BELGIAN WELDING INSTITUTE NPO

Belgisch Instituut voor Lastechniek VZW
Institut Belge de la Soudure ASBL

Director: Ir. F. MAAS, IWE

Zwijnaarde, 29 June 2017

REPORT NR. 16/351

REQUESTED BY: **ZINGAMETALL BVBA**
T.a.v. de heer Jason Serck
Industriepark - Rozenstraat 4
B - 9810 Eke (Belgium)

SUBJECT: **Investigation into the mixing of ZINGA coatings**

ir. Fleur Maas, IWE - Director

ir. Jens Conderaerts

Correspondence:
Technologiepark 935
B - 9052 Zwijnaarde
• Tel. +32 (0) 9 292 14 00
• Fax +32 (0) 9 292 14 01
• E-mail: Fleur.Maas@bil-ibs.be
• Website: www.bil-ibs.be

Registered Office:
A. Van Osslaan 1-4
B-1120 Brussel
• Tel. +32 (0) 2 260 11 70
• Fax +32 (0) 2 260 11 79

FORTIS 210-0056673-77
BTW BE 0 406 606 875

Investigation into the mixing of ZINGA coatings

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Figures and Tables

1. Information received

The Belgian Welding Institute (BWI) received four coated steel samples. Both sides are shown in Figure 1 and Figure 2. Samples are given BWI-reference A to D. The coating is as follows:

- A: ZINGA + copper
- B: ZINGA + copper + ZINGA
- C: Zinc primer + copper
- D: Zinc primer + copper + zinc primer

The method of application is as follows. Zinga or zinc primer was applied on a blasted steel surface and was kept at room temperature for a period of 7 days. The sheet was subsequently covered with a thin layer of copper particles. Afterwards, for samples B and D, a second layer of Zinga or zinc primer was applied on top of the layer of copper particles.

2. Request

The BWI is requested to prepare a metallographic section of the different layers of the coating and to evaluate the mixability.

3. Conclusion

On sample B, copper particles are observed throughout the thickness of the coating. This means that the second ZINGA layer has mixed with the first ZINGA layer.
This result shows the mixability of the ZINGA coating with previous ZINGA coating layers.

Sample D shows a distinctive layered pattern of the first zinc primer layer on the steel, covered by a layer with copper particles, covered by the second zinc primer layer.
This result shows that the zinc primer is not mixable with previous zinc primer layers.

ir. Fleur Maas, IWE - Director ir. Jens Conderaerts

Note: If you should wish to recuperate the remaining test material, we kindly ask you to contact us within a period of three months. After this period we will dispose of it. Thank you in advance.

4. Experimental results

4.1. Method

Samples are cut in the center (see Figure 2). After embedding, grinding and polishing, the samples are examined by light microscopy. All pictures are taken at the same magnification.

4.2. Result

Figure 3 to Figure 10 show the microscopic images of the layers.

Sample A shows a ZINGA layer with a layer of copper particles on top (Figure 3 and Figure 4).
Sample B shows a mixed copper and ZINGA layer (Figure 5 and Figure 6). Copper particles are observed throughout the thickness of the coating. This means that the second ZINGA layer has mixed with the first ZINGA layer.

Sample C shows a zinc primer layer with a layer of copper particles on top (Figure 7 and Figure 8).
Sample D shows a distinctive layered pattern of a zinc primer layer on the steel, covered by a layer with copper particles, covered by a zinc primer layer (Figure 9 and Figure 10). The copper particles did not mix with the zinc primer coating.

