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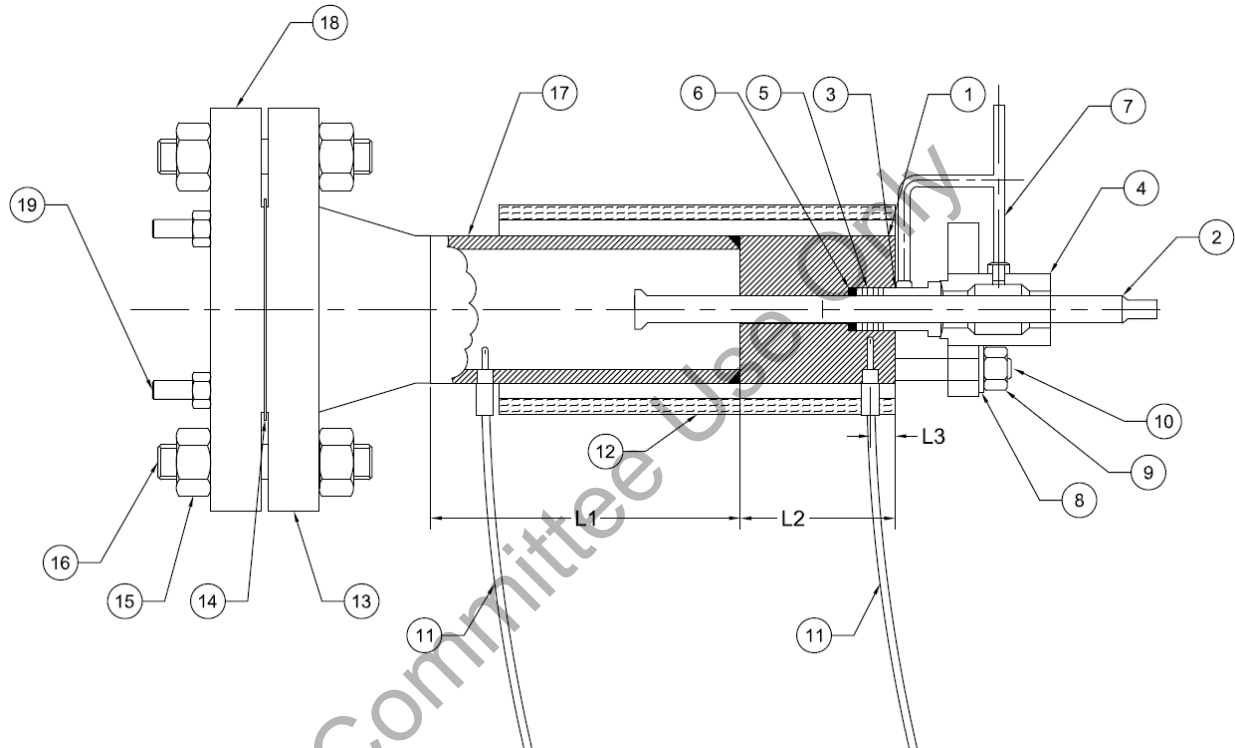
**Affected Publication:** API 622, *Type Testing of Process Valve Packing for Fugitive Emissions*, Third Edition, October 2018

## Addendum 1

Page 1, Section 1 Scope add d) to the first list

d) See Addendum 1, Annex HT for High Temperature Testing Procedure

Page 5, Figure 1 and Table 1 revised dimension L3 and changed the height of the gland flange:



Page 4, Section 4.1.1 Table 3 add at end of paragraph:

All dimensions and tolerances in Table 3 are to be checked and verified prior to testing.

Page 5, Table 1 revised dimension L3: (Moved Thermocouple closer to packing)

Item	1/8 in. Packing Fixture	1/4 in. Packing Fixture
L3	15.88 mm (0.625 in.)	28.58 mm (1.125 in.)

