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**SOUTH AFRICAN QUALIFICATIONS AUTHORITY
REGISTERED QUALIFICATION:**

Occupational Certificate: Sugar Processing Machine Operator

SAQA QUAL ID	QUALIFICATION TITLE			
98912	Occupational Certificate: Sugar Processing Machine Operator			
ORIGINATOR				
Development Quality Partner - AgriSETA				
PRIMARY OR DELEGATED QUALITY ASSURANCE FUNCTIONARY			NQF SUB-FRAMEWORK	
-			OQSF - Occupational Qualifications Sub-framework	
QUALIFICATION TYPE	FIELD	SUBFIELD		
Occupational Certificate	Field 01 - Agriculture and Nature Conservation	Secondary Agriculture		
ABET BAND	MINIMUM CREDITS	PRE-2009 NQF LEVEL	NQF LEVEL	QUAL CLASS
Undefined	152	Not Applicable	NQF Level 03	Regular-ELOAC
REGISTRATION STATUS		SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE
Registered		SAQA 05113/16	2016-07-28	2019-07-28
LAST DATE FOR ENROLMENT		LAST DATE FOR ACHIEVEMENT		
2020-07-28		2023-07-28		

In all of the tables in this document, both the pre-2009 NQF Level and the NQF Level is shown. In the text (purpose statements, qualification rules, etc), any references to NQF Levels are to the pre-2009 levels unless specifically stated otherwise.

This qualification does not replace any other qualification and is not replaced by any other qualification.

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

The purpose of this qualification is to prepare a learner to operate as a Sugar Processing Machine Operator.

A Sugar Processing Machine Operator attends to the operation of equipment used in a sugar processing plant and maintains the consistent availability of processed material to required standards and volumes.

A qualified learner will be able to:

- Operate pre-set sugar processing equipment in a sugar mill.
- Operate programmable sugar processing equipment in a sugar mill.
- Operate a bank of inter-linked equipment that functions in sequence in a sugar mill.
- Perform work activities in accordance with occupational safety, health and quality requirements.

Rationale:

Sugar Processing Machine Operators are employed by enterprises involved in processing raw sugar cane into sugar and a range of by-products. Persons currently employed in operational positions, as well as persons seeking to enter the sugar milling industry, will benefit from this qualification.

The sugar milling industry has long been established as a key component of the value chain of the agricultural sector. South Africa has been producing sugar and sugar by-products for many years, for consumption by the both the local and the international markets. The maintenance of efficiencies and quality standards in sugar production has a marked impact on the production costs of sugar products and resulting consumer pricing. The Sugar Processing Machine Operator fulfils a key role in the production of sugar and sugar by-products used by various consumer markets.

Past training practices for staff employed in related functionalities mainly focused on a range of in-house training programmes offered by individual companies with the support of the Sugar Milling Research Institute and the technical training facility of the South African Sugar Association, the Shukela Training Centre. This qualification recognises past practices that has worked well for the industry over many years, but further enhances these programmes through the establishment of an occupational qualification that formalises and structures practical and experiential learning components.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

Recognition of Prior Learning (RPL):

RPL for access to the external integrated summative assessment: Accredited providers and approved workplaces must apply the internal assessment criteria specified in the related curriculum document to establish and confirm prior learning. Accredited providers and workplaces must confirm prior learning by issuing a statement of result or certifying a work experience record.

RPL for access to the qualification: Accredited providers and approved workplaces may recognise prior learning against the relevant access requirements.

Entry Requirements:

- NQF Level 1 with Mathematics.

RECOGNISE PREVIOUS LEARNING?

Y

QUALIFICATION RULES

This qualification is made up of the following compulsory Knowledge and Practical Skill Modules:

Knowledge Modules:

- 716106000-KM-01, Occupational Safety, Health and Environmental Protection, NQF Level 2, 4 Credits.
- 716106000-KM-02, Sugar processing equipment and technology, at NQF Level 3, 24 Credits.
- 716106000-KM-03, Basic business studies, at NQF Level 2, 4 Credits.
- 716106000-KM-04, Quality assurance, at NQF Level 3, 8 Credits.

Total number of credits for Knowledge Modules: 40.

Practical Skill Modules:

- 716106000-PM-01, Operate pre-set sugar processing equipment, at NQF Level 2, 12 Credits.
- 716106000-PM-02, Operate programmable sugar processing equipment, at NQF Level 3, 24 Credits.
- 716106000-PM-03, Operate a bank of inter linked equipment that functions in sequence in a sugar mill, at NQF Level 03, 8 Credits.
- 716106000-PM-04, Meet occupational health, safety, environment and quality standards, at NQF Level 03, 8 Credits.

