



Procedure: **Internal Process Qualification**  
Prepared By: **Dennis P. Hickie**  
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**DISTRIBUTION:** RUSA, R(T), R(M), R(S) - Engineering Department personnel

**REFERENCE:** ISO9002 paragraph 4.5.1, (General) Document and Data Control

**PURPOSE:** To establish an **Internal Qualification Process** (IPQ) specifications for Rectron or subcontractor products which may be incorporated in Rectron data sheets and which may be used to judge whether or not particular products meet customer specifications and is suitable for product introduction.

**SCOPE:** All products existing in Rectron data book (4<sup>th</sup> Edition) or earlier are considered to have met the requirements of this procedure. This procedure is for those items which will be included in future Rectron data sheets and catalogs. This procedure is not intended to handle customer specifics or customer devices.

**PROCEDURE:** Need for Rectron Internal Process Qualification for specifications received from a source which includes, among others, the following:

1. Rectron factories
2. Current non-Rectron subcontractor
3. Customer
4. Internal Rectron
5. Potential new subcontractor

\*For products sold into US market, the Vice President of RUSA will be included in all steps of product development and along with RUSA team, will be instrumental in assisting and advising of US customer/market specific requirements that need incorporating into product specifications/qualification

Upon completion of **Product Proposal Plan**, Rectron will perform parametric and **High Reliability Test** capabilities in line with attached Form HRTC-1. The completed and assembled documentation will be sent to RUSA for approval. The RUSA team will review documentation (along with any specific customer) and advise if changes are necessary or applicable to the American market.

If any changes from the factory data sheet are required for the American market, changes will be made and "Americanized" data sheets sent to R(T) for approval using attached form IPQ-1

After R(T) approval of "Americanized" data sheet is given, form IPQ-1 is countersigned by R(T) VP Engineering and a copy sent to RUSA for filing.

The IPQ approval sheet (form IPQ-1), along with the details of the changes made to any existing Rectron or subcontractor data sheets during the "Americanization" process and all other supporting correspondence, are retained in the Engineering files for two years from original issue of the specification. Product specifications will be filed under the Rectron family type designated and referenced in a quality record.

**TRAINING:** No training necessary since reference to ISO9002 paragraph should hold enough information and guidance for operational procedure.



## Internal Process Qualification

Rectron Part Family:

Subcontractor Part #:

Description:

Specification

Prepared By: \_\_\_\_\_

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

Is Subcontractor Approval Required:

Yes \_\_\_\_\_

No \_\_\_\_\_

Subcontractor

Approval: - \_\_\_\_\_

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

Approved By: \_\_\_\_\_

Date:- \_\_\_\_\_



## HIGH RELIABILITY-TEST CAPABILITIES

### **Barometric Pressure**

This equipment simulates low atmospheric pressure encountered in non-pressurized environments up to 200,000 feet..

### **Humidity**

This equipment evaluates units in an accelerated manner, and monitors the effects of their resistance to high humidity and heat conditions.

Typical RH of 90 to 98% is achieved.

### **Salt (Spray) and Salt Atmosphere**

The equipment provides an accelerated laboratory corrosion test simulating the effects of seacoast atmospheres. Salt concentration and velocity per day can be maintained between 10,000 and 50,000 mgm/m<sup>2</sup>/day. Salt Atmosphere- Salt spray 5%- 20% salt solution.

### **Thermal Shock Temp.- Cycling**

This test determines the resistance of devices to exposure at extremely high and low temperatures.

Chamber limits - 74° C to 250° C

### **Mass Spectrometer Detector Leak (Fine Leak)**

To determine the effectiveness (or the hermeticity) of the seal on devices with internal cavities which are evacuated or contain air or gas. Machine limits  $1 - 10^{-9}$  to  $10 - 10^{-6}$  atm.

### **Gross Leak**

Determine seal leak greater than  $10 - 10^{-6}$  atm cc/Sec

### **Constant Acceleration:**

Determines the effects of a centrifugal force on devices up to 700,000g under space environment (refrigerated vacuum).

### **Shock**

Subjects the devices to conditions resulting from sudden applied forces or abrupt changes in motion produced by rough handling, transportation or field operation from 10 to 4,500g

### **Vibration Noise**

Measures the amount of electrical noise produced by the devices under vibration from 9-5kHz and 0-70g.

### **Non-Operating Life**

To determine the effects on devices at elevated temperatures. Temperature ranges up to 300 C.

### **Operating Life Test**

To operate the devices under intended condition to screen and eliminate marginal devices eliminate mortality

*Steady State Operating Life  
Reverse Bias Operating Life  
Intermittent Operating Life*

### **Solderability - Lead integrity (Lead Tension)**

Determine the solderability on all devices from 0 to 400 C

Lead Tension- Designed to check the capabilities of the devices to withstand straight pulls

### **Lead integrity (bending stress)**

Check the quality of leads, welds and seals of the devices to withstand bends under specific weights

### **Lead integrity (lead torque)**

Check the devices, leads and seals for resistance to twisting motion. Equipment limits from .5 cmkg to 100 mkg.

### **Hi-Power Microscopic inspection**

Examine internal and external construction of devices up to 600 times.

### **Bond Strength**

This determines strength of lead bonding between the active area of the device and connecting packaging lead.

### **Vibration Fatigue**

Tests the effects of vibration within the frequency range of 60 Hz at 0-70g.