Page 6, Table 2 revised the height of the gland flange: (Changed Gland Height to 1" to resemble a valve)

Item	1/8 in. Packing Fixture	1/4 in. Packing Fixture
D	25.4 mm (1.00 in.)	25.4 mm (1.00 in.)

Page 7, Table 3 revised the Stuffing Box Depth: (Revised bore depth on the 1/4" rig from 1.75 to 1.375+/- .062")

Item	1/8 in. Packing Fixture	1/4 in. Packing Fixture
Stuffing box depth (including bottom spacer)	19.05 mm $\pm$ 1.57 mm (0.75 in. $\pm$ 0.062 in.)	34.9 mm $\pm$ 1.57 mm (1.375 in. $\pm$ 0.062 in.)

*Page 8, Section 4.2.2 a) revised paragraph shall read:*

Maximum repeatability:  $\pm 2.0$  ppmv at 0 ppmv to 100 ppmv

*Page 8, Section 4.2.2 c) revised paragraph shall read:*

Maximum response time to reach final value (from 0 ppmv to 100 ppmv): 15 seconds.

*Page 8, Section 4.2.2 d) revised paragraph shall read:*

Maximum recovery time to return to 10 % of initial value: 10 seconds

*Page 8, Section 4.2.2 e) revised paragraph shall read:*

Sample flow rate at probe inlet: 0.25 - 1.5 l/min

*Page 16, Section 6.1b) revised paragraph shall read:*

A sample from each ring in the packing set, die-formed or braided, will be tested.

*Page 16, Section 6.1gi) ~~revised~~-added paragraph shall read:*

After one hour, the samples shall continue ramping up at 10 °C (18 °F) per minute to the final test temperature of 593 °C (1100 °F)  $\pm 2$  °C (3.6 °F). This test temperature shall be held for 24 hours and then cooled.

*Page 16, Section 6.1hj) revised paragraph shall read:*

Weigh samples after cooling and record weight.

*Page 16, Section 6.1end of section add the following note to the end of this section:*

NOTE: TGA testers have the capability to weigh samples without being removed from the heat source. This test method also follows an established testing standard, FSA-G-604-07 Method B, issued by the Fluid Sealing Association.

*Annex HT, New Annex added for High Temperature Testing of Packing.*

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**Annex HT**  
**High Temperature Testing Procedure**  
**(Informative)**

## **HT.1 Packing Selection and Preparation**

### **HT.1.1 General**

The high temperature test of Annex HT may be performed after completion of testing per Section 4 of this standard (i.e.; after completion of 1510 mechanical cycles) or done on a stand alone basis using new packing.

### **HT.1.2 Pre-Qualification**

The packing shall ~~meet~~ be qualified to the latest edition of API 622 latest edition before commencing with evaluation per this annex.

### **HT.1.3 Test Preparation**

If this test is done as a continuation to the standard temperature test of Section 4, the gland nuts shall be removed and the studs and threads cleaned and relubricated. Torque the previously tested packing ~~The packing is be installed and torqued~~ per paragraph 4.3.3.

If this is a new test of a previously compliant packing then install new packing per manufacturers recommended procedure.

## **HT.2 Test Setup**

### **HT.2.1 Test Media**

97% minimum purity methane shall be used as the test gas at room temperature. At the elevated temperatures specified in this annex, 97% minimum purity helium shall be used.

### **HT.2.2 Miscellaneous**

All other setup and calibration requirements not noted above, shall be per Section 4.

## **HT.3 Test Profile**

The following describes the testing cycles in Figure 4-HT

a) Mechanical cycles for the first 3 days are 100 per day.

b) Thermal cycle per day is 1.

