

No. 303

12 March 2004

Established in terms of Act 58 of 1995**SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)**

In accordance with regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Secondary Agriculture

Registered by NSB 01, Agriculture and Nature Conservation, publishes the following qualifications and unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualification and unit standards upon which qualifications are based. The full qualification and unit standards can be accessed via the SAQA web site at www.saqqa.org.za. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, Hatfield Forum, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address ***below and no later than 12 April 2004***. All correspondence should be marked **Standards Setting – SGB for Secondary Agriculture** and addressed to

The Director: Standards Setting and Development
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JOE SAMUELS

DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



National Certificate: Metallised Paper Production – NQF Level 3

Field: Agriculture and Nature Conservation

Sub-field: Secondary Agriculture

NQF level: 3

Credits: 134

Rationale for the Qualification

This Qualification will allow persons currently in, or aspiring to enter the tobacco environment and others, to obtain an integrated practical and theoretical grounding in the operation of metallised paper production and the functions thereof. This will ensure a portable, nationally recognized Qualification that will:-

- Improve the quality of safety in the work environment.
- Optimally utilize resources in the production industry
- Lead to transformation in economic growth and social development.

The typical range of learners is the currently employed, unemployed and other persons, who want to enter a learning programme to obtain a Nation Certificate in Metallised Paper Production at NQF Level 3, to continue building a career path in this industry.

Improved levels of knowledge and skills lead to greater ability to produce at more competitive costs and better quality, which will impact positively both on the society and the economy of the country.

Rules of combination

To obtain this Qualification, all fundamental and core unit standards are compulsory.

The learner must also select and complete one of the elective unit standards below:

- Prepare mixtures for metallised paper
- Supply raw material to production machines

Access to the Qualification

There are no restrictions placed on learners but except those that are mentioned under learning assumed to be in place.

Purpose of the Qualification:

This Qualification is aimed at level 3 on the National Qualification Framework. It provides learners with the opportunity to obtain competence in specialised metallised paper production processes and practices, namely preparing for metallised paper production, maintaining the metallising processes, shutting down and cleaning as well as quality monitoring and providing opportunity for learners to grow in this specific field.

The fundamental learning, which learners will acquire, will allow them to be able to compile verbal and written communications and perform basic calculations. This Qualification complies with the objectives of the NQF with regard to facilitating access to, mobility and progression within the Tobacco Processing Industry.

The Qualification focuses on the skills, knowledge, values and attitude required to progress further in the industry. The intention is to release the potential of people, in order for them to grow, develop and become more competent workers. This Qualification will furthermore add value to the individuals, their workplace and the economy as a whole.

Learning assumed to be in place

The learner will have appropriate levels of written Communication, English proficiency, Numeracy and occupational competence equivalent to grade 10 (NQF2) standards.

Exit level outcomes and associated assessment criteria**Exit level outcome 1**

Recall and explain the basic principles, safety procedures and work ethics in the Tobacco Processing Industry in order to meet industry and work standards.

Associated Assessment Criteria

- The Tobacco Processing Industry's basic principles are interpreted and explained.
- The Tobacco Processing Industry's safety procedures are interpreted and explained.
- The Tobacco Processing Industry's work ethics are interpreted and explained.
- The Tobacco Processing Industry's quality management principles and practices are interpreted and explained.

Exit level outcome 2

Describe and perform the functions/duties/responsibilities required in the preparation for the metallised paper production process during material supply, paper treatment, metallising the paper and slitting of paper roll.

Associated Assessment Criteria

- Work site preparation procedures are identified and explained.
- Consequences of not adhering to work site procedures are explained.
- The relevant material supply, paper treatment, metallising the paper and slitting of paper roll activities are performed in accordance with standard operating procedures.
- Procedures for handling equipment and material correctly and according to safety

requirements are explained and implemented.

Exit level outcome 3

Describe and perform the functions/duties/responsibilities required to ensure the metallised paper production procedures are maintained throughout the process.

Associated Assessment Criteria

- Work site metallised paper production procedures are identified and explained.
- Consequences of not adhering to work site procedures regarding material supply, paper treatment, metallising the paper and slitting of paper roll are explained.
- The relevant activities are performed in accordance with standard operating procedures and quality requirements.
- Procedures for handling equipment and material correctly and according to safety requirements are explained and implemented.

Exit level outcome 4

Describe and perform the functions/duties/responsibilities required to ensure the shut-down procedures are adhered to.

Associated Assessment Criteria

- Prescribed work site shut-down procedures are explained and implemented according to schedule.
- Consequences of not adhering to work site shut-down procedures are explained.
- The relevant shut-down activities are performed in accordance with standard operating procedures and quality requirements.
- Procedures for handling equipment and material correctly and according to safety requirements are explained and implemented.

Exit level outcome 5

Carry-out the functions/duties/responsibilities required to ensure the cleaning of work area and equipment according to requirements.

Associated Assessment Criteria

- Work site cleaning procedures are identified and implemented.
- Consequences of not adhering to and following work site cleaning procedures are explained.
- The relevant cleaning activities are performed in accordance with standard operating procedures, environmental, safety, health measures and quality requirements.
- Procedures for handling equipment and cleaning material correctly and according to safety requirements are explained and implemented.

Exit level outcome 6

Demonstrate the ability to work effectively as a member of a multi-cultural manufacturing team.

Associated Assessment Criteria

- Own particular team structure and purpose are identified and explained.
- Roles and responsibilities of each team member are identified and described.
- External (environmental) factors that influence the workings and success of the team are explained and assessed.
- The ability to perform in a team is achieved and maintained.

Criteria for internal and external assessors

Assessors need experience in the following areas:

Interpersonal skills, subject matter and assessment.

The assessor needs to be competent in the planning and conducting assessment of learning outcomes and design and develop assessments as described in the relevant unit standards. The assessors must have achieved a qualification in filter rod production or in a related field at a minimum of NQF level 4.

The subject matter experience of the assessor can be established by recognition of prior learning.

Assessors need to be registered with the relevant Education and Training Quality Assurance Body.

International comparability

Website benchmarking was done with Australia, Canada, New Zealand, Ireland and Scotland but none could be found. Furthermore, the International Tobacco Industry was also investigated for relevant Qualification information, but even within the Industry, nothing could be found to make Industry specific comparisons.

Therefore this could be regarded as one of the first formalized Qualifications in cigarette production.

Articulation possibilities

The generic nature of this qualification and the focus on multi-skilling will provide for portability across various sectors in the processing domain. It is envisaged that learners completing this qualification will be employable in fast moving consumer goods industries, amongst others such as the sugar industry, tea processing industry and others.

It prepares the learner and forms the basis for progression towards other qualifications such as Further Education and Training Certificate in Metallised Paper Technology at NQF Level 4 and Tobacco Services at NQF Level 4. The qualification will enable learners to acquire recognised qualifications at different levels across a wide cross-section of skills.

While the qualification will diverge as they progress upwards, there is enough commonality to provide for a solid base of generic skills. The learner will have multiple choices of learning paths and career paths in various technical occupations such as Cigarette Packaging Technology and Metallised Paper Technology.

Integrated Assessment Criteria:

Unit standards associated with this Qualification must be used to assess specific and critical cross-field outcomes. Assessment should focus in an integrated way on determining the competence of the learner in terms of the overall purpose and title of this Qualification.

The term integrated assessment also implies that the theoretical and practical components should be assessed together and assess combinations of practical, foundational and reflective competencies.

Assessment activities should be done in real workplace situations and where simulations or role-plays are used, there should be supporting evidence to show that the learner is able to display the competencies to the real work situation.

All assessments should be conducted in line with the following documented principles of assessment: appropriateness, fairness, manageability, and integration into work of learning, validity, direct, authentic, sufficient, systematic, open and consistent.

Learners wishing to be assessed will need to provide evidence of the following:

- Verbal and written explanations of reasons for adhering to operational and work site procedures as well as statutory requirements, adhering to specific sequence of operations, identifying deviations, taking corrective actions and recording relevant data, and reporting deviations outside the jobholder's responsibility.
- Demonstrations of a range of operational actions relating to applying quality control on metallised paper, preparing for and metallise paper, shutting down and cleaning a pre and post treatment machine, metallising machine, slitting machine and applying general safety in the work place. Learners will also demonstrate an understanding of the Tobacco Processing Industry.
- Oral or written questioning regarding the reflexive competencies within the Qualification:

If the identifying and solving of problems, team work, organising one-self, the using of applied science, the implication of actions and reactions in the world as a set of related systems are not clear from the observation a method of oral questioning or a cases study should be applied to determine the whole person development and integration of applied knowledge and skills.

