

**ISO 15848-1:2015**  
**Helium Fugitive Emission Test Report**

*Performed for*

**A-T Controls, Inc.**

[www.a-tcontrols.com](http://www.a-tcontrols.com)



2R80DAV Actuator with FKM Seals  
Mounted to a 1-1/2 inch Class 150 Series F90 Ball Valve  
Product Code: F90-F1-150/2R3D-XX

Project Number: 218159  
Test Start Date: December 3, 2018



*Performed by*

**YARMOUTH RESEARCH AND TECHNOLOGY, LLC**

434 Walnut Hill Road  
North Yarmouth, ME 04097 USA  
(207) 829-5359  
[info@yarmouthresearch.com](mailto:info@yarmouthresearch.com)  
[www.yarmouthresearch.com](http://www.yarmouthresearch.com)

# Yarmouth Research and Technology, LLC

## Fugitive Emission Test Data Sheet

**Customer:** A-T Controls, Inc

**Date:** 12/3/2018

**Project #:** 218159

**Valve Description:** 2R80DAV actuator with FKM seals mounted to a 1-1/2" Series F90

**Product Code:** F90-F1-150/2R3D-XX

**Sample Supplied by:** Customer

**Stem Diameter:** 19.1 mm

**Packing Nut Torque:** 208 in\*lbs

**Test Conditions**

**Test Standard:** ISO/FDIS 15848-1:2015

**Test Stand:** Yarmouth Stand 1

**Tightness Class:** BH

**Allowable:** 3.39E-05 mbar l/sec

**Test Media:** 99% Helium

**Endurance Class:** CO3 2500 Mechanical Cycles

**Temperature Class:** 200C 4 Thermal Cycles

**Pressure Class:** ANSI 150

**Rating:** 285 psig @ambient

198 psig @high temp

**Testing Method:** Suck Through Method

**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 20 seconds

**Test Data Summary - Stem Seal**

| Cycle Number       | Nom.Temp (C) | Static Stem Seal Leakage (mbar l/sec) |          | Packing Retorque See Notes |
|--------------------|--------------|---------------------------------------|----------|----------------------------|
|                    |              | Avg.                                  | Max.     |                            |
| 0                  | 20           | 1.3E-06                               | 1.5E-06  |                            |
| 50                 | 20           | 1.1E-06                               | 1.5E-06  |                            |
| 50                 | 200          | 1.4E-06                               | 1.4E-06  |                            |
| 100                | 200          | 1.0E-06                               | 1.1E-06  |                            |
| 100                | 20           | 8.5E-07                               | 9.0E-07  |                            |
| 150                | 20           | 8.3E-07                               | 8.8E-07  |                            |
| 150                | 200          | 3.6E-06                               | 3.7E-06  |                            |
| 200                | 200          | 1.9E-06                               | 9.1E-07  |                            |
| 205                | 20           | 9.1E-07                               | 9.9E-07  |                            |
| 1,000              | 20           | 1.2E-06                               | 1.2E-06  |                            |
| 1,000              | 200          | 1.1E-05                               | 1.1E-05  |                            |
| 1,500              | 200          | 6.3E-06                               | 6.3E-06  |                            |
| 1,500              | 20           | 1.1E-06                               | 1.1E-06  |                            |
| 2,000              | 20           | 6.7E-04                               | 6.8E-04  | 1                          |
| 2,000              | 20           | 1.7E-06                               | 1.9E-06  |                            |
| 2,000              | 200          | 1.6E-06                               | 1.7E-06  |                            |
| 2,500              | 200          | 1.1E-06                               | 1.1E-06  |                            |
| 2,500              | 20           | 1.2E-06                               | 1.3E-06  |                            |
| Maximum Leakage:   |              | 6.7E-04                               | 6.8E-04  |                            |
| Maximum Allowable: |              | 3.39E-05                              | 3.39E-05 |                            |

# Yarmouth Research and Technology, LLC

## *Test Data Summary - Body Seal*

| Cycle Number       | Nom.Temp (C) | Leakage - PPMv |      |
|--------------------|--------------|----------------|------|
|                    |              | Avg.           | Max. |
| 0                  | 20           | 0              | 0    |
| 205                | 20           | 0              | 0    |
| 1,500              | 20           | 0              | 1    |
| 2,500              | 20           | 1              | 1    |
| Maximum Leakage:   |              | 1              | 1    |
| Maximum Allowable: |              | 50             | 50   |

## *Test Data Summary - Operating Actuator Pressure*

| Cycle Number | Nom.Temp (C) | Operating Actuator Pressure (psig) |
|--------------|--------------|------------------------------------|
| 0            | 20           | 25                                 |
| 2,500        | 20           | 9                                  |

## *Packing Retorque Notes:*

| Adjustment Number                 | Static Leakage Readings before Tightening (mbar l/sec) |          | Before Adjustment Nut Torque (ft-lb) | After Adjustment Nut Torque (ft-lb) | Operating Actuator Pressure (psig) |                  |
|-----------------------------------|--|----------|--------------------------------------|-------------------------------------|------------------------------------|------------------|
|                                   | Avg.   | Max.     |                                      |                                     | Before Adjustment                  | After Adjustment |
|                                   | 1  |          |                                      |                                     |                                    |                  |
| 2                                 |  |          |                                      |                                     |                                    |                  |
| 3                                 |  |          |                                      |                                     |                                    |                  |
|                                   |  | 3.39E-05 | 3.39E-05                             | <- Maximum Allowable Leakage        |                                    |                  |
| <b>Nut Torque at End of Test:</b> |  |          |                                      | 10                                  | <i>ft-lb</i>                       |                  |

## *Performance Class:*

ISO FE BH - CO3 - SSA 1 - t200C - ANSI Class 150 - ISO 15848-1

## *Results*

The valve met the requirements of the performance class stated above.

## *Certified By*



Matthew J. Wasielewski, PE  
 President and Manager  
 Yarmouth Research and Technology, LLC