~~e) Record gland height at start, end and after any gland nut adjustments.~~

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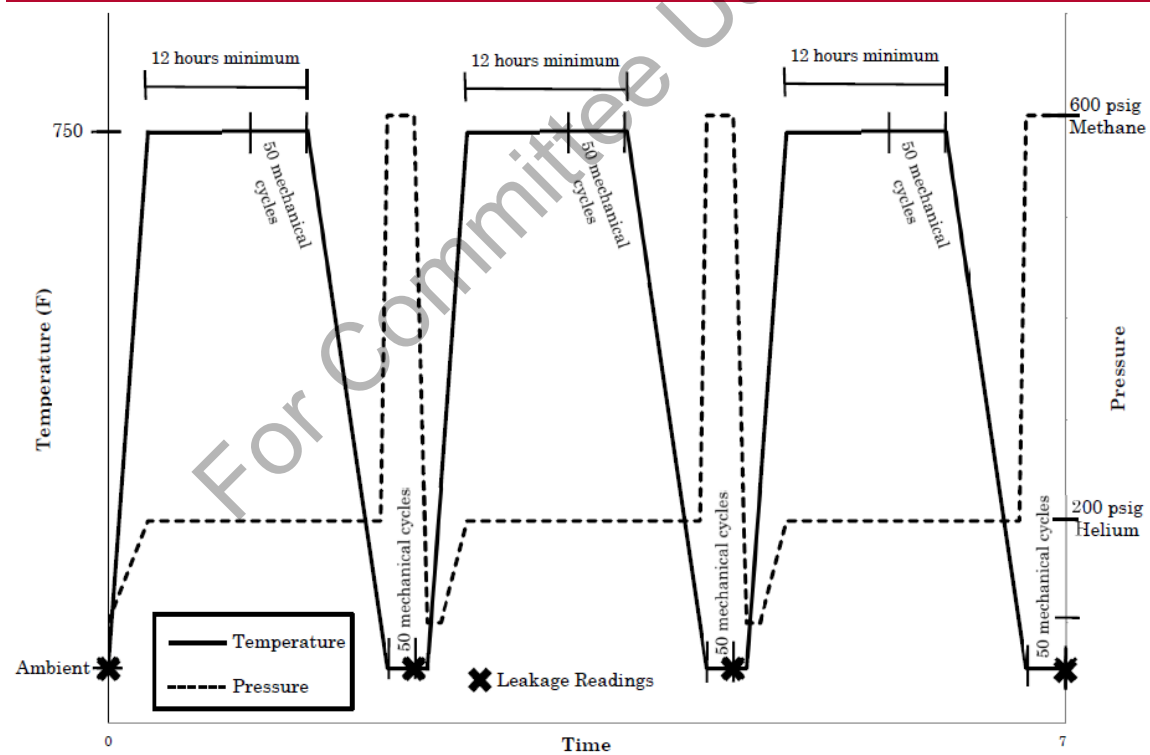
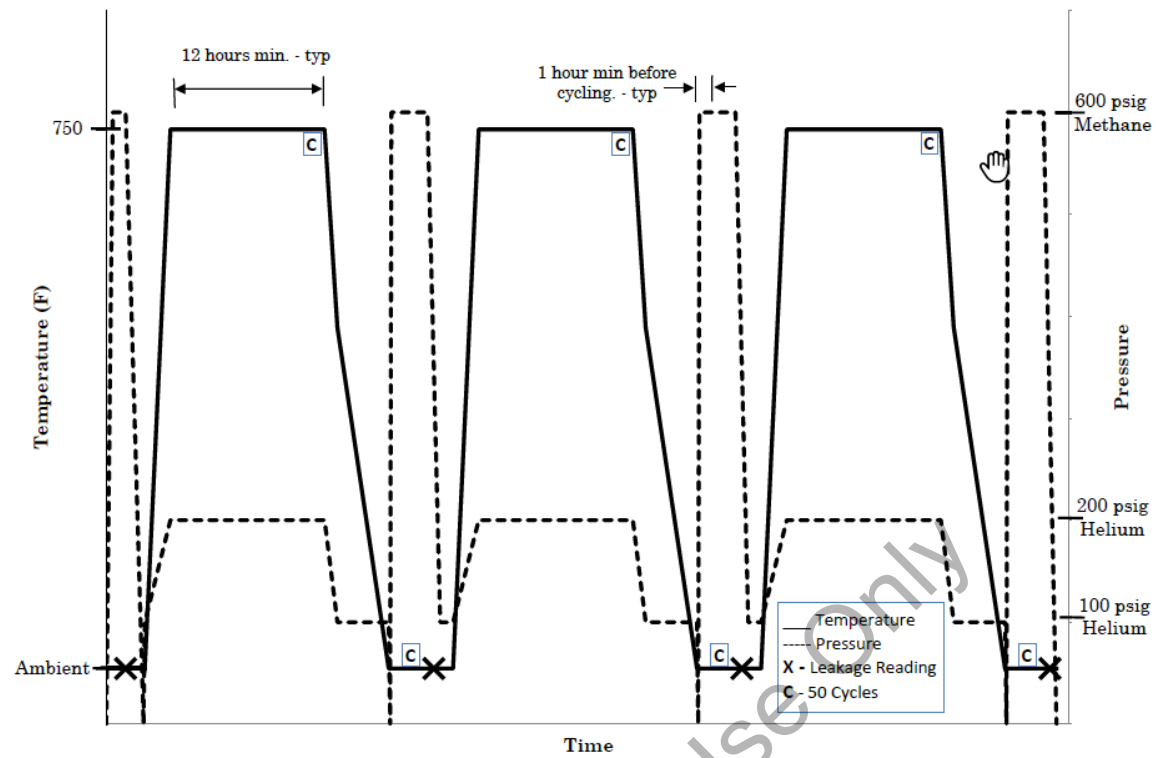