Total number of credits for Practical Skill Modules: 52.

This qualification also requires the following Work Experience Modules:

- 716106000-WM-01, Pre-set sugar processing equipment operation, at NQF Level 2, 20 Credits.
- 716106000-WM-02, Operation of programmable sugar processing equipment or equipment set-up in series, at NQF Level 3, 24 Credits.
- 716106000-WM-03, Operation of a bank of equipment set-up in series, at NQF Level 3, 8 Credits.
- 716106000-WM-04, Occupational health, safety, environment and quality standards, at NQF Level 3, 8 Credits.

Total number of credits for Work Experience Modules: 60.

EXIT LEVEL OUTCOMES

1. Operate pre-set sugar processing equipment in a sugar mill.
2. Operate programmable sugar processing equipment in a sugar mill.
3. Operate a series of inter linked equipment that functions in sequence in a sugar mill.
4. Meet occupational health, safety and quality standards.

ASSOCIATED ASSESSMENT CRITERIA

Associated Assessment Criteria for Exit Level Outcome 1:

- Pre-set sugar processing equipment is inspected, started up, monitored and shut down in accordance with operating procedures.
- Minor equipment of pre-set sugar processing equipment is removed and fitted to meet changes in production specifications.
- Production targets and required volumes of material processed by the pre-set equipment are met to achieve factory throughput targets.
- Pre-set equipment is cleaned and cared for to meet equipment functionality standards.
- Knowledge of sugar processing and technology the operation of pre-set equipment is applied to maintain the required operating parameters.

Associated Assessment Criteria for Exit Level Outcome 2:

- Programmable equipment used in the processing of sugar are inspected, monitored and shut down in accordance with operating procedures.
- Production targets and required volumes of material are processed by the programmable equipment are met to achieve factory throughput targets.
- The supply of services and utilities required for the operation of programmable equipment is monitored and problems reported to maintain equipment functionality.
- A constant flow and throughput of material is achieved in terms of required volumes and quality standards.
- Knowledge of sugar processing and technology is applied during the operation, reading of instrumentation and the adjustment of settings of programmable equipment to achieve the required equipment operating parameters.
- Cleaning cycles of programmable equipment are initiated and effectiveness monitored to maintain the integrity of the processing phase and the achievement of quality standards.
- Production data is collected, analysed, interpreted and presented to maintain production data recording and reporting standards.

Associated Assessment Criteria for Exit Level Outcome 3:

- A bank of equipment that functions in sequence is inspected, started up, monitored and shut down in accordance with operating procedures.
- Material volumes and flow targets are met to ensure the achievement of factory throughput targets.
- Knowledge of mechanical systems and sugar material handling is applied during the operation of a bank of equipment that functions in sequence to ensure factory throughput targets.
- Equipment and mechanical systems are cleaned and cared for to maintain system integrity and functionality.

Associated Assessment Criteria for Exit Level Outcome 4:

- Safety, health and environmental protection standards are met and potential risks are recognised and reported.
- Personal protective equipment is selected, used and cared for and restrictive measures are adhered to, to minimise injuries and exposure to risks.
- In-line quality samples are collected and visually inspected for compliance with set quality

parameters.

- Material sampling and sample handling practices are performed in accordance with prescribed procedures and traceability requirements.
- Knowledge of quality control and systems (HACCP) are applied to meet the related standards in a sugar mill.
- In-line quality tests are conducted, the results interpreted and adjustments to equipment settings are made to minimise product re-work and risks of non-conforming product.
- Various sources of quality related information (instrument/PLC readings, quality reports, sensory cues) is integrated to determine quality standards.
- Laboratory quality reports are read with insight and used to make informed adjustment to the operating parameters of equipment.

Integrated Assessment:

Integrated formative assessment:

The skills development provider will use the curriculum to guide them on the stipulated internal assessment criteria and weighting. They will also apply the scope of practical skills and applied knowledge as stipulated by the internal assessment criteria. This formative assessment leads to entrance into the integrated external summative assessment.

Integrated summative assessment:

An external integrated summative assessment, conducted through the relevant Quality Council for Trades and Occupation (QCTO) Assessment Quality partner is required for the issuing of this qualification. The external integrated summative assessment will focus on the Exit Level Outcomes and Associated Assessment Criteria. QCTO registered assessors will complete a theoretical assessment at the place of work. The assessment must allow for oral assessment of learners, will include case studies and be structured as a multiple choice assessment. Assessors who did not take part in the internal assessment process will conduct all external assessments.

