Perform Air International Inc.
Fabrication Control Manual
Section: XIII
Process: XIII.08 Inspection Sampling Plans

Revision	Revision Date	Revision Change
N/I	12/29/2023	Initial Release/Re-release

1.0 Purpose:

Inspection sampling is used to evaluate products and hardware after establishing a reliability of process quality.

2.0 Scope:

Sampling plans and procedures described in this document shall be utilized for the inspection of products when referenced, specified or contained within procedures, instructions, or other working documents. Perform Air International sampling plans were developed using MIL-STD-105, United Technologies Supplier Sampling Requirements and incorporating IRR criteria.

3.0 Responsibility:

3.1 The Manufacturing Department has responsibility for the development, implementation and maintenance of this procedure.

3.2 The Quality Assurance Manager is responsible for the periodic review of the elements of this procedure to ensure that this procedure satisfies customer requirements for sampling methods. The Quality Assurance Manager shall also ensure that sampling methods provide an acceptable level of confidence in the quality of manufactured and procured hardware.

3.3 All inspection personnel shall comply with the elements of this procedure when this procedure is referenced within other procedures and/or working documents.

4.0 Definitions

4.1 **Characteristic**: Features, properties or functions of a part, assembly or product that can be tested, measured or observed to determine if the item conforms to specifications.

4.2 Classification or Characteristics:

4.2.1 **Key Characteristics**: Special characteristics identified by customer or design requirements, which require special handling and generally 100% inspection.

4.2.2 **Critical**: A characteristic of a part or product which, if discrepant, would in all probability, create a hazardous or unsafe condition for personnel using or maintaining the part or product or would seriously affect the satisfactory operation of the part or product.

4.2.3 **Major**: A characteristic (other than one classified as critical) of a product, which, if discrepant, could cause a failure in the operation or function of the product and thereby limit the product's usability and reliability.

4.2.4 **Minor**: A characteristic of a part or product, which if discrepant, does not significantly reduce the usability of the part or product or have any significant bearing on the effect or operation of the part or product.

4.3 **C=0 Sampling**: Sampling inspection that specifies zero (0) failures in a sample size as the acceptance criteria for a lot.

4.4 **Lot**: A lot shall be all parts of the same part number, material, size and shape, processed at the same time, using the same processing materials, under the same conditions and presented to inspection at one time.

4.5 **Detailed Inspection Plan (DIP)**: A form, listing the inspected characteristics of a part and the sample plan and acceptable quality level (AQL) used for each characteristic.

4.6 **Initial Reliability Requirement (IRR)**: Is the degree of confidence that a characteristic will be defect free from an established process. An inspection database has been developed to track specific characteristic acceptance history.

4.7 **Acceptable Quality Level (AQL)**: Is a quality level established on a prearranged system of inspection using samples selected at random.

5.0 Procedure:

5.1 Inspection sampling shall only be used after establishing the Initial Reliability Requirement (IRR) for each characteristic. Inspection personnel will access the Inspection database to determine the IRR as described in section 7.2. All characteristics that do not meet the IRR shall be 100% inspected.

5.2 Unless otherwise required by specific instructions (customer or specification), PAI's sampling plans shall be utilized for In-Process and Final Inspection as a method of determining product quality.

5.3 C=0 shall be used in all areas of sampling inspection except as noted in hardware specifications. C=0 applies to each characteristic. The entire lot must be rejected on one rejected characteristic from a sample unless that specific characteristic is screened 100% for defects.

5.4 Inspection Sampling shall not be used for the following circumstances.

5.4.1 When customer requirements specify 100% inspection of a characteristic after finding a discrepancy in one or more pieces of an inspected lot.

5.4.2 When heightened (100%) inspection is required as part of a corrective action to address an identified failure, 100% inspection shall be employed until Quality Assurance has determined that implemented corrective action has adequately addressed the identified discrepancy.

5.4.3 At any time that Quality Assurance determines that a set of circumstances exists that lowers the confidence level of sample inspection to assure an adequate level of quality.

5.4.4 KEY Characteristics require a review of the customer or design requirements for inspection levels.

5.5 Use of sampling plans, by inspection function.

Purchased Product Receiving:

5.5.1 Receiving Inspection is considered a redundant inspection from a supplier with an approved quality system and would only be required to be inspected to a standard sampling plan if the supplier does not provide a First Article Inspection Report or Detailed Inspection Plan.

5.5.2 Unless otherwise instructed or required by specification or contract, Receiving Inspection shall select enough characteristics and sample lot to verify the general configuration of the product. PAI's Inspection database, by Part Number Activity, shall be reviewed to determine increased sampling as required based on historical data. Suppliers are required to submit an inspection plan with documented inspection results for each lot.

5.5.3 Parts classified as "Standard Parts" (NAS, AN, MS, etc.) shall be inspected as noted in 7.1.2. If a rejection from the sample is noted, the Quality Engineer shall be notified of the rejection and provide directions on the sample inspection. In all other products, the C=0 acceptance criteria shall apply.

Outside Processing Receiving:

5.5.4 A sample shall be pulled in accordance with the approved sampling plan. A minimum of 8 characteristics shall be verified for the sample pulled. Characteristics will vary each time a new inspection is performed. An inspection stamp shall be placed on the supplier's DIP next to the characteristics that are verified.

Manufacturing and Assembly Final Inspection:

5.5.5 Shall determine the classification of characteristics as defined in Section 7.3 to determine the inspection sample size.

5.6 IRR must be established for each characteristic prior to using sampling methods in Manufacturing and Final Inspection areas.

5.6.1 Establish IRR as follows:

Characteristic	**Critical**	**Major**	**Minor**
IRR	**100 %**	**97%**	**92%**
Sampling authorized after:	100% inspection No Sampling Allowed	76 Accepted Characteristics in a row	28 Accepted Characteristics in a row

5.7 Classification of characteristics:

5.7.1 100% Inspection: Shall be required on drawing features identified as Critical, KEY, Structural Critical (SC), Hardness Critical (HC), or specifically required by the drawing, specification, or purchase order.

5.7.2 Major: Characteristics with a tolerance of .010 or less, use the table below: This table meets **.65 AQL** sampling criteria.

Lot Size	**Sample Size**
Up to 15	All
16 to 150	20
151 to 280	29
281 to 1200	47
1201 to 3200	53
3201 and over	68

5.7.3 Minor: Characteristics having a tolerance of greater than .010, use the table below: this table meets **1.5 AQL** sampling criteria.

Lot Size	**Sample Size**
Up to 5	All
6 to 7	5
8 to 11	6
12 to 19	7
20 to 50	8
51 to 90	11

91 to 150	13
151 to 280	19
281 to 500	21
501 to 1200	27
1201 to 3200	35
3201 over	38

5.8 Use of sampling tables

5.8.1 After determining sample size, inspectors shall remove from the lot, in a random manner, the number of sample pieces required for inspection. Each sample piece shall then be inspected for compliance of each characteristic to the applicable table or specification.

5.8.2 Inspectors shall show, on the Detailed Inspection Plan, each characteristic inspected, and the sampling quantity level used.

5.9 All lots presented to inspection require a 100% visual inspection for proper orientation of details, configuration, identification and markings, damage, preservation, and for processing to protect from damage.

6.0 Records:

6.1 Aerospace Standard; Quality Management System, Section 8.2.3, 8.2.4, 7.3.3 - **AS9100**

6.2 UTC Supplier Sampling Requirements.- **ASQR-20.1**