- A portfolio of evidence is required to prove the practical, foundational and reflexive competencies of the learner which may include production and quality statistics.
- Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
- Unit standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, foundational and reflexive competencies.

Recognition of prior learning

This Qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Where RPL is required the learner will need to prove applied competence in that specific area in order to obtain recognition of that skill and / or knowledge.

Evidence can be presented in a variety of forms, including international or previous local Qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records. The assessment methods and tools to be used to assess Prior Learning shall be decided upon jointly by the assessor and the learner.

Moderation option

Anyone assessing a learner against these unit standards must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable achievement of these unit standards or will assess these unit standards must be accredited as a provider with the relevant ETQA. Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures.

Therefore anyone wishing to be assessed against these unit standards may apply to be assessed by any assessment agency, assessor or provider institution, which is accredited by the relevant ETQA.

NEW UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 2**1. TITLE: DEPICT BASIC DETAILS OF THE TOBACCO PROCESSING INDUSTRY**

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|----------------------|--|
| Specific Outcome 1:1 | Demonstrate a basic understanding of the tobacco processing industry |
| Specific Outcome 1:2 | Demonstrate an understanding of safety in the work place |
| Specific Outcome 1:3 | Demonstrate an understanding of work ethics |
| Specific Outcome 1:4 | Demonstrate an understanding of quality management |

2. TITLE: CLEAN A SLITTING MACHINE

- | | |
|----------------------|---|
| Specific Outcome 2:1 | Prepare a slitting machine for cleaning |
| Specific Outcome 2:2 | Clean a slitting machine |
| Specific Outcome 2:3 | Record data |
| Specific Outcome 2:4 | Complete cleaning process |

3. TITLE: CLEAN A METALLISING MACHINE

- | | |
|----------------------|--|
| Specific Outcome 3:1 | Prepare a metallising machine for cleaning |
| Specific Outcome 3:2 | Clean a metallising machine |
| Specific Outcome 3:3 | Record data |
| Specific Outcome 3:4 | Complete cleaning process |

4. TITLE: CLEAN A PRE AND POST TREATMENT MACHINE

- | | |
|----------------------|---|
| Specific Outcome 4:1 | Prepare a pre and post treatment machine for cleaning |
| Specific Outcome 4:2 | Clean a pre and post treatment machine |
| Specific Outcome 4:3 | Record data |
| Specific Outcome 4:2 | Complete cleaning process |

5. TITLE: HANDLE PRODUCTION WASTE

- | | |
|----------------------|---|
| Specific Outcome 5:1 | Prepare for removal of production waste |
| Specific Outcome 5:2 | Remove waste |
| Specific Outcome 5:3 | Record waste data |
| Specific Outcome 5:4 | Complete waste removal process |

6. TITLE: HANDLE FILTER ROD STOCK

- | | |
|----------------------|---|
| Specific Outcome 6:1 | Prepare tray filler unit for production |
| Specific Outcome 6:2 | Perform tray filling |
| Specific Outcome 6:3 | Store filled trays |
| Specific Outcome 6:4 | Distribute filter rods |
| Specific Outcome 6:5 | Apply the post tray filling process |

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 3**1. TITLE: APPLY QUALITY CONTROL ON METALLISED PAPER**

- | | |
|----------------------|--|
| Specific Outcome 1:1 | Demonstrate an understanding of quality control |
| Specific Outcome 1:2 | Demonstrate an understanding of metallised paper production standards |
| Specific Outcome 1:3 | Demonstrate the ability to identify metallised paper faults |
| Specific Outcome 1:4 | Demonstrate the ability to consider a range of options and make decisions about quality deviations |

2. TITLE: PREPARE A SLITTING MACHINE FOR PRODUCTION

- | | |
|----------------------|--|
| Specific Outcome 2:1 | Ensure the readiness of the slitting machine |
| Specific Outcome 2:2 | Apply raw materials |
| Specific Outcome 2:3 | Prepare equipment |
| Specific Outcome 2:4 | Position material and equipment |

3. TITLE: SLIT METALLISED ROLLS

- | | |
|----------------------|---------------------------------|
| Specific Outcome 3:1 | Commence production |
| Specific Outcome 3:2 | Produce silted rolls |
| Specific Outcome 3:3 | Maintain process quality |
| Specific Outcome 3:4 | Apply the post slitting process |

4. TITLE: PREPARE A PRE AND POST TREATMENT MACHINE FOR PRODUCTION

- | | |
|----------------------|---|
| Specific Outcome 4:1 | Setting up the pre and post treatment machine |
|----------------------|---|

- Specific Outcome 4:2 Apply raw materials
- Specific Outcome 4:3 Position material and equipment

5. TITLE: PREPARE A METALLISING MACHINE FOR PRODUCTION

- Specific Outcome 5:1 Ensure the readiness of the metallising machine
- Specific Outcome 5:2 Apply raw materials
- Specific Outcome 5:3 Position material and equipment

6. TITLE: METALLISE TREATED PAPER ROLLS

- Specific Outcome 6:1 Commence metallising process
- Specific Outcome 6:2 Produce metallised rolls
- Specific Outcome 6:3 Maintain process quality
- Specific Outcome 6:4 Apply the post metallising process

7. TITLE: PROCESS PRE AND POST TREATED PAPER ROLLS

- Specific Outcome 7:1 Commence production
- Specific Outcome 7:2 Produce pre and post treated paper rolls
- Specific Outcome 7:3 Maintain process quality
- Specific Outcome 7:4 Apply pre and post treatment process

8. TITLE: SHUT DOWN A SLITTING MACHINE

- Specific Outcome 8:1 Prepare for shutdown
- Specific Outcome 8:2 Perform basic cleaning
- Specific Outcome 8:3 Perform basic maintenance
- Specific Outcome 8:4 Restore work area

9. TITLE: SHUT DOWN A METALLISING MACHINE

- Specific Outcome 9:1 Prepare for shutdown
- Specific Outcome 9:2 Perform basic cleaning
- Specific Outcome 9:3 Perform basic maintenance
- Specific Outcome 9:4 Restore work area

10. TITLE: SHUT DOWN A PRE AND POST TREATMENT MACHINE

Specific Outcome 10:1	Prepare for shutdown
Specific Outcome 10:2	Perform basic cleaning
Specific Outcome 10:3	Perform basic maintenance
Specific Outcome 10:4	Restore work area

11. TITLE: PREPARE MIXTURE FOR METALLISED PAPER

Specific Outcome 11:1	Establish mixture needs
Specific Outcome 11:2	Prepare mixtures
Specific Outcome 11:3	Analyse mixtures

ELECTIVE UNIT STANDARDS:**UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 2****1. TITLE: SUPPLY RAW MATERIALS TO PRODUCTION MACHINES**

Specific Outcome 1:1	Plan and prepare for material supply
Specific Outcome 1:2	Distribute materials
Specific Outcome 1:3	Record materials supplied

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 3**2. TITLE: PREPARE MIXTURES FOR METALLISED PAPER**

Specific outcome 2:1	Establish mixtures need
Specific outcome 2:2	Prepare mixtures
Specific outcome 2:3	Analyse mixtures

National Certificate: Metallised Paper Production at NQF level 3					
NQF Level 2		NQF Level 3		Total	
	ID No	Credits	ID No	Credits	
Fundamental			8968	5	
			8969	5	
			8970	5	
			8973	5	
				20	20
			9010	2	
			9011	5	
			9012	5	
			9013	4	
				16	16
Core				4	
				6	
				10	
				4	
				6	
				12	
				4	
				8	
				14	
				4	
Electives				72	88
				5	
				5	10
Total Credits for Qualification - 134					



National Certificate: Tobacco Production – NQF Level 3

Field: Agriculture and Nature Conservation

Sub-field: Secondary Agriculture

NQF level: 3

Credits: 120

Rationale for the Qualification

This Qualification will allow persons currently in, or aspiring to enter the tobacco processing environment and others to obtain an integrated practical and theoretical grounding in the operation of cigarette production and the functions thereof. This will ensure a portable, nationally recognized Qualification that will:-

- Improve the quality of safety in the work environment.
- Optimally utilize resources in the production industry.
- Lead to transformation in economic growth and social development.

The typical range of learners is the currently employed, unemployed and other persons, who want to enter a learning programme to obtain a National Certificate in Cigarette Production at NQF Level 3, to continue building a career path in this industry.

Improved levels of knowledge and skills lead to greater ability to produce at more competitive costs and better quality, which will impact positively both on the society and the economy of the country.

The learner will have demonstrated an ability to make decisions and consider a range of options after completion of the following unit standards in three specified areas:

Rules of combination

To obtain this Qualification, all fundamental and core unit standards are compulsory.