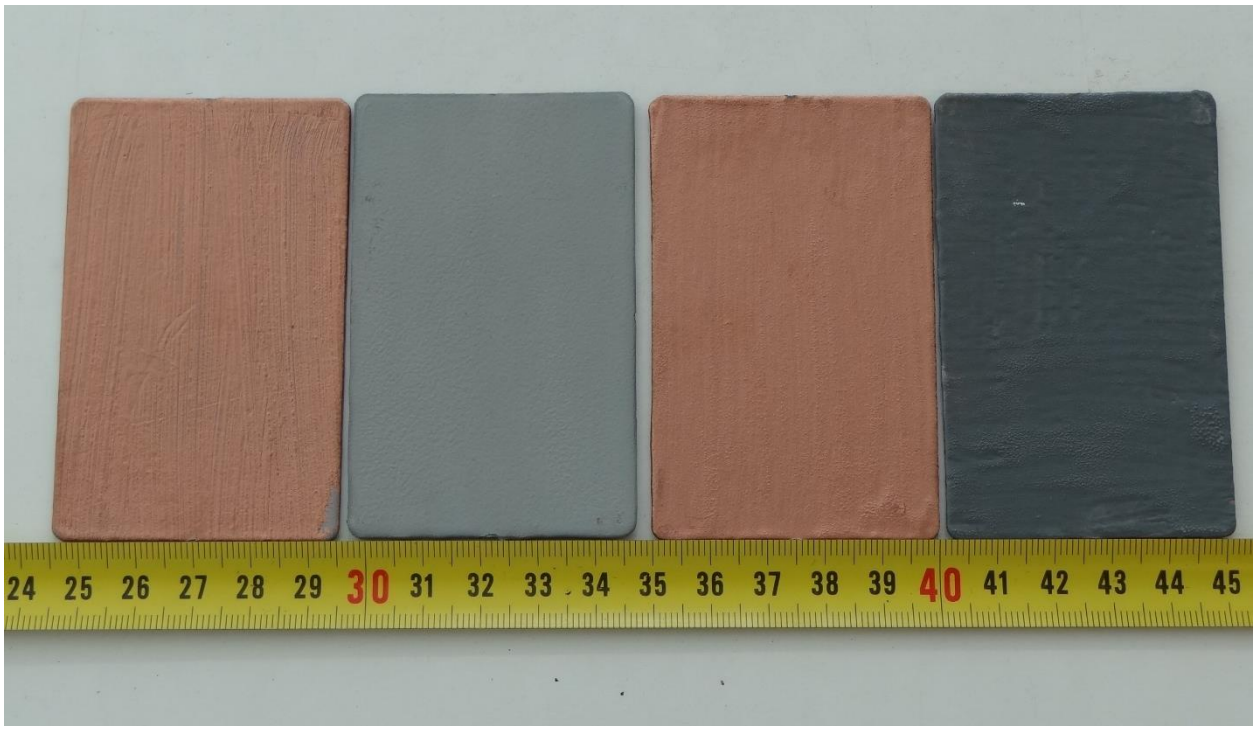

Figure 1:Samples received. From left to right: A to D.