INTERNATIONAL COMPARABILITY

The international comparability study was conducted to examine comparable qualifications and programmes, which exist in other countries. The comparability exercise focused on two countries namely, Australia and India.

Australia:

The Certificate in Sugar Milling Industry Operations registered in Australia was selected for comparison. The certificate includes a selection of 67 learning units, of which 30% are sugar equipment operation specific. A large number of learning units in areas that are not included in the South African qualification are included by Australia. These mainly relate to learning areas such as vehicle operation and engineering related studies included in artisan specific qualifications in South Africa.

Comparable sugar processing technology and equipment operation units include:

Sugar Processing Equipment operation:

- Operate basic machinery and equipment.
- Operate a process control interface.
- Operate an evaporation process.
- Conduct cane weighbridge operations.
- Operate a tipping station.
- Operate an extraction station.
- Operate a juice clarification process.
- Operate a mud filtration process.
- Chemically clean equipment.
- Operate a pans station.
- Operate a low grade fugal station.
- Operate a high grade fugal station.
- Operate a crystalliser station process.
- Adjust cane delivery schedules to meet daily milling requirements.
- Analyse and convey workplace information.
- Operate a sugar system.

Occupational Health, Safety and environmental protection:

- Apply OHS requirements, policies and procedures in the construction industry.
- Contribute to OHS processes.

- Participate in environmentally sustainable work practices.

Quality aspects:

- Perform standard tests on cane samples.
- Collect and prepare samples.
- Perform factory control tests.

Vastada Sugar Institute in India:

The Vastada Sugar Institute in India, training institution, offers a certificate program in Sugar Manufacturing. This certificate includes learning units:

- Chemical Control.
- Instrumentation.
- Sugar Engineering.
- Clarification and Filtration.
- Sugar Manufacture (Centrifugals).
- Sugar Manufacture (Evaporation).
- Chemical Engineering.

The Sugar Technologists Association of India:

The Sugar Technologists Association of India (STAI) is an apex body of sugar industry professionals and institutions (Can be compared to a Professional Body). The association prioritised key training areas through a participatory process of their members, including:

- Preparatory devices and Juice extraction systems.
- Filtration and clarification.
- Crystallization.
- Vacuum and cooling systems.
- Centrifuging, pumps, compressors, and carriers and conveyors.

Conclusion:

The Australian Certificate in Sugar Milling Industry Operations includes a number of units in sugar processing theory and equipment operation that compare well with the South African qualification.

The Certificate programme in Sugar Manufacturing offered by the Vastada Sugar Institute in India compares well with the South African qualification.

It is further noted that the South African qualification addresses the priority learning areas identified by the members of the Sugar Technologists Association of India.

ARTICULATION OPTIONS

This qualification articulates horizontally with the:

- National Certificate in Chemical Operations at NQF Level 3, (ID 78528).
- National Certificate Food and Beverages Processing in Soft Drinks Processing, Level NQF 3, (ID 20508).

This qualification articulates vertically with the:

- Further Education and Training Certificate: Chemical Operations, Level 4, (ID 78529).

MODERATION OPTIONS

N/A

CRITERIA FOR THE REGISTRATION OF ASSESSORS

N/A

NOTES

Qualifying for external assessment:

In order to qualify for an external assessment, learners must provide proof of completion of all required modules by means of statements of results and work experience.

Foundational Learning Competence is a pre-requisite for access to the external integrated summative assessment.

Additional legal or physical entry requirements:
None

Criteria for the accreditation of providers:
Accreditation of providers will be done against the criteria as reflected in the relevant curriculum on the QCTO website.

The curriculum title and code is: 716106000: Sugar Processing Machine Operator.

This qualification encompasses the following trades as recorded on the NLRD:

- This qualification is not a trade.

Part Qualifications:
None.

UNIT STANDARDS:

This qualification is not based on Unit Standards.

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION:

NONE

PROVIDERS CURRENTLY ACCREDITED TO OFFER THIS QUALIFICATION:

This information shows the current accreditations (i.e. those not past their accreditation end dates), and is the most complete record available to SAQA as of today. Some Primary or Delegated Quality Assurance Functionaries have a lag in their recording systems for provider accreditation, in turn leading to a lag in notifying SAQA of all the providers that they have accredited to offer qualifications and unit standards, as well as any extensions to accreditation end dates. The relevant Primary or Delegated Quality Assurance Functionary should be notified if a record appears to be missing from here.

NONE

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