In addition, a learner must select one of the following combinations from the elective unit standards below:

(1)

- Laminate tipping material
- Apply quality control on the final product

(2)

- Apply quality control on filter rods
- Supply raw material to production machines

Access to the Qualification

There are no restrictions placed on learners but except those that are mentioned under learning assumed in place.

Purpose of the Qualification:

This Qualification is aimed at level 3 on the National Qualification Framework. It provides learners with the opportunity to obtain competence in specialised cigarette production processes and practices, namely preparing for cigarette production, maintaining the cigarette production processes, shutting down and cleaning thereof as well as quality monitoring and providing opportunity for learners to grow in this specific field.

The fundamental learning, which learners will acquire, will allow them to be able to compile verbal and written communications and perform basic calculations. This Qualification complies with the objectives of the NQF with regard to facilitating access to, mobility and progression within the Tobacco Processing Industry.

The Qualification focuses on the skills, knowledge, values and attitude required to progress further in the industry. The intention is to release the potential of people, in order for them to grow, develop and become more competent workers. This Qualification will furthermore add value to the individuals, their workplace and the economy as a whole.

Learning assumed to be in place:

The learner will have appropriate levels of written Communication, Language proficiency, Numeracy and occupational competence equivalent to grade 9 (NQF1) standards.

Exit level outcomes and associated assessment criteria

Exit level outcome 1

Recall and explain the basic principles, safety procedures and work ethics in the Tobacco Processing Industry in order to meet industry and work standards.

Associated Assessment Criteria

- The Tobacco Processing Industry's basic principles are interpreted and explained.
- The Tobacco Processing Industry's safety procedures are interpreted and explained.
- The Tobacco Processing Industry's work ethics are interpreted and explained.
- The Tobacco Processing Industry's quality management principles and practices are interpreted and explained.

Exit level outcome 2

Describe and perform the functions/duties/responsibilities required in the preparation for the cigarette production process during material supply, tobacco filling of the machines and brand change-over.

Associated Assessment Criteria

- Work site preparation procedures are identified and explained.
- Consequences of not adhering to work site procedures are explained.
- The relevant supply, filling and change-over activities are performed in accordance with standard operating procedures.
- Procedures for handling equipment and material correctly and according to safety requirements are explained and implemented.

Exit level outcome 3

Describe and perform the functions/duties/responsibilities required to ensure the cigarette production procedures are maintained throughout the process.

Associated Assessment Criteria

- Work site cigarette production procedures are identified and explained.
- Consequences of not adhering to work site procedures regarding cigarette rod making, filter attachment and cigarette supply to packaging are explained.
- The relevant activities are performed in accordance with standard operating procedures and quality requirements.
- Procedures for handling equipment and material correctly and according to safety requirements are explained and implemented.

Exit level outcome 4

Describe and perform the functions/duties/responsibilities required to ensure the shut-down procedures are adhered to.

Associated Assessment Criteria

- Prescribed work site shut-down procedures are explained and implemented according to schedule.
- Consequences of not adhering to work site shut-down procedures are explained.
- The relevant shut-down activities are performed in accordance with standard operating procedures and quality requirements.
- Procedures for handling equipment and material correctly and according to safety requirements are explained and implemented.

Exit level outcome 5

Explain and carry-out the functions/duties/responsibilities required to ensure the cleaning of work area and equipment according to requirements.

Associated Assessment Criteria

- Work site cleaning procedures are identified and implemented.
- Consequences of not adhering to and following work site cleaning procedures are explained.

- The relevant cleaning activities are performed in accordance with standard operating procedures, environmental, safety, health measures and quality requirements.
- Procedures for handling equipment and cleaning material correctly and according to safety requirements are explained and implemented.

Exit level outcome 6

Demonstrate the ability to work effectively as a member of a multi-cultural manufacturing team.

Associated Assessment Criteria

- Own particular team structure and purpose are identified and explained.
- Roles and responsibilities of each team member are identified and described.
- External and environmental factors that influence the workings and success of the team are explained and assessed.
- The ability to perform in a team is achieved and maintained.

Exit level outcome 7

Collect, record and retrieve production related data in accordance with work site procedures.

Associated Assessment Criteria

- Type of data required for processing is identified and explained.
- Production data is gathered, recorded and extracted according to instructions and within specified time frames.
- Consequences of not recording and extracting correct production data are explained.

Criteria for internal and external assessors

Assessors need experience in the following areas:

Interpersonal skills, subject matter and assessment.

The assessor needs to be competent in the planning and conducting assessment of learning outcomes and design and develop assessments as described in the relevant unit standards. The assessors must have achieved a qualification in the field of tobacco production or in a related field at a minimum of NQF level 4.

The subject matter experience of the assessor can be established by recognition of prior learning.

Assessors need to be registered with the relevant Education and Training Quality Assurance Body.

International comparability

Website benchmarking was done with Australia, Canada, New Zealand, Ireland and Scotland but none could be found. Furthermore, the International Tobacco Industry was also investigated for relevant Qualification information, but even within the Industry, nothing could be found to make Industry specific comparisons.

Therefore this could be regarded as one of the first formalized Qualifications in cigarette production.

Articulation possibilities

The generic nature of this qualification and the focus on multi-skilling will provide for portability across various sectors in the processing domain. It is envisaged that learners completing this qualification will be employable in fast moving consumer goods industries, amongst others such as the sugar industry, tea processing industry and others.

It prepares the learner and forms the basis for progression towards other qualifications such as Further Education and Training Certificate in Metallised Paper Technology at NQF Level 4 and Tobacco Services at NQF Level 4. The qualification will enable learners to acquire recognised qualifications at different levels across a wide cross-section of skills.

While the qualification will diverge as they progress upwards, there is enough commonality to provide for a solid base of generic skills. The learner will have multiple choices of learning paths and career paths in various technical occupations.

Integrated Assessment Criteria:

Unit standards associated with this Qualification must be used to assess specific and critical cross-field outcomes. Assessment should focus in an integrated way on determining the competence of the learner in terms of the overall purpose and title of this Qualification.

The term integrated assessment also implies that the theoretical and practical components should be assessed together and assess combinations of practical, foundational and reflective competencies.

Assessment activities should be done in real workplace situations and where simulations or role-plays are used, there should be supporting evidence to show that the learner is able to display the competencies to the real work situation.

All assessments should be conducted in line with the following documented principles of assessment: appropriateness, fairness, manageability, and integration into work of learning, validity, direct, authentic, sufficient, systematic, open and consistent.

Learners wishing to be assessed will need to provide evidence of the following:

- Verbal and written explanations of reasons for adhering to operational and work site procedures as well as statutory requirements, adhering to specific sequence of operations, identifying deviations, taking corrective actions and recording relevant data, and reporting deviations outside the jobholder's responsibility.
- Demonstrations of a range of operational actions relating to applying quality control on the cigarettes, preparing for and producing cigarettes, shutting down and cleaning a cigarette maker, conducting a cigarette brand change-over and applying general safety in the work place. Learners will also demonstrate an understanding of the Tobacco Processing Industry.
- Oral or written questioning regarding the reflexive competencies within the Qualification:

If the identifying and solving of problems, team work, organising one-self, the using of applied science, the implication of actions and reactions in the world as a set of related systems are not clear from the observation a method of oral questioning or a cases

study should be applied to determine the whole person development and integration of applied knowledge and skills.

- A portfolio of evidence is required to prove the practical, foundational and reflexive competencies of the learner which may include production and quality statistics.
- Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
- Unit standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, foundational and reflexive competencies.

Recognition of prior learning

This Qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Where RPL is required the learner will need to prove applied competence in that specific area in order to obtain recognition of that skill and / or knowledge.

Evidence can be presented in a variety of forms, including international or previous local Qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records. The assessment methods and tools to be used to assess Prior Learning shall be decided upon jointly by the assessor and the learner.

Moderation options

Anyone assessing a learner against these unit standards must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable achievement of these unit standards or will assess these unit standards must be accredited as a provider with the relevant ETQA. Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures.

Therefore anyone wishing to be assessed against these unit standards may apply to be assessed by any assessment agency, assessor or provider institution, which is accredited by the relevant ETQA.