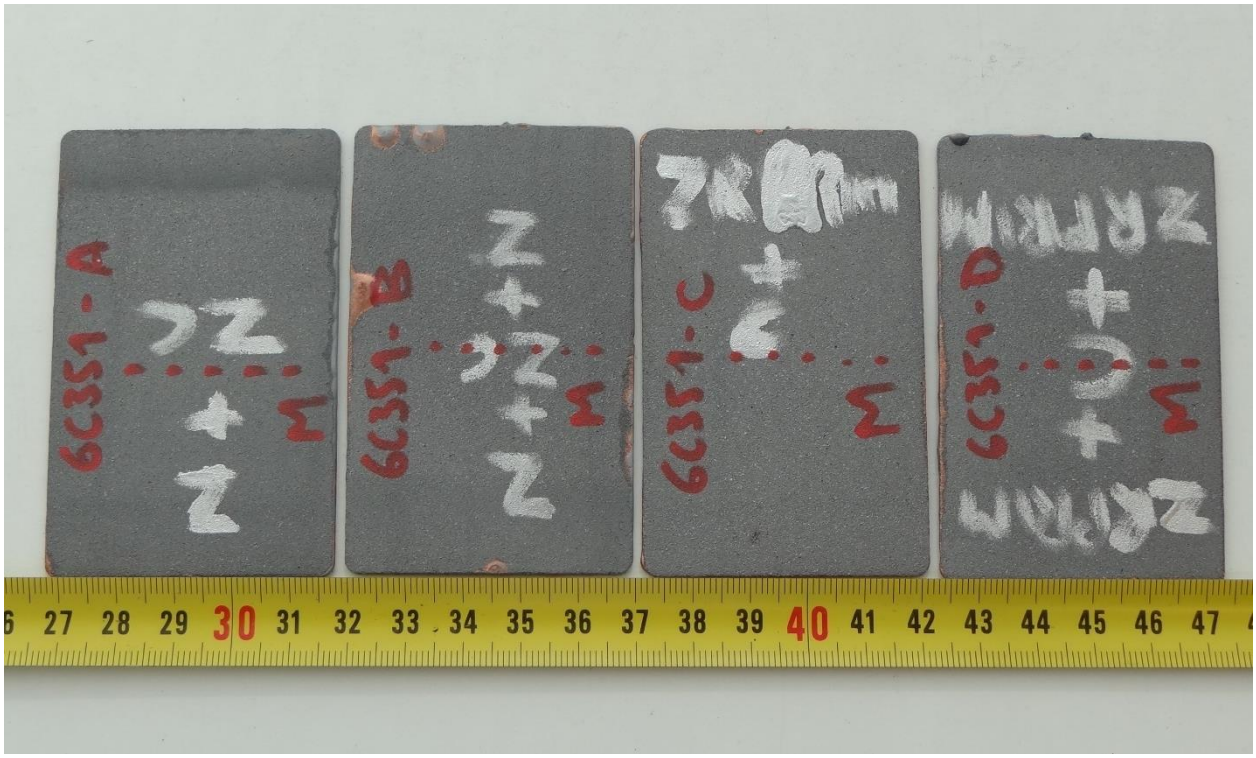

Figure 2:Indication of sampling location.

