Additive Manufacturing Training Course: Industrial 3D Printing, DfAM and Part Qualification

14 – 18 December 2026
Paris - Right Bank business hotel



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Introduction:

Additive manufacturing training course covering industrial 3D printing, DfAM and part qualification is a 1-week course for mechanical, maintenance, spare-parts, R&D and manufacturing engineering staff that ends with an Additive Spare Part Business Case for a case plant. Plants hold costly stocks of slow-moving spares and wait months for discontinued parts, while printed parts ordered without design rules, post-processing or test evidence distort, crack or fail approval. Nominees already design, specify or maintain mechanical parts and work through case studies built on spare-parts catalogues, build files and test data. CoreConcept Training Center delivers this additive manufacturing training course.

Course Objectives:

- Apply ISO/ASTM 52900 terminology to classify additive process families and screen plant parts for printing feasibility
- Select powder bed fusion, directed energy deposition, material extrusion, vat photopolymerisation or binder jetting and a feedstock material for a given part duty
- Redesign a part with DfAM rules, topology optimisation and lattices, then prepare its build orientation, supports and plate layout
- Specify the post-processing route for a printed metal part, including stress relief, hot isostatic pressing, machining and surface finishing
- Plan inspection, CT scanning and mechanical test coupons to qualify a printed part, and set controls for metal powder hazards
- Build a cost per part model and business case comparing on-demand printing with stocked spare parts

Target Audience:

- Mechanical and design engineering staff responsible for part geometry, material callouts and drawings
- Maintenance and reliability engineering staff responsible for restoring equipment when spares are late or discontinued
- Spare-parts and materials management staff responsible for stocking decisions and catalogue data
- R&D and product development staff responsible for prototypes and new component concepts
- Manufacturing and production engineering staff responsible for running or outsourcing printing and finishing operations
- Quality and inspection staff responsible for approving supplied parts against specification

Course Outline:

Day 1: Additive Manufacturing Foundations and Industrial Use Cases

- ISO/ASTM 52900 Vocabulary for Additive Manufacturing Terms
- Layer-Wise Build Principle Versus Subtractive and Formative Routes
- Industrial Use Cases for Tooling, Jigs and End-Use Parts
- Technology Readiness Screening of Candidate Parts for Printing
- Current-State Survey of Plant Parts and Printing Opportunities

Day 2: Process Families, Feedstock Materials and As-Built Properties

- Powder Bed Fusion with Laser and Electron Beam Sources
- Directed Energy Deposition for Repair and Near-Net Shapes
- Material Extrusion and Vat Photopolymerisation for Polymer Parts
- Binder Jetting with Sintering Shrinkage and Density Limits
- Feedstock Powder, Filament and Resin Property Comparison Matrix

Day 3: Design for Additive Manufacturing and Build Preparation

- DfAM Rules for Overhangs, Wall Thickness and Trapped Powder
- Topology Optimisation Workflow from Load Cases to Printable Geometry
- Lattice Structures and Part Consolidation for Lighter Assemblies
- Build Orientation Choice for Anisotropy, Surface and Support Volume
- Slicing, Support Generation and Build Plate Nesting Plan

Day 4: Post-Processing, Qualification, Cost and Powder Safety

- Support Removal, Stress Relief and Hot Isostatic Pressing Sequence
- Machining Allowance and Surface Finishing of Printed Faces
- CT Scanning and Mechanical Test Coupons for Part Qualification
- Cost per Part Model Covering Machine Hours and Powder Reuse
- Metal Powder Handling, Explosion Risk and Protective Equipment Controls

Day 5: Case Study on an Additive Spare Part for a Case Plant

- Digital Inventory Screening of the Case Plant Spares Catalogue
- Process and Material Selection for the Chosen Spare Part
- DfAM Redesign and Build Preparation Sheet for the Part
- Qualification Test Plan and Cost Comparison with Stocked Supply
- Additive Spare Part Business Case Completion and Peer Defence

Skills You Will Gain:

- Additive Process Selection
- Feedstock Material Evaluation
- Topology Optimisation Setup
- Build Orientation Planning
- Post-Processing Route Specification
- Printed Part Qualification
- Digital Spare Parts Screening
- Additive Cost Modelling

Why Attend This Course:

- Deliver an Additive Spare Part Business Case to the maintenance manager and the engineering authority that approves replacement parts
- Decide which spare parts to print on demand, in which process and material, and which to keep in stock
- Avoid printed parts that distort, crack or fail approval because supports, heat treatment or testing were skipped
- Share DfAM rules, a build preparation checklist and powder handling controls with design and workshop colleagues

Conclusion:

Back at work, the participant presents the Additive Spare Part Business Case to the maintenance manager, the spare-parts lead and the engineering authority that approves replacement parts. They use it to decide which catalogue items move to on-demand printing, which process and material each part needs, and which qualification tests must pass before a printed part is fitted. After the first printed part has run in service, the unit should review its inspection results, actual cost per part and lead time against the stocked supply baseline and update the screening criteria.

Frequently Asked Questions FAQ:

What should participants know before the additive manufacturing training course?

Participants should already design, specify, maintain or inspect mechanical parts and read engineering drawings and material specifications. No prior printing experience or advanced CAD skill is needed. Bringing a list of slow-moving or hard-to-source spare parts helps them apply the case work to their own plant.

How does this additive manufacturing training course differ from a general manufacturing processes course?

It spends all one week on printing: process families, feedstock, DfAM, build preparation, post-processing, qualification, cost and powder safety. General manufacturing processes courses compare machining, forming, casting and moulding and treat printing as one route among several.

Why does build orientation matter in industrial 3D printing?

Build orientation decides support volume, surface quality on critical faces, build time and the direction of weaker layer bonds. A poor choice adds finishing cost and can place a load path across layers, so orientation is fixed together with the part's load cases and inspection plan.

What do participants take back from the additive manufacturing training course?

Participants take back an Additive Spare Part Business Case covering part screening, process and material choice, DfAM redesign, build preparation, post-processing, a qualification test plan and a cost per part comparison with stocked supply, plus a powder handling checklist they can adapt.