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 2**1. TITLE: DEPICT BASIC DETAILS OF THE TOBACCO PROCESSING INDUSTRY**

Specific Outcome 1:1	Demonstrate a basic understanding of the tobacco processing industry
Specific Outcome 1:2	Demonstrate an understanding of safety in the work place
Specific Outcome 1:3	Demonstrate an understanding of work ethics
Specific Outcome 1:4	Demonstrate an understanding of quality management

2. TITLE: CLEAN A CIGARETTE MAKER

Specific Outcome 2:1	Prepare cigarette maker for cleaning
Specific Outcome 2:2	Clean cigarette maker
Specific Outcome 2:3	Apply the post cleaning process

3. TITLE: FILL CIGARETTE TRAYS

Specific Outcome 3:1	Prepare tray filler unit for production
Specific Outcome 3:2	Maintain the tray filling process
Specific Outcome 3:3	Inspect top layers of cigarettes
Specific Outcome 3:4	Equip filled trays with identification
Specific Outcome 3:5	Complete tray filling process

4. TITLE: HANDLE PRODUCTION WASTE

Specific Outcome 4:1	Prepare for removal of production waste
Specific Outcome 4:2	Remove waste
Specific Outcome 4:3	Record waste data

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 3**1. TITLE: APPLY QUALITY CONTROL ON CIGARETTES**

Specific Outcome 1:1	Demonstrate an understanding of quality control
Specific Outcome 1:2	Demonstrate an understanding of cigarette production standards

Specific Outcome 1:3 Demonstrate the ability to consider a range of options and make decisions about quality deviation

2. TITLE: PREPARE A CIGARETTE MAKER FOR PRODUCTION

Specific Outcome 2:1 Ensure the readiness of the cigarette maker

Specific Outcome 2:2 Apply raw materials

Specific Outcome 2:3 Position material and equipment

3. TITLE: PRODUCE CIGARETTES

Specific Outcome 3:1 Commence production

Specific Outcome 3:2 Produce cigarettes

Specific Outcome 3:3 Maintain process quality

4. TITLE: SHUT DOWN A CIGARETTE MAKER

Specific Outcome 4:1 Prepare for shut down

Specific Outcome 4:2 Perform basic cleaning

Specific Outcome 4:3 Perform basic maintenance

Specific Outcome 4:4 Apply the post shut-down procedure

5. TITLE: CONDUCT A CIGARETTE BRAND CHANGE-OVER

Specific Outcome 5:1 Prepare cigarette maker for change-over

Specific Outcome 5:2 Conduct change-over

6. TITLE: CAPTURE AND RETRIEVE PRODUCTION RELATED DATA ON A PRODUCTION MACHINE'S DATA PROCESSOR

Specific Outcome 6:1 Prepare to capture production data

Specific Outcome 6:2 Enter production data

Specific Outcome 6:3 Retrieve production data

Specific Outcome 6:4 Capture data

NEW ELECTIVE UNIT STANDARDS

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 2

1. TITLE: LAMINATE TIPPING MATERIAL

Specific Outcome 1:1	Prepare to laminate tipping material
Specific Outcome 1:2	Laminate tipping material
Specific Outcome 1:3	Confirm product quality
Specific Outcome 1:4	Apply the post laminating process

2. TITLE: SUPPLY RAW MATERIALS TO PRODUCTION MACHINES

Specific Outcome 2:1	Plan and prepare for material supply
Specific Outcome 2:2	Distribute materials
Specific Outcome 2:3	Record materials supplied

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 3

1. TITLE: APPLY QUALITY CONTROL ON THE FINAL PRODUCT

Specific Outcome 1:1	Demonstrate an understanding of quality control
Specific Outcome 1:2	Demonstrate an understanding of cigarette packaging standards
Specific Outcome 1:3	Demonstrate the ability to identify packaging faults
Specific Outcome 1:4	Demonstrate the ability to consider a range of options and make decisions

2. TITLE: APPLY QUALITY CONTROL ON FILTER RODS

Specific Outcome 2:1	Demonstrate an understanding of quality control
Specific Outcome 2:2	Demonstrate an understanding of filter rod production standards
Specific Outcome 2:3	Demonstrate the ability to identify filter rod faults
Specific Outcome 2:4	Demonstrate the ability to consider a range of options and make decisions about quality deviations

National Certificate: Tobacco Production at NQF level 3						
	NQF Level 2	ID No	Credits	NQF Level 3	ID No	Credits
Fundamental				Accommodate audience and context needs in oral communication	8968	5
				Interpret and use information from texts	8969	5
				Write texts for a range of communicative contexts	8970	5
				Use language and communication in occupational learning programmes	8973	5
				Language/Communication		20
				Demonstrate understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	9010	2
				Use mathematics to investigate and monitor the financial aspects of personal and business issues	9011	5
				Investigate life and work related problems using data and probabilities	9012	5
				Measure, estimate and calculate physical quantities and explore, describe and represent, interpret and justify geometrical relationships in two and three dimensional space relevant to the life or workplace of the community	9013	4
				Mathematics/Numeracy		16
Core	Depict basic details of the Tobacco processing industry		3	Condition tobacco for processing		12
	Apply quality control during tobacco processing		5	Cut threshed stem		14
	Clean production support units		4	Cut lamina		10
	Clean cutting machine		3	Apply additives to threshed tobacco		8
	Operate in a team	8420	4			
	Clean conditioning machines		4			
	Clean tobacco fines filler unit		2			
			25			44
	Fill outrag bins		3	Pre-condition unmanufactured tobacco		6
	Prepare tobacco humidants		3	Operate lift truck	8038	6
Electives			6			12
						15
Choice of 15 Credits from the Elective area of learning						
Total Credits for Qualification : 120						



Further Education and Training Certificate: Tobacco Services – NQF Level 4

Field: Agriculture and Nature Conservation

Sub-field: Secondary Agriculture

NQF level: 4

Credits: 142

Rationale for the Qualification

This Qualification will allow persons currently in, or aspiring to enter the tobacco processing environment and others to obtain an integrated practical and theoretical grounding in the operation of tobacco processing and the functions thereof. This will ensure a portable, nationally recognized Qualification that will:-

- Improve the quality of safety in the work environment.
- Optimally utilize resources in the tobacco processing industry.
- Lead to transformation in economic growth and social development.

The typical range of learners is the currently employed, unemployed and other persons, who want to enter a learning programme to obtain a National Certificate in Tobacco Services at NQF Level 4, to continue building a career path in this industry.

Improved levels of knowledge and skills lead to greater ability to produce at more competitive costs and better quality, which will impact positively both on the society and the economy of the country.

Rules of combination

To obtain this Qualification, all fundamental and core unit standards are compulsory.

In addition, a learner must select one of the following elective unit standards below:

- Remove tobacco unit packaging material
- Deliver batch to Primary Processing

Access to the Qualification

There are no restrictions placed on learners but except those that are mentioned under learning assumed to be in place.

Purpose of the Qualification

This Qualification is aimed at level 4 on the National Qualification Framework. It provides learners with the opportunity to obtain competence in specialised tobacco processes and practices, namely for receiving, storing, dispatching and delivering of tobacco, as well as quality monitoring and providing opportunity for learners to grow in this specific field.

The fundamental learning, which learners will acquire, will allow them to be able to compile verbal and written communications and perform basic calculations. This Qualification complies with the objectives of the NQF with regard to facilitating access to, mobility and progression within the tobacco processing industry.

The Qualification focuses on the skills, knowledge, values and attitude required to progress further in the industry. The intention is to release the potential of people, in order for them to grow, develop and become more competent workers. This Qualification will furthermore add value to the individuals, their workplace and the economy as a whole.

Learning assumed to be in place

The learner will have appropriate levels of written Communication, English proficiency, Numeracy and occupational competence equivalent to grade 11 (NQF3) standards.

Exit level outcomes and associated outcomes**Exit level outcome 1**

- Recall and explain the basic principles, safety procedures and work ethics in the Tobacco Processing Industry in order to meet industry and work standards.

Associated Assessment Criteria

- The Tobacco Processing Industry's basic principles are interpreted and explained.
- The Tobacco Processing Industry's safety procedures are interpreted and explained.
- The Tobacco Processing Industry's work ethics are interpreted and explained.
- The Tobacco Processing Industry's quality management principles and practices are interpreted and explained.

Exit level outcome 2

- Describe and perform the functions/duties/responsibilities required in the preparation for and receiving of tobacco.

Associated Assessment Criteria

- Work site preparation procedures are identified and explained.
- Statutory requirements are described and explained.
- Consequences of not adhering to work site procedures and statutory requirements are explained.
- The relevant receiving activities are performed in accordance with standard operating procedures.
- The relevant completion of documentation and capture of data are performed in accordance with standard work site procedures.
- Procedures for handling equipment and product correctly and according to safety requirements are explained and implemented.

Exit level outcome 3

- Describe and perform the functions/duties/responsibilities required to ensure the availability and quality of tobacco for processing are maintained throughout the process.

