



## Hornet IPG

### RGA Testing Protocol

Effective Date:

Rev:

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#### 1 Purpose

This protocol prescribes methods and records results necessary to verify water vapor content, and oxygen content for the 3025 Hornet IPG. This protocol is based on MIL standards with reference to specific methods established at Med-Ally.

#### 2 Scope

This document specifies internal gas requirements, test outsourcing instructions, and forms to record testing results.

#### 3 References

Document No.	Title
MIL-STD 883K	TEST METHOD STANDARD MICROCIRCUITS
MIL-STD 750-1A-CHG-2	ENVIRONMENTAL TEST METHODS FOR SEMICONDUCTOR DEVICES

#### 4 Appendices

Appendix:	Title
A	Analytic Testing Request Form (For Reference Only)
B	Visual Inspection
C	Test Results
D	Additional Notes Area (if required)

#### 5 Definitions

Abbreviation or Term	Definition
DVT	Design Verification Test
IPG	Implantable Pulse Generator
PPM	Parts per Million (by molecule type)

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## 6 Testing Protocol

6.1 The following requirements for internal gas analysis will be applicable:

6.1.1 Less than 5,000 ppm of H<sub>2</sub>O per MIL-STD-750-1A w/Change 2, 1018.6, section 3.1

6.1.2 Less than 50ppm fluorocarbons (leak test fluid, hydrocarbons, solvents, etc.) per MIL-STD-750-1A w/Change 2, 1018.6, section 3.1

6.1.3 Internal Gas should be approximately 75% Argon, 25% Helium, however, this is not acceptance criteria.

6.2 Tested Device Drawing Number: \_\_\_\_\_

6.3 Information for Outsourcing:

6.3.1 Establish the approximate volume of the device:

Volume: \_\_\_\_\_ Initial \_\_\_\_\_ Date \_\_\_\_\_

6.3.2 Complete the form from the applicable laboratory completing the test. Any test procedure or method that complies with the requirements of MIL-STD-750-1A w/Change 2 may be used to complete internal gas analysis testing. See Appendix A for an example form, with examples of notes required to ensure testing is completed as required.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

6.4 Approval:

A representative from QA must review and approve the specification information and submission for prior to shipment.

Quality Approval to Execute Testing:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

6.5 Sample Generation

6.5.1 Record the pre-glovebox entry bake times and temperatures used if applicable:

Oven: \_\_\_\_\_

Bake Time: \_\_\_\_\_

Bake Temperature: \_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

Initial: \_\_\_\_\_ Date: \_\_\_\_\_

#### 6.5.2 Record the Antechamber Control Parameters Used:

Auto Evacuate SP (mbar): \_\_\_\_\_

Antechamber Cycles: \_\_\_\_\_

Auto Refill Duration(sec): \_\_\_\_\_

Auto Final Refill(sec): \_\_\_\_\_

Initial: \_\_\_\_\_ Date: \_\_\_\_\_

#### 6.5.3 Record the H2O and O2 information provided by the glovebox sensors prior to starting the welding process:

O2: \_\_\_\_\_ ppm

O2 Sensor Asset# \_\_\_\_\_

O2 Sensor Last Cal: \_\_\_\_\_ Due: \_\_\_\_\_

H2O: \_\_\_\_\_ ppm

H2O Sensor Asset# \_\_\_\_\_

H2O Sensor Last Cal: \_\_\_\_\_ Due: \_\_\_\_\_

Initial: \_\_\_\_\_ Date: \_\_\_\_\_

#### 6.5.4 Complete hermetic welding for the number of samples required above using the standard process work instructions:

Work Instruction: \_\_\_\_\_

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6.5.5 Complete a visual inspection of the devices per the applicable drawing. Complete the inspection table in Appendix B.

Initial: \_\_\_\_\_ Date: \_\_\_\_\_

6.5.6 Leak Test all samples, using Appendix C to record the sample leak rates:

Equipment : \_\_\_\_\_

Last Calibration: \_\_\_\_\_ Due: \_\_\_\_\_

Assembly Drawing: \_\_\_\_\_

Leak Rate Requirement: \_\_\_\_\_

Initial: \_\_\_\_\_ Date: \_\_\_\_\_

6.5.7 Sample Preparation Notes (If applicable):

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## 6.6 Lab Testing:

**NOTE: Any testing laboratory that can meet the testing requirements and volume tolerances may be used.**

6.6.1 Obtain a submission form from the testing facility. Complete the form. Reference Appendix A for notes to include in the submission.

