



ACCEPTANCE SAMPLING INSPECTION

1.0 PURPOSE

To establish a uniform method for attribute sampling inspection based on the requirements of MIL-STD-105 within Eaton Corporation.

2.0 SCOPE

This procedure applies to all components manufactured by, or supplied to Eaton, with the intended purpose to use them as, or within, deliverable product.

3.0 APPLICABLE DOCUMENTS

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
ANSI / ASQC Z1.4	Sampling Procedures and Tables for Inspection by Attributes
QCP 5.8	Quality Requirements for Suppliers and Subcontractors
QCP 11.0	Control & Disposition of Nonconforming Material
QCP 15.0	Statistical Quality Control
QCP 22.0	Statistical Process Control
QCP 23.0	Certified Operator Program
QCP 15.1.1	Sampling Inspection (Pratt and Whitney)

4.0 DEFINITIONS

Inspection by Attributes

Inspections made by attribute sampling categorize items as either defective or nondefective.

Defective Item

A defective item is an item having one or more nonconforming characteristics.

Acceptable Quality Level (AQL)

The AQL is the maximum percentage defective (or the maximum number of defects per hundred units) that can be considered satisfactory as a process average.

Lot or Batch

This term shall mean "Inspection Lot" or "Inspection Batch" and is to be considered as the number of items gathered at one time from which the samples are drawn for inspection (See 7.3).

5.0 GENERAL

5.1 This plan is a modification of the MIL-STD-105 and emphasizes the fact that the plan will never accept a lot when a sample reveals a nonconformance. In all instances, the Accept value shall be 0 and the Reject value shall be 1.

5.1.1 Except as directed by the customer, "Critical" characteristics, as explicitly defined by the customer, shall not be sampled.

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- 5.2 Sampling Inspection in accordance with the requirements of this plan shall be the preferred method of determination of item quality conformance unless otherwise specified by the applicable Program Quality Assurance Plan.
- 5.2.1 The requirements of this plan are imposed on Eaton suppliers through QCP 5.8.
- 5.3 Inspection Level (I, II, III, S-1, S-2, S-3, or S-4)
Inspection Level II shall normally be used unless otherwise specified.
- 5.4 Sampling Plan Type (Single, Double, or Multiple)
Single sampling shall be used unless otherwise specified.
- 5.4.1 Alternate characteristic specific sampling may be utilized when specified by Quality Engineering and approved by the customer. When alternate sampling is utilized the affected characteristic shall be identified as "Eaton special". QCP 15.0 paragraph 4.2.1.
- 5.4.2 Data gathered as part of a sampling plan shall be identified and stored as outlined in QCP 13.0.
- 5.5 Acceptable Quality Level (AQL)
- The applicable AQL value shall be determined for each characteristic by one of the following methods:
- Sampling Plan Tolerance Chart (Figure 1)
 - AQL specifically invoked by customer (e.g. QCP 15.1.1)
- 5.5.1 The tolerance chart shown in Figure 1 may be used to assign the appropriate AQL value.
- 5.5.2 Receiving Audit
- A Receiving Audit is an inspection made to verify key characteristics on parts furnished by Eaton approved suppliers.
- 5.5.2.1 Receiving Inspection will be required for selected key characteristics listed on the vendor receiving inspection SOP. These characteristics will be determined by the Receiving Cell Quality representative and/or Product Engineer. Acceptance of remaining print characteristics will be based on the conformance of audited characteristics.

6.0 QUALITY ELEMENTS

- 6.1 Normal, Tightened, or Reduced Inspection
- Normal inspection shall initially be used unless otherwise specified.
- 6.2 For a given lot size, determine the number of samples to be selected from Tables I, II, or III.
- 6.2.1 The samples will be selected at random. The method of sampling shall give each unit in the population an equal chance of being selected.
- 6.3 Randomly select from the Lot the required number of samples. Use the sample size shown for NORMAL inspection. This plan shall be used unless TIGHTENED or REDUCED sampling is required or allowed by the following:

- 6.3.1 The sample plan shall be switched from NORMAL to TIGHTENED when 2 out of 5 consecutive inspection lots have been rejected on the NORMAL inspection plan.
- 6.3.2 The sample plan shall be switched from TIGHTENED to 100% if sampling has remained at the TIGHTENED level for 10 consecutive lots.
- 6.3.3 The sample plan may be switched from 100% to TIGHTENED when three consecutive inspection lots have been accepted at the 100% inspection level.
- 6.3.4 The sample plan may be switched from TIGHTENED to NORMAL when 5 consecutive inspection lots have been accepted on the TIGHTENED inspection plan.
- 6.3.5 The sample plan may be switched from NORMAL to REDUCED when all of the following have been met:
- The preceding 10 inspection lots have been on NORMAL inspection and none have been rejected (lots comprised of rework or repairs shall not be counted into this total); and
 - Production is at a steady rate
NOTE: Steady rate allows for processing by lot, as long as the manufacturing process (i.e., same machines, or alternates with proven process capability [Cpk], fixtures, gaging, etc.) remains unchanged.

