHER	SS316	1	
13	PANEL NUT	SS316	1	
14	HANDLE	AL	1	



H: Panel Hole Dia
I: Max Panel Thickness

NO.	PART NO.	TUBE O.D (Inch)	A	B	C	D	E	F	G	H	I
1	SBVF3603-SB	1/2	59.2	118.4	17.5	19.3	41.1	27.7	74.2	22.9	9.7

(mm)



Rev.	Issue Date	Issued for	Preliminary	J.H. JEONG	H.P. SEO	J.H. LIM
PURCHASER		Description	Originator	Checked	Approved	
CLIENT						
PROJECT NAME	SSS 21호					
PROJECT NO.	-					
P.O. NO.	-					
MFR. MODEL/TYPE	SBVF360 Series					
ITEM NAME	BALL VALVE					
TAG NO.	-					
DRAWING NO.	- 20240805-01-398-02					

GENERAL ARRANGEMENT DRAWING for TUBE FITTING





BMT CO., LTD

Fugitive Emissions Type Test Report (SINV Serise)

According to ISO 15848-1

Date : 2024.08.05

DOC. NO. : BMT-TR240805-02

Instrument Valve For SINV Needle Vale Serise

Tested by

이 지민

Date : 24.08.05

Approved by

김영민

Date : 24.08.05

Witnessed by



Date : 2024 .08. 05



Fugitive Emissions Type Test Report (SINV Serise)

BMT CO., LTD

According to ISO 15848-1

PAGE 2 OF 5

Date 2024.08.05

DOC NO. BMT-TRV240805-02

STEP	Pressure (Bar)	Temperature (°C)	Cycle Test	Leakage (Max)		Date	Operating Torque(N.m)	
				Stem Seal	Body Seal		Open	Close
[Step 1] Preliminary tests at the room temperature	378 Bar	20.7°C	-	1.2 E-06	1.2 E-06	24.07.02	Open Close	4 N/A
[Step 2] Mechanical cycle test at the room temperature	378 Bar	21.3°C	50 Cycle	1.3 E-06	N/A	24.07.05	N/A	
[Step 3] Static test at the selected test low temperature	378 Bar	-50°C	-	1.2 E-06	N/A	24.07.09	N/A	
[Step 4] Mechanical cycle test at the selected test low temperature	378 Bar	-50°C	50 Cycle	1.2 E-06	N/A	24.07.12	N/A	
[Step5] Intermediate static test at the max temperature	378 Bar	150°C	-	1.2 E-06	N/A	24.07.16	N/A	
[Step6] Mechanical cycle test at the max temperature	378 Bar	150°C	50 Cycle	1.3 E-06	N/A	24.07.19	N/A	
[Step 7] Static test at the selected test low temperature	378 Bar	-50°C	-	1.3 E-06	N/A	24.07.23	N/A	
[Step 8] Mechanical cycle test at the selected test low temperature	378 Bar	-50°C	50 Cycle	1.3 E-06	N/A	24.07.26	N/A	
[Step 9] Final test at the room temperature	378 Bar	24.0°C	5 Cycle	1.3 E-06	1.3 E-06	24.07.30	Open Close	3.4 N/A

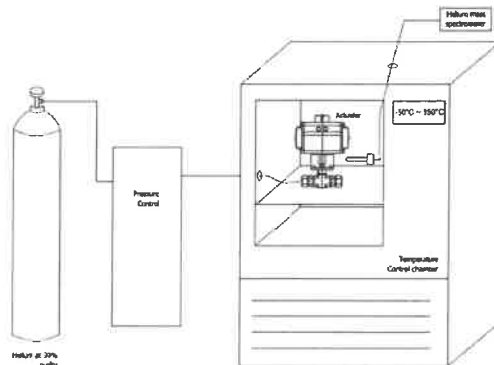
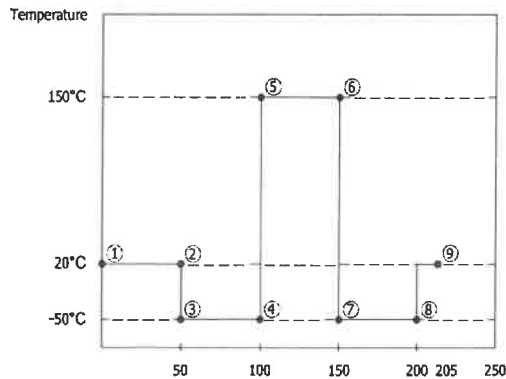
Remark

