



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Finish Tube And Pipe Products Training

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 119048 · NQF Level 3 · 20 Credits · 17 Days

COURSE OVERVIEW

This course equips learners with the knowledge and skills to finish tube and pipe products to industry standards. It covers the processes, tools, and quality checks required to ensure finished products meet specifications. By the end, learners will be able to apply finishing techniques and verify product conformity.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	119048
Accreditation	SAQA Accredited · NQF Level 3 · 20 Credits
Duration	17 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Demonstrate the ability to select and use appropriate tools and equipment for finishing tube and pipe products.
- Apply finishing techniques to achieve specified surface finishes and dimensional tolerances.
- Inspect finished tube and pipe products for defects and conformity to specifications.
- Implement safety procedures and quality control measures during finishing operations.
- Evaluate the quality of finished products and recommend corrective actions when necessary.

WHO SHOULD ATTEND

- This course is designed for operators, artisans, and quality control personnel involved in the manufacturing or finishing of tube and pipe products in industries such as construction, automotive, or engineering.

COURSE OUTLINE

Day 1: Introduction to Tube and Pipe Finishing

- Overview of tube and pipe products and applications
- Types of materials: steel, stainless steel, aluminium, copper, plastics
- Introduction to finishing processes: cutting, deburring, bending, welding, coating
- Health and safety regulations (OHS Act, PPE requirements)
- Quality standards and specifications (ISO, SANS)
- Basic measurement and inspection tools

Day 2: Tube and Pipe Materials and Properties

- Mechanical properties: tensile strength, hardness, ductility
- Seamless vs. welded tube manufacturing
- Material specifications: grades, schedules, wall thickness
- Corrosion resistance and surface finishes
- Material handling, storage, and identification
- Introduction to material testing methods

Day 3: Cutting and Sawing Operations

- Types of saws: hacksaws, band saws, chop saws, abrasive saws
- Cutting parameters: speed, feed, blade selection
- Measuring and marking techniques
- Deburring after cutting
- Safety procedures for cutting operations
- Quality checks: squareness, burr removal, length tolerance

Day 4: Deburring and Edge Finishing

- Burr formation and classification
- Manual deburring tools: files, scrapers, reamers
- Mechanical deburring: bench grinders, sanders, abrasive pads
- Internal deburring techniques
- Edge radius and chamfering
- Quality inspection: visual and tactile checks

Day 5: Bending and Forming Fundamentals

- Bending theory: neutral axis, springback, bend allowance
- Types of benders: manual, hydraulic, rotary draw
- Tooling selection: mandrels, wiper dies, pressure dies
- Step-by-step bending process
- Common defects and troubleshooting
- Measuring bend angles and radii

Day 6: Advanced Bending Techniques

- Compound bends and bending in multiple planes
- Introduction to CNC bending: programming basics
- Bend sequencing and nesting
- Lubrication types and application methods
- Heat-assisted bending for thick-walled tubes

- Dimensional inspection: CMM, templates, gauges

Day 7: Tube and Pipe Joining: Welding Basics

- Welding processes: MIG, TIG, stick, orbital
- Joint types: butt, lap, tee, corner
- Edge preparation: beveling, cleaning, fit-up
- Welding parameters: current, voltage, travel speed
- Tack welding and sequencing
- Weld inspection: visual, dye penetrant, radiographic basics

Day 8: Advanced Welding and Brazing

- Welding positions and techniques
- Brazing and soldering: filler metals, fluxes, joint design
- Heat control: interpass temperature, cooling rates
- Distortion control: clamping, backstepping, preheating
- Weld testing: bend tests, tensile tests, hardness tests
- Welder qualification and certification

Day 9: Surface Preparation and Cleaning

- Surface contaminants: oil, rust, scale, paint
- Mechanical cleaning: abrasive blasting, wire brushing, grinding
- Chemical cleaning: solvents, alkaline cleaners, acid pickling
- Passivation of stainless steel
- Surface profile measurement
- Cleanliness standards (SSPC, NACE)