Figure 41-HT

#### HT.4 Test Procedure

1. Pressurize fixture to 41.4 barg  $\pm$  1.7 barg (600 psig  $\pm$  25 psig) with methane and hold for 1-hour minimum.

2. With stem static, measure and record stem seal leakage over 1 minute duration.
3. If maximum static leakage exceeds 100 PPMv, perform the following steps
  - a. Measure remaining gland nut torque by tightening with a torque wrench until movement is observed and record.
  - b. If torque is below manufacturer's recommended level, torque gland nuts to recommended level and measure leakage. Record leakage.
  - c. If leakage is below 100 PPMv, proceed with test.
  - b-d. If leakage is above 100 PPMv, test is aborted as a Fail.
4. Release pressure to atmospheric pressure.
5. Pressurize fixture with helium so that 13.8 barg  $\pm$  1.7 barg (200 psig  $\pm$  25 psig) is achieved when fixture temperature reaches 399 °C  $\pm$  14 °C (750 °F  $\pm$  25 °F).
6. Heat fixture ~~so that~~until temperature of thermocouple nearest the packing chamber is 399 °C  $\pm$  14 °C (750 °F  $\pm$  25 °F).
7. Hold pressure and temperature for 12 hours minimum. Time may be cumulative or continuous.
8. Between hour 11 and 12 hold, cycle fixture 50 times at conditions of 13.8 barg  $\pm$  1.7 barg (200 psig  $\pm$  25 psig) and 399 °C  $\pm$  14 °C (750 °F  $\pm$  25 °F).
9. After 12 hour hold and cycles are completed, cool fixture ~~to ambient temperature~~allowing pressure and temperature to drop until ambient temperature is reached while maintaining a minimum of 7 barg (100 psig) with helium. Insulation may be removed.
10. Release pressure to ~~atmospheric 0 psig~~pressure.
11. Pressurize fixture to 41.4 barg  $\pm$  1.7 barg (600 psig  $\pm$  25 psig) with methane and hold for 1-hour minimum.
12. ~~During or a~~After 1 hour hold, cycle fixture 50 times at conditions of 41.4 barg  $\pm$  1.7 barg (600 psig  $\pm$  25 psig).
13. With stem static, measure and record stem seal leakage over 1 minute duration.
14. If maximum static leakage exceeds 100 PPMv, perform the following steps
  - a. Measure remaining gland nut torque by tightening with a torque wrench until movement is observed and record.
  - b. If there has not been a previous torque adjustment and torque is below manufacturer's recommended level, retorque gland nuts to recommended level and measure leakage. Record leakage.
  - b-c. If there has been a previous torque adjustment, test is aborted as a Fail.
15. Repeat Steps 4-13 two more times for a total of 3 thermal cycles and 300 mechanical cycles.
- 15-16. At the completion of the test record entries according to HT.6.