Associated Assessment Criteria

- Work site procedures are identified and explained.
- Consequences of not adhering to work site warehouse procedures are explained.
- The relevant activities are performed in accordance with standard operating procedures and quality requirements.
- The relevant cleaning activities are performed in accordance with standard operating procedures, environmental, safety, health measures and quality requirements.
- Procedures for handling equipment and product correctly and according to safety requirements are explained and implemented.

Exit level outcome 4

- Describe and perform the functions/duties/responsibilities required to ensure the dispatching of tobacco procedures are adhered to.

Associated Assessment Criteria

- Prescribed work site dispatching procedures are explained and implemented according to order schedule.
- Statutory requirements are described and explained.
- Consequences of not adhering to work site procedures and statutory requirements are explained.
- The relevant dispatching activities are performed in accordance with standard operating procedures and quality requirements.
- The relevant completion, submitting of documentation and update of database are performed in accordance with standard work site procedures.
- Procedures for handling equipment and product correctly and according to safety requirements are explained and implemented.

Exit level outcome 5

- Explain and carry-out the functions/duties/responsibilities required to ensure the delivery of tobacco to batching according to requirements.

Associated Assessment Criteria

- Prescribed work site delivering procedures are explained and implemented according to requirements.
- Consequences of not adhering to and following work site delivering procedures are explained.
- The relevant delivering activities are performed in accordance with standard operating procedures and quality requirements.
- The relevant completion and submitting of documentation are performed in accordance with standard work site procedures.
- Procedures for handling equipment and cleaning material correctly and according to safety requirements are explained and implemented.

Exit level outcome 6

- Explain and perform the functions/duties/responsibilities required to ensure the receiving of tobacco in batching according to requirements.

Associated Assessment Criteria

- Prescribed work site receiving procedures are explained and implemented according to requirements.
- Consequences of not adhering to work site procedures and quality requirements are explained.
- The relevant receiving activities are performed in accordance with standard operating procedures and quality requirements.
- The relevant cleaning activities are performed in accordance with standard operating procedures, environmental, safety, health measures and quality requirements.
- Procedures for handling equipment and product correctly and according to safety requirements are explained and implemented.

Exit level outcome 7

- Demonstrate the ability to work effectively as a member of a multi-cultural manufacturing team.

Associated Assessment Criteria

- Own particular team structure and purpose are identified and explained.
- Roles and responsibilities of each team member are identified and described.

- External (environmental) factors that influence the workings and success of the team are explained and assessed.
- The ability to perform in a team is achieved and maintained.

Criteria for internal and external assessors

Assessors need experience in the following areas:
Interpersonal skills, subject matter and assessment.

The assessor needs to be competent in the planning and conducting assessment of learning outcomes and design and develop assessments as described in the relevant unit standards. The assessors must have achieved a qualification in the field of tobacco services or in a related field at a minimum of NQF level 5.

The subject matter experience of the assessor can be established by recognition of prior learning.

Assessors need to be registered with the Education and Training Quality Assurance Body.

International comparability

Website benchmarking was done with Australia, Canada, New Zealand, Ireland and Scotland but none could be found. Furthermore, the International Tobacco Industry was also investigated for relevant Qualification information, but even within the Industry, nothing could be found to make Industry specific comparisons.

Therefore this could be regarded as one of the first formalised Qualifications in Tobacco Services.

Articulation possibilities

The generic nature of this qualification and the focus on multi-skilling will provide for portability across various sectors in the processing domain. It is envisaged that learners completing this qualification will be employable in fast moving consumer goods industries, amongst others such as the sugar industry, tea processing industry and others.

It prepares the learner and forms the basis for progression towards other qualifications such as National Diploma in Tobacco Production at NQF Level 5 and Cigarette Production Technology at NQF Level 4. The qualification will enable learners to acquire recognised qualifications at different levels across a wide cross-section of skills.

While the qualification will diverge as they progress upwards, there is enough commonality to provide for a solid base of generic skills. The learner will have multiple choices of learning paths and career paths in various technical occupations namely, product analyst and factory manager.

Integrated Assessment Criteria

Learners will produce evidence of the following:

- Verbal and written explanations of reasons for adhering to operational and work site procedures as well as statutory requirements, adhering to specific sequence of operations, identifying deviations, taking corrective actions and recording relevant data, and reporting deviations outside the jobholder's responsibility.

- Demonstrations of a range of operational actions relating to the receiving, storing and issuing of unmanufactured tobacco and applying general safety in the work place.
- Oral or written questioning regarding the reflexive competencies within the Qualification:

If the identifying and solving of problems, team work, organising one-self, the using of applied science, the implication of actions and reactions in the world as a set of related systems are not clear from the observation, a method of oral questioning or a case study should be applied to determine the whole person development and integration of applied knowledge and skills.

- A portfolio of evidence is required to prove the practical, foundational and reflexive competencies of the learner which may include processing and quality statistics.
- Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
- Unit standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, foundational and reflexive competencies.

Recognition of prior learning

This Qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Where RPL is required the learner will need to prove applied competence in that specific area in order to obtain recognition of that skill and / or knowledge.

Evidence can be presented in a variety of forms, including international or previous local Qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records. The assessment methods and tools to be used to assess Prior Learning shall be decided upon jointly by the assessor and the learner.

Moderation options

Anyone assessing a learner against these unit standards must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable achievement of these unit standards or will assess these unit standards must be accredited as a provider with the relevant ETQA. Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures.

Therefore anyone wishing to be assessed against these unit standards may apply to be assessed by any assessment agency, assessor or provider institution, which is accredited by the relevant ETQA.

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 2**1. TITLE: DEPICT BASIC DETAILS OF THE TOBACCO PROCESSING INDUSTRY**

Specific Outcome 1:1	Demonstrate a basic understanding of the tobacco processing industry
Specific Outcome 1:2	Demonstrate an understanding of safety in the work place
Specific Outcome 1:3	Demonstrate an understanding of work ethics
Specific Outcome 1:4	Demonstrate an understanding of quality management

2. TITLE: STACK UNMANUFACTURED TOBACCO

Specific Outcome 2:1	Prepare stacking area
Specific Outcome 2:2	Stack un-manufactured tobacco
Specific Outcome 2:3	Label stacks
Specific Outcome 2:4	Maintain the condition of stacked un-manufactured tobacco

3. TITLE: ISSUE UNMANUFACTURED TOBACCO PROCESSING

Specific Outcome 3:1	Prepare for issuing of un-manufactured tobacco
Specific Outcome 3:2	Withdraw un-manufactured tobacco
Specific Outcome 3:3	Complete issuing of un-manufactured tobacco

4. TITLE: SUPPLY TOBACCO UNITS TO TOBACCO LINE

Specific Outcome 4:1	Prepare for tobacco supply
Specific Outcome 4:2	Deliver tobacco to batching line

5. TITLE: PREPARE A BATCH FOR PRIMARY PROCESSING

Specific Outcome 5:1	Prepare for batching
Specific Outcome 5:2	Perform batching

6. TITLE: LOAD TOBACCO CONVEYANCE UNITS

Specific Outcome 6:1 Prepare for loading

Specific Outcome 6:2 Perform loading

7. TITLE: RECEIVE TOBACCO BLEND ORDER

Specific Outcome 7:1 Prepare for receiving of blend order

Specific Outcome 7:2 Offload tobacco blends

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 3**1. TITLE: VERIFY UNPACKED BLEND ORDER**

Specific Outcome 1:1 Prepare for verification of blend order

Specific Outcome 1:2 Check tobacco blends

Specific Outcome 1:3 Apply the post verification of blend order

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 4**1. TITLE: RECEIVE UNMANUFACTURED TOBACCO**

Specific Outcome 1:1 Prepare for receiving of un-manufactured tobacco

Specific Outcome 1:2 Receive un-manufactured tobacco

Specific Outcome 1:3 Oversee the offload of un-manufactured tobacco

Specific Outcome 1:4 Complete the receiving of un-manufactured tobacco

2. TITLE: DISPATCH UNMANUFACTURED TOBACCO

Specific Outcome 2:1 Prepare for dispatching of un-manufactured tobacco

Specific Outcome 2:2 Load un-manufactured tobacco

Specific Outcome 2:3 Complete the dispatching of un-manufactured tobacco

3. TITLE: STORE UNMANUFACTURED TOBACCO

Specific Outcome 3:1 Prepare for stacking

Specific Outcome 3:2	Oversee stacking
Specific Outcome 3:3	Record stacked stock
Specific Outcome 3:4	Maintain the condition of stacked un-manufactured tobacco
Specific Outcome 3:5	Control warehouse stock

4. TITLE: DISPATCH RECOVERED TOBACCO UNIT PACKAGING MATERIAL

Specific Outcome 4:1	Plan and prepare for dispatching of packaging material
Specific Outcome 4:2	Dispatch packaging material
Specific Outcome 4:3	Complete dispatching

