

1. Product description

Peikko ECO Galvanizing™ is a surface coating method for the protection of steel against corrosion. It is used to protect steel articles, for instance anchor bolts, which are exposed to weather or other environmental stress by coating them partly or completely.

2. Normative references

Peikko ECO Galvanizing™ fulfills the following standards:

- EN ISO 12670 (Thermal spraying – Components with thermally sprayed coatings – Technical supply conditions)
- EN ISO 2063 (Thermal spraying – Metallic and other inorganic coatings – Zinc, aluminium and their alloys)

3. Preparation of surface to be coated

The surface of the steel article is thoroughly cleaned and roughened by abrasive blasting before coating.

4. Surface coating

Coating method is thermal sprayed zinc coating (metallizing) which is produced by heating the zinc to its molten stage and projecting it in a stream of gas onto the surface to be protected. To ensure reliable and consistent level of quality on coatings, the coating process is automated and handled by robots.



5. Thickness and lifetime of coating

Minimum local thickness of sprayed zinc coating on Peikko anchor bolts is 100 µm. Coating fulfills environmental class C3 of standard EN ISO 9223:2012 (50 years life cycle in urban environment).

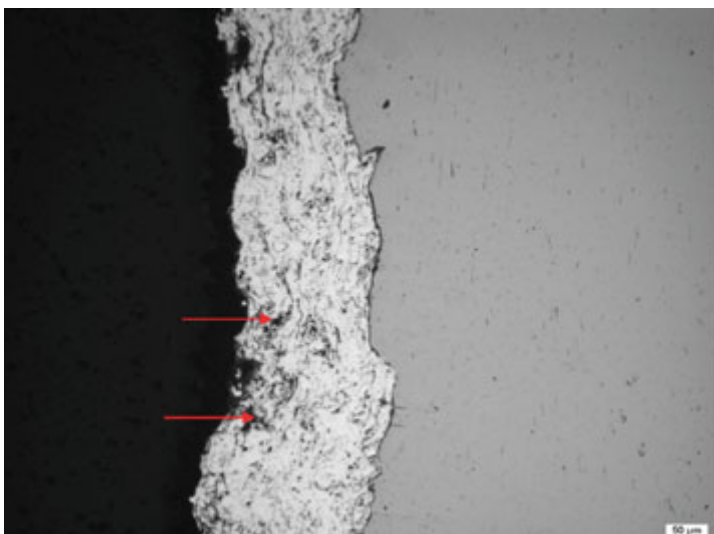
Hot dip galvanizing



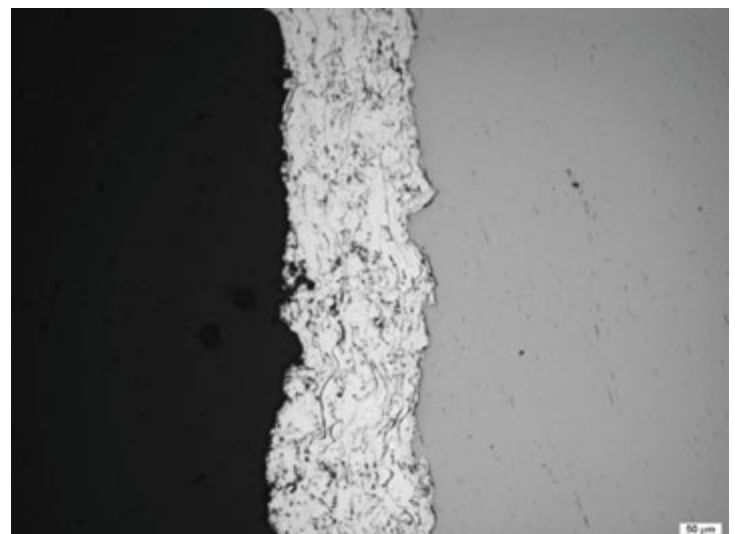
ECO Galvanizing™



Galvanized test samples after the neutral salt spray test of 480 hour.



General view of the ECO Galvanized test piece after 240 hours test time. Corrosion penetration into the coating is marked with arrows.



General view of the ECO Galvanized test piece before neutral salt spray test.

6. Comparison between thermal zinc spraying and hot-dip galvanizing

- **Protection performance**

According to neutral salt spray test, 480 hours, the performance of thermally sprayed zinc coating is similar as expected from a hot-dip galvanized zinc coating provided that the coating thicknesses are above 100 µm.

- **Stress corrosion**

According to laboratory tests the thermally sprayed zinc coating does not lead to stress corrosion cracking (SCC) when coating high strength steel bolts (Rm 1070-1200 MPa). Unprotected bolts may fast lose their strength due to corrosion.

- **Hydrogen embrittlement**

There is no risk of hydrogen embrittlement when coating high strength steel bolts by thermal zinc spraying. This is because surface cleaning is done by abrasive blasting. Opposed to blasting, problems may occur during the acid pickling process of hot-dip galvanizing. Hydrogen embrittlement can result in the premature failure of the anchor bolt.

- **Heat transfer**

There is no risk of possible strength reduction of high strength steel bolt materials (heat treated) during the thermal zinc spraying process. Opposed to spraying, strength reduction may occur with certain materials due to the introduction of heat during the hot-dip galvanizing process.

- **Zinc reaction in concrete (hydrogen absorption)**

There is no risk of possible zinc reaction in fresh concrete which might lead to reduced bonding when anchor bolts are partly coated with thermally sprayed zinc. Zinc surface of hot-dip galvanized anchor bolts should be passivated before putting them in touch with fresh concrete. Passivation takes usually 2-6 weeks from galvanizing process.

7. Application

Peikko is using ECO Galvanizing™ for partial coating of anchor bolts. The coating is made to the upper part of the bolt to protect the surface where the concrete is not protecting the bolt. The coating extends minimum 50 mm below the nominal concrete surface.

Lifetime of Peikko ECO Galvanizing™ in different environmental classes according to EN ISO 9223:2012

Environmental category	Corrosivity category	Coating life (years)
C1	Interior: dry	Thickness loss insignificant
C2	Interior: occasional condensation Exterior: exposed rural inland	
C3	Interior: high humidity, some air pollution Exterior: urban inland or mild coastal	50...