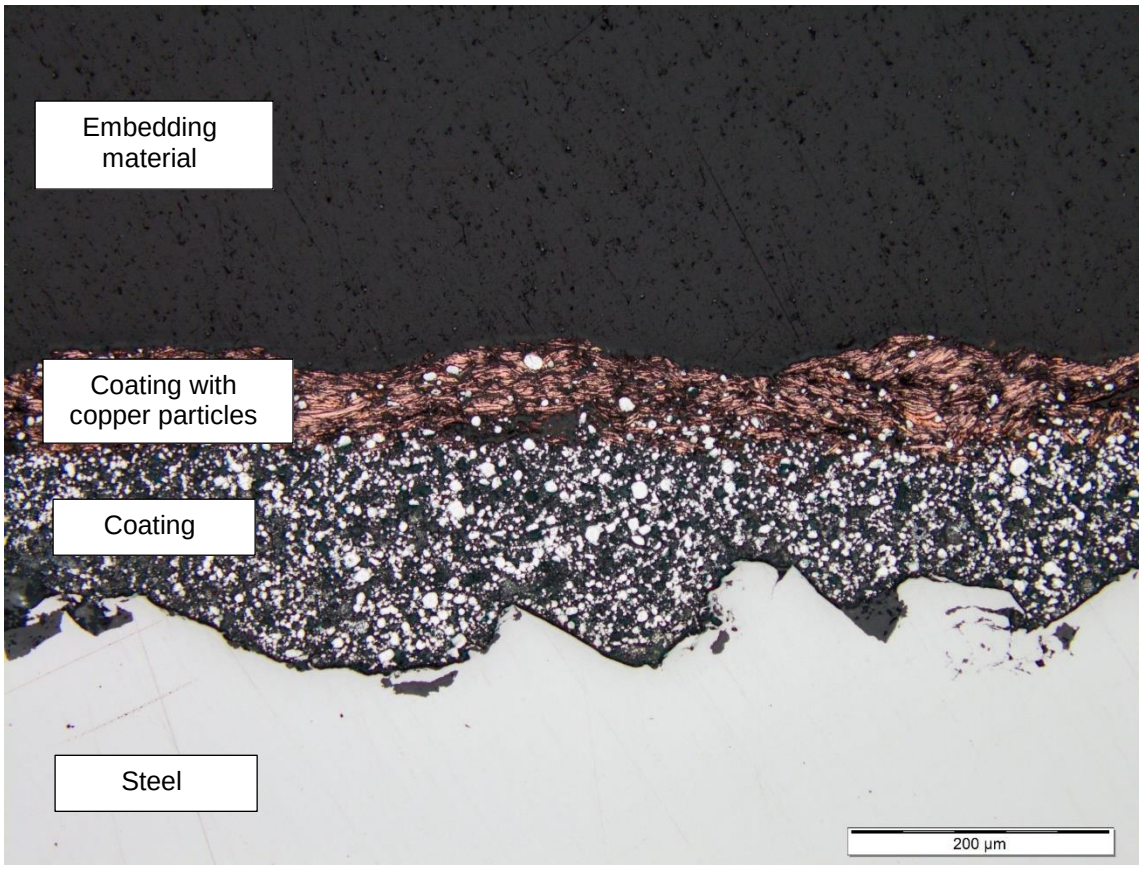

Figure 3: A-1

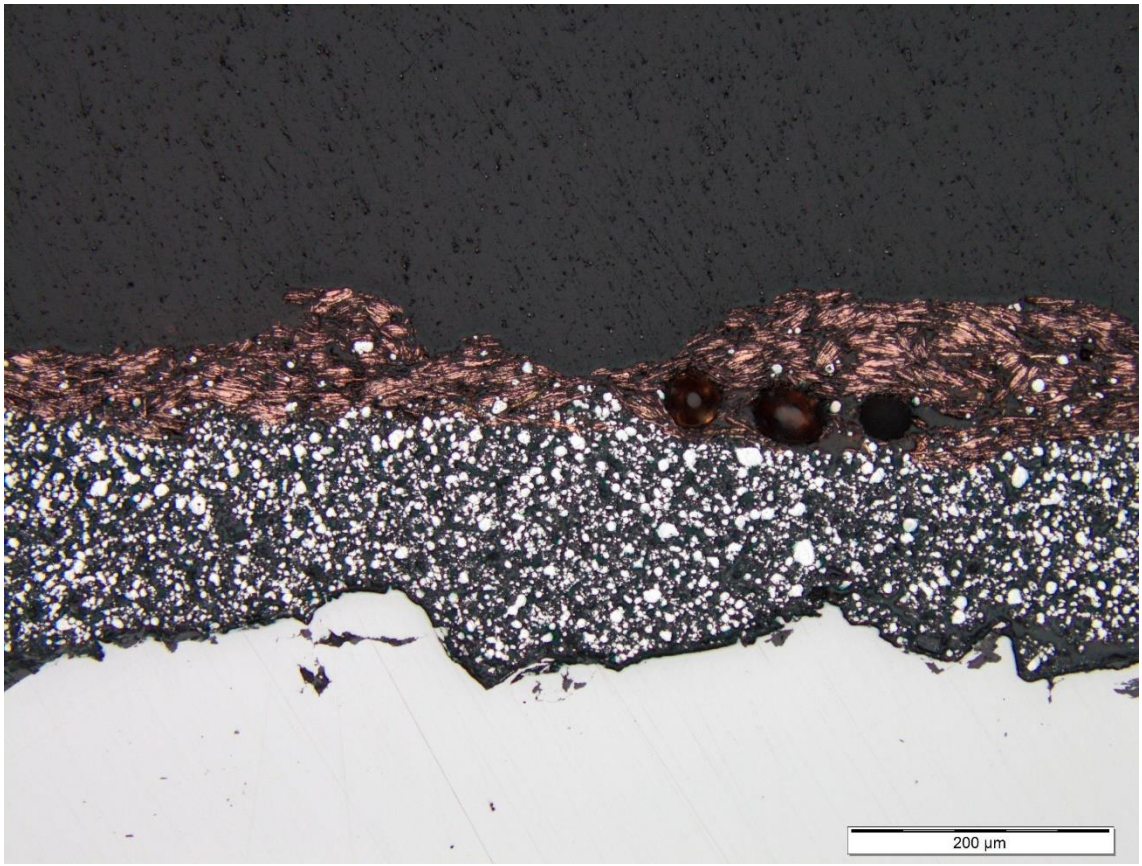

Figure 4: A-2.

