Zinc Kettle Wall Thickness Measuring Using Ultrasound at Elevated Temperature

Presentation to the Nordic Galvanizers Association

Author: David Watkins – (Managing Director)
Zinco UK Limited

Advanced Technical Services for the Hot Dip Galvanizing Industry
Contents

• Who we are.
• Need for regular kettle inspection.
• Non invasive technology.
• Operations.
• Benefits / considerations.
• Summary.
Who we are….

• **Zinco UK Limited** is a JV Company owned by Zinco Service SRL (*based in Italy*) and Hereford Galvanizers (*based in the UK*).

• Zinco Service SRL – over 35 years associated with the hot dip galvanizing industry.

• Hereford Galvanizers – privately owned and with over 40 years in operation.
Need for Regular Inspection

• Zinc kettle corrosion due to wear / age.
• Avoid molten zinc spill causing economical & environmental disaster.
• Allows for planned kettle changes.
Traditional Inspection

- Pumpout - into holding vessels or barrels.
- Time / cost / Health & Safety issues.
- Downtime 5 – 10 days.
- Sometimes unavoidable!

*Advanced Technical Services for the Hot Dip Galvanizing Industry*
Traditional Inspection

- Allows visual inspection of corrosion.
- Repairs if necessary.
Non Invasive Technology

- Development of ultrasound technology in conjunction with NRC Montreal.
- Specialist clad steel ultrasound probe (patented technology) developed that measures the kettle wall thickness, with the kettle still full of zinc.
- Kettle Inspection Device (KID) is born out of 3 years R & D.
Advanced Technical Services for the Hot Dip Galvanizing Industry
Data Collection

• Probe mounted onto kettle to give 3D movement.
• Cooled by C02.
• Temperature of probe constantly monitored.
• Burner / heat shield areas critical.
Data Collection

- Probe connected to PC whereby signal is interpreted.
- Instant results.
- Data stored for distribution.
- Number of readings depends on kettle size; e.g. 7.0m long – 150 reference points.
Typical Thickness Map
KID Operations

• ZUK proposal is accepted by the customer and inspection date agreed.
• Full Scope of works given to the customer.
• Customer arranges C02 locally.
• KID equipment delivered in its own container.
• Inspection – most installations within 1 day.
• “Grouping” geographical inspections of plants reduces costs (everyone benefits).
Logistics - Scandinavia

- Equipment shipped on a “groupage basis”.
- Denmark – daily.
- Finland, Norway, Sweden – twice a week.
- Transit time: 2 – 3 days.
- Technicians – fly / drive to the customer.
Benefits of non invasive inspection

• Accuracy to +/- 1.5mm.
• Comparative data available.
• Nearly 50 inspections in Europe & North America.
• Low cost compared to traditional pump out.
• Time savings allow you to keep galvanizing!
Considerations

• Enclosure height : min 4.1m needed.
• Depth generally measured up to 2.4m deep, deeper probe is now being developed.
• House Keeping – kettle should be free from dross / top of bath clean.
• Kettle bottom – can’t be measured.
• Need for repair – which can be planned.
Some of customers include :-

• Galva 45 – France.
• Limburge Galvanisatie nv – Belgium.
• Galva Power Group – Belgium.
• Galco Steel – Ireland.
Summary

• Non invasive technology – no loss of kettle wall thickness with traditional pump-outs.
• Most installations can be undertaken in a day.
• KID testing to suit customers production needs.
• Financial benefits vs. traditional pump out!
• Typical KID inspection would be 30% of the cost compared to using holding vessels.
Any Questions?

Please refer to our website
http:www.zincouk.com

or

email : info@zincouk.com