

Certificate

**Certificate of Conformity with Fugitive Emission
Testing Acc. to EN ISO 15848-1:2015+2017Amd**

Certificate no.: **01 202 TWN/K-200199**

Name and address of
the applicant / license
holder : **A-T Controls, Inc.
9955 International Blvd. Cincinnati, OH 45246, USA**

We hereby certify that the results of Valve Stem Assembly Sealing System tests carried out under our witness on the industrial valve(s) below meeting the requirements in the standard mentioned above.

This certificate does not imply assessment of the product production. It reflects only our witness findings to tested valve described herein at the time and the place of test, and does not refer to any other matters. This certificate only includes the external leakage test to the stem assembly, excluding any valve body part or sealing leak rate measurement.

Detail valve technical data and manufacturer information refer to Appendix and Test Report.

Model/ Type identification **F9R**
Description of tested valve: **2", Class 300, Ball Valve**
Test Report No.: **T10902011**
Performance Class: **ISO FE BH—CO3—SSA0—t200°C—Class300—ISO 15848-1**

Name, Address of
Manufacturer : **Terofox Valves Integrated Corp.
26F No.789 Zhongming S. Rd., South Dist., Taichung City
40255, Taiwan, R.O.C.**

Certificate valid until: **Feb. 21, 2030**

**TÜV Rheinland Taiwan Ltd.
Industrial Services**



Dr. Fuh-Wen Shiue

**Taipei/Taiwan,
2020/03/11**



Appendix to Certificate 01 202 TWN/K-200199

Construction & Test Data

Name and address of the applicant / license holder : **A-T Controls, Inc.**
9955 International Blvd. Cincinnati, OH 45246, USA

Name, Address of Manufacturer : **Terofox Valves Integrated Corp.**
26F No.789 Zhongming S. Rd., South Dist., Taichung City 40255, Taiwan, R.O.C.

Test Report No.: **T10902011**

Model :	F9R
Nominal Diameter / Nominal Pressure :	2" / Class 300
Type of Valve	Ball Valve
Stem Size/Stem Drawing:	19mm / 20191021-03; 2019.10.21
Body /Stem Seal Drawing:	20191017-04; 2019.10.17
Stem Sealing Material:	Graphite+MG1241
Body Sealing Material:	Seal 1: TFM1600; Seal 2: Graphite+SS316 S.W.
Assembly Drawing:	20200131-01; 2020.01.31
Test Gas:	Helium
Tightness Class:	BH; Leakage Rate $\leq 10^{-4}$ mg /(s*m)
Endurance Class:	CO3; 2,500 mechanical cycles
Temperature Class:	RT to 200°C

This products fulfills the requirement of specified setting of sealing gasket for stem performance and housing seal/packing of TA-Luft 02- Technical Instructions on Air Quality Control, Section 5.2.6.4 of 2002/7/24 in connection with VDI 2440, section 3.3.1.3.

The Valve Sealing System is in compliance with the above mentioned requirements. The test and the classification is based on a type approval and does not include the factory inspection.



Taipei/Taiwan,
2020/03/11

TÜV Rheinland Taiwan Ltd.
Industrial Services

Fuh-Wen Shiu
Dr. Fuh-Wen Shiu

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財團法人金屬工業研究發展中心
METAL INDUSTRIES RESEARCH AND DEVELOPMENT CENTRE

閥類製品國際檢測服務中心

VALVE INTERNATIONAL TEST CENTER

桃園市龍潭區工二路 267 號
TEL:03-4092187 FAX:03-4096892
No. 267, Gong 2nd Rd., Longtan Dist., Taoyuan City 325, Taiwan, R.O.C.

閥製品逸散型式試驗報告
EMISSION TYPE TESTING REPORT OF VALVE
TEST NO. T10902011

組長
LABORATORY CHIEF

謝松良

報告簽署人
REPORT AUTHORIZED PERSON

張志新



Steel Day

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日期： 109 年 02 月 27 日

DATE: Feb. 27, 2020

(1)委託者及地址 <i>NAME AND ADDRESS OF THE CLIENT</i>	台灣德國萊因技術監護顧問股份有限公司 TUV Rheinland Taiwan Ltd. 台北市松山區八德路四段 758 號 11 樓 11F.,No.758,Sec.4,Bade Rd.,Songshan Dist., Taipei, Taiwan (R.O.C.)
(2)閥製造廠商及地址 <i>NAME AND ADDRESS OF VALVE MANUFACTURER</i>	如圖面附件 Refer to drawing attachments
(3)試驗地點 <i>PLACE OF TEST</i>	閥類製品國際檢測服務中心 VALVE INTERNATIONAL TEST CENTER 桃園市龍潭區工二路 267 號 No. 267, Gong 2nd Rd., Longtan Dist., Taoyuan City 325, Taiwan, R.O.C.
(4)試驗日期 <i>THE DATE OF TEST</i>	2020.02.05 ~ 2020.02.21
(5)試驗規範 <i>TEST SPECIFICATION</i>	ISO 15848-1, SECOND EDITION, 2015 (AMENDMENT 1, 2017-02)
(6)閥種類 <i>TYPE OF VALVE</i>	球閥 Ball Valve
(7)型號 <i>MODEL</i>	F9R
(8)閥標稱尺寸 <i>NOMINAL SIZE</i>	2 inch
(9)閥壓力等級 <i>PRESSURE RATING</i>	Class 300
(10)閥桿作動模式 <i>STEM MOTION</i>	Rotating and Non-Rising
(11)閥桿密封 <i>STEM SEAL</i>	Graphite+MG1241
(12)閥體材質 <i>BODY MATERIAL</i>	ASTM A351 CF8M
(13)閥體密封 <i>BODY SEAL</i>	Body Seal 1 : TFM 1600 Body Seal 2 : Graphite+SS 316.S.W.

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(14)閥桿直徑 <i>STEM DIAMETER</i>	ϕ 19.0 mm
(15)閥桿密封尺寸 <i>STEM SEAL DIMENSIONS (ID/OD/H)</i>	19.1 mm / 24.0 mm / 7.5 mm
(16)閥體密封尺寸 <i>BODY SEAL DIMENSIONS (ID/OD/H)</i>	Body Seal 1 : 65.6 mm / 70.0 mm / 3.3 mm Body Seal 2 : 70.0 mm / 80.0 mm / 5.0 mm
(17)測試流體 <i>TEST FLUID</i>	99% Helium
(18)測試溫度/壓力 <i>TEST FLUID TEMPERA- TURE / PRESSURE</i>	RT : 50.6 kgf/cm ² 200°C : 36.4 kgf/cm ²
(19)量測方式 <i>TESTING METHOD</i>	Bagging Mode
(20)偵測器 <i>INSTRUMENT</i>	Varian MODEL : VS PRO2
(21)閥桿行程 <i>STEM TRAVEL</i>	0 -> 90°
(22)循環頻率 <i>CYCLE FREQUENCY</i>	10 cycles/min (Full Close→ Full Open→ Full Close/ For 1 cycle)
(23)累計機械循環次數 <i>ACCUMULATED NUMBER OF MECHANICAL CYCLES</i>	2500 times
(24)允許洩漏值 <i>ALLOWABLE LEAKAGES</i>	Stem : $\leq 3.39 \times 10^{-6}$ atm*cc / sec, (Class AH) $\leq 3.39 \times 10^{-5}$ atm*cc / sec, (Class BH) Body Seal : ≤ 50 ppmv
(25)熱循環 <i>THERMAL CYCLES</i>	4 times
(26)閥桿密封調整次數 <i>NUMBER OF STEM SEAL ADJUSTMENTS</i>	RT ~ 200°C : 0 times

