

Q: Are there sampling protocols to help ensure that a group of parts has obtained the proper zinc coating thickness?

A: Yes, a sampling protocol has been developed by the American Society of Testing and Materials (ASTM) since a coating thickness measurement for each piece of galvanized material in a project would not be practical. ASTM A 123/ A 123M states, “for products whose surface area is equal to or less than 160 in² (1032 cm²), the entire surface of the tested product constitutes a specimen. In the case of products containing multiple material categories or steel thickness ranges, that product will contain more than one test specimen.” In addition, products with surface areas greater than 160 in² (1032 cm²) are considered multi-specimen products. Sampling Terms:

Lot - Unit of production or shipment from which a sample is taken for testing

Sample - A collection of individual units of product from a single lot

Specimen - The surface of an individual test product or a portion of a test product which is a member of a lot or a member of a sample representing that lot

Test Product - An individual unit of product that is a member of the sample

For single specimen products, each specimen is randomly selected. For thickness measurement tests, a minimum of five widely dispersed measurements are taken over the surface area of the specimen in order to represent the average specimen coating thickness. The average value of the five coating thickness measurements must be greater than or equal to one grade below the minimum average coating thickness for the material category. In Figure 1, the separation of a lot into a sample and individual specimen is shown.

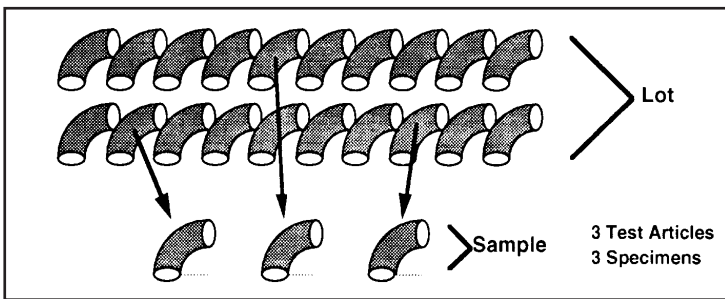


Figure 1: Single-specimen articles

A multi-specimen product is defined as having a surface area larger than 160 in² (1032 cm²), or has multiple steel thicknesses, or contains more than one coating category. In order to test coating thickness of products whose surface area is greater than 160 in² (1032 cm²), they are subdivided into three continuous local sections with equivalent surface areas, each of which constitutes a unique specimen. In the case of any such local section containing more than one material category or steel thickness range, that section will contain more than one specimen. In Figure 2, the separation of a lot into a sample and individual specimen is shown.

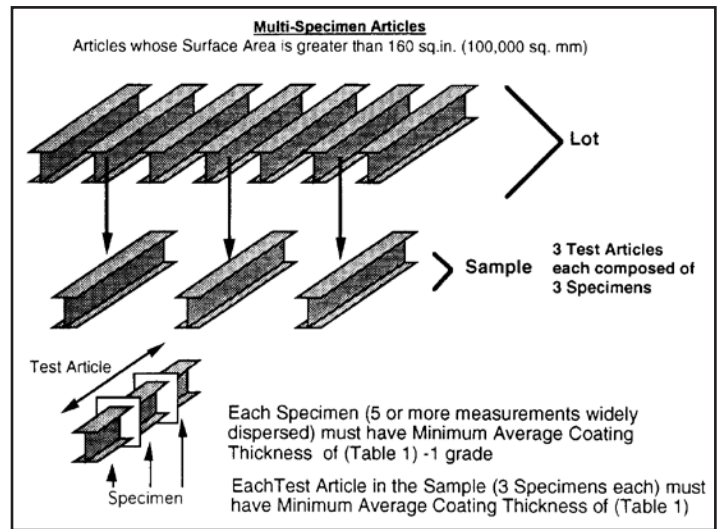


Figure 2: Multi-specimen articles

For products that are hot-dip galvanized following either ASTM A 123 / A 123M or A 153 / A 153M, Table 1 is used to determine the minimum number of specimens for sampling from any given lot size.

# of Pieces in Lot	# of Specimens
3 or less	All
4 to 500	3
501 to 1200	5
1201 to 3200	8
3201 to 10,000	13
10,001+	20

Table 1: Minimum number of specimens for ASTM A 123/A 123 M or A 153/A 153 M

For rebar that is hot-dip galvanized according to ASTM A 767, the information below is used to determine the minimum number of samples per lot, measurements per sample, and the total number of measurements required for each of the different coating thickness measurement techniques.

- Magnetic Thickness
 - 3 Samples per lot
 - 5 or more measurements per sample
 - 15 measurements, at minimum, comprise the average
- Microscopy Method
 - 5 samples per lot
 - 4 measurements per sample
 - 20 measurements, at minimum, comprise the average
- Stripping and Weighing
 - 3 samples per lot

The minimum average coating thickness for a lot is the average of the specimen values and must meet the minimum for the material category. The minimum for an individual specimen is one grade below the minimum for the material category. An individual measurement on a part has no minimum thickness requirements but bare areas are not allowed. All parts that do not meet these requirements must be resorted and reinspected or rejected and regalvanized.