microZINQ for all: DIN 50997 standard for zinc-aluminium batch galvanizing approved

17.08.2020 – Gelsenkirchen. The Materials Testing Standards Committee (NMP, Normausschuss Materialprüfung / Working Committee for hot-dip coating) has adopted the standard DIN 50997 at its concluding session, thus paving the way for its publication. Analogous to DIN EN ISO 1461, zinc-aluminium batch galvanizing coatings are thus covered by a generally applicable procedural standard: The new standard for batch galvanizing describes the requirements for properties and testing of zinc-aluminium coatings applied to manufactured iron or steel parts by means of thin-film galvanizing. The scope of DIN 50997, which is valid with immediate effect, also includes the microZINQ® batch galvanizing surface from the Gelsenkirchen-based surface specialist Voigt & Schweitzer (ZINQ), which has already received numerous awards for innovation and sustainability.

The discontinuous hot-dip galvanizing ("batch galvanizing") of manufactured iron and steel components has a tradition going back more than 150 years and the basic features of the process have been set out in a process standard for more than 50 years. Due to increased demand for batch-galvanized products in new areas of application and increased demands on the technical properties and resource efficiency of zinc coatings, there is a focus on new alloys for batch-galvanizing melts. The superior properties of zinc-aluminium coatings are already well-known and standardised from the strip galvanizing sector. The standard DIN 50997 that has now been published is only the second batch galvanizing standard in Germany besides the regulation on classic batch galvanizing coatings from 1967 and governs the properties and testing of zinc-aluminium coatings. These coatings have already been used millions of times for more than ten years in a variety of applications such as automotive and commercial vehicle construction, but so far mainly on the basis of manufacturers' factory standards.

Keen interest in standardisation work

The German committee responsible for the preparation of the standard was the Working Committee NA 062-01-75 AA "hot dip coatings" of the DIN standards committee NMP, which was comprised mainly of industry representatives from the steel processing and galvanizing sectors.

The very high level of participation in standardisation work, both on the user side and from public authorities, science and research, as well as the rapid implementation from draft to finished standard

in just under one and a half years, reflects the keen interest in and need for the standardisation of innovative processes in the field of surface technology.

What the standard regulates: Less is more

The DIN 50997 standard is a national standard that describes the requirements for the properties and testing of zinc-aluminium coatings that are applied to manufactured iron or steel parts by means of thin-film galvanizing. The aluminium content of the zinc-aluminium melt must be a mass fraction of at least 4.0 % and at most 6.0 %.

Since influencing factors such as the silicon or phosphorus content of the steel have no effect on the optical properties of zinc-aluminium coatings, the entire surface of the component will have a uniform metallic-silvery gloss regardless of the steel composition, in contrast to batch galvanized surfaces according to DIN EN 1461.

The local layer thickness for zinc-aluminium coatings must be at least 5 µm (micrometres) and the average layer thickness for zinc-aluminium coatings must be at least 6 µm. For batch galvanizing coatings in accordance with DIN EN 1461, much higher minimum layer thicknesses apply, which can only seldom be undercut due to the reactivity of the molten zinc. The thickness of the zinc coating is less decisive for the corrosion protection performance than the ability of the zinc coating to form stable top layers. The formation of top layers is different for zinc and zinc-aluminium coatings: Studies by the Fraunhofer Institute for Manufacturing Engineering and Automation (IPA) have shown that zinc-aluminium coatings are capable of forming extremely stable top layers under atmospheric stress. As a result, it could be shown that corrosive elements such as chlorides from the atmosphere are used to build up crystalline top layers, so that corrosion becomes protection. The corrosion-inhibiting property of the top layer formation applies to all zinc coatings, but especially to zinc-aluminium coatings such as microZINQ, because here closed top layers are formed under corrosive stress which can inhibit the corrosion process on the surface until it stops in the so-called transpassive area.

DIN 50997: Market and customer driven

“The convincing properties of zinc-aluminium coatings have led to a keen interest in innovative technologies in the field of surface technology” confidently states Dr Birgitt Bendiek, Managing Director of Technology and Development at ZINQ. “The reason for the development of the standard is

the increasing demand for modern, innovative zinc coatings, which open up new fields of application through optimised product properties of batch galvanizing and thus the material combination of steel and zinc. The standard is customer driven. The application for the new standard was submitted by Welser, the leading profile manufacturer in Europe, who will develop further products based on the new standard that will be protected against corrosion with zinc-aluminium coatings."

In fact, the new DIN 50997 standard takes into account the range of innovative, highly effective corrosion protection systems already on the market and thus also microZINQ batch galvanizing. As early as in 2015, microZINQ received general technical approval (Allgemeine bauaufsichtliche Zulassung) from Deutsches Institut für Bautechnik. This general technical approval was the first step for microZINQ to be used as a surface in structural applications for building products.

"With the new DIN 50997, we now have a nationally valid framework for the application of zinc-aluminium coatings that incorporates validated findings from science, technology and practical experience – this opens up new potential for microZINQ", summarises Lars Baumgürtel, Managing Partner of ZINQ. "And we will continue to work on developing solutions for our customers around innovative and sustainable corrosion protection. As part of our NextZINQ innovation programme, the focus is not only on new efficient zinc coatings with a long service life, but also on the recyclability of batch-galvanized products in terms of circular quality."

Zinc-aluminium coatings for all

The publication of DIN 50997 gives users the opportunity to use a standardised, highly efficient and durable corrosion protection for all types of steel applications. For users with high in-house needs and the desire to have their own coating capacity, ZINQ also offers microZINQ technology under a licensing system.

The subsidiary ZINQ Technologie GmbH specialises in assisting licensees in project implementation from systems planning through to the ongoing production process. In 2018, ZINQ awarded the first technology license for microZINQ to a German automobile manufacturer, who was thus able to replace their previous coating plant with a more environmentally friendly and efficient process. On the basis of the new standard, this example can now set a precedent in all conceivable applications where steel needs to be protected against corrosion.

About Voigt & Schweitzer:

Voigt & Schweitzer has specialised in hot-dip galvanizing and coating for more than 125 years, and today is the market leader in the field of corrosion protection on steel by zinc. The company, united under the umbrella brand ZINQ®, is focused on the development and production of innovative, Cradle to Cradle® certified surfaces which are used in a diverse range of applications in steel processing. Every year, more than 650,000 tonnes of steel at 45 European locations are protected against corrosion with ZINQ.

About microZINQ®:

The introduction of microZINQ onto the mass market of the metalworking industry took place with the expansion of capacity in 2015 at the microZINQ site in Hagen. The investment in the construction of a new 7-metre facility also included funding from the state of North Rhine-Westphalia and the European Union from the European Regional Development Fund to the sum of approx. 1.7 million euros.

Press contact

Voigt & Schweitzer GmbH & Co. KG
Nordring 4
D-45894 Gelsenkirchen

Tel.: +49 209 319270-336
Fax: +49 209 319270-13
Email: **presse@zinq.com**