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 2

1. TITLE: REMOVE TOBACCO UNIT PACKAGING MATERIAL

Specific Outcome 1:1	Prepare for removal of packaging
Specific Outcome 1:2	Perform removal
Specific Outcome 1:3	Sort packaging material
Specific Outcome 1:4	Restore work area

2. TITLE: DELIVER BATCH TO PRIMARY PROCESSING

Specific Outcome 2:1	Prepare for batch delivery
Specific Outcome 2:2	Implement batch delivery
Specific Outcome 2:3	Record batch delivery

Further Education and Training Certificate: Tobacco Services at NQF level 4										
	NQF Level 2	ID No	Credits	NQF Level 3	ID No	Credits	NQF Level 4	ID No	Credits	Total
Fundamental				Accommodate audience and context needs in oral communication	8968	5	Engage in sustained oral communication and evaluate spoken texts	8974	5	
				Interpret and use information from texts	8969	5	Read, analyse and respond to a variety of texts	8975	5	
				Write texts for a range of communicative contexts	8970	5	Write for a wide range of contexts	8976	5	
				Use language and communication in occupational learning programmes	8973	5	Use language and communication in occupational learning programmes	8979	5	
				Second Language/Communication		20	First Language/Communication		20	40
							Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	9014	6	
							Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life-related problems	9015	6	
							Measure, estimate and calculate physical quantities and explore, critique and prove geometrical relationships in two and three dimensional space in the life and workplace of the adult with increasing responsibility	9016	4	
							Mathematics/Numeracy		16	16
					Verify unpacked blend order		5	Receive unmanufactured tobacco		12
Core			3				Dispatch unmanufactured tobacco		12	
			6				Dispatch recovered tobacco unit packaging material		8	
			4				Store unmanufactured tobacco		10	
			4				Function in a team	8561	4	
			5							
			3							
			4							
Electives			29			5			46	80
			3			6				
			3							
			6			6				6
Elective unit standards for 6 Credits must be selected										
Total Credits for Qualification - 142										

Elective unit standards for 6 Credits must be selected

Total Credits for Qualification - 142



National Certificate in Paprika Oleoresin Extraction and Blending NQF level 3

Field: Agriculture and Nature Conservation

Sub-field: Secondary Agriculture

NQF level: 3

Credits: 120

Rationale for the qualification

This qualification is aimed at people who are working in the Paprika Oleoresin industry or who would like to start a career in the industry. It is aimed at formalising the skills required in the Paprika Oleoresin extraction and blending processes to facilitate career-pathing and to provide access to new entrants. The qualification provides learners with access to learning in specialised areas within the Paprika Oleoresin industry. It also provides learners with the necessary background knowledge and skills to be portable within other Agricultural Industries.

Purpose of the qualification

This qualification is registered at level 3 on the National Qualification Framework. Learners will, once assessed and qualified, be able to demonstrate competence in milling and pellitising of paprika raw material, extraction and blending of Paprika Oleoresin according to prescribed industry quality standards, showing an understanding of the uniqueness of the processes used in this industry. This will provide the learner with opportunities to grow within any of these fields.

Learners who embark on obtaining this qualification will find that the acquisition of competence in the respective unit standards, which make up the qualification, will add value not only to their respective positions, but to the industry as well.

It will provide the broad knowledge, skills and values needed in the Paprika Oleoresin extraction industry and will facilitate access to, and mobility and progression within, education and training to progress along a learning path for learners who:

- Were previously disadvantaged or were unable to complete their schooling.

- Wish to extend their range of skills and knowledge of the industry and have worked in the Paprika Oleoresin Extraction industry for a number of years, but have no formal qualification or recognition of skills in this area.

Rules of Combination

This qualification consists of a minimum of 120 credits taken from 36 Fundamental, 68 Core and a minimum of 16 from 73 electives. At least 72 credits are at level 3.

Access to the qualification

There are no restrictions placed on learners but except those mentioned under learning assumed to be in place.

Learning assumed to be in place

The learner will have appropriate levels of Communication, Language, Numeracy and occupational competence equivalent to NQF2.

Exit Level Outcomes and Associated Assessment Criteria**Exit level outcome 1**

Handle and process paprika raw material

Associated assessment criteria

- Paprika raw material is offloaded and inspected according to standard operating procedures
- Principles of grading and sampling paprika raw material must be explained and applied.
- Reasons and consequences for not rejecting non-conforming material are explained.
- Machinery is prepared, maintained and used according to manufacturers specifications and work site procedures.
- Raw material received is weighed, documented and communicated according to standard working procedures.

Exit level outcome 2

Demonstrate an understanding of deseeding and milling of Paprika

Associated assessment criteria

- Machinery start-up, operating and shut procedures are applied according to standard operating procedures.
- Process principles of deseeding and milling of paprika are explained.
- Consequences of not storing seed and pericarp according to standard operating

- procedures are explained.
- Deseeding and milling processes are reconciled, documented and communicated according to standard working procedures.

Exit level outcome 3

Demonstrate the ability to Pellitise paprika

Associated assessment criteria

- Machinery is prepared, used and maintained according to manufacturers specifications and work site procedures.
- Pellitise processes and factors impacting on firmness and temperature of pellets are understood and explained.
- Reasons and consequences of not conditioning pellets according to standard working procedures are explained.
- Pellitise processes are reconciled, documented and communicated according to standard working procedures.

Exit level outcome 4

Demonstrate the ability to operate extractor, desolventiser

Associated assessment criteria

- Machinery start-up, operating and shut procedures are applied according to standard operating procedures.
- Reasons and consequences of not monitoring extractor equipment are recalled and explained.
- Importance of reporting deviations and taking appropriate action to be explained.
- Extraction processes are documented and communicated according to standard working procedures.
- Machinery start-up, operating and shut procedures are applied according to standard operating procedures.
- Reasons and consequences of not monitoring extractor equipment are explained.
- The basic principles of working with hexane and steam are explained.
- Importance of reporting deviations and taking appropriate action are explained.
- Extraction processes are documented and communicated according to standard working procedures.

Exit level outcome 5

Demonstrate the ability to operate an evaporator polishing plant

Associated assessment criteria

- Process start-up, operating and shut procedures are applied according to standard operating procedures.
- Reasons and consequences of not monitoring evaporator equipment are recalled and explained.
- The basic principles of working with hexane and steam to be explained.

- Importance of reporting deviations and taking appropriate action to be explained.
- Evaporating processes are documented and communicated according to standard working procedures.
- Process start-up, operating and shut procedures to be applied according to standard operating procedures.
- Reasons and consequences of not monitoring evaporator equipment are recalled and explained.
- The basic principles of working with hexane and steam to be explained.
- Importance of reporting deviations and taking appropriate action are explained.

Exit level outcome 6

Demonstrate an understanding of blending paprika oleoresin

Associated assessment criteria

- Oleoresin blending process and factors impacting on obtaining required Asta values against blending sheets are understood and explained.
- Blended product is weighed, drummed and numbered according to standard working procedures.
- Blended product is reconciled against input material according to standard working procedures.
- Basic principles of taking representative samples are recalled and explained.
- Blending process is documented and communicated according to standard working procedures.

International comparability

A thorough search was done to find international qualifications and unit standards in Paprika producing countries specific to the extraction and blending of paprika oleoresin, but no formal unit standards and qualifications could be found.

However, areas such as food processing were compared to New Zealand qualifications these were:

- National Certificate in food and related products processing-Level 2 (0342)
- National Certificate in food and related products processing-Level 3 (0343)

Unit standards in the New Zealand Qualifications Authority without qualifications in the related field were found with some similar aspects:

- Blend finished products manually-level 2 (7836)
- Blend liquid food products using automated product equipment-level 2 (7836)

A comparison of the above qualifications and unit standards was undertaken and the best practice points were highlighted and used in the generation of this qualification's unit standards.

Integrated assessment criteria

All assessments should be conducted in line with the following documented principles of assessment: appropriateness, fairness, manageability, integration into work of learning, validity, direct, authentic, sufficient, systematic, open and consistent.

Learners will produce evidence of the following:

- Verbal and written explanations of reasons for adhering to operational and work site procedures as well as statutory requirements, adhering to specific sequence of operations, identifying deviations, taking corrective actions and recording relevant data, and reporting deviations outside the jobholder's responsibility.
- Demonstrations of a range of operational actions relating to applying quality control in in-take, deseeding, and milling of paprika raw material and applying general safety in the work place. Learners will also demonstrate an understanding of the Paprika Industry.
- Oral or written competence regarding the reflective competencies within the qualification.