Day 10: Coating and Painting

- Coating types: primers, enamels, epoxies, polyurethanes
- Application methods: HVLP spray, airless spray, electrostatic
- Powder coating: process, equipment, curing
- Coating defects: runs, sags, orange peel, blistering
- Dry film thickness measurement
- Adhesion tests: cross-hatch, pull-off

Day 11: Threading and End Finishing

- Thread standards: NPT, BSP, metric, UNF
- Dies and taps: selection and maintenance
- Power threading: die heads, threading machines
- Manual threading: die stocks, taper reamers
- Thread inspection: pitch, depth, taper gauges
- Thread protection and sealing compounds

Day 12: Flanging, Grooving, and Swaging

- Flanging: types (lap joint, raised face), tooling, process
- Grooving: roll grooving, cut grooving, tools
- Swaging: reduction, expansion, tooling
- Hydraulic tool operation and maintenance
- Dimensional inspection: diameter, roundness, wall thickness
- Application in piping systems

Day 13: Assembly and Fitting

- Assembly methods: threaded, flanged, welded, grooved
- Fitting selection: elbows, tees, reducers, couplings
- Torque values and tightening sequences
- Pipe supports: hangers, clamps, guides
- Alignment techniques: laser, straightedge, levels
- Leak testing: hydrostatic, pneumatic, vacuum

Day 14: Quality Control and Inspection

- Quality control plan elements
- Dimensional measurement tools and techniques
- NDT methods: visual, dye penetrant, magnetic particle, ultrasonic
- Statistical process control basics
- Non-conformance reporting and corrective actions
- Inspection documentation and traceability

Day 15: Troubleshooting and Defect Analysis

- Common defects: cracks, porosity, distortion, surface defects
- Root cause analysis: 5 Whys, fishbone diagram, FMEA
- Corrective actions: process adjustments, tool maintenance, training
- Preventive measures: standard procedures, checklists
- Continuous improvement: PDCA cycle, Kaizen
- Case studies and group exercises

Day 16: Automation and Advanced Technologies

- Automation overview: robots, conveyors, automated inspection
- Robotic welding: programming, safety, applications
- CNC bending and cutting automation
- Lean manufacturing: 5S, value stream mapping, waste reduction
- Digital monitoring: sensors, data collection, analytics
- Cost-benefit analysis of automation

Day 17: Integration and Final Assessment

- Practical project: finish a tube/pipe assembly to specification
- Process planning: sequence, tools, materials, inspections
- Final assessment: written test and practical demonstration
- Feedback and improvement areas
- Career pathways and further learning opportunities
- Course wrap-up and certification preparation

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **20 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 53,800.00	R 53,800.00
1	In-House	R 69,900.00	R 69,900.00
1	On-Campus (Pretoria)	R 80,700.00	R 80,700.00

UPCOMING SESSIONS

Start	End	Method	Venue
10 Aug 2026	01 Sep 2026	On-Campus	Dubai, UAE
11 Aug 2026	02 Sep 2026	On-Campus	Pretoria, South Africa
12 Aug 2026	03 Sep 2026	On-Campus	Abu Dhabi, UAE
13 Aug 2026	04 Sep 2026	On-Campus	Durban, South Africa
13 Aug 2026	04 Sep 2026	On-Campus	Mauritius
14 Aug 2026	07 Sep 2026	On-Campus	Cape Town, South Africa
17 Aug 2026	08 Sep 2026	On-Campus	Pretoria, South Africa
18 Aug 2026	09 Sep 2026	On-Campus	Abu Dhabi, UAE

Contact us if no suitable date is listed – on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

- 1. Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 119048) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
- 2. Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
- 3. Apply by phone or WhatsApp:** call +27 12 004 8389 or WhatsApp +27 65 077 6310 and we will prepare your quotation and reserve your seats.
- 4. Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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