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

*Performed for*

**A-T Controls, Inc.**

www.a-tcontrols.com

1½ inch FD9C-F6 Series Direct Mount API-607
4th Edition Firesafe 2-Piece, NACE MR-0175,
Carbon Steel BV, ANSI 600# Flanged, Full Port,
F07 / F10 B.C., W/ CTFE Seats
Product Code: FD9C-F1-0150-CXX

Project Number: 220336
Test Start Date: September 25, 2020

*Performed by*


**YARMOUTH RESEARCH AND TECHNOLOGY, LLC**

434 Walnut Hill Road
North Yarmouth, ME 04097 USA
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# Yarmouth Research and Technology, LLC

## Fugitive Emission Test Certificate
### ISO 15848-1: 2015

| | |
|---|---|
| ***Certificate Number:*** | 220336A |

| | |
|---|---|
| ***Test Start Date:*** | 9/25/2020 |
| ***Test End Date:*** | 10/1/2020 |

***Customer Information***

| | |
|---|---|
| Customer: | A-T Controls, Inc. |
| Web Address: | www.a-tcontrols.com |
| Manufacturer Location: | 9955 International Blvd. Cincinnati, OH 45246 |

***Valve Information***

| | | | |
|---|---|---|---|
| Valve Description: | 1-1/2" FD9C-F6 Series Direct Mount API-607 4th Edition Firesafe 2-Piece, NACE MR-0175, Carbon Steel BV, ANSI 600# Flanged, Full Port, F07 / F10 B.C., W/ CTFE Seats. | | |
| Product Code: | FD9C-F1-0150-CXX | | |
| Body Material: | ASTM A216 Grade WCB | | |
| Body Seal: | Graphite | | |
| Stem Material: | ASTM A276 316SST | | |
| Stem Seal: | Graphite | | |
| Tightness Class: | BH | Stem Diameter: | 23.9 mm |
| Test Fluid: | Helium | Valve Size: | 1 1/2 inch |
| Endurance Class: | CO2 | Valve Pressure Class: | ANSI 600 |
| Temperature Class: | 200C | Number of Packing Adjustments: | 0 |

***Test Results***

**Performance Class: ISO 15848-BH-CO2-SSA0-t(200C)-ANSI Class 600**

***This certificate refers to the above mentioned product. This is to certify that the test specimen provided is in conformity with the standard mentioned above. This certificate does not imply assessment of the production of the product. Qualification of similar valves to the tested valve shall be done in accordance with section 8 of the test specification.***

***Certified By***

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

## Fugitive Emission Test Data Sheet

**Customer:** A-T Controls, Inc. **Date:** 9/25/2020

**Project #:** 220336

**Valve Description:** 1-1/2" FD9C-F6 Series Direct Mount API-607 4th Edition Firesafe 2-Piece, NACE MR-0175, Carbon Steel BV, ANSI 600# Flanged, Full Port, F07 / F10 B.C., W/ CTFE Seats.

**Product Code:** FD9C-F1-0150-CXX

**Sample Supplied by:** Customer

**Stem Diameter:** 23.9 mm

**Packing Nut Torque:** 17.3 ft-lb

***Test Conditions***

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

**Tightness Class:** BH **Allowable:** 4.3E-05 mbar l/sec

**Test Media:** 99% Helium

**Endurance Class:** CO2 1500 Mechanical Cycles

**Temperature Class:** 200C 3 Thermal Cycles

**Pressure Class:** ANSI 600 **Rating:** 1480 psig @ambient 1270 psig @high temp

**Testing Method:** Suck Through Method

**Mounting Position:** Stem and Bore Horizontal

**Max. Allowable Body Seal Leakage:** 50 PPMv by sniffing method

**Leakage Device:** Pfeiffer SmartTest HLT560

**Cycling Rate:** 1 cycle per 30 seconds

***Test Data Summary - Stem Seal***

| *Cycle Number* | *Nom.Temp (C)* | *Static Stem Seal Leakage (mbar l/sec)* | | *Packing* |
|---|---|---|---|---|
| | | *Avg.* | *Max.* | *Retorque See Notes* |
| 0 | 20 | 8.8E-07 | 9.1E-07 | |
| 50 | 20 | 9.5E-07 | 9.9E-07 | |
| 50 | 200 | 1.0E-05 | 1.3E-05 | |
| 100 | 200 | 1.4E-05 | 1.6E-05 | |
| 100 | 20 | 1.5E-06 | 1.5E-06 | |
| 150 | 20 | 2.5E-06 | 2.8E-06 | |
| 150 | 200 | 1.7E-05 | 2.2E-05 | |
| 200 | 200 | 1.9E-05 | 2.2E-05 | |
| 205 | 20 | 2.1E-06 | 2.3E-06 | |
| 1,000 | 20 | 2.2E-06 | 2.8E-06 | |
| 1,000 | 200 | 6.1E-06 | 6.4E-06 | |
| 1,500 | 200 | 7.6E-07 | 7.7E-07 | |
| 1,500 | 20 | 1.6E-06 | 1.9E-06 | |
| Maximum Leakage: | | **1.9E-05** | **2.2E-05** | |
| Maximum Allowable: | | **4.3E-05** | **4.3E-05** | |

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## *Test Data Summary - Body Seal*

| *Cycle Number* | *Nom.Temp (C)* | *Leakage - PPMv* | |
|---|---|---|---|
| | | *Avg.* | *Max.* |
| 0 | 20 | 0 | 1 |
| 205 | 20 | 0 | 1 |
| 1,500 | 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 | 15 |
| 1,500 | 20 | 16 |

## *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 | | | | | | |
| | **4.3E-05** | **4.3E-05** | **<- Maximum Allowable Leakage** | | | |

## *Performance Class:*

ISO FE BH - CO2 - SSA 0 - t200C - ANSI Class 600 - 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