Standard Test Method for
Attribute Sampling of Metallic and Inorganic Coatings[1]

1. Scope

1.1 This test method gives sampling plans that are intended for use in the inspection of metallic and inorganic coatings for conformance to ASTM standard specifications.

1.2 The plans in this test method, except as noted, have been selected from some of the single sampling plans of MIL-STD-105D. The specific plans selected are identified in Tables 1-3 of this test method. The plan of Table 4, which is used for destructive testing, is not from the Military Standard. This standard does not contain the Military Standard's requirement for tightened inspection when the quality history of a supplier is unsatisfactory.

1.3 The plans are based on inspection by attributes, that is, an article of product is inspected and is classified as either conforming to a requirement placed on it, or as nonconforming. Sampling plans based on inspection by variables are given in Test Method B762. Variables plans are applicable when a test yields a numerical value for a characteristic, when the specification imposes a numerical limit on the characteristic, and when certain statistical criteria are met. These are explained in Test Method B762.

1.4 The plans in this test method are intended to be generally suitable. There may be instances in which tighter or looser plans or ones that are more discriminating are desired. Additional plans that may serve these needs are given in Guide B697. Also, Guide B697 describes the nature of attribute sampling plans and the several factors that must be considered in the selection of a sampling plan. More information and an even greater selection of plans are given in MIL-STD-105D, MIL-STD-414, ANSI/ASQC Z1.9-1979, Refs (1-7)[2], and in Guide B697.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[3]
B697 Guide for Selection of Sampling Plans for Inspection of Electrodeposited Metallic and Inorganic Coatings
B762 Test Method of Variables Sampling of Metallic and Inorganic Coatings

2.2 *ANSI Standard:*[4]
ANSI/ASQC Z1.9-1979 Sampling Procedures and Tables for Inspection by Variables for Percent Non-Conformance

2.3 *Military Standards:*[5]
MIL-STD-105D Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-414 Sampling Procedures and Tables for Inspection by Variables for Percent Defective

3. Terminology

3.1 *Definitions:*

3.1.1 *destructive test*—test that destroys the tested article or makes it nonconforming to a requirement.

3.1.2 *inspection lot*—collection of articles of the same kind that is submitted to inspection for acceptance or rejection as a group.

3.1.3 *nondestructive test*—test that neither destroys the tested article nor makes it nonconforming to a requirement.

3.1.4 *sample*—articles randomly selected from an inspection lot whose quality is used to decide whether or not the inspection lot is of acceptable quality.

4. Significance and Use

4.1 Sampling inspection permits the estimation of the overall quality of a group of product articles through the inspection of a relatively small number of product items drawn from the group.

---

[1] This test method is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatingsand is the direct responsibility of Subcommittee B08.10 on Test Methods.

Current edition approved Nov. 1, 2016. Published November 2016. Originally approved in 1975. Last previous edition approved in 2010 as B602 – 88 (2010). DOI: 10.1520/B0602-88R16.

[2] The boldface numbers in parentheses refer to the list of references at the end of this standard.

[3] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[5] Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098.

TABLE 1 Level I—Sampling Plan for Nondestructive Tests[A]

Inspection Lot Size	Sample Size	Acceptance Number	AQL, %	50/50 Point, %	LQL, %	AOQL,%
1 to 20[B]	all	0	...	...	...	...
21 to 280	20	0	0.26	3.4	11.0	1.8
281 to 1 200	80	1	0.44	2.1	4.8	1.1
1 201 to 3 200	125	2	0.65	2.1	4.3	1.1
3 201 to 10 000	200	3	0.68	1.8	3.3	0.97
10 001 to 35 000	315	5	0.83	1.8	2.9	1.0
Over 35 000	500	7	0.80	1.5	2.4	0.90

[A] Taken from MIL-STD-105D, Single Sampling Plan, Level II, AQL = 0.65, Normal Inspection.
[B] The smallest lots are 100 % inspected, and so there is no sampling risk. For this reason, there are no AQL, etc.

TABLE 2 Level II—Sampling Plan for Nondestructive Tests[A]

Inspection Lot Size	Sample Size	Acceptance Number	AQL, %	50/50 Point, %	LQL, %	AOQL,%
1 to 8[B]	all	0	...	...	...	...
9 to 90	8	0	0.64	8.3	25	4.6
91 to 280	32	1	1.1	5.2	12	2.6
281 to 500	50	2	1.7	5.3	10	2.7
501 to 1 200	80	3	1.7	4.6	8.2	2.4
1 201 to 3 200	125	5	2.1	4.5	7.4	2.5
3 201 to 10 000	200	7	2.0	3.9	5.9	2.2
10 001 to 35 000	315	10	2.0	3.4	4.9	2.1
Over 35 000	500	14	1.9	2.9	4.0	1.9

[A] Taken from MIL-STD-105D, Single Sampling Plan, Level II, AQL = 1.5, Normal Inspection.
[B] The smallest lots are 100 % inspected, and so there is no sampling risk. For this reason, there are no AQL, etc.

TABLE 3 Level III— Sampling Plan for Nondestructive Tests[A]

Inspection Lot Size	Sample Size	Acceptance Number	AQL, %	50/50 Point, %	LQL, %	AOQL,%
1 to 5[B]	all	0	...	...	...	...
6 to 50	5	0	1.0	12.9	37	7.4
51 to 150	20	1	1.8	8.2	18	4.2
151 to 280	32	2	2.6	8.2	16	4.3
281 to 500	50	3	2.8	7.3	13	3.9
501 to 1 200	80	5	3.3	7.1	11	4.0
1 201 to 3 200	125	7	3.2	6.1	9.4	3.6
3 201 to 16 000	200	10	3.1	7.3	7.7	3.3
16 001 to 35 000	315	14	2.9	4.7	6.4	3.0
Over 35 000	500	21	3.0	4.3	5.6	2.9

[A] Taken from MIL-STD-105D, Single Sampling Plan, Level II, AQL = 2.5, Normal Inspection.
[B] The smallest lots are 100 % inspected, and so there is no sampling risk. For this reason, there are no AQL, etc.

TABLE 4 Sampling Plan for Destructive Test[A]

Inspection Lot Size	Sample Size	Acceptance Number	AQL,%	50/50 Point, %	LQL,%
1 to 25	2	0	2.5	29	68
26 to 1 200	13	1	2.8	13	27
1201 to 35 000	32	2	2.6	8.3	16
Over 35 000	55	3	2.5	6.6	12

[A] AOQLs are not given because destructive tests cannot be used to screen rejected lots. This plan is not found in MIL-STD-105D.

4.2 The selection of a sampling plan provides purchasers and sellers a means of identifying the minimum quality levels that are considered to be satisfactory.

4.3 Because sampling plans will only yield estimates of the quality of a product, the results of the inspection are subject to error. Through the use of sampling plans, the risk of error is known and controlled.

5. General

5.1 In sampling inspection, a relatively small number of articles (the sample) is selected randomly from a larger number of articles (the inspection lot) and is inspected for conformance to the requirements placed on the articles. Based on the results, a decision is made either to accept or reject the inspection lot. Sampling is used, rather than inspection of every article in a lot, to reduce cost. Also, some test methods are destructive, in which cases sampling inspection must be used to avoid destroying the lot.

5.2 There is always a risk that a sample will not be representative of the lot from which it is drawn. The larger the sample, the smaller this risk, but, the larger the cost of inspection. So the selection of a sampling plan involves the balancing of the costs of inspection against the consequences of accepting an undesirable number of nonconforming articles. If every article in an inspection lot conforms to its requirements, every article in the sample will conform also. Such lots will always be accepted. If only a few articles in an