Stem sealling leak rate mesurement : sniffing method

Body sealling leak rate mesurement : sniffing method

1. Mechanical-cycle classes for isolating valves

2. Test set-up





BMT CO., LTD

Fugitive Emissions Type Test Report (SINV Serie)

According to ISO 15848-1

PAGE 3 OF 5

Date 2024.08.05

DOC NO. BMT-TRV240805-02

[Step 1] Preliminary tests at the room temperature



Test Pressure : 378 Bar, Temperature : 20.7°C



Leakage Stem Seal: 1.2 E-06



Leakage Body Seal: 1.2 E-06



Operating Torque(N.m): Open: 4, Close: N/A

[Step 2] Mechanical cycle test at the room temperature



Test Pressure : 378 Bar, Temperature : 21.3°C, Cycle Test : 50 Cycle



Leakage Stem Seal: 1.3 E-06

[Step 3] Static test at the selected test low temperature



Test Pressure : 378 Bar, Temperature : -50°C



Leakage Stem Seal: 1.2 E-06



BMT CO., LTD

Fugitive Emissions Type Test Report (SBVF360 Serie)

According to ISO 15848-1

PAGE 4 OF 5

Date 2024.08.05

DOC NO. BMT-TRV240805-02

[Step 4] Mechanical cycle test at the selected test low temperature



Test Pressure : 378 Bar, Temperature : -50°C, Cycle Test : +50 Cycle



Leakage Stem Seal: 1.2 E-06

[Step5] Intermediate static test at the max temperature



Test Pressure : 378 Bar, Temperature : 150°C



Leakage Stem Seal: 1.2 E-06

[Step 6] Mechanical cycle test at the max temperature

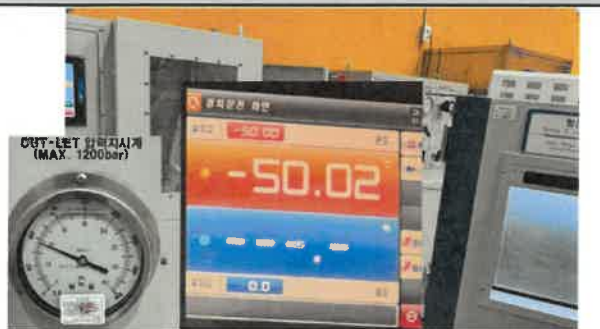


Test Pressure : 378 Bar, Temperature : 150°C, Cycle Test : +50 Cycle



Leakage Stem Seal: 1.3 E-06

[Step 7] Static test at the selected test low temperature



Test Pressure : 378 Bar, Temperature : -50°C



Leakage Stem Seal: 1.3 E-06





BMT CO., LTD

Fugitive Emissions Type Test Report (SBVF360 Serie)

According to ISO 15848-1

PAGE 5 OF 5

Date 2024.08.05

DOC NO. BMT-TRV240805-02

[Step8] Mechanical cycle test at the selected test low temperature



Test Pressure : 378 Bar, Temperature : -50 °C, Cycle Test : +50 Cycle



Leakage Stem Seal: 1.3 E-06

[Step9] Final test at the room temperature



Test Pressure : 455 Bar, Temperature : 24.0 °C



Leakage Stem Seal: 1.3 E-06



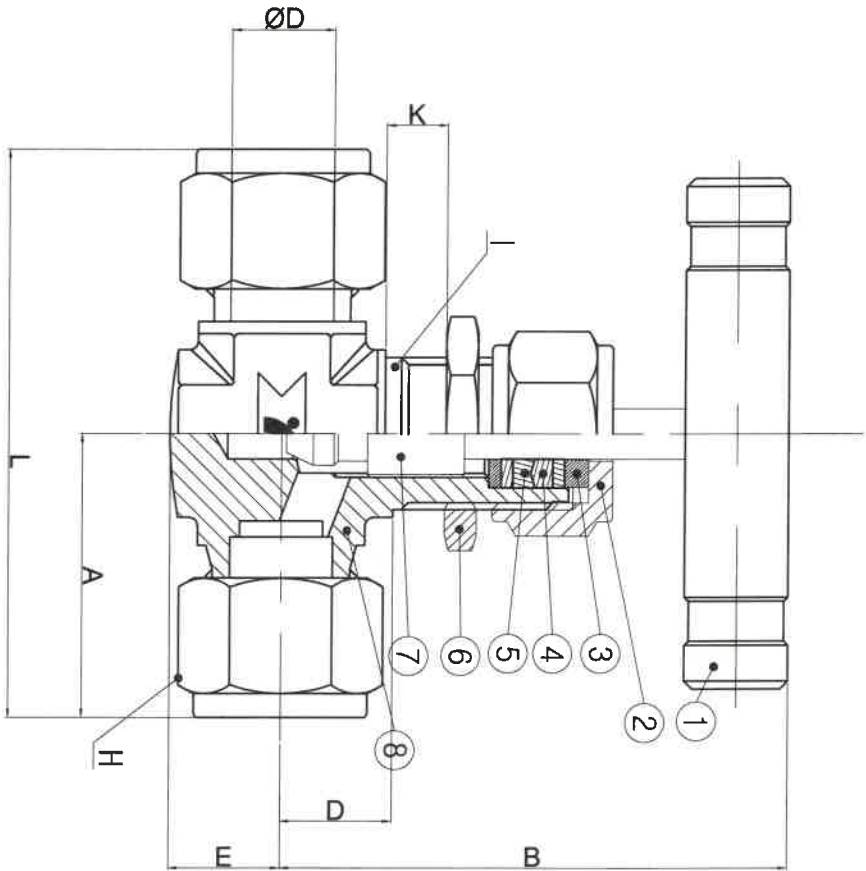
Leakage body Seal: 1.3 E-06



Operating Torque(N.m): Open: 3.3, Close: N/A



NO.	DESCRIPTION	MATERIAL	Q'TY	REMARK
1	BAR HANDLE	SS304	1	
2	PACKING NUT	SS316	1	
3	PACKING GLAND	SS316	1	
4	UPPER PACKING	PTFE	1	
5	LOWER PACKING	PTFE	1	
6	LOCK NUT	SS304	1	
7	STEM	SS316	1	
8	BODY	SS316	1	



H: Panel Hole Dia
I: Max Panel Thickness

NO.	PART NO.	TUBE O.D.		Orifice	CV	Width Across		Dimensions, mm							REMARK
		ØD, Inch	D			H	L	A	D	E	Panel Hole Drill(I)	Panel Mount Thickness K(Min)	K(Max)	H	
1	S1W-54	1/2	6.4	0.73	7/8	71.2	35.6	21	21	20	3.17	6.35	63.5		

SGS
KOREA/KR17
REVIEWED
WITNESSED
2024.08.05
JK

Rev. A	05.AUG.24	Issued for Preliminary	J.H.JEONG	H.P.SEO	J.H.LIM
Rev.	Issue Date	Description	Originator	Checked	Approved
PURCHASER: SGS					
CLIENT					
PROJECT NAME	SGS 215				
PROJECT NO.	-				
PO. NO.	-				
MFR. MODEL/TYPE	S1W Series				
ITEM NAME	NEEDLE VALVE				
TAG NO.	-				
DRAWING NO.	- 2024-01-398-01				
GENERAL ARRANGEMENT DRAWING FOR TUBE FITTING					
BMT Co., Ltd.					



