

Coating thickness control - Applicable for coatings formed during hot dip galvanizing

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The following branch standard for thickness control (measurement) after hot dip galvanizing is a practical application of EN ISO 1461 that satisfies reasonable requirements from the customer, while simultaneously being affordable by the galvanizer.

1. Selection of the significant surface and test area

For details or fabrications that are to be hot dip galvanized to a specified coating thickness, the customer and the galvanizer shall reach an agreement on significant surface(s) and indicate this/these on drawings or other specifications. Test areas for measurements are jointly selected from those surfaces. When selecting test areas, take into consideration any variations that may arise due to the design of the fabrication.

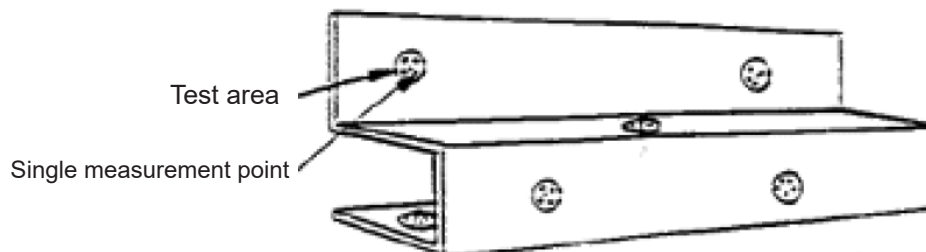
2. Significance of “average coating thickness (minimum)”

The EN ISO 1461 standard gives two values for minimum coating thickness, “local coating thickness (minimum)” and “average coating thickness (minimum)”.

“Local coating thickness (minimum)”, is the average of the measures that are made within a small test area.

“Average coating thickness (minimum)” is the average of all test areas, within the significant surface, for every sample.

This is illustrated in the figure below:



The requirement for “local coating thickness (minimum)” should not be compared to the results of individual measurements. The coating can be thinner or thicker at individual points, depending on the steel surface’s composition and structure.

The significant surfaces, within the 10-100 cm² interval, should contain one test area (1). Objects with significant surfaces >100 cm² and up to 2 m² require at least one test area (≥1). Objects with significant surfaces >2 m² are to have at least three tested areas (≥ 3) per object.

3. Measurement method

Normally, the magnetic thickness method is used in accordance with ISO 2178, which, when used correctly, provides accurate measurement results, quickly and easily. Small components, without good measurement points, can be weighed. (See standard EN ISO 1460).

4. Calibration

Depending on the age of the gauge, it may be necessary to take the material into consideration – thickness,

distance to the edge or hole – and bends in the component’s surface, when calibrating (follow the manufacturer’s instructions). In these cases, it should be done on an uncoated, but clean and polished surface of a similar component as the one that is going to be measured.

Newer gauges are more accurate and calibration is done against a number of references that are comparable to most components that are hot dip galvanized. For all carbon steel, with a carbon content under 0.5 % and thickness ≥ 1.5 mm, the same piece of carbon steel can be used for zeroing. Span setting is done on foil that has a coating thickness similar to that expected of the component.

5. Measurement strategy

As noted in 1 above, the customer and the galvanizer should jointly establish the areas to be tested. These are used when measuring and the results are registered according to Section 2. Within each test area, which shall be at least 10 cm^2 *, at least five magnetic gauge measurements should be done. If any of these measurements fall below the recommended value in the EN ISO 1461 standard, they are acceptable, as long as the average, for the test area, is equal to or larger than the local coating thickness value, in accordance with the current table in the standard.

** For smaller details several items may be needed to create an effective area of at least 10 cm^2 .*

6. Test sample

The following table, which is found in EN ISO 1461, provides the minimum number of test sample per lot. If the customer requests a larger number of test samples, this should be agreed upon when ordering.

Number of articles in lot	Minimum number of articles in the control sample
1 to 3	All
4 to 500	3
501 to 1 200	5
1 201 to 3 200	8
3 201 to 10 000	13
> 10 000	20

In addition to the above, which is the final inspection, also measurements during production can be performed, to ensure that the requirements are met.

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