

Domain**AIR CONDITIONING AND
REFRIGERATION****Title:****Demonstrate knowledge of physics
related to air conditioning and
refrigeration****Level: 2****Credits: 6****Purpose**

This unit standard specifies the competencies required to demonstrate knowledge of physics related to air conditioning and refrigeration. It includes demonstrating basic knowledge of engineering science terms and calculations associated with air conditioning and refrigeration, explaining the basic refrigeration and complete work and do housekeeping. This unit standard is intended for those who work as air conditioning and refrigeration artisan.

Special Notes

1. Entry information:

Prerequisite

- Unit 567 - *Apply health and safety routines in an air conditioning and refrigeration workplace* or demonstrated equivalent knowledge and skills.
- Unit 1706 - *Demonstrate knowledge on fundamentals of physics related to Air Conditioning and Refrigeration*

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

3. 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.

4. Glossary of terms:

- '*specifications*' refers to any, or all of the following: manufacturers' specifications and recommendations, workplace specific requirements
- '*PH chart*' refers to pressure enthalpy chart. The PH chart is an important tool used to describe the property changes that take place during each phase of the refrigeration cycle and provides a graphical means of study
- '*SI units*' refers to metric systems used in Namibia based on the International System of Units
- '*calculation*' means determining the dimensions, quality or capacity of an object by applying mathematical methods.

5 Regulations and legislation 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.

6. Performance of all elements in this unit standard must comply with industry standards.
7. 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: Demonstrate basic knowledge of engineering science terms and calculations associated with Air - conditioning and Refrigeration.

Range

Engineering science terms may include but are not limited to piston displacement, compression ratio and efficiency and calculations related to basic engineering science such as force, work, power, torque, and calculations related to compressor performance such as, piston displacement, compressor capacity, compression ratio, power output, and efficiency.

Performance Criteria

- 1.1 Basic engineering science terms are defined.
- 1.2 Calculations related to basic engineering science terms are identified and described.
- 1.3 Calculations related to compressor performance are identified and applied.
- 1.4 Results of calculations are explained, confirmed and recorded.

Element 2: Explain the basic refrigeration cycle.

Range

Refrigeration may include but is not limited to commercial, industrial and air conditioning components such as contactors, circuit breaker, driers, and/or sight glass, solenoid, pressure switch, receiver, compressor, condenser and evaporator.

Performance Criteria

- 2.1 Refrigeration components and PH chart is sketched and explained in line with refrigeration system operational requirements.
- 2.2 Components and control devices' functions are explained and related with the refrigeration cycle.
- 2.3 Cycle stages are identified and described.

Registration Data

Subfield:	Mechanical Engineering
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Body responsible for review:	Namibia Training Authority