BMT CO., LTD





Fugitive Emissions Type Test Report (Superlok Fitting)

According to ISO 15848-1

Date : 2024.08.05

DOC. NO. : BMT-TR240805-03

Instrument Fitting For Superlok Serise

Tested by	Approved by	Witnessed by
<p>01 차 단 </p> <p>Date : 24.08.05</p>	<p>김영준 </p> <p>Date : 24.08.05</p>	<p> </p> <p>Date : 2024.08.05</p>



BMT CO., LTD

Fugitive Emissions Type Test Report (Superlok Fitting)

(Superlok Fitting)

According to ISO 15848-1

PAGE 1 OF 5

Date 2024.08.05

DOC NO. BMT-TRF240805-01

Manufacturer	Name		BMT CO., LTD					
	Address		35, Sanmakgongdannam 11-gil, Yangsan-si, Gyeongsangnam-do, South Korea					
Reference Standard	ISO 15848-1 Second Edition 2015-06-01							
	Model Series		Superlok Fitting (3/4", 1")					
	Size		3/4 inch, 1 inch (Tube O.D)	Class	N/A			
Product Description for Type Test	Body		ASTM A276 316					
	Bonnet		N/A	Vee Steam	N/A			
	Stem		N/A					
			Diameter	N/A	Roughness(Max.)	N/A		
	Seals	Body	Type	N/A	Size (mm)	N/A		
		Stem	Type	N/A	Size (mm)	N/A		
Test Condition	Test Fluid		Helium (99.99%)		Test Temp.	t(-50) (±5%), RT, t(150) (±5%)		
	Test Pressure	-50°C	207 Bar (3,000 psi)		Prssure In	207 Bar (3,000 psi)		
		RT	207 Bar (3,000 psi)		Prssure Out	Vent to the atmosphere		
		150°C	207 Bar (3,000 psi)		Prssure Hold Time	30 sec		
	Class	Tightness	BH		Total Number of cycles	t (-50°C) t (150°C) 205 Cycle		
Temperature		t (-50°C), t (150°C)						
Endurance		CO1						
Test Equipment	Helium Detector		ASM 142		Torque Wrench	N/A		
	Thermo Indicator		TK4S-T4RN					
	Thermo couple		K-Type		Pressuer Gauge	SC-210E (1000Bar)		
Maximum Allowable Leakage	Stem Seal (mbar.l/s)	N/A		Body Seal (ppmv)	≤50 ppmv			
		N/A			(ISO 15848-1 Table 2)			
Actual Leakage	Stem Seal (mbar.l/s)	N/A	Max.	N/A	Body Seal (mbar.l/s)	t -50°C	Max.	5.9 (ppmv)
			Min.	N/A			Min.	5.4 (ppmv)
Operating Torque Max/(Kgf.cm)	Start	Open	N/A		End	Open	N/A	
		Close	N/A			Close	N/A	
Post test examination		Good						
Test Result		<input checked="" type="checkbox"/> Accept <input type="checkbox"/> Reject ()						
Remark								
* Attachment (1). Drawing : SRU-8-4-SLE-250805-03 (2). Hydrostatic test certificate : TRF240805-01								
Tested by		Reviewed by		Approved by		Witnessed by		
Date : 24.08.05		Date : 24.08.05		Date : 24.08.05		Date : 2024.08.05		

BMT CO., LTD

A4(210mm X 297mm)





Fugitive Emissions Type Test Report (Superlok Fitting)

