



Aluminium Extrusion and Surface Finishing

Course: Press, Dies, Anodising and Powder Coating



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Introduction:

Aluminium extrusion and surface finishing, covering press operation, dies, anodising and powder coating, is a 1-week course for press, die shop and finishing line staff, ending with an Extrusion and Finishing Line Recovery Plan for a case plant. Profile plants lose recovery and customer acceptance when billet temperature drifts, dies are corrected by habit and anodised or coated profiles fail on colour, film or adhesion. Nominees already run presses or finishing lines and learn through inspection walkthroughs of press logs and line records. CoreConcept Training Center delivers this aluminium extrusion course.

Course Objectives:

- Set billet heating, taper quench, ram speed and exit temperature windows for each alloy and profile family
- Select and correct solid, porthole and bridge dies using bearing and choke adjustments, nitriding and die life records
- Control press quench, stretching and artificial ageing so profiles reach T5 or T6 properties without distortion
- Operate anodising and powder-coating lines to hold film thickness, colour, seal quality and adhesion
- Diagnose die lines, pick-up, blisters, streaks, dimensional drift and finish rejects and trace each to its process step
- Prepare an Extrusion and Finishing Line Recovery Plan that ranks butt, scrap and reject reduction actions for a case plant

Target Audience:

- Staff responsible for setting and running extrusion presses, pullers and stretchers on each shift
 - Staff responsible for die shop work including die correction, nitriding and die life records
 - Staff responsible for anodising and powder-coating line baths, ovens and spray booths
 - Staff responsible for profile inspection, finish testing and release of window, facade and industrial profiles
 - Staff responsible for production planning, recovery reporting and scrap remelt flows in profile plants
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Course Outline:

Day 1: Profile Plant Landscape, Alloys and Recovery Baseline

- 6xxx Alloy Selection for Architectural and Industrial Profiles
- Extrusion Ratio, Shape Factor and Press Capacity Review
- Billet Quality Checks for Homogenisation, Grain and Inclusions
- Press, Puller, Cooling Table and Stretcher Line Walkthrough
- Recovery Baseline Using Butt, Back-End and Stretch Scrap

Day 2: Press Setup, Die Types and Thermal Control

- Billet Heating and Taper Quench Temperature Profile Setting
- Container, Stem and Dummy Block Alignment Checks
- Solid, Porthole and Bridge Die Construction Compared
- Ram Speed and Exit Temperature Window Mapping
- Press Quench Selection With Air, Mist and Water Spray

Day 3: Die Correction, Ageing and Finishing Line Operation

- Die Correction, Nitriding and Die Life Tracking Records
- Artificial Ageing Oven Cycles for T5 and T6 Tempers
- Sulfuric Anodising Current Density, Bath Temperature and Film Build
- Electrolytic Colouring, Dye Absorption and Hot Water Sealing Control
- Chromate-Free Pretreatment, Electrostatic Powder Booth and Cure Oven Settings

Day 4: Profile Defects, Finish Rejects and Loss Analysis

- Die Lines, Pick-Up and Weld Seam Root Cause Analysis
- Blisters, Streaks and Coarse Grain Band Diagnosis
- Dimensional Drift, Twist and Bow Gauge Inspection
- Anodic Film Thickness, Seal Quality and Colour Match Rejects
- Powder Film Thickness, Cross-Cut Adhesion and Cure Failures

Day 5: Inspection Walkthrough and Extrusion and Finishing Line Recovery Plan

- Case Plant Press Log and Die Card Walkthrough
 - Case Finishing Line Reject Records and Pareto Ranking
 - Case Butt Length, Stretch Scrap and Recovery Economics Model
 - Case Die Life and Thermal Window Improvement Actions
 - Extrusion and Finishing Line Recovery Plan Completion and Review
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Skills You Will Gain:

- Extrusion Thermal Window Setting
- Die Correction Practice
- Quench and Ageing Control
- Anodic Film Control
- Powder Coating Line Control
- Profile Defect Diagnosis
- Recovery and Scrap Analysis
- Finish Reject Investigation

Why Attend This Course:

- Deliver an Extrusion and Finishing Line Recovery Plan to the plant manager, production lead and finishing supervisor with ranked recovery actions
- Decide when to change billet temperature, ram speed, die bearings or bath settings using press logs, die cards and test results
- Avoid lost press hours, scrapped profiles and customer rejections for colour, film or adhesion faults
- Coach press crews, die shop technicians and finishing operators with the defect atlas, die card and line checklists

Conclusion:

Back at work, the participant hands the Extrusion and Finishing Line Recovery Plan to the plant manager, production lead and finishing supervisor. They use it to choose which press settings, die practices, quench and ageing cycles and finishing line controls to change first, and to set recovery and reject targets for each press. The die shop adopts its die card and correction log. After the first month of trials, the unit should compare recovery, die life and finish reject figures with the plan baseline, then revise the priority list.

Frequently Asked Questions FAQ:

What should participants know before an aluminium extrusion and surface finishing course?

Participants should already work on an extrusion press, in a die shop or on an anodising or powder-coating line and read basic production logs. Bringing anonymised press logs, die cards or reject records helps during the case work.

How does an aluminium extrusion and surface finishing course differ from a primary aluminium smelting course?

This course starts with a cast billet and ends with a finished profile: press, dies, quench, ageing, anodising and powder coating. Smelting courses cover potlines, alumina feeding and cast house metal, while polymer extrusion courses deal with plastics rather than metal.

Why does exit temperature matter in aluminium extrusion and surface finishing?

Exit temperature decides whether alloying elements stay in solution for ageing and whether the surface tears or streaks. Too low and strength falls after ageing; too high and pick-up, tearing and streaks appear, often showing only after anodising.

What do participants take back from the aluminium extrusion and surface finishing course?

Participants take back an Extrusion and Finishing Line Recovery Plan for a case plant, plus a die correction card, a defect atlas, a recovery calculation sheet and finishing line checklists adaptable to their own presses and lines.