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)

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_2O 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:_____

Notes:_____

_____

_____

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:_____

Initial:_____ Date:_____

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):

_____

_____

_____

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:_____

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:

_____

_____

_____

_____

_____

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):

_____

_____

_____

_____

_____

_____

_____

_____

_____

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

ATLANTIC ANALYTICAL LABORATORY
The Gold Standard for Gas Analysis

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 H2O 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.

PJLA Testing
Accreditation # 59415

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

Appendix B: Visual Inspection

Sample #	Pass/Fail	Comments

Signature:_____ Date:_____Page___ of____

Appendix C: Leak Testing Results

Sample #	Leak Rate	Pass/Fail	Comments

Signature:_____ Date:_____ Page___ of____

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

Signature:_____ Date:_____ Page___ of____