BMT CO., LTD

According to ISO 15848-1

PAGE 2 OF 5

Date 2024.08.05

DOC NO. BMT-TRF240805-01

STEP	Pressure (Bar)	Temperature (°C)	Cycle Test	Leakage (Max)		Date	Operating Torque(N.m)
				Stem Seal	Body Seal		
[Step 1] Preliminary tests at the room temperature	207 Bar	19.9°C	-	N/A	1.2 E-06	24.07.02	N/A
[Step 2] Mechanical cycle test at the room temperature	207 Bar	22.3°C	50 Cycle	N/A	1.3 E-06	24.07.05	N/A
[Step 3] Static test at the selected test temperature	207 Bar	-50°C	-	N/A	1.3 E-06	24.07.09	N/A
[Step 4] Mechanical cycle test at the selected test temperature	207 Bar	-50°C	50 Cycle	N/A	1.2 E-06	24.07.12	N/A
[Step5] Intermediate static test at the room temperature	207 Bar	150°C	-	N/A	1.2 E-06	24.07.16	N/A
[Step6] Mechanical cycle test at the room temperature	207 Bar	150°C	50 Cycle	N/A	1.2 E-06	24.07.19	N/A
[Step 7] Static test at the selected test temperature	207 Bar	-50°C	-	N/A	1.3 E-06	24.07.23	N/A
[Step 8] Mechanical cycle test at the selected test temperature	207 Bar	-50°C	50 Cycle	N/A	1.2 E-06	24.07.26	N/A
[Step 9] Final test at the room temperature	207 Bar	21.1°C	5 Cycle	N/A	1.3 E-06	24.07.30	N/A

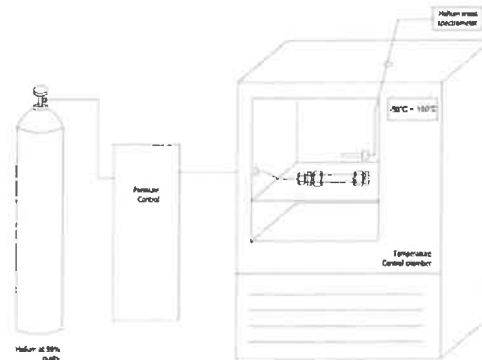
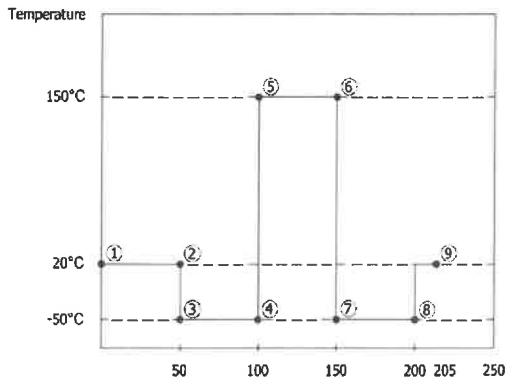
Remark

Stem sealling leak rate mesurement : sniffing method

Body sealling leak rate mesurement : sniffing method

1. Mechanical-cycle classes for isolating valves

2. Test set-up





BMT CO., LTD

Fugitive Emissions Type Test Report (Superlok Fitting)

According to ISO 15848-1

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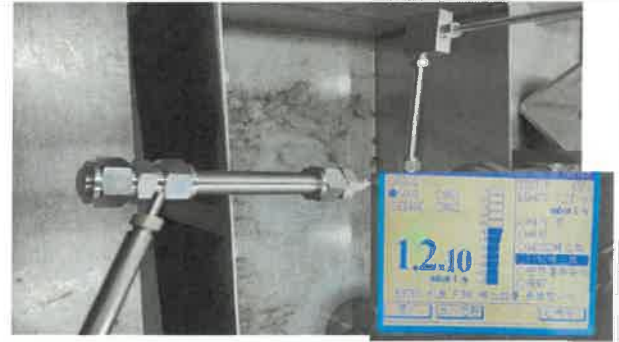
Date 2024.08.05