6.6.2 Specify to the lab if the samples should be returned at the completion of testing.

6.6.3 Package the devices for shipment as to avoid damage in transit.

6.6.4 Prior to shipping review all paperwork for completeness. Include a review by a quality representative for verification.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

(QA) Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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6.6.5 Upon Data and Part Return:  
6.6.5.1 Review the provided reports for completeness:

Initial: \_\_\_\_\_ Date: \_\_\_\_\_

6.6.5.2 Review the data for acceptance:

Initial: \_\_\_\_\_ Date: \_\_\_\_\_

6.6.5.3 Attach all lab data to this protocol:

Initial: \_\_\_\_\_ Date: \_\_\_\_\_

Notes:

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**7 Approvals**

7.1 Verify testing results meet requirements

Initial\_\_\_\_\_ Date\_\_\_\_\_

7.2 Quality Approval

- 7.2.1 Review Protocol
- 7.2.2 Review Appendix B: Visual Inspection
- 7.2.3 Review Appendix C: Leak Testing Results
- 7.2.4 Review Appendix D: Additional Notes (if applicable)
- 7.2.5 Ensure Testing Results are attached

Signature:\_\_\_\_\_ Date:\_\_\_\_\_

7.3 Other Approval (If required):

Signature:\_\_\_\_\_ Date:\_\_\_\_\_

7.4 Notes (if required):

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## Appendix A: Analytic Testing Request Form (For Reference Only):



## Analytical Testing Request Form

**Project Discussed with:** Bruce Gollob ☐ Ralph Ciotti ☐ Ben Behler ☐ Fred Pikula ☐ **Date:** \_\_\_\_\_

**Pricing:** Verbal Quote Obtained ☐ Written Quote Obtained ☐ Quotation Needed ☐

### PAYMENT INFORMATION:

Purchase Order Number: \_\_\_\_\_

OR

Name on Credit Card: \_\_\_\_\_

Credit Card Number: \_\_\_\_\_

CC Expiration Date: \_\_\_\_\_

Signature: \_\_\_\_\_

### \*REQUESTED TURNAROUND TIME:

**Standard Analysis** (7-10 days – Base Pricing): ☐

**RUSH** Same Day Analysis (Base Pricing x 3): ☐

**RUSH** 24-hour Analysis (Base Pricing x 2): ☐

**RUSH** 48-hour Analysis (Base Pricing x 1.5): ☐

**RUSH** 1-week Analysis (Base Pricing x 1.25): ☐

\* Expedited analysis requires prior notification and increased pricing. Rush availability may vary based on analysis.

**Number of Samples Submitted:** \_\_\_\_\_ ☐ In Duplicate **Sample Date:** \_\_\_\_\_

**Sample Identification:** (Gas type, sample location, background, hazards, etc.)

75% Ar, 25% He

(Battery or other hazards included?)

Volume: XXX cc

**Analytical Testing/Special Instructions:** (Test methods, specifications, analytes required, detection limits, etc.)

Less than 5,000ppm H<sub>2</sub>O per methods of MIL-STD-750-1A w/Change 2

Include all available information on additional gas contents

**Sample Disposition:** Discard: ☐ Return Sample: ☐ Return Empty Cylinder: ☐ (fill out shipping details below)

UPS: ☐ Account # \_\_\_\_\_

Standard Ground: ☐

FedEx: ☐ Account # \_\_\_\_\_

2-3 Day: ☐

Overnight: ☐

International shipments are pre-pay only (UPS International). Domestic HAZMAT sample returns are shipped via Common Carrier Collect.

### Report Results to:

Contact Name: \_\_\_\_\_

Company: \_\_\_\_\_

Street Address: \_\_\_\_\_

City/State/ZIP: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Analytical results will be emailed to the contact listed above. Hard copy results available upon request.



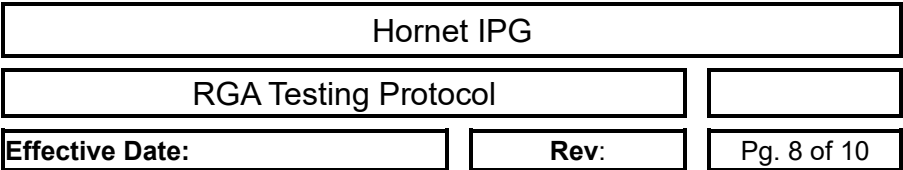
### Atlantic Analytical Laboratory, LLC

Mailing address: P.O. Box 220 • Whitehouse, NJ 08888 USA

Shipping address: 291 Route 22 East • Salem Industrial Park – Building #2 • Lebanon, NJ 08833 USA  
(908)-534-5600 • [www.atlanticanalytical.com](http://www.atlanticanalytical.com)

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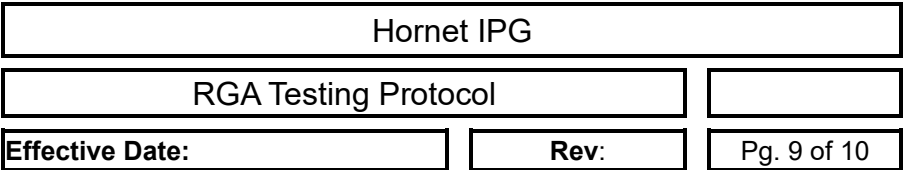
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**Appendix D: Additional Notes (if required). Notes may be typed or hand written:**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Page \_\_\_\_ of \_\_\_\_