



National Certificate: Air-conditioning, Refrigeration and Ventilation

SAQA QUAL ID	QUALIFICATION TITLE			
65449	National Certificate: Air-conditioning, Refrigeration and Ventilation			
ORIGINATOR		ORIGINATING PROVIDER		
ABET BAND	MINIMUM CREDITS	PRE-2009 NQF LEVEL	NQF LEVEL	QUAL CLASS
Undefined	136	Level 2	NQF Level 02	Regular-Unit Stds Based

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

This qualification enables a competent learner at NQF Level 2, under supervision, to demonstrate a basic ability to install, service, repair and operate mechanical equipment that is used in the air conditioning, refrigeration and ventilation industry.

The technical skills required for this purpose are scarce and there is a growing demand for technicians skilled in the mechanical, electrical and thermal sciences. These qualifications are ideally suited to school-leavers (male and female) who have an interest in the engineering sciences and have practical skills. This series of qualifications also equips the learner with entrepreneurial skills which would lead to self employment in the SMME field (Most businesses in the field of air conditioning, refrigeration, and ventilation are in fact SMME's).

This qualification specifically suits learners who have an interest in science and mathematics as well as manual dexterity (ability to use tools) and a consciousness of personal and environmental safety.

Learners credited with this Qualification will be able to:

- Identify and handle refrigerants.
- Identify and use basic tools.
- Identify and work with component parts for air-conditioning, refrigeration and ventilation equipment.
- Understand the basic operation of air-conditioning, refrigeration and ventilation systems.
- Work safely and responsibly in the plant environment.

This is the first qualification in a series of qualifications which will lead to a learner acquiring all the skills required to work in the industry in the repair, maintenance, installation, manufacture and ultimately design of the mechanical/electrical systems which provide temperature control for environmental or process needs. By qualifying at this level, **a learner will achieve the status of an Assistant Mechanic**. The broader framework of qualifications (2008) is demonstrated by the following hierarchy of qualifications:

- **Assistant Mechanic - Level 2** (Technical competence - Has a basic understanding of equipment and is able to carry out technical work under supervision).
- **Mechanic - Level 3**, - (Technical competence - Has a knowledge of equipment and systems and is able to carry out technical work without supervision).
- **Artisan - Level 4**, - (Technical competence - Has an advanced knowledge of systems and equipment and is able to work without supervision and to supervise a team).

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

This qualification assumes that the candidate has already achieved a General Education and Training Certificate at NQF Level 1 or ABET Level 4 or Grade 9 school level.

QUALIFICATION RULES

- Fundamental component: **36 credits**.
- Core component: **75 credits**.
- Elective component: **25 credits**.

**UNIT STANDARDS:**

	ID	UNIT STANDARD TITLE	NQF LEVEL	CREDITS
Core	116236	Define and explain the principles of thermodynamics and carry out basic calculations involving heat	Level 2	5
Core	116223	Demonstrate knowledge of the OHS Act as it applies to employees in the air-conditioning, refrigeration and ventilation industries	Level 2	3
Core	116232	Demonstrate understanding of fundamentals of electricity and its application in air conditioning, refrigeration and ventilation equipment	Level 2	4
Core	262177	Explain the basic vapour compression cycle, the components, the handling and storage of refrigerants	Level 2	8
Core	116355	Handle refrigerant containers and transfer refrigerants into service cylinders	Level 2	3
Core	116230	Identify materials, piping, fitting, jointing methods and insulation materials used for air-conditioning and refrigeration installations	Level 2	4
Core	116334	Identify refrigerant containers, explain handling procedures and discuss the use of refrigerants	Level 2	3
Core	116239	Identify, use and maintain hand tools and measuring instruments used in the air-conditioning, refrigeration and ventilation trades	Level 2	12
Core	116335	Identify, use and maintain refrigeration trade specific tools and instruments	Level 2	8
Core	116229	Join and install refrigerant piping	Level 2	9
Core	116241	Work Safely and use safety equipment when carrying out mechanical or electrical work on air conditioning, refrigeration and ventilation installations	Level 2	7
Core	116700	Maintain safety in the handling group 1 and 2 refrigerants	Level 3	9
Fundamental	119463	Access and use information from texts	Level 2	5
Fundamental	7480	Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3
Fundamental	9008	Identify, describe, compare, classify, explore shape and motion in 2-and 3-dimensional shapes in different contexts	Level 2	3
Fundamental	12444	Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts	Level 2	3
Fundamental	119455	Respond to selected literary texts	Level 2	5
Fundamental	119460	Use language and communication in occupational learning programmes	Level 2	5
Fundamental	7469	Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2
Fundamental	9007	Work with a range of patterns and functions and solve problems	Level 2	5
Fundamental	119456	Write/present for a defined context	Level 2	5
Elective	13202	Apply study and learning techniques	Level 2	3
Elective	116246	Behave in the proper manner under working conditions	Level 2	4
Elective	116238	Clean air-conditioning, refrigeration and ventilation plants, components and work sites	Level 2	4
Elective	116234	Identify and apply fixing methods for piping, ducting and equipment used in the trade of air-conditioning, refrigeration and ventilation	Level 2	6



Elective	116233	Identify and state application of belt drives, couplings, gearboxes and bearings used on air-conditioning, refrigeration and ventilation plants and recognize misaligned, mismatched and worn components	Level 2	6
Elective	116243	Install, connect and maintain electrical cables and conductors as applied in air conditioning, refrigeration and ventilation installations	Level 2	6
Elective	116245	Perform basic arc welding of metals as applicable to air-conditioning, refrigeration and ventilation installations	Level 2	4
Elective	116244	Sketch and construct electrical circuits applicable to single-phase air conditioning, refrigeration and ventilation installations	Level 2	9

QUALIFICATION Cost

- Fundamental component: **36 credits. = R10800.00**
- Core component: **75 credits. = R22500.00**
- Elective component: **25 credits. = R7500.00**
- **Total: 136 credits. = R40800.00 Excl. Vat**