DOC NO. BMT-TRF240805-01

[Step 1] Preliminary tests at the room temperature



Test Pressure : 207 Bar, Temperature : 19.9℃

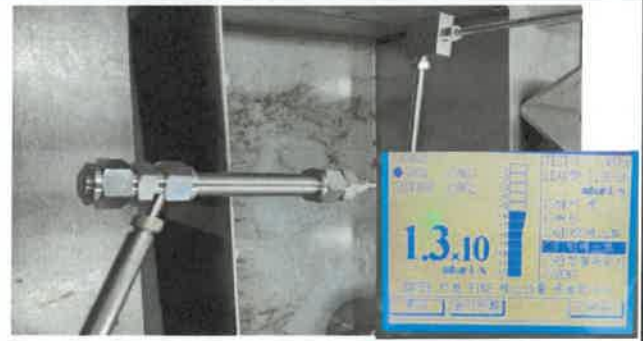


Leakage body Seal: 1.2 E-06

[Step 2] Mechanical cycle test at the room temperature



Test Pressure : 207 Bar, Temperature : 22.3℃, Cycle Test : 50 Cycle



Leakage body Seal: 1.3 E-06

[Step 3] Static test at the selected test low temperature



Test Pressure : 207 Bar, Temperature : -50℃



Leakage body Seal: 1.3 E-06





BMT CO., LTD

Fugitive Emissions Type Test Report

According to ISO 15848-1

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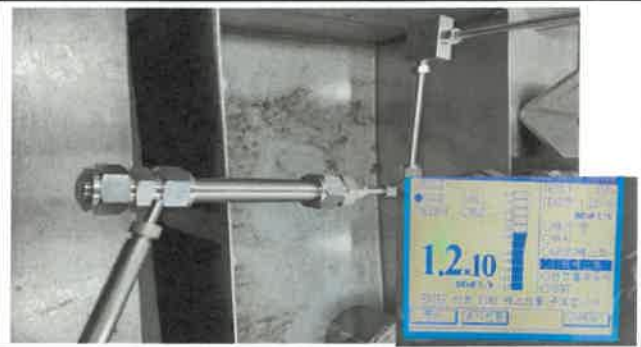
Date 2024.08.05

DOC NO. BMT-TRF240805-01

[Step 4] Mechanical cycle test at the selected test low temperature



Test Pressure : 207 Bar, Temperature : -50°C, Cycle Test : +50 Cycle

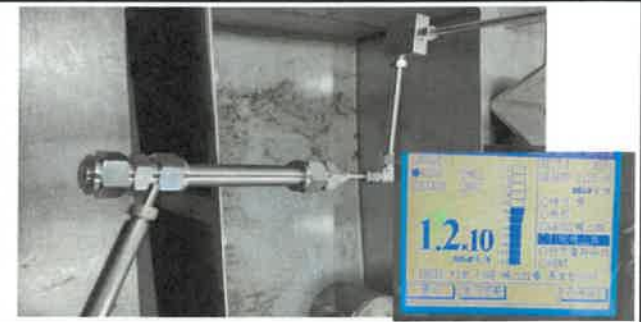


Leakage body Seal: 1.2 E-06

[Step5] Intermediate static test at the max temperature



Test Pressure : 207 Bar, Temperature : 150°C



Leakage body Seal: 1.2 E-06

[Step 6] Mechanical cycle test at the max temperature



Test Pressure : 207 Bar, Temperature : 150°C, Cycle Test : +50 Cycle



Leakage body Seal: 1.2 E-06

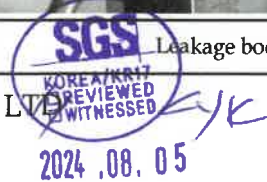
[Step 7] Static test at the selected test low temperature



Test Pressure : 207 Bar, Temperature : -50°C



Leakage body Seal: 1.3 E-06





BMT CO., LTD

Fugitive Emissions Type Test Report

According to ISO 15848-1

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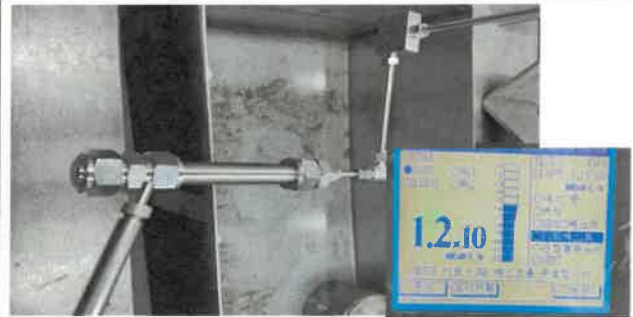
Date 2024.08.05

