API Standard 641, First Edition, 2016
Test Report

"Type Testing of Quarter-turn Valves for Fugitive Emissions"

Performed for

Guide Valve Limited

www.gvs-vci.com

4 inch ANSI 2500 Trunnion Mounted Ball Valve
Product Code: 4" ANSI 2500 GB1

Project Number: 220106
Test Start Date: March 12, 2020

Performed by

YARMOUTH RESEARCH AND TECHNOLOGY, LLC

434 Walnut Hill Road
North Yarmouth, ME 04097 USA
(207) 829-5359
info@yarmouthresearch.com
www.yarmouthresearch.com

Yarmouth Research and Technology, LLC

API 641 TEST CERTIFICATE

Certificate Number:	220106A

Test Start Date:	12-Mar-20
Test End Date:	18-Mar-20

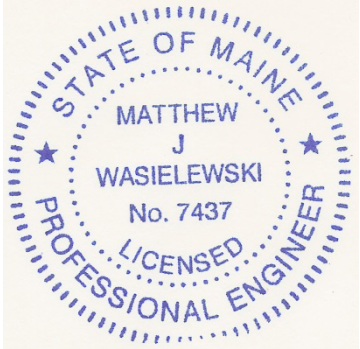
Customer Information	
Customer:	Guide Valve Limited
Web Address:	www.gvs-vci.com
Manufacturer Location:	51 Terecar Drive, Woodbridge, Ontario, Canada

Valve Information			
Valve Size:	4"	Valve Pressure Class:	2500
Valve Description:	4" ANSI Trunnion Mounted Ball Valve		
Product Code:	4" ANSI 2500 GB1		
Assembly Drawing No.:	*Not Supplied*		
API/ASME Design Standards:	API 6D, ASME B16.34		
Stem Seal Description:	LIP SEALS + GRAPHITE		
Body Seal Description:	Graphite		

Test Results		
Test Specification:	API 641, First Edition, 2016	
Max. Allowable Stem Seal Leakage:	100	PPMv Methane
Number of Mechanical Cycles:	610	
High Temperature:	464	deg. F
Test Pressure at Ambient Temp.:	600 psig	
Test Pressure at High Temp.:	600 psig	
Did valve pass test requirements?	***YES***	

Valves of the same quarter-turn design as the test valve may be deemed to be qualified subject to paragraph 11 of the test specification.

Matthew J. Wasielewski, PE
President and Manager
Yarmouth Research and Technology, LLC
434 Walnut Hill Road
North Yarmouth, ME 04097 USA



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FUGITIVE EMISSION TEST SUMMARY

Customer: Guide Valve Limited **Start Date:** 12-Mar-20

Project Number: 218488 **End Date:** 18-Mar-20

Manufacturing Facility: 51 Terecar Drive, Woodbridge, Ontario, Canada

Valve Information

Valve Description:	4" ANSI Trunnion Mounted Ball Valve		
Product Code:	4" ANSI 2500 GB1		
Valve Selected by:	Manufacturer		
API/ASME Design Standard(s):	API 6D, ASME B16.34		
Body Material:	ASTM 350 LF2	Stem Material:	4140
Body Seal Description:	Graphite		
Manufacturer's Published Running Torque:	671 ft-lb	Closing Torque:	811 ft-lb

Stem Seal Information

Stem Seal Description:	LIP SEALS + GRAPHITE				
Recommended Packing Torque:	*N/A*				
Nominal ID:	2.24	inches	OD:	2.56	inches
Minimum Sealing Stress:	*N/A*		Stack Height:	1.57	inches
Stem Seal Chamber Depth:	1.77	inches	# of Rings:	3 LIP SEALS + 1 GRAPHITE	

Test Conditions

Test Specification:	API 641, First Edition, 2016		
Maximum Allowable Leakage:	100	PPMv	
Cycling Rate:	30	seconds per cycle	
Maximum Temperature:	464	F	
Amb. Temp. Test Pressure:	600 psig	High Temp. Test Pressure:	600 psig

Stem Seal Leakage Data

Cycle Number	*Stem Seal Temp - (F)*	*Pressure (psig)*	*Static Leakage (PPMv)*		*Dynamic Leakage (PPMv)*	
			Avg.	*Max.*	*Avg.*	*Max.*
0	70	600	1	1		
100	70	600	6	7	7	8
101	463	600	14	16		
200	461	600	13	15	19	20
201	73	600	1	2		
300	73	600	0	1	1	1
301	462	600	6	7		
400	464	600	5	6	5	6
401	93	600	1	1		
500	91	600	3	3	2	3
501	465	600	1	2		
600	464	600	3	3	3	4
601	90	600	1	1		
610	87	600	0	1	1	1
		Averages ->	**4**	**5**	**5**	**6**
		Maximums ->	**14**	**16**	**19**	**20**

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Body Seal Leakage

Leak Path	*Cycle Number*	*Bonnet Temp - (F)*	*Pressure (psig)*	*Leakage (PPMv)*	
				Avg.	*Max.*
Body Seal A	0	71	600	1	1
Body Seal B	0	71	600	1	1
Bonnet Seal	0	71	600	1	1
Body Seal A	610	80	600	0	1
Body Seal B	610	80	600	0	1
Bonnet Seal	610	78	600	1	1

Operating Actuator Pressure			
	Operating Actuator Pressure First Cycle:	15	psig
	Operating Actuator Pressure Last Cycle:	10	psig

Results

Number of Mechanical Cycles Completed:	610	
Number of Thermal Cycles Completed:	3	
Maximum Static Leakage Throughout Test:	16	PPMv
Maximum Dynamic Leakage Throughout Test:	20	PPMv
Maximum Body/Bonnet Leakage Throughout Test:	1	PPMv

Final Test Results:	**PASS**

Qualifications of similar valves according to para. 11 of test standard per		
	Valve Group:	***D***

Test Notes:

Certified By

Matthew J Wasielewski, PE
President and Manager
Yarmouth Research and Technology, LLC
Test Technician: Jesse Jarvi