For Receiving Inspection, steady rate shall mean processing by the same vendor to the same manufacturing process, with shipments made to Eaton at a frequency of at least one shipment every six months.
- 6.3.6 The sample plan shall be switched back from REDUCED to NORMAL if either of the following occur during REDUCED inspection:
- A lot is rejected (except lots comprised of rework or repairs).
 - Conditions, such as an irregular production rate, become known which warrant that normal inspection be reinstated.
- 6.3.7 A sample plan shall be determined for each specific characteristic to be inspected (i.e., all characteristics to be verified need not use the same sampling plan).
- 6.4 Inspect all sample pieces in accordance with the requirements of the applicable part drawing and SOP's.
- 6.5 Indicate the results of inspection on the required inspection report forms.
- 6.6 Note: Paragraphs 6.1 - 6.4 **WILL NOT** apply when nonconformances are detected by the operator and identified for MRB consideration.
- 6.7 If no defects are found in the sample lot, release the entire lot to stock or to further processing.
- 6.8 If one or more defects are found in the sample, 100% screening of the affected characteristics is required. Any defective pieces shall be documented as nonconforming and dispositioned in accordance with QCP 11.0.



ACCEPT 0											
REJECT 1											
NORMAL											
SINGLE SAMPLE PLAN TABLE											
LOT SIZE											
AQL	INSPECTION LEVEL II	2 To 8	9 To 15	16 To 25	26 To 50	51 To 90	91 To 150	151 To 280	281 To 500	501 To 1200	1201 To Up
0.25	SAMPLE	*	*	*	*	50	50	50	50	50	80
0.40	SAMPLE	*	*	*	32	32	32	32	32	50	80
0.65	SAMPLE	*	*	20	20	20	20	20	32	50	80
1.00	SAMPLE	*	*	13	13	13	13	20	32	50	80
2.50	SAMPLE	5	5	5	5	8	13	20	32	50	80
4.00	SAMPLE	3	3	3	5	8	13	20	32	50	80
6.50	SAMPLE	2	2	3	5	8	13	20	32	50	80
10.00	SAMPLE	2	2	3	5	8	13	20	32	50	80

TABLE I

* 100% Inspection



ACCEPT 0											
REJECT 1											
TIGHTENED											
SINGLE SAMPLE PLAN TABLE											
LOT SIZE											
AQL	INSPECTION LEVEL II	2 To 8	9 To 15	16 To 25	26 To 50	51 To 90	91 To 150	151 To 280	281 To 500	501 To 1200	1201 To Up
0.25	SAMPLE	*	*	*	*	80	80	80	80	80	125
0.40	SAMPLE	*	*	*	*	50	50	50	50	80	125
0.65	SAMPLE	*	*	*	32	32	32	32	50	80	125
1.00	SAMPLE	*	*	20	20	20	20	32	50	80	125
2.50	SAMPLE	*	8	8	8	13	20	32	50	80	125
4.00	SAMPLE	5	5	5	8	13	20	32	50	80	125
6.50	SAMPLE	3	3	5	8	13	20	32	50	80	125
10.00	SAMPLE	3	3	5	8	13	20	32	50	80	125

TABLE II

*100% Inspection



ACCEPT 0											
REJECT 1											
REDUCED											
SINGLE SAMPLE PLAN TABLE											
LOT SIZE											
AQL	INSPECTION LEVEL II	2 To 8	9 To 15	16 To 25	26 To 50	51 To 90	91 To 150	151 To 280	281 To 500	501 To 1200	1201 To Up
0.25	SAMPLE	*	*	20	20	20	20	20	20	20	32
0.40	SAMPLE	*	13	13	13	13	13	13	13	20	32
0.65	SAMPLE	*	8	8	8	8	8	8	13	20	32
1.00	SAMPLE	5	5	5	5	5	5	8	13	20	32
2.50	SAMPLE	2	2	2	2	5	5	8	13	20	32
4.00	SAMPLE	2	2	2	2	5	5	8	13	20	32
6.50	SAMPLE	2	2	2	2	5	5	8	13	20	32
10.00	SAMPLE	2	2	2	2	5	5	8	13	20	32

TABLE III

* 100% Inspection

(ATTACHMENT)

TOLERANCE CHART

(The following applies unless otherwise designated as Eaton special)

<u>CHARACTERISTIC</u>	<u>TOLERANCES</u>	<u>AQL</u>
Length, Depth, I.D., O.D., Radii, Chamfer, Flatness, Parallelism, Perpendicularity	.0010 or less	.4
Form Tolerance, Position, Concentricity, Roundness, Straightness, Angularity, Cylindricity, Runout, Profile of a Surface, Profile of a Line	.0011 to .0029	2.5
	.003 and over	6.5
Visual - 100% Inspection required except as noted below		
Angularity	0°30' or less	2.5
	0°31' and over	6.5
Surface Finish	10 RMS or less	.4
	11 RMS to 32 RMS	2.5
	33 RMS and over	6.5
Threads (except on Hardware)	All	.4
Spline and Gear Geometry	All	.4
Electrical Test Characteristics	All	.4
Casting Forgings	All	6.5
Bar Stock & Mill Products	All	6.5
Hardware Type Items:		
Fasteners, Connectors, Washers, O-Rings, Gaskets, Wire, Springs, Shipping Closures	Significant Dimensional	6.5
	Visual	2.5

TOLERANCE CHART

Note: All non-flight hardware items which are specifically utilized for closure requirements such as plastic end caps, plastic bags, bulk packing materials, plastic cap plugs, wood shipping closures, etc. shall be inspected per the following method: A small sample shall be taken from each lot. One (1) piece shall be inspected complete per characteristics listed on the receiving SOP. This piece shall then be visually compared to the remaining parts in the sample. If the remaining pieces match the inspected part, the entire lot shall be accepted. Discrepant characteristics shall be checked using standard screening procedures.

All NDT inspection shall be performed 100% unless otherwise specified per Eaton Quality Assurance.

FIGURE 1