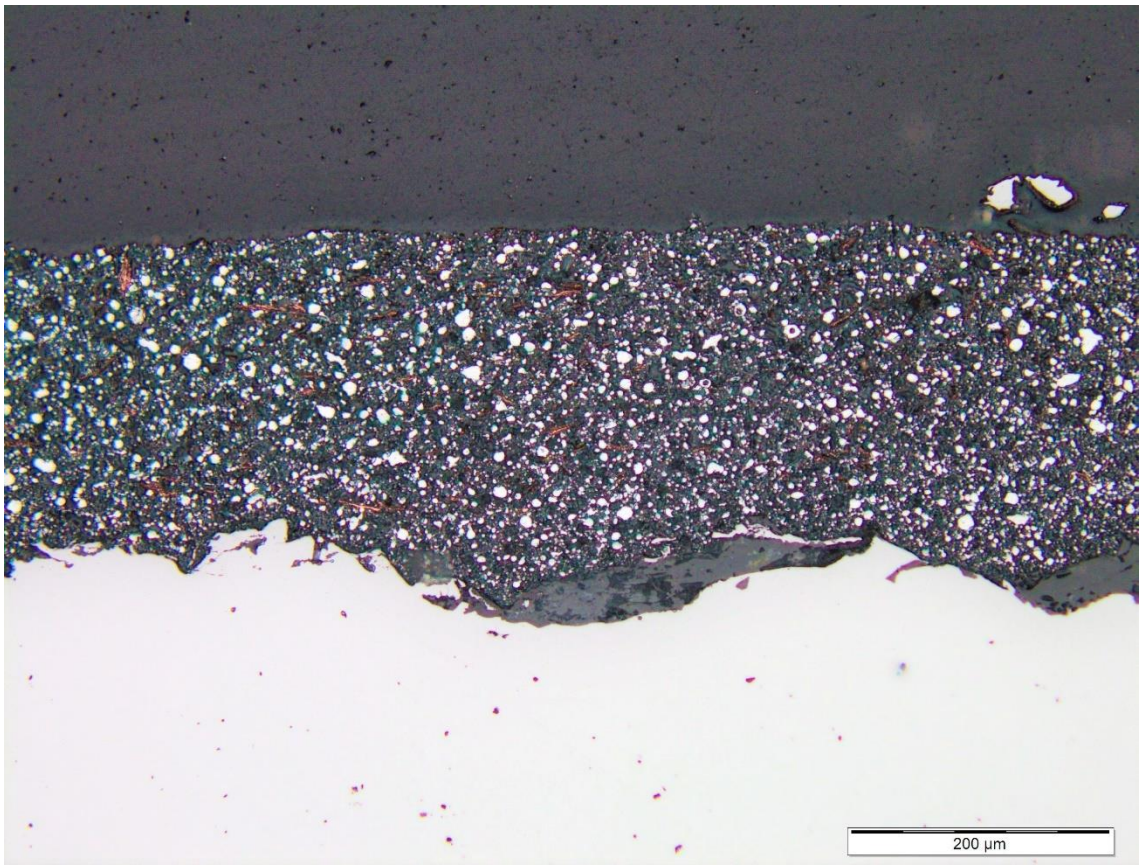

Figure 5: B-1.

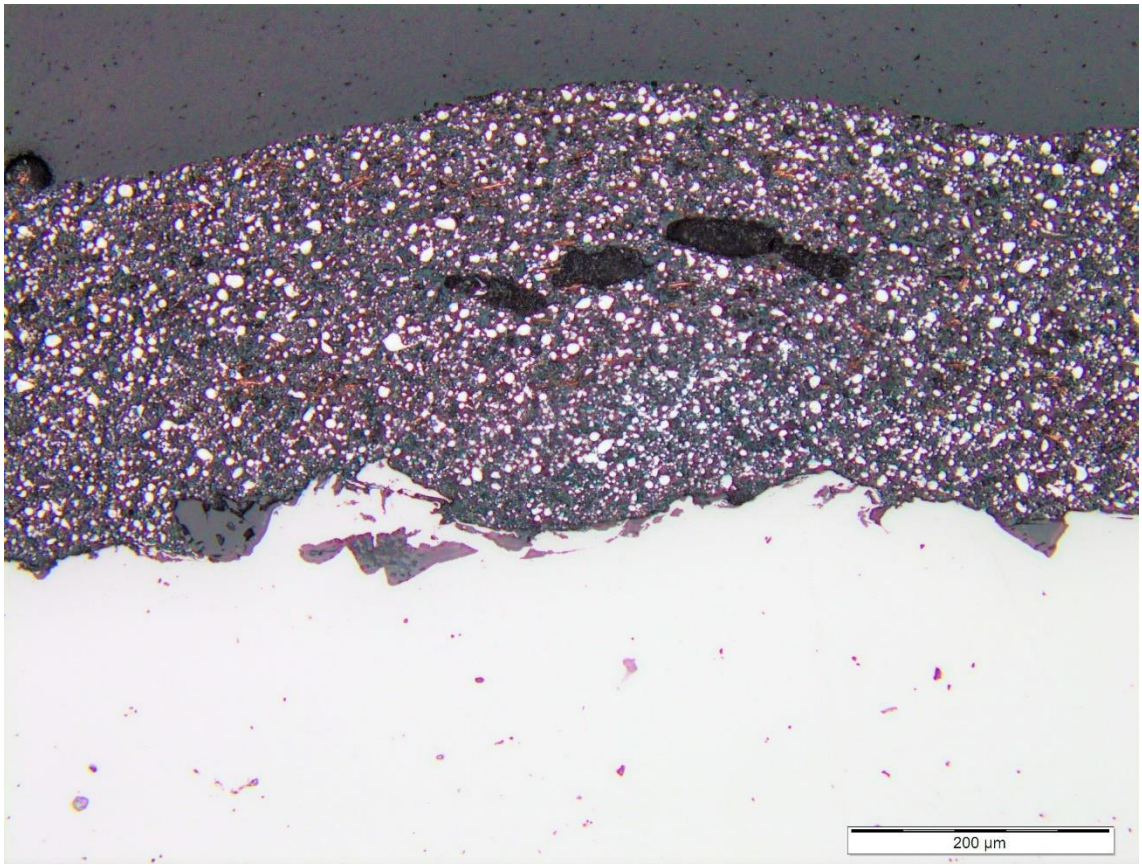

Figure 6: B-2.

