

Domain AIR CONDITIONING AND REFRIGERATION**Title: Maintain industrial air conditioning and refrigeration systems****Level: 3****Credits: 8****Purpose**

This unit standard specifies the competencies required to maintain industrial air conditioning and refrigeration systems. It includes planning and prepares for work; troubleshoot on industrial air conditioning and refrigeration systems; repair industrial systems and perform housekeeping.

This unit standard is intended for those who works as air conditioning and refrigeration artisans.

Special Notes

1. Entry information:

Prerequisite

- *Unit 1157 - Demonstrate basic knowledge of workplace health and safety.*

2. To demonstrate competence, at minimum evidence is required to repair one industrial air conditioning and one industrial refrigeration system.

3. Assessment evidence may be collected from a real workplace or a simulated workplace or an appropriate simulated realistic environment in which air conditioning and refrigeration operations are carried out.

4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' specifications and/or company's guidelines and instructions.

5. Glossary of terms:

- *"ACR"* refers to air conditioning and refrigeration systems
- *"Specifications"* refers to any, or all of the following: manufacturers' specifications and recommendations, workplace specific requirements
- *"Industrial refrigeration"* refers to large refrigeration plants for cold storage, quick-freezing, and chilling of foodstuffs and other types of processing of daily products.

6. Regulations, legislation and standards relevant to this unit standard include the following:
 - Labour Act, No. 11, 2007
 - Occupational Health and Safety Regulations No. 18, 1997 and all subsequent amendments.
 - Import and Export control act, 1994.
 - NAMS 5149-4: 2021 (ISO 5149-4: 2014)
 - ISO 817: 2014
 - SANS 10147: 2014
7. Performance of all elements in this unit standard must comply with industry standards.
8. This unit standard applies to single-phase and three-phase Air conditioning and Refrigeration systems.

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority and the Namibia Training Authority. All approved unit standards, qualifications and national assessment arrangements are available on the Namibia Training Authority website www.nta.com.na.

Elements and Performance Criteria

Element 1: Plan and prepare for work

Range

Air conditioning and refrigeration service hand tools may include but not limited to turning tools; special spanners; swage and flare tools; gripping tools; holding tools; for hammering and driving tools; cutting and forming tools; pulling and pushing tools; measuring tools; bending tools; and measuring instruments.

Air conditioning and refrigeration service power tools may include but not limited to air blow gun, drill machine, arc/ argon welding machine, and grinder.

Equipment may include but not limited to oxy-acetylene gas welding set, charging station/manifold gauges, recovery machine, and vacuum pump.

Performance Criteria

- 1.1 Work instructions including job cards, specifications and operational details are interpreted and confirmed.
- 1.2 Workplace inspection is carried out in line with safety standards.
- 1.3 Safety requirements are applied in line with safety and workplace policies.
- 1.4 Tools and equipment are selected in line with the job requirements.
- 1.5 Material required are selected and obtained in line with job specifications.
- 1.6 Calibration requirements for tools, instruments and equipment are carried out in line with job requirements.
- 1.7 Environmental protection requirements are outlined and followed in line with environmental legislative requirements.

Element 2: Troubleshoot on industrial Air conditioning and refrigeration systems

Range

Inspection may include but is not limited to check for seals, leakage, fan belts, pressure switch, vibration, fan blade, bearings, ducting, filters, air distribution, and motors.

Tests may include but not limited to mechanical tests (pressure test, leakage test), electrical circuit tests, and operational tests.

Tools and equipment may include but not limited to leak testing equipment; halide leak detector; electronic leak detector; halogen leak detector; soapy water, pressure testing equipment such as manifold gauges; and electrical testing equipment; multimeter; mega meter; electrical blower; phase rotation tester; solenoid tester; stethoscope; and anemometer.

Performance Criteria

- 2.1 Information required for testing industrial systems are outlined in line with job specifications.
- 2.2 Inspections are carried out in line with job specifications.
- 2.3 Testing of the system is conducted in line with industrial standards.
- 2.4 Faults are identified and rectified in line with job specifications.

Element 3: Repair industrial systems

Range

Repair methods may include but not limited to evacuating of refrigerant; charging of refrigerant, disassembling and assembling of system components; and replacing of system components.

Tools may include but not limited to spanners, screw drivers, manifold gauges, multi meter, allen keys, and shifting spanner.

Performance Criteria

- 3.1 Information required for repairing commercial systems are outlined in line with job specifications.
- 3.2 Appliance is isolated from power source in line with the industrial safety standards.
- 3.3 Components are tagged and stored in line with the job specifications.
- 3.4 Repairing is carried out in line with the industrial standards.
- 3.5 Commissioning is carried out in line with the job specifications.

Element 4: Perform housekeeping

Range

Work completion details may include but not limited to job card sign-out form for equipment.

Performance Criteria

- 4.1 Work area is cleared of waste, cleaned, restored and secured in line with job specifications.
- 4.2 Reusable material is collected and stored in line with job specifications.
- 4.3 Equipment used are cleaned, checked, maintained and stored in line with Job specifications/work instructions.

Registration Data

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Body responsible for review:	Namibia Training Authority

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