## HT.5 Acceptance Criteria

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The High Temperature (HT) Fugitive Emissions Test Report shall indicate “pass” when the measured leakage of the packing does not exceed 100 PPMv. One (1) packing nut adjustment is allowed throughout the test.

#### **HT.6 Recording and Documentation**

**HT.6.1** ~~Previous~~ The most current API 622 test results are to be included in the HT test report.

**HT.6.2** Fugitive emissions test results shall be provided on the Fugitive Emissions Test Report Summary provided in Annex HT1.

**HT.6.3** Leak measurements shall be recorded at the beginning of the test and at established intervals throughout the test, as required per Figure 4-HT.

**HT.6.4** Gland height shall be measured and recorded at the beginning, ~~and~~ end of the test and after any gland nut adjustments~~of the test~~.

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## Annex HT1 - Test Forms

### Fugitive Emissions Test Report Summary

Record testing data and readings from Section HT6 on this form.

#### Table HT.1— Fugitive Emissions Test Report Summary

**API Standard 622**

**Fugitive Emissions Test Report Number** \_\_\_\_\_

Testing Profile: Check One <input type="checkbox"/> Rotating <input type="checkbox"/> Rising		Manufacturer: _____ Description: _____ _____	
Testing Facility: _____ Technician: _____ Witness: _____ Start Date: _____ Completion: _____		Source: _____ Date: _____ <input type="checkbox"/> Manufacturer <input type="checkbox"/> Distributor Packaged: _____ _____ Indicate New or Current: <input type="checkbox"/> New <input type="checkbox"/> Current	
Initial Gland Nut Torque		Indicate New or Current: <input type="checkbox"/> New <input type="checkbox"/> Current	
lbf-ft			
lbf-in.			
Nm			
Notes concerning installation instructions: _____ _____ _____ _____			
<b>Testing Profile Details (Testing Data)</b>			
<b>Test Segment</b>	<b>Leak Measurement Static</b>	<b>Reference Temperature at Stuffing Box</b>	
Start, Ambient P = _____			
After 1 <sup>st</sup> Thermal Cycle and 50 Mechanical Cycles at Ambient Temp P = _____			
After 2nd Thermal Cycle and 50 Mechanical Cycles at Ambient Temp P = _____			
After 3rd Thermal Cycle and 50 Mechanical Cycles at Ambient Temp P = _____			

Emissions Testing Report Summary	
Test Number:	Test Date:
Packing Material:	Style Number:
Packing Manufacturer:	Source of Sample:
Test Packing Cross-section:	Laboratory Name:
	Location of Test:
Gland OD and ID (at the packing): OD =    ID =	Gland Bolt Diameter = Packing Material:
Number of Mechanical Cycles:	Packing Compression % of Free Height =
<u>Gland Height at Start:</u> <u>At End:</u>	Final Torque on Gland Nuts (each side) = _____ / _____
Number of Thermal Cycles:	Test Results
Maximum Test Pressure:	Pass [ ]    Fail [ ]
Packing Configuration:  Number of rings tested: Check the following: <input type="checkbox"/> Ring shape (square, circular, vee) <input type="checkbox"/> Solid or split <input type="checkbox"/> Braided <input type="checkbox"/> Die formed <input type="checkbox"/> Spool stock <input type="checkbox"/> Wire or other reinforcement <input type="checkbox"/> Corrosion inhibitor and type <input type="checkbox"/> Other:	Show sketch or picture of packing installation. Define each ring: