CORE CONCEPT

Hot-Dip Galvanizing Plant Operations Course: Pretreatment, Zinc Kettle and Coating Inspection

5 – 9 September 2027
Dammam - Eastern Province five-star

Hot-Dip Galvanizing Plant Operations Course: Pretreatment, Zinc Kettle and Coating Inspection

Ref: 1933_28845 **Date:** 5 – 9 September 2027 **Location:** Dammam - Eastern Province five-star **Fees:** 19500 SAR

Introduction:

Hot-dip galvanizing plant operations, covering pretreatment, zinc kettle and coating inspection, is the subject of this 1-week course for kettle, pretreatment, quality and galvanizing purchasing staff, ending with a Galvanizing Line Control and Zinc Consumption Plan for a case plant. Galvanizers lose margin when spent pickle acid, weak flux and drifting kettle temperature raise dross, ash and zinc pick-up per tonne, while fabricators receive bare spots and distorted work. Nominees already run tanks, the kettle or coating checks and learn through inspection walkthroughs of jigging, dipping and test records. CoreConcept Training Center delivers this hot-dip galvanizing course.

Course Objectives:

- Control degreasing, hydrochloric acid pickling, rinsing and zinc ammonium chloride flux baths using titration, iron content and density limits
- Set zinc kettle temperature, bath additions and immersion and withdrawal speeds for each steel section and work type
- Reduce dross and ash formation and zinc pick-up per tonne through bath practice, skimming and drainage technique
- Predict coating weight and appearance from steel silicon and phosphorus content and section thickness, and advise fabricators on venting, draining and distortion
- Measure and accept coating thickness, adherence and finish against ISO 1461 and ASTM A123 and decide on repair or regalvanizing
- Prepare a Galvanizing Line Control and Zinc Consumption Plan that ranks pretreatment, kettle and inspection actions for a case plant

Target Audience:

- Staff responsible for zinc kettle operation, bath additions, skimming and dross removal on each shift
- Staff responsible for degreasing, pickling, rinsing and flux tanks and their chemical analysis records
- Staff responsible for coating thickness testing, visual inspection and release of galvanized work
- Staff responsible for jigging, crane cycles and throughput planning in batch galvanizing plants
- Staff responsible for specifying, ordering and accepting galvanized steelwork for fabrication shops and contractors

Course Outline:

Day 1: Galvanizing Plant Landscape and Zinc Consumption Baseline

- Batch Galvanizing Versus Continuous Strip and Electrogalvanizing Routes
- Zinc and Iron Reaction Forming Gamma, Delta and Zeta Layers
- Plant Layout Walk From Jigging Bay to Quench Tank
- ASTM B6 Zinc Grades and Kettle Bath Purity Requirements
- Zinc Consumption per Tonne Baseline From Kettle Records

Day 2: Pretreatment Chemistry and Coating Standards

- Alkaline and Acid Degreaser Selection With Temperature and Strength Checks
- Hydrochloric Acid Pickling Strength, Iron Build-Up and Inhibitor Control
- Rinse Tank Carry-Over and Cascade Rinsing Arrangement
- Zinc Ammonium Chloride Flux Ratio, Density and Iron Removal
- ISO 1461 and ASTM A123 Minimum Coating Thickness Tables

Day 3: Zinc Kettle Operation and Dipping Practice

- Kettle Temperature Window and Heating Burner Profile Checks
- Aluminium, Nickel and Bismuth Bath Addition Practice
- Immersion Speed, Dwell Time and Withdrawal Rate Setting
- Surface Ash Skimming and Bottom Dross Grabbing Routines
- Drainage, Vibration, Centrifuging and Quench or Passivation Steps

Day 4: Reactive Steels, Distortion and Coating Defects

- Silicon and Phosphorus Reactivity and the Sandelin Effect
- ISO 14713 Venting and Draining Hole Design for Fabrications
- Thermal Distortion of Thin Plate and Asymmetric Sections
- Bare Spots, Flux Inclusions, Dross Pimples and Runs Diagnosis
- Hydrogen Embrittlement Risk and Coating Peel on High-Strength Steel

Day 5: Inspection Walkthrough and the Galvanizing Line Control and Zinc Consumption Plan

- Case Plant Pickle and Flux Tank Analysis Record Review
- Magnetic Gauge Thickness Survey Against Reference Areas
- Case Defect Log Ranking With Repair or Regalvanize Decisions
- Zinc Pick-Up, Dross and Ash Loss Cost Model
- Galvanizing Line Control and Zinc Consumption Plan Completion and Review

Skills You Will Gain:

- Pickle Acid Management
- Flux Bath Control
- Kettle Temperature Control
- Dross and Ash Reduction
- Reactive Steel Assessment
- Galvanized Coating Inspection
- Galvanizing Defect Diagnosis
- Zinc Cost Tracking

Why Attend This Course:

- Deliver a Galvanizing Line Control and Zinc Consumption Plan to the plant manager and the quality lead with ranked actions for each tank and the kettle
- Decide when to dump or regenerate pickle acid, adjust flux or change kettle settings using analysis and thickness data
- Avoid rejected loads, customer complaints over bare spots or distortion and zinc lost as dross, ash and excess pick-up
- Coach kettle crews, jiggers and fabricators with the defect atlas, venting checklist and tank analysis sheets

Conclusion:

Back at work, the participant hands the Galvanizing Line Control and Zinc Consumption Plan to the plant manager, the kettle supervisor and the quality lead. They use it to set analysis limits for degreasing, pickling and flux tanks, fix kettle temperature and addition practice, agree venting and steel selection rules with fabricators and set zinc use targets per tonne. After the first month under the plan, the unit should compare zinc pick-up, dross and ash weights and defect rates with the baseline, then revise the action list.

Frequently Asked Questions FAQ:

What should participants know before a hot-dip galvanizing plant operations course?

Participants should already work on pretreatment tanks, the zinc kettle, coating inspection or galvanizing purchasing and read basic production logs. Bringing anonymised tank analysis sheets, kettle records or thickness reports helps during the case work.

How does a hot-dip galvanizing plant operations course differ from a general protective coatings course?

This course covers immersion in molten zinc: pickling, fluxing, kettle chemistry, dross, reactive steels and galvanized coating acceptance. Protective coatings courses deal with blasted steel and applied paint systems, and electroplating courses deposit metal from an electrolyte with current.

Why does steel chemistry matter in hot-dip galvanizing plant operations?

Silicon and phosphorus in the steel speed up the zinc and iron reaction. Reactive steels can produce coatings that are much thicker, dull grey and brittle, which raises zinc use per tonne and the risk of flaking.

What do participants take back from the hot-dip galvanizing plant operations course?

Participants take back a Galvanizing Line Control and Zinc Consumption Plan for a case plant, plus tank analysis sheets, a defect atlas, a venting and draining checklist and a zinc loss cost model adaptable to their own plant.