

Newsletter October 2018

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Danish "The Silo" won the Global Galvanizing Awards at Intergalva in Berlin

"In the new district Nordhamnen in Copenhagen, Denmark's most expensive apartment is built in an old silo. The 380 square meter apartment with four balconies is now announced for DKK 30 million" This was to be read in a Swedish newspaper recently. For the Copenhageners, the worn concrete silo with the graffiti text "Hva drikker mølfr" was a well-known profile, but hardly any beautiful building. Therefore, the change is even more impressive! The 42 apartments in the renovation project "The Silo" in Nordhamnen are ready for occupation in December and are now out for sale. The old building has undergone a wonderful transformation, and we at Nordic Galvanizers are of course proud that Architect Cobe, who designed the conversion, chose hot-dip galvanized steel to the facade of this prestigious building!

The building is located near the sea and the corrosion category is considered to be C4. The coating thickness was specified to a minimum of 100 microns. The used steel was S 235 with a sulfur content in the area 0.20-0.25 % and a thickness of 3 mm. The facade consists of a large number of pieces, many with their own identity, and the traceability during the assembling process has been of large importance. On September 25th, EGGA organized a meeting with the architect company Cobe, which has drawn the facade. It was very interesting and also included a study visit to the Silo and the spectacular apartments.

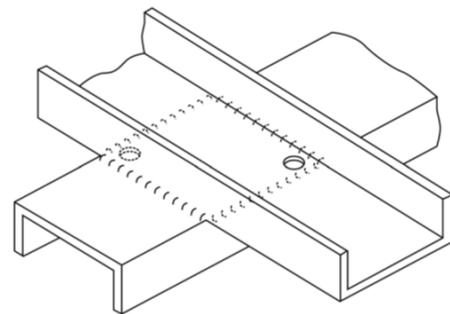
Recommendations for galvanizing of constructions with overlapping surfaces

It is well known that overlapping surfaces like in weld-on reinforcements and lap joints need holes for safe galvanizing. However, information about the size and number of the holes have not been that clear, and often it is some form of guessing to try to find out what is needed.

After an accident in one plant caused by insufficient holding NG has looked closer on this, and found some recommendations in the new, coming revision of the galvanizing standard ISO 13713-2.



The Silo - as spectacular in reality as in the picture!
Photo credit: Rasmus Hjortshøj – COAST



It is really important to be aware of that the holes must be big enough, at least 12 mm in diameter. Smaller holes become easily clogged and the possibility of drainage is stopped. An explosion could be the consequence.

Area of Overlap	Recommended Action
Up to 100 cm ²	Circumferential tight weld. See NOTE 1.
100 to 1000 cm ²	In diagonally opposite positions, either: 2 x ≥ 12 mm holes at corners or 2 x ≥ 25 mm intermittence of welds at corners. See also NOTE 2.
1000 to 2500 cm ²	Either: 4 x ≥ 12 mm holes at corners or 4 x ≥ 25 mm intermittence of welds at corners. See also NOTE 2.
≥ 2500 cm ²	In diagonally opposite positions, either: ≥ 12 mm holes at corners and circumferentially at least every 300 mm from the corners or ≥ 25 mm intermittence of weld at corners and circumferentially at least every 300 mm from the corners
NOTE 1 The material used should be dry for the welding process and the overlapping parts should be smooth and assembled without gaps.	
NOTE 2 Agreement between designer and galvanizer is required to coordinate the position of holes and points of lifting for galvanizing	

Steel with low reactivity - a more and more common problem?

We have earlier informed about aluminium killed steels with too low reactivity to fulfil the coating thickness requirements in EN ISO 1461. It seem to be steel with low silicon content (often kalled "ultra low Si" with a content below 0.01 %) and with an aluminium content higher than 0.04 %. The surface roughness of this steels is normally low (so called "Laser steel"), which also may influence on the reactivity.

Last spring DOT, NG and a steel supplier made a study were 23 steels with thickness between 3-12 mm were galvanized in a nickel alloyed bath. Of these only four fulfilled the thickness requirements; two that were blasted before galvanizing and two that were silicon killed. The rest, with a silicon content between 0.01-0.021 %, all failed.

As a next step in the study parallell dipping trials was performed in both nickel allyed and nickel free zinc bath. Aluminium killed steel samples with thickness 3 and 10 mm were pretreated in the same plant. One group was galvanized at Vadstena Varmförzinkning, which has nickel in tha bath, and one group was galvanized at Prozink, which has a nickel free melt. The dipping time was 2,67 minutes.

From this part of the study the following conclusions could be drawn:

* 3 mm plates dipped in Ni free bath fulfil the requirements according to 1461 after 2,67 min dipping time.

* The steel thickness seems not to influence on the coating thickness as much as expected. The coating thickness on the 10 mm samples is almost the same as on the 3 mm samples, but since the thickness requirements on them are higher, they fail.

* There is quite a large difference in coating thickness on this type of steel dipped in Ni-alloyed bath related to Ni-free bath, 10 – 20 microns, both on 3 and 10 mm steel.

The result is in line with what we saw from the earlier study performed by DOT.

One idea for further studies was to increase the dipping time in Ni-free bath for 10 mm samples, to see if it is possible to reach acceptable thicknesses. Those trials were performed at Prozink, and the dipping times 5 and 10 minutes were used. It was shown that with a dipping time of 10 minutes the coating thickness was around 85 - 88 microns, which fulfil the requirements according to EN ISO 1461.

To get a higher understanding for what actually happens when galvanizing these steels a number of the samples from the trials at Vadstena Varmförzinkning and Prozink have been delivered to the research institute Swerea KIMAB for metallographic studies.

Today we don't know how large the part of these steels are on the market. The use of nickel additions to the bath has been more and more common in whole Europe in recent years, and probably the benefit from savings in

zinc consumption is still larger than the problem with low coating thickness on this type of steels. But to be able to deliver a proper product - or give advice - to all types of customers, we need to know more in this field.

Information about this type of steels will be given in the new revision of the galvanizing standard ISO 14713-2 that will come in the beginning of next year. EGGA will also ask for an extra revision of EN ISO 1461 to add information in this area.

The trip to U.S.

NG now preparing for our study trip to Florida 12-17 November! It is a group of 23 galvanizers from our association that will visiting galvanizing plants over there. It will be really interesting and we will of course report back to you that not have the possibility to join this time.

Annual meeting 2019 - maybe on Iceland!

The plan is to arrange NG:s annual meeting and conference 2019 on Iceland! We have one member there, FerroZink with the contact person Steinar Magnússon. He will give us some advice around the arrangements and we will start to work on this issue as soon as we are back from U.S. If it is possible to have the meeting there depends among other things on the availability and costs for flights from other Nordic countries to Iceland. More information will follow!

How is the business?

We have got a little bit different reports from our members this autumn. It seems like the demand for hot dip galvanizing varies between different parts of the Nordic region, and some members consider that they have had less to do than normal for the season. We hope that the market has recovered well and that everyone has a productive period to look forward to.



Courses for hot dip galvanizing operators

As usual, NG will arrange a number of operator courses at different locations in the Nordic countries. Special information about these occasions will be sent out separately. If you are interested in a course at your plant, either for your own operators only or an "open" course with participants from other facilities too, please contact us at the information office. This, of course, applies even if you are interested in sending participants to a course arranged at some other plant.