If the identifying and solving of problems, team work, organising oneself, the using of applied science, the implication of actions and reactions in the world as a set of related systems are not clear from the observation, a method of oral questioning or a case study should be applied to determine the whole person development and integration of applied knowledge and skills.

- A portfolio of evidence is required to prove the practical applied and foundational competencies of the learner which may include the milling, deseeding, pellitising of paprika and the extraction and blending of paprika.
- Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
- Unit standards in the qualification must be used to assess the specific and critical cross-field outcomes. During the integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflective competencies.

Articulation possibilities

This qualification lends itself to both vertical and horizontal articulation possibilities. These possibilities ensure both mobility and progression for the learner in other fields of learning such as the dairy, macadamia and fish industries and areas where supervisory competence is required. The learning areas outlined in the purpose of the qualification indicate the horizontal articulation possibilities.

Horizontal and Vertical articulation possibilities:

- National Certificate Farming NQF level 3 (ID 20289)
- Further Education and Training Certificate Grain Milling NQF level 4 (ID 48659)

Recognition of prior learning

This qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Where RPL is required the learner will need to prove competence in that specific area in order to obtain recognition of that skill and knowledge.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practise and performance records. The assessment methods and tools to be used to assess Prior Learning shall be decided upon jointly by the assessor and the learner.

Moderation

Moderation includes internal and external moderation of assessments. Internal and external moderation systems must ensure that all assessors produce assessments that are credible, fair, reliable, consistent, adequate and practical.

Internal and external moderation systems must provide learning opportunities that are transparent, affordable and enhancing development in the field and sub field of the National Qualifications Framework.

The accredited provider with the relevant ETQA must be able to provide internal moderation.

Unit standards and specific outcomes at NQF level 1**1. TITLE DESEED PAPRIKA RAW MATERIAL**

Specific Outcome 1:1 Prepare for the deseeding of Paprika

Specific Outcome 1:2 Deseed Paprika

Specific Outcome 1:3 Complete deseeding of paprika

Unit standards and specific outcomes at NQF level 2**1. TITLE PROCESS PAPRIKA RAW MATERIAL**

Specific Outcome 1:2 Prepare for the intake process

Specific Outcome 1:2 Handle Paprika

Specific Outcome 1:3 Complete the intake process

2. TITLE MILL PAPRIKA

Specific Outcome 2:2 Prepare for milling of paprika

Specific Outcome 2:2 Mill Paprika

Specific Outcome 2:3 Complete the milling of paprika

3. TITLE PELLITISE PAPRIKA

Specific Outcome 3:3 Prepare for Pellitise process

Specific Outcome 3:3 Pellitise paprika

Specific Outcome 3:3 Complete Pellitise process

Unit standard and specific outcomes at NQF level 3**1. TITLE OPERATE EXTRACTOR**

Specific Outcome 1:1 Prepare the Paprika oleoresin extraction process

Specific Outcome 1:2 Extract Paprika Oleoresin

Specific Outcome 1:3 Complete the extraction process

2. TITLE OPERATE DESOLVENTISER

Specific Outcome 2:1 Prepare for Paprika Spent Hexane recovering process

Specific Outcome 2:2 Recover Hexane from Paprika spent

Specific Outcome 2:3 Complete the Paprika Spent Hexane recovery process

3. TITLE OPERATE EVAPORATOR

Specific Outcome 3:1 Prepare for Paprika Miscella Hexane evaporation process
Specific Outcome 3:2 Evaporate Hexane from Paprika Miscella
Specific Outcome 3:3 Complete the evaporation of Hexane from Paprika Miscella

4. TITLE OPERATE POLISHING PLANT

Specific Outcome 4:1 Prepare for Paprika Polishing Oleoresin process
Specific Outcome 4:2 Polishing Paprika oleoresin
Specific Outcome 4:3 Complete the polishing process

5. TITLE DEMONSTRATE AN UNDERSTANDING OF PAPRIKA PROCESSING

Specific Outcome 5:1 Demonstrate knowledge of Paprika processing
Specific Outcome 5:2 Demonstrate an understanding of Safety in the workplace
Specific Outcome 5:3 Demonstrate an understanding of work ethics
Specific Outcome 5:4 Demonstrate an understanding of quality management

Elective unit standards:

Unit standard and specific outcomes at NQF level 3

1. TITLE BLEND PAPRIKA OLEORESIN

Specific Outcome 1:1 Prepare for blending process
Specific Outcome 1:2 Blend Paprika Oleoresin
Specific Outcome 1:3 Weigh and Drum blended product
Specific Outcome 1:4 Complete blending process

National Certificate: Paprika Oleoresin Extraction and Blending at NQF level 3					
NQF Level 2		NQF Level 3		Total	
	ID No	Credits	ID No	Credits	Total
Fundamental			Accommodate audience and context needs in oral communication	8968	5
			Interpret and use information from texts	8969	5
			Write texts for a range of communicative contexts	8970	5
			Use language and communication in occupational learning programmes	8973	5
			Language/Communication		20
			Demonstrate understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	9010	2
			Use mathematics to investigate and monitor the financial aspects of personal and business issues	9011	5
			Investigate life and work related problems using data and probabilities	9012	5
			Measure, estimate and calculate physical quantities and explore, describe and represent, interpret and justify geometrical relationships in two and three dimensional space relevant to the life or workplace of the community	9013	4
			Mathematics/Numieracy		16
Core	Desaerd paprika raw material	6	Introduction to paprika processing		8
	Pelittise Paprika	6	Operate polishing plant		12
			Operate evaporator		12
			Operate extractor		12
			Operate desolventiser		12
Electives		12			56
	Intake of raw material	12	Apply basic business principles	8000	9
	Mill paprika	6	Manage work time effectively	9530	3
	Operate in a team	4	Blend paprika oleoresin		12
	Perform basic first aid	4	Lead a team, plan, allocate and assess their work	9527	4
			Maintain occupational health, safety and general housekeeping	8016	8
		26			36
Learners must select elective unit standards for a minimum of 16 credits					
Total Credits for Qualification - 120					



Further Education and Training Certificate: Sugar Processing - NQF level 4

Field: Agriculture and Nature Conservation
Sub-field: Secondary Agriculture
NQF Level: 4
Credits: 140

Rationale for the Qualification

This Qualification is aimed at people who are working in the sugar processing industry or who would like to start a career in the industry. It provides further learning for learners who have completed the National Certificate in Sugar Processing NQF 2 and therefore facilitates/supports career progression. The Qualification provides learners with access to more advanced learning within the sugar processing industry. It also provides learners with the necessary background knowledge and skills to be portable within other Industries.

Through the above the Qualification will address one of the key priorities of the Department of Labour in the reduction of unemployment and under employment. It will assist in creating job opportunities and to create a better nation at large.

Purpose of the Qualification:

This Qualification is aimed at level 4 on the National Qualification Framework. It provides learners with the opportunity to obtain competence in controlling sugar processing operations. It also provides the learner with the opportunity to gain competence in selected specialised fields including extraction, sugar refining or laboratory practice.

The fundamental learning, which learners will acquire, will allow them to be able to compile verbal and written communications and perform essential calculations. The core learning will enable the learner to oversee and control unit operations in a sugar processing factory. This Qualification complies with the objectives of the NQF with regard to facilitating access to, mobility and progression within the sugar processing industry.

The Qualification focuses on the skills, knowledge, values and attitude required to progress in industry. The intention is to release the potential of people, in order for them to grow, develop and become more competent workers in industry and the sugar processing industry in particular. This Qualification will furthermore add value to the individuals, their workplace and the economy as a whole.

Rules of combination

This Qualification consists of a minimum of 140 credits taken from 57 Fundamental, 72 Core and a minimum of 11 credits from the Elective area of specialisation.