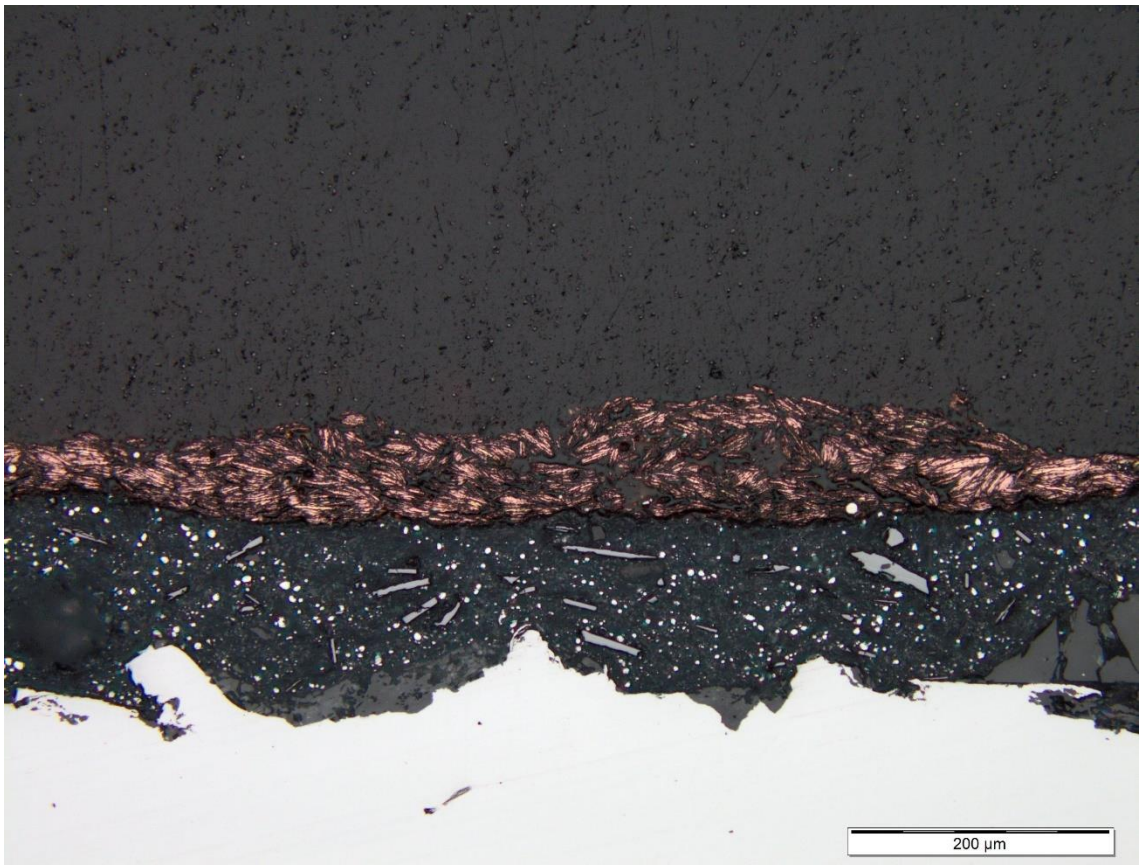

Figure 7: C-1.

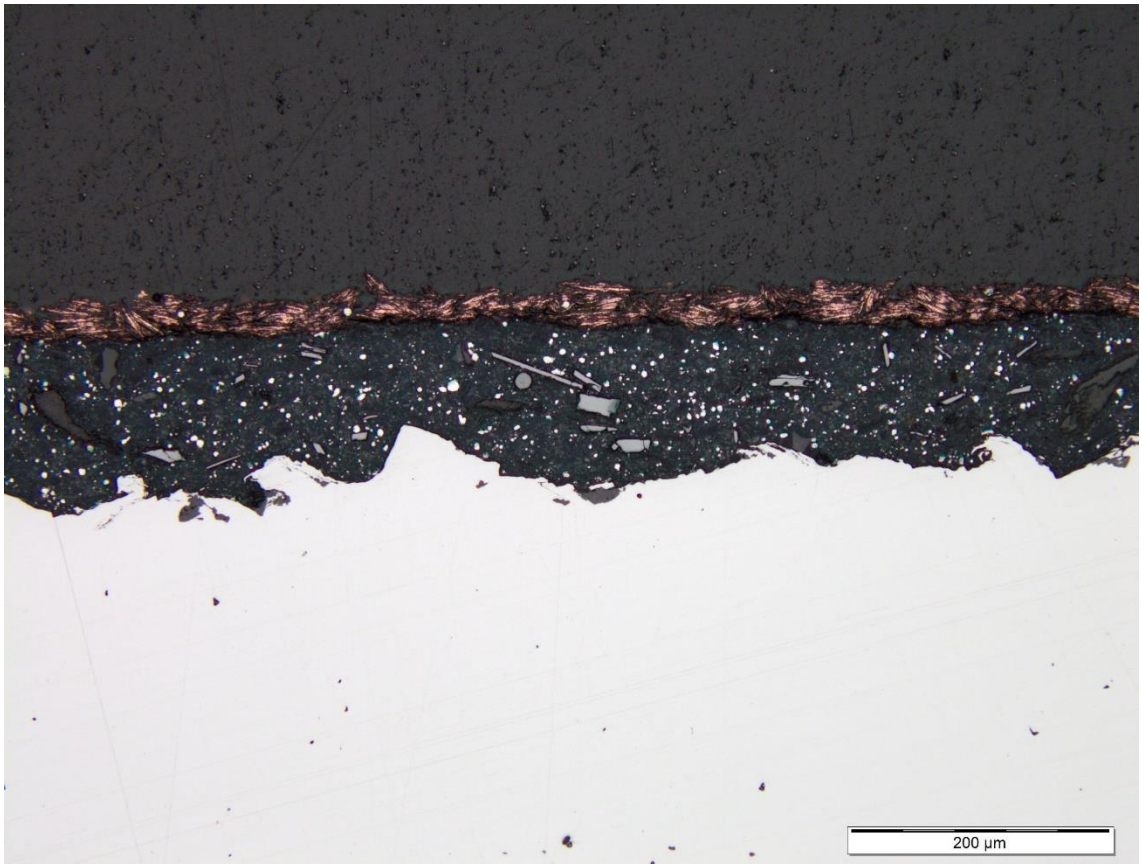

Figure 8: C-2.

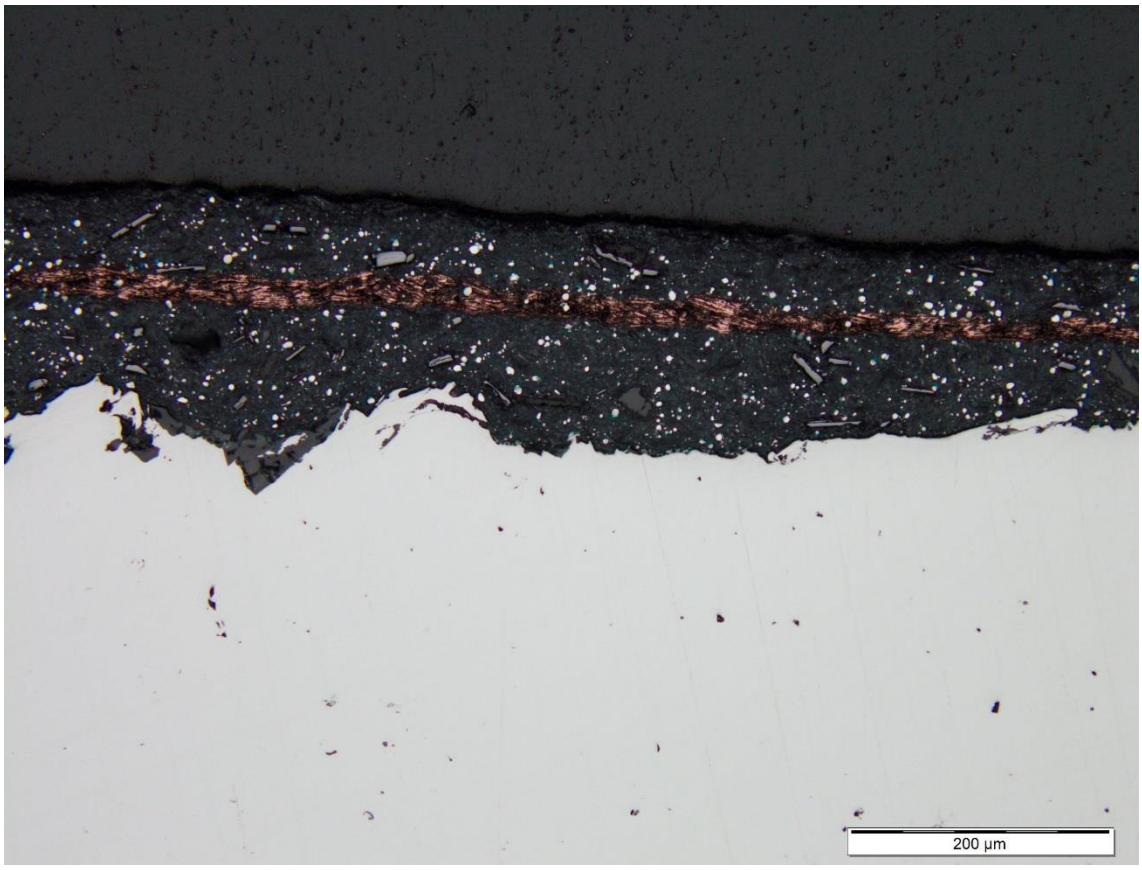

Figure 9: D-1.

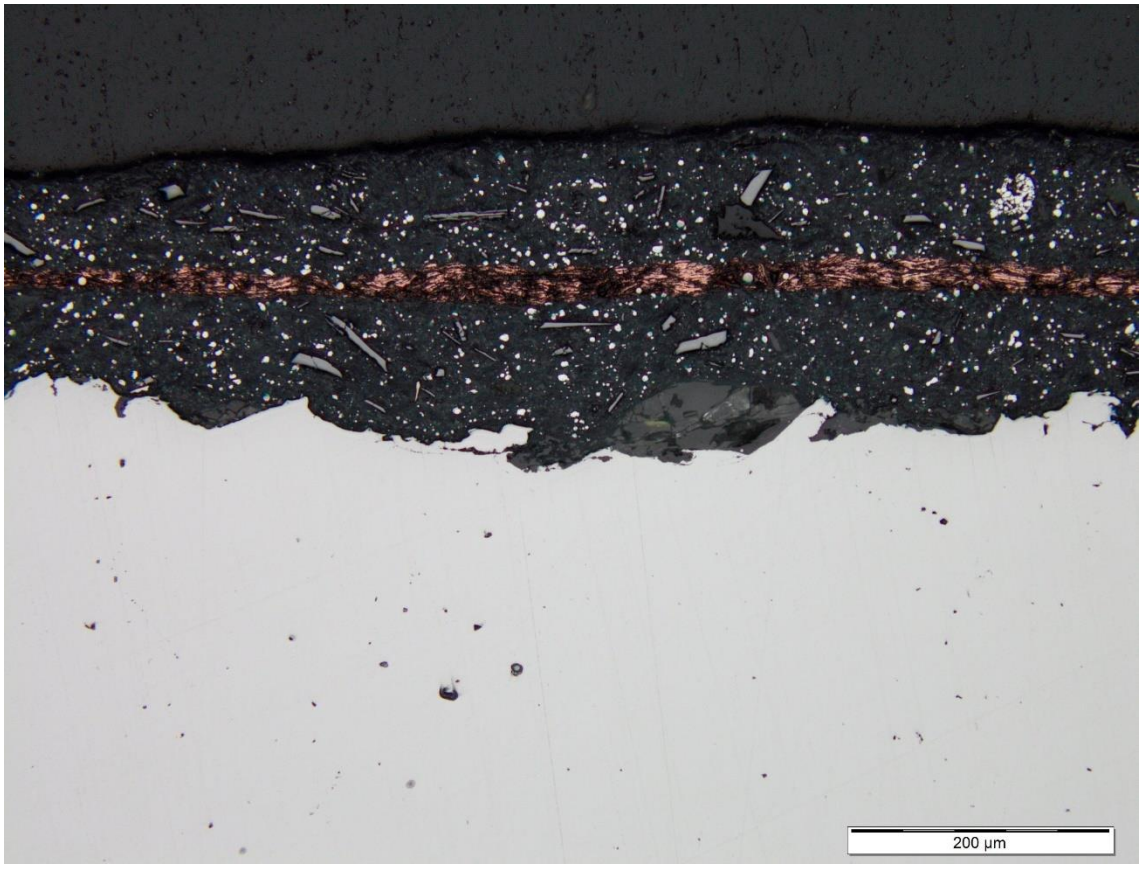

Figure 10: D-2.