DOC NO. BMT-TRF240805-01

[Step8] Mechanical cycle test at the selected test low temperature



Test Pressure : 207 Bar, Temperature : -50°C, Cycle Test : +50 Cycle

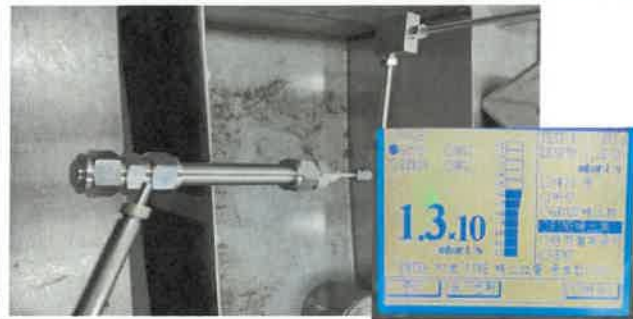


Leakage body Seal: 1.2 E-06

[Step9] Final test at the room temperature



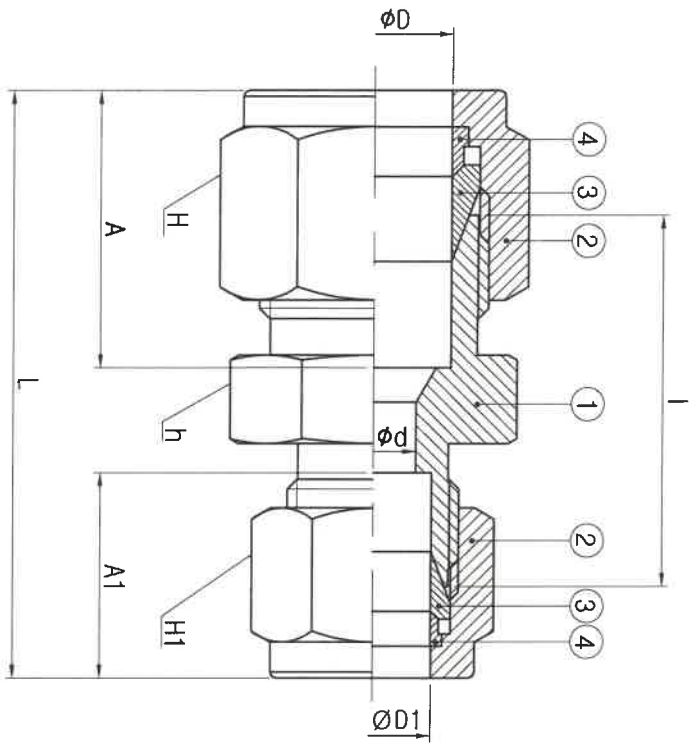
Test Pressure : 207 Bar, Temperature : 21.1 °C



Leakage body Seal: 1.3 E-06

SGS
 KOREA/KR17
 REVIEWED
 & WITNESSED
 2024.08.05

NO.	DESCRIPTION	MATERIAL	QTY	REMARK
1	BODY	BRASS	1	
2	FRONT FERRULE	BRASS	2	
3	BACK FERRULE	BRASS	2	
4	NUT	BRASS	2	



NO.	PART NO.	TUBE O.D. . Inch		d Min	Width Across Flat, Inch				Dimensions, mm				REMARK
		D	D1		h	H	H1	A	A1	I	L		
5	SRU-8-6-B	3/4	1/2	10.4	1-1/16	1-1/8	7/8	24.38	22.86	33.27	53.59		
7, 8	SRU-12-8-B	1	1/2	10.4	1-3/8	1-1/2	7/8	24.3	22.8	39.50	63.24		


 2024.08.05
 YK

Rev. Issue Date	31.AUG.13	Issued for Preliminary	J.H. JEONG	H.P. SEO	J.H. LIM
Rev. Description		Description	J.H. JEONG	H.P. SEO	J.H. LIM
PURCHASER		SGS			
CLIENT					
PROJECT NAME		SGS 215			
PROJECT NO.		-			
PO. NO.		-			
MFR. MODEL/TYPE		SRU Series			
ITEM NAME		REDUCING UNION			
TAG NO.					
DRAWING NO.		- 20240805-01-998-03			
GENERAL ARRANGEMENT DRAWING for TUBE FITTINGS 