



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

Refrigerant Piping Installation And Joining Techniques Training

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 116229 · NQF Level 2 · 9 Credits · 6 Days

COURSE OVERVIEW

This course equips learners with the skills and knowledge required to install refrigerant piping and apply appropriate joining techniques in compliance with South African regulations and industry standards. It covers the selection of materials, safe handling of refrigerants, and proper joining methods to ensure system integrity and performance.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	116229
Accreditation	SAQA Accredited · NQF Level 2 · 9 Credits
Duration	6 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply relevant safety regulations and environmental guidelines when handling refrigerants and piping materials.
- Select appropriate piping materials, fittings, and joining methods based on system requirements and refrigerant type.
- Demonstrate correct techniques for cutting, bending, flaring, and brazing or soldering refrigerant piping.
- Install refrigerant piping systems ensuring proper support, slope, and leak-free joints.
- Evaluate completed installations for compliance with specifications and industry standards.
- Implement pressure testing and leak detection procedures to verify system integrity.

WHO SHOULD ATTEND

- This course is designed for refrigeration and air conditioning technicians, installers, and maintenance personnel who are responsible for the installation and joining of refrigerant piping in residential, commercial, and industrial systems.

COURSE OUTLINE

Day 1: Introduction to Refrigerants and Safety Standards

- Overview of refrigeration cycle principles
- Types of refrigerants: CFCs, HCFCs, HFCs, and natural refrigerants
- Introduction to the Pressure-Enthalpy diagram
- South African legislative framework: OHS Act and SANS standards
- Hazards associated with refrigerants: toxicity, flammability, pressure
- Environmental impact and responsible handling practices
- Introduction to system components: compressor, condenser, evaporator, expansion device
- Basic system schematics and symbols

Day 2: Piping Materials, Specifications, and Preparation

- Copper piping types: ACR, soft, hard-drawn; sizes and wall thicknesses
- Steel and aluminium piping applications
- Pipe sizing calculations and pressure drop considerations
- Proper use of measuring tapes, tube cutters, and reamers
- Deburring techniques and inspection for imperfections
- Cleaning procedures: brushes, solvents, and nitrogen purging
- Storage and handling best practices to prevent contamination
- Introduction to piping supports, hangers, and expansion loops

Day 3: Brazing and Soldering Techniques

- Theory of capillary action and joint design
- Filler metals: phosphor-copper and silver-based alloys
- Flux types, application, and post-join cleaning
- Oxy-acetylene safety: cylinder handling, regulators, hoses, and flashback arrestors
- Flame adjustment: neutral, oxidizing, and carburizing
- Heating techniques and temperature control
- Step-by-step brazing procedure on practice coupons
- Visual inspection criteria: fillet shape, penetration, and discoloration

Day 4: Mechanical and Flared Jointing Methods

- Types of mechanical fittings: flare, compression, and bite-type
- Flare fitting standards: SAE 45-degree vs. JIC 37-degree
- Proper use of flaring tools: single, double, and bubble flares
- Torque specifications and sequential tightening patterns
- Gasket and O-ring material compatibility with refrigerants
- Application of thread sealants and lubricants
- Hands-on practice: creating and assembling mechanical joints
- Leak testing methods: soap bubble and electronic detector

Day 5: System Installation, Evacuation, and Charging

- Reading and interpreting piping and instrumentation diagrams (P&IDs)
- Component installation: filter-driers, sight glasses, solenoid valves
- Proper routing: slopes, traps, and vibration isolation
- Vacuum pump operation and micron gauge use
- Vacuum decay test and triple evacuation method

- Charging methods: vapour, liquid, and weigh-in
- Use of manifold gauges and temperature-pressure charts
- Commissioning checklist and log sheet completion

Day 6: Advanced Applications, Troubleshooting, and Assessment

- Parallel compressor rack piping and oil management
- Heat reclaim system piping configurations
- Troubleshooting scenarios: vibration fractures, corrosion, thermal stress
- Advanced leak detection: ultrasonic, infrared, and dye methods
- Repair techniques: section replacement and epoxy sealing
- Final integrated practical project: install, evacuate, and charge a circuit
- Theory and practical summative assessment
- Course recap, Q&A, and resource handover

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 **9 NQF credits** at **NQF Level 2**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 25,600.00	R 25,600.00
1	In-House	R 33,300.00	R 33,300.00
1	On-Campus (Pretoria)	R 38,400.00	R 38,400.00

UPCOMING SESSIONS

Start	End	Method	Venue
04 Aug 2026	11 Aug 2026	On-Campus	Pretoria, South Africa
04 Aug 2026	11 Aug 2026	On-Campus	Lagos, Nigeria
05 Aug 2026	12 Aug 2026	On-Campus	Johannesburg, South Africa
06 Aug 2026	13 Aug 2026	On-Campus	Mauritius
07 Aug 2026	14 Aug 2026	On-Campus	Cape Town, South Africa
10 Aug 2026	17 Aug 2026	On-Campus	Pretoria, South Africa
11 Aug 2026	18 Aug 2026	On-Campus	Abu Dhabi, UAE
12 Aug 2026	19 Aug 2026	On-Campus	Mauritius

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 116229) 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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