The learner will have demonstrated an ability to make decisions and consider a range of options after completion of the following Unit Standards in three specified areas:

Fundamental learning:

Language

- Engage in Sustained Oral Communication and Evaluate Spoken Texts (ID No. 8974)
- Read, Analyse and Respond to a Variety of Texts (ID No 8975)
- Write for a Wide Range of Texts (ID No 8976)
- Use the Writing Process to Compose Texts Required in the Business Environment (ID No 12153)

Second Language

- Accommodate Audience and Context Needs in Oral Communication (ID No 8968)
- Interpret and Use Information from Texts (ID No 8969)
- Write Texts for a Range of Communicative Contexts (ID No 8970)
- Use the Writing Process to Compose Texts Required in the Business Environment (ID No 8973)

Mathematics

- Work with a Wide Range of Patterns and Inverse Functions and Solve Related Problems (ID No 7470)
- Find the Derivative and Integrals of a Range of Functions Including the Trigonometric Functions and Apply these to Problems (ID No 7481)
- Find the Derivatives and Antiderivatives of a Range of Simple Functions and Apply these to Problems Involving Curve Sketching, Areas Under Curves, Maxima and Minima and Rates of Change (ID No 7482)
- Describe, Represent, Analyse and Explain Changes in Shape and Motion in 2- and 3-Dimensional Space with Justification (ID No 7484)

Core learning:

- Explain the Sugar Cane Processing Value Chain
- Apply the Terms Pol, Brix & Purity
- Monitor Health & Safety Policies
- Demonstrate Knowledge and Operations of Mechanical and Electrical Systems (ID No 12058)
- Demonstrate a Knowledge of Fundamental Chemical and Physical Reactions
- Control Clarification Operations
- Control Evaporation Operations
- Control Pan Boiling Operations
- Control Centrifugation Operations

Elective learning:

- Control Cane Yard Operations
- Control Sugar Extraction Operations
- Control Refinery Operations
- Control Laboratory Activities
- Provide First Aid
- Assess Pollution and Control Pollution
- Implement and Maintain a Food Production Quality Control System
- Operate in a Business
- Work as a Project Team Member (ID No 10135)
- Produce and Use Spreadsheets for Business

Access to the Qualification

There are no further restrictions placed on learners that may prevent them from gaining access to this Qualification, except the requirements outlined below in the "Learning assumed to be in place".

Learning assumed to be in place:

Learners are assumed to:

- Have attained competence in mathematics and communication skills at NQF 3 or equivalent
- Have attained the National Certificate in Sugar Processing NQF 2 or demonstrated competence at that level through recognition of prior learning

Exit level outcomes and associated assessment criteria:**Exit Level Outcome 1**

Explain the Process Flow of a Sugar Cane Processing Factory Including Typical Pol, Brix and Purity Values for the Major Processing Streams

Associated Assessment Criteria

- The various unit operations used in a sugar factory are explained and their interrelationships identified
- The terms Pol, Brix and Purity are explained and related to the co-ordination of sugar processing activities

Exit Level Outcome 2

Monitor Occupational Health & Safety Policies in a Sugar Processing Factory

Associated Assessment Criteria

- Information regarding Occupational Health & Safety is provided to the work group
- The organisation's procedures for monitoring and controlling risks are explained and implemented
- The organisation's procedures for providing Occupational Health & Safety training are implemented and monitored
- The organisation's procedures for maintaining occupational health and safety records are implemented and monitored

Exit Level Outcome 3

Demonstrate Knowledge and Operation of Mechanical and Electrical Systems

Associated Assessment Criteria

- Basic Mechanical Principles are explained
- Startup, operation and shutdown of mechanical equipment is demonstrated
- Maintenance of mechanical equipment is explained
- Basic principles of electricity are explained
- The practices and procedures used for managing electrical fires are demonstrated

Exit Level Outcome 4

Demonstrate a knowledge of Fundamental Chemical and Physical Reactions

Associated Assessment Criteria

- The fundamental physical reactions are defined, explained and examples given
- The properties of light are defined and explained
- Redox reactions and acid-base reactions are described and explained according to standard chemical principles

- The properties and tests for Oxygen, Hydrogen and Carbon dioxide are described
- The four types of chemical bonds are described
- The measurement and factors affecting the rate of chemical reactions are explained

Exit Level Outcome 5

Control Juice Clarification Operations

Associated assessment criteria

- The principles of clarification operations are explained
- Performance of clarification operations are monitored and assessed
- Clarification operations are controlled and coordinated
- The effect of clarification operations on subsequent processes is explained

Exit Level Outcome 6

Operate and Control Pan Boiling Evaporation Operations

Associated assessment criteria

- The principles of evaporation operations are described and explained
- Performance of evaporation operations are monitored and assessed
- Evaporation operations are controlled and coordinated
- The principles of Pan Boiling operations are described and explained
- Performance of Pan Boiling operations are monitored and assessed
- Pan Boiling operations are controlled and coordinated
- The impact of Pan Boiling operations on subsequent processes is explained

Exit Level Outcome 7

Control Centrifugation and Cane Yard Operations

Associated assessment criteria

- The principles of Centrifugation operations are explained
- Performance of Centrifugation operations are monitored and assessed
- Centrifugation operations are controlled and coordinated
- The impact of Centrifugation operations on subsequent processes is explained
- Cane yard processes are described and explained
- Performance of cane yard operations are monitored and assessed
- Cane yard operations are controlled and coordinated

Exit Level Outcome 8

Monitor and Control Extraction, Sugar Refinery Operations and Laboratory Activities

Associated assessment criteria

- Extraction operations are described and explained
- Performance of extraction operations are monitored and assessed
- Extraction operations are controlled and coordinated
- The principles of sugar refinery operations are described and explained
- Performance of sugar refinery operations are monitored and assessed
- Sugar refinery operations are controlled and coordinated
- The impact of Refinery operations on sugar quality is described and explained
- Laboratory functions/activities are explained
- Laboratory activities are monitored and assessed
- Laboratory activities are controlled and coordinated
- The role of the laboratory in relation to the process is explained

Criteria for internal and external assessors

Assessors need experience in the following areas:

Interpersonal skills, subject matter and assessment.

The assessor needs to be competent in the planning and conducting of assessment of learning outcomes and design and develop assessments as described in the relevant Unit Standards. The subject matter experience must be well developed within the field of sugar processing.

The subject matter experience of the assessor can be established by recognition of prior learning.

Assessors need to be registered with the relevant Education and Training Quality Assurance Body.

International comparability

Comparisons were done against Unit Standards and the Australian Sugar Milling Qualification registered at level III with the Australian National Training Authority:

- Certificate III in Sugar Milling
National Code SUG30102

The abovementioned Qualification was used to benchmark this Qualification's Unit Standards. In general the National Certificate in Sugar Processing NQF 4 Qualification and its component Unit Standards were found to be very similar in content and scope in comparison to its international counterpart.

Integrated Assessment Criteria:

Unit Standards associated with this Qualification must be used to assess specific and critical cross-field outcomes. Assessment should focus in an integrated way on determining the competence of the learner in terms of the overall purpose and title of this Qualification.

The term integrated assessment also implies that the theoretical and practical components should be assessed together and assess combinations of practical, applied, foundational and reflective competencies.

Assessment activities should be done in real workplace situations and where simulations or role-plays are used, there should be supporting evidence to show that the learner is able to display the competencies to the real work situation.

All assessments should be conducted in line with the following documented principles of assessment: appropriateness, fairness, manageability, integration into work of learning, validity, direct, authentic, sufficient, systematic, open and consistent.

Learners wishing to be assessed will need to provide evidence of the following:

- Verbal and written explanations of reasons for adhering to operational and work site procedures as well as statutory requirements, adhering to specific sequence of operations, identifying deviations, taking corrective actions and recording relevant data, and reporting deviations outside the jobholder's responsibility.
- Documentation and explanation of administrative records completed during the process of sugar processing.
- Demonstrations of a range of actions in co-ordinating the handling of materials and equipment during sugar processing (i.e. startup, processing, shutdown and shift

changeovers) and applying general safety in the workplace. Learners will also demonstrate an understanding of the Sugar Processing industry.

- A portfolio of evidence is required to prove the practical, applied and foundational competencies of the learner, which may include production and quality data.

Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.

Unit Standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should assess combinations of practical/applied, foundational (theory) and reflective competencies.

Recognition of prior learning (RPL)

This Qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Where RPL is required the learner will need to prove competence in that specific area in order to obtain recognition of that skill and knowledge.

Evidence can be presented in a variety of forms, including international or previous local Qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records. The assessment methods and tools to be used to assess Prior Learning shall be decided upon jointly by the assessor and the learner.

Moderation Options

Anyone assessing a learner against these unit standards must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable achievement of these unit standards or will assess these unit standards must be accredited as a provider with the relevant ETQA. Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures.

Therefore anyone wishing to be assessed against these unit standards may apply to be assessed by any assessment agency, assessor or provider institution, which is accredited by the relevant ETQA.

NEW UNIT STANDARD TITLES AT NQF LEVEL 4

1. Title: Explain the sugar cane processing value chain
2. Title: Apply the terms pol, brix and purity
3. Title: Control clarification operations
4. Title: Control evaporation operations
5. Title: Control pan boiling operations
6. Title: Control centrifugation operations
7. Title: Control cane yard operations
8. Title: Control sugar extractions operations
9. Title: Control refinery operations
10. Title: Control laboratory activities

TITLES OF UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 4**1. TITLE: EXPLAIN THE SUGAR CANE PROