

ISO 15848-1
Helium Fugitive Emission Test Report

Performed for

Metso Automation

www.metso.com



1" Class 600 Series 4000 Ball Valve
1 4A2236XTB1

CO3 Endurance Level

Project Number: 212272

Test Date: Jan. 4, 2013



Performed by

YARMOUTH RESEARCH AND TECHNOLOGY, LLC

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Fugitive Emission Test Data Sheet

Customer: Metso Automation

Date: 1/4/2013

Project #: 212272

Product Description: 1" Cl600 ball valve with mounted pneumatic actuator

1 4A2236XTB1

Packing Description: stem seals: TFM, stem bearings: TFM, stem seal configuration: live loaded

Sample Supplied by: Customer

Stem Diameter: 12.6 mm

Packing Nut Torque: 20 in*lbs

Test Conditions

Test Standard: ISO 15848-1, First Edition 2006

Test Stand: Yarmouth Stand 1

Tightness Class: BH

Allowable: 2.21E-05 atm cc/sec

Test Media: 99% Helium

Endurance Class: C03 2500 Mechanical Cycles

Temperature Class: 200C 4 Thermal Cycles

Pressure Class: 600

Rating: 1200 @ambient

800 @high temp

Testing Method: Purge for stem seals, sniffing (enclosed area) for bonnet seal

Mounting Position: Stem and Bore Horizontal

Max. Allowable Bonnet Gasket Leakage: 50 PPMv by sniffing method

Leakage Device: Pfeiffer SmartTest HLT560

Cycling Rate: 1 cycle per 15 seconds

Test Data Summary - Stem Seal

Cycle Number	Nom.Temp (C)	Stem Seal Leakage Readings - atm cc/sec				Packing	Actuator
		Static		Dynamic		Retorque	Pressure
		Avg.	Max.	Avg.	Max.	See Notes	(psig)
0	20	8.8E-07	9.7E-07	2.0E-06	2.1E-06		30
125	20	1.9E-06	2.0E-06	2.6E-06	2.7E-06		30
125	200	1.2E-05	1.2E-05	1.1E-05	1.2E-05		30
250	200	8.7E-06	8.9E-06	8.9E-06	9.3E-06		30
250	20	3.1E-06	4.0E-06	7.5E-06	9.2E-06	1	30
375	20	4.0E-06	5.3E-06	4.9E-06	6.2E-06		30
375	200	4.7E-06	4.9E-06	5.6E-06	5.9E-06		30
500	200	6.3E-06	6.5E-06	6.7E-06	7.0E-06		30
500	20	1.1E-05	1.2E-05	1.2E-05	1.7E-05		30
1,000	20	5.1E-06	6.6E-06	7.7E-06	9.0E-06	2	30
1,000	200	8.4E-06	8.6E-06	8.5E-06	8.6E-06		30
1,500	200	5.2E-06	5.5E-06	5.4E-06	5.7E-06		30
1,500	20	7.9E-06	8.4E-06	1.3E-05	1.7E-05		30
2,000	20	9.4E-06	1.4E-05	1.4E-05	2.3E-05	3	30
2,000	200	3.6E-06	3.7E-06	3.8E-06	3.9E-06		30
2,500	200	5.2E-06	5.4E-06	5.4E-06	5.5E-06		30
2,500	20	5.9E-06	6.5E-06	9.9E-06	1.4E-05		30
Maximum Leakage:		1.2E-05	1.4E-05	1.4E-05	2.3E-05		30
Maximum Allowable:		2.21E-05	2.21E-05				

Yarmouth Research and Technology, LLC

Test Data Summary - Bonnet Seal

Cycle Number	Nom.Temp (C)	Leakage - PPMv	
		Avg.	Max.
0	20	1	1
500	20	1	1
1,500	20	1	1
2,500	20	1	1
Maximum Leakage:		1	1
Maximum Allowable:		50	50

Packing Retorque Notes:

			Static Leakage		Before	After
Adjustment	Cycle	Nom.Temp	Readings before Tightening		Adjustment	Adjustment
Number	Number	(C)	Avg.	Max.	Nut Torque	Nut Torque
					(in-lb)	(in-lb)
1	250	20	3.2E-04	3.9E-04	15	20
2	1,000	20	6.3E-03	6.5E-03	12	25
2	2,000	20	2.1E-03	2.9E-03	12	25
	Maximum Allowable:		2.21E-05	2.21E-05		

Results

Valve did passed CO3 level with 3 packing nut adjustments.

Additional valves qualified by this test according To Section 8 of the standard:

½" -2" (DN 15-50)	4000-Series Mod. B, (Reduced Bore)
½" - 1½" (DN 15-40)	4000-Series Mod. B, (Full Bore)
¼" - 2" (DN 15-50)	Eliminator, Mod. B, Ball Valves
¼" - 2" (DN 15-50)	A-Style, Mod. D, Ball Valves
½" - 2" (DN 15-50)	7000- Series, Flanged, Ball Valves
½" - 1½" (DN 15-40)	9000- Series, Flanged, Ball Valves

Witnessed:

President, Yarmouth Research

Matthew J. Wasielewski

