

APPLICATION NOTE

Application of FISCHER products

AN005en

Duplex Measurement of Lacquer/Zn/Fe for Steel Roofing Systems from BUDMAT®

Roofs are exposed to very harsh weather conditions over many years. To avoid corrosion and guarantee the longevity of steel sheet roofing, the coating of the steel must be of the highest quality. The coating structure is typically built up of three layers of lacquer over a basic zinc coating.

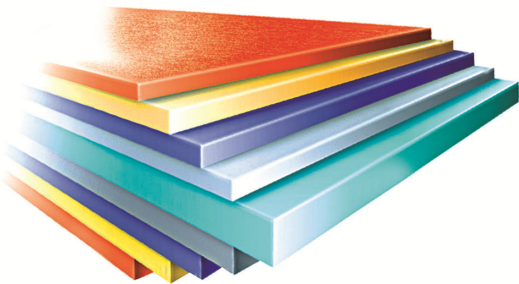


Figure 1: Layered coating structure of coated steel sheets used for the manufacture of roofing: steel base material (green), zinc coating (light blue), protective layer (dark blue) and 2 layers of lacquer (yellow, red).

The norm PN-EN 508 – 1.2010 defines the minimum requirement of 275 g/m² zinc coating for such roof coverings. On top of the galvanization there are different types of lacquers available for use, which, together, determine the coating's final scratch resistance.

Steel sheet roofing materials coated in gloss or matte polyester typically have inner lacquer layers measuring between 27-38 µm. They are considered "thin-layered coatings" and are generally covered by a written guarantee of 10 years.

However, the most highly recommended types have "thick-layered coatings" with an inner lacquer layer 50 µm thick, which gives the steel sheets greater resistance to corrosion and mechanical damage. These high-quality products, such as those provided by the Polish manufacturer BUDMAT®, can be warranted for 30 years.

A characteristic of these sheets is their increased resistance to the kinds of frictional strain to which a roof is often subjected, such as frozen snow, or during assembly. The surface layer contains polymer or ceramic grain which prevents surface scratching.

During the manufacturing process the coated steel sheets are measured with the PHASCOPE® PMP10 DUPLEX. This instrument uses two different electromagnetic measurement methods to determine the thickness of the paint and zinc layers in a single measurement process and displays the results separately: The magnetic induction method is used for measuring the overall thickness of the paint and zinc on top of the ferrous base material, whereas the phase-sensitive eddy current method is employed for measuring just the zinc coating, irrespective of overlying paint layers. The thickness of the paint layer is calculated automatically as the difference between these two results.

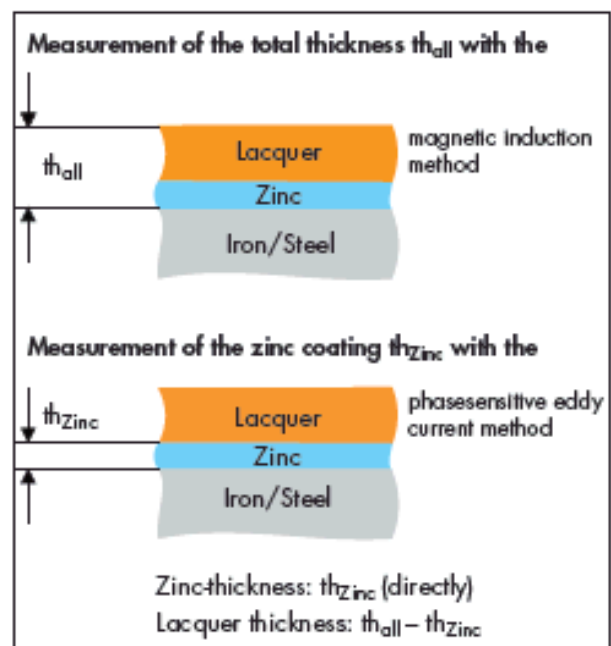


Figure 2: Principle of duplex measurements



Figure 3: Cold forming of roof coverings

Duplex measurements are taken from each production batch and automatically recorded from the host computer – a total quality philosophy. A quality certificate is provided with each delivery.

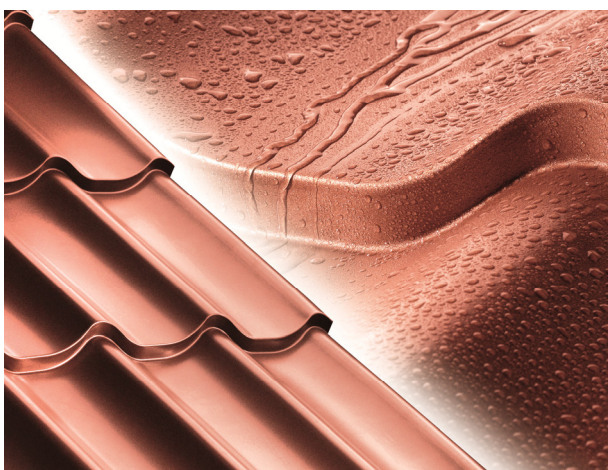


Figure 4: The final product: Quality-assured roof coverings.

Because the PHASCOPE® PMP10 DUPLEX instruments are designed for mobile use, it is also possible to test the coating quality of pre-existing roofs.



Figure 5: PHASCOPE® PMP10 DUPLEX

30-year guarantees can only be provided on steel roofing systems produced according to a high-tech, quality-based manufacturing philosophy. But that requires continuous, vigilant monitoring of the thicknesses of zinc and lacquer coatings on the steel sheet. Because of its ability to perform duplex measurements of different types of coating materials, the instrument ideally suited for this challenge is the handheld PHASCOPE® PMP10 DUPLEX. For further information please contact your local partner for FISCHER products.

Application Note prepared in cooperation with BUDMAT – one of the leading manufacturers of steel roofs and facades, gutter systems and construction profiles. For further info:

www.budmat.pl