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(27)試驗結果 TEST RESULTS

單項次機械循環 (次) Single Mechanical Cycles (times)	累計機械循環(次) Accumulated Mechanical Cycles (times)	溫度 Temperature (°C) (Flow line)	壓力 Pressure (kgf/cm ²)	洩漏量測 Leakage Measurement		轉動扭矩 Turning Torque (N.m) Open / Close
				閥桿 (Stem) (atm*cc/sec)	閥體密封 (Body Seal) (ppmv)	
0	0	RT	50.6	2.3 x 10 ⁻⁷	-----	28.6/25.0
50	50			1.4 x 10 ⁻⁶		
0	50	200°C	36.4	5.7 x 10 ⁻⁷		
50	100			1.1 x 10 ⁻⁶		
0	100	RT	50.6	6.0 x 10 ⁻⁷		
50	150			1.2 x 10 ⁻⁶		
0	150	200°C	36.4	1.1 x 10 ⁻⁶		
50	200			1.1 x 10 ⁻⁶		
5	205	RT	50.6	1.8 x 10 ⁻⁶	-----	
795	1000			9.7 x 10 ⁻⁶		
0	1000	200°C	36.4	1.2 x 10 ⁻⁶		
500	1500			1.4 x 10 ⁻⁶		
0	1500	RT	50.6	1.3 x 10 ⁻⁶	-----	
500	2000			1.3 x 10 ⁻⁶		
0	2000	200°C	36.4	1.1 x 10 ⁻⁶		
500	2500			1.4 x 10 ⁻⁶		
0	2500	RT	50.6	2.1 x 10 ⁻⁶	-----	6.0/6.3

The judgments in this report are based on the results obtained without considering measurement uncertainty.

Performances Classes Achieved :

Tightness Class : BH

Endurance Class : CO3

Temperature Class : t(RT, 200°C)

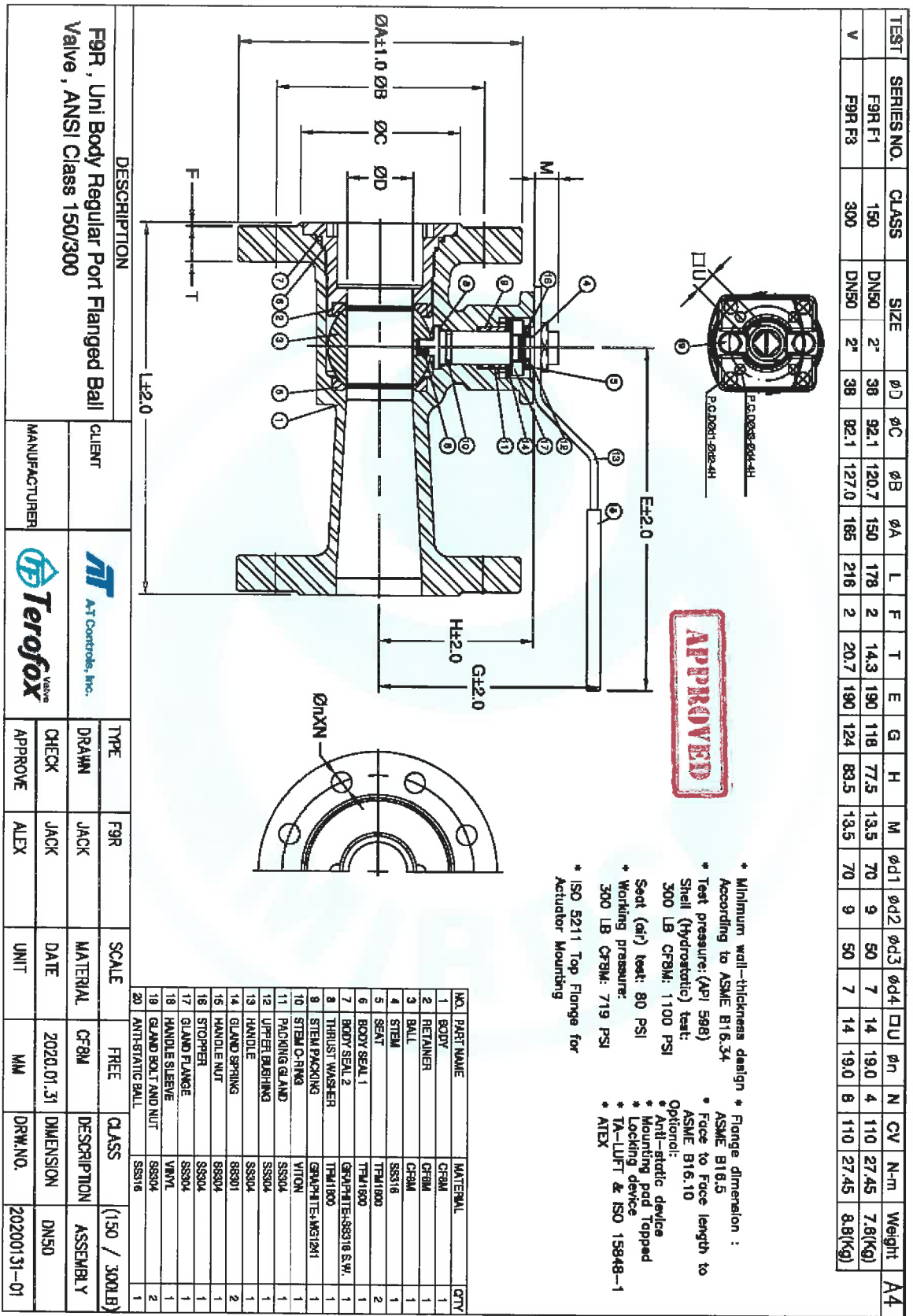
Number of Stem Seal Adjustment : RT ~ 200°C : SSA-0.



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附件 樣品圖面 Attachment Drawing of the Testing Sample
(Drawing No. : 20200131-01)



TEST	SERIES NO.	CLASS	SIZE	ØD	ØC	ØB	ØA	L	F	T	E	G	H	M	Ød1	Ød2	Ød3	Ød4	Øn	N	CV	N-m	Weight	A4	
	F9R F1	150	DN50	2"	38	92.1	120.7	150	178	2	14.3	190	118	77.5	13.5	70	9	50	7	14	19.0	4	110	27.45	7.8(kg)
V	F9R F3	300	DN50	2"	38	92.1	127.0	165	216	2	20.7	190	124	83.5	13.5	70	9	50	7	14	19.0	8	110	27.45	8.8(kg)

DESCRIPTION
F9R, Uni Body Regular Port Flanged Ball Valve, ANSI Class 150/300

CLIENT
A.T Controls, Inc.

MANUFACTURER
Terofox Valve

TYPE
DRAWN JACK
CHECK JACK
APPROVE ALEX

SCALE
FREE

MATERIAL
CF8M

DATE
2020.01.31

UNIT
MM

CLASS
150 / 300(LB)

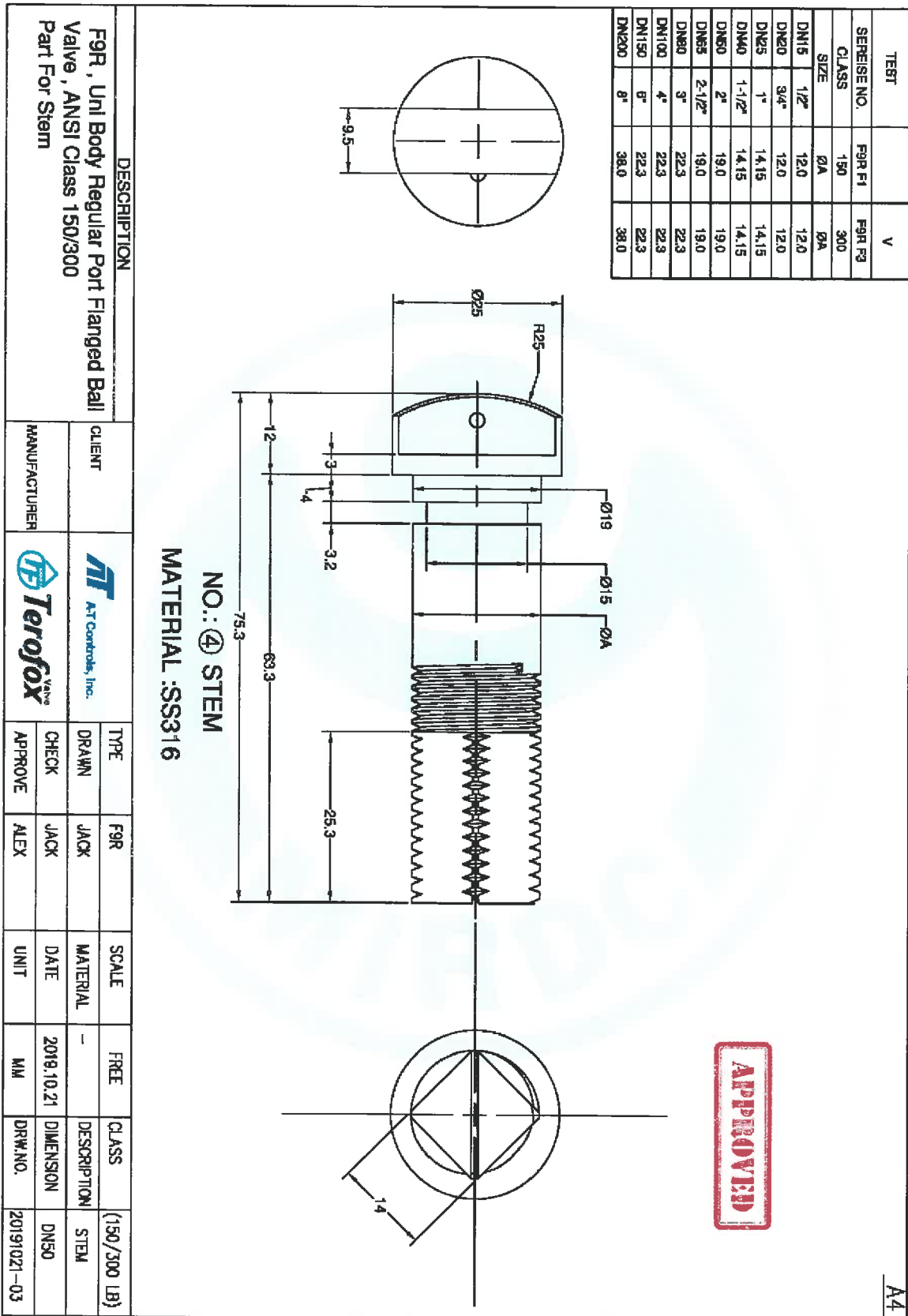
DESCRIPTION
ASSEMBLY

DIMENSION
DN50

DRW. NO.
20200131-01

TEST NO. T10902011

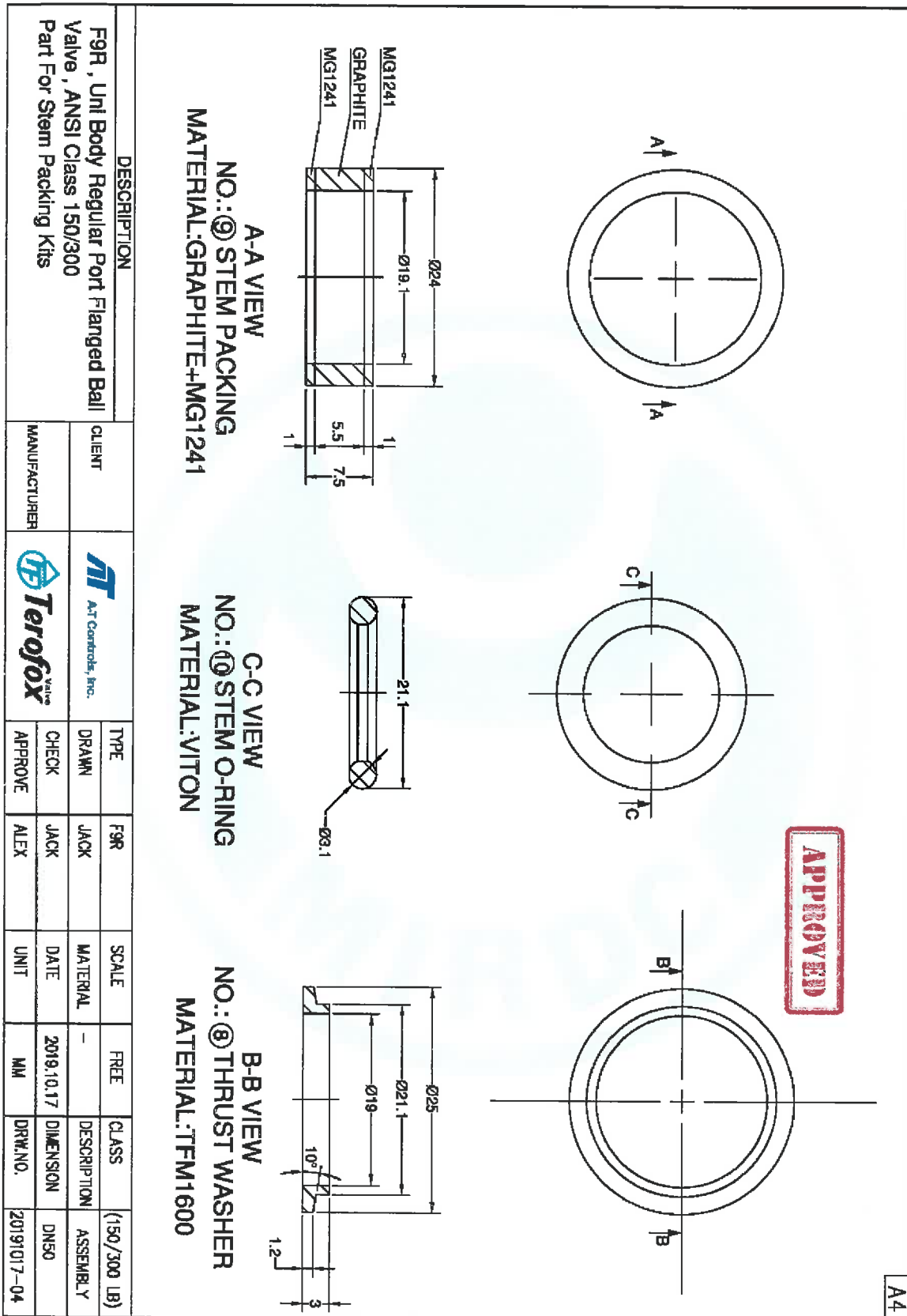
附件 閥桿圖面 Attachment Drawing of the Stem
(Drawing No. : 20191021-03)



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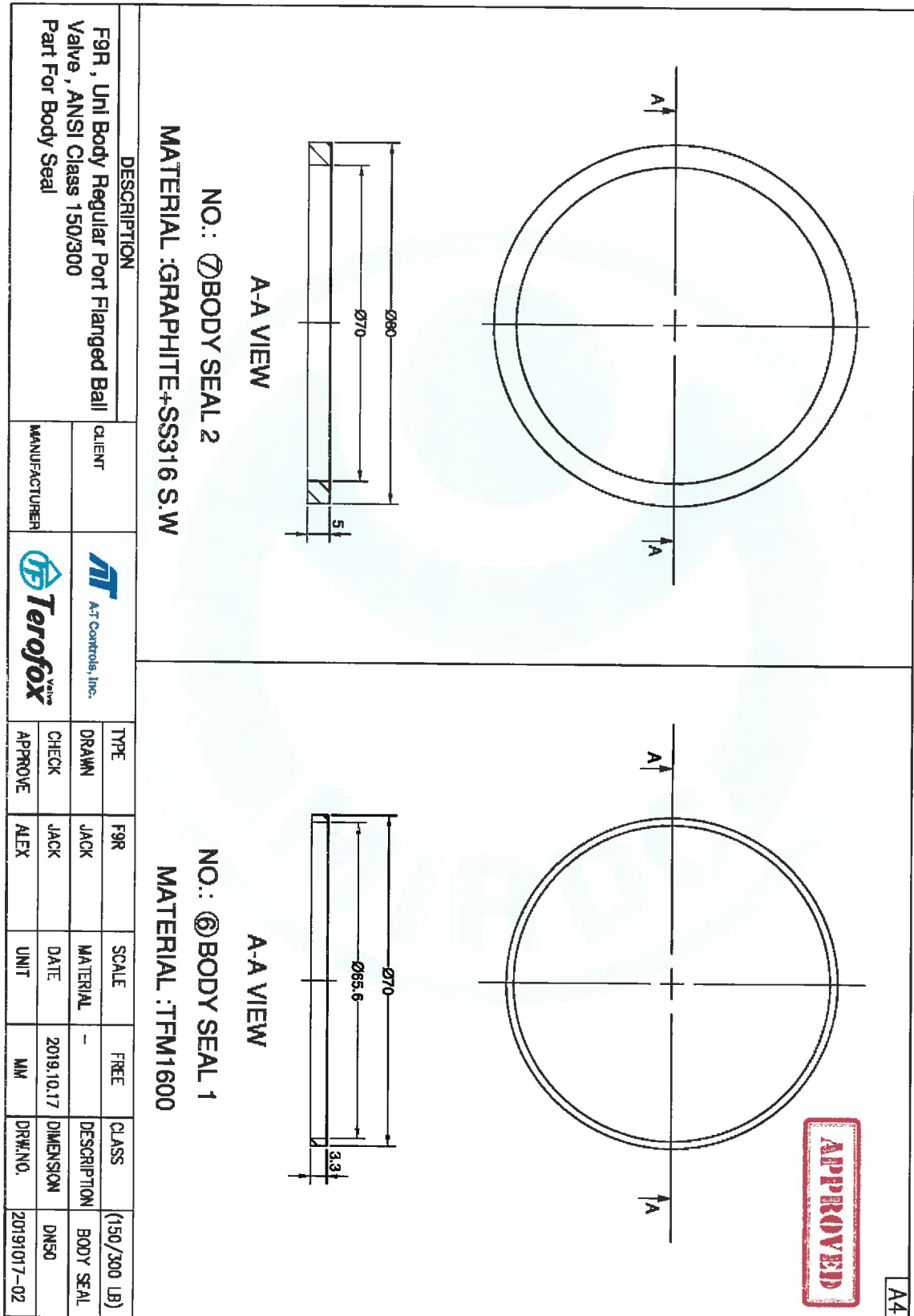
附件 閥桿密封圖面 Attachment Drawing of the Stem packing
(Drawing No. : 20191017-04)



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附件 閥體密封圖面 Attachment Drawing of the Body Seal
(Drawing No. : 20191017-02)



APPROVED

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TEST

NO. T10902011



附件 廠商自行壓力測試證明 (續)

Attachment Manufacturers self-pressure test certificate (continued)

 Terofox Valves Integrated Corp	試壓紀錄 Pressure Test Record						
	文件號(Doc.No.)	TFQ-06-02	版本(Ver)	A	發行日期(Date)	2017/03/10	頁碼(Page)

客戶 Customer	A-T Controls, Inc	單號 Ref No.	
客戶單號 PO No.		訂單號 PI No.	
型號 Model No.	F9R (F3)		
產品描述 Products Description	F9R , UNI BODY REGULAR PORT FLANGE BALL VALVE , ASME CLASS 300		
尺寸 Size	2"	數量 Quantity	1
標稱壓力 Pressure	720 Psi	測試標準 Test STD	API 598


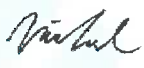
測試照片 Photos

閥門序列號 Valve Serial No.		
殼體試壓 Shell Test	閥門 Valve	壓力錶 Guage
		
高壓密封測試 High Pressure Closure Test	閥門 Valve	壓力錶 Guage
	No Test	No Test
高壓密封測試 High Pressure Closure Test	左側 Left side	壓力錶 Guage
	No Test	No Test
	右側 Right side	壓力錶 Guage
	No Test	No Test



附件 廠商自行壓力測試證明 (續)

Attachment Manufacturers self-pressure test certificate (continued)

		試壓紀錄 Pressure Test Record	
Terofox Valves Integrated Corp		文件號(Doc No.)	TFQ-06-02
		版本(Ver)	A
		發行日期(Date)	2017/08/10
		頁碼(Page)	2 / 2
低壓密封測試 Low Pressure Closure Test	左側 Leftside	壓力錶 Guage	
		80 Pis	
	右側 Right side	壓力錶 Guage	
		80 Psi	
結果及核准 Result & Signature			
<input checked="" type="checkbox"/> 合格 Acceptable <input type="checkbox"/> 不合格 Unacceptable <input type="checkbox"/> 重做/修補 Rework / Repair			
檢驗員簽章(Inspected by): 		檢驗日期(Date): 2020.02.03	



附件：測試照片 Attachment Testing Pictures



照片一 測試樣品(球閥 2 inch Class 300)
Picture 1 Test sample (Ball Valve 2 inch Class 300)



照片二 閥桿洩漏量測過程
Picture 2 View of Emission Test



照片三 測試壓力 50.6 kgf/cm²
Picture 3 Test Pressure 50.6 kgf/cm²



照片四 計數單元
Picture 4 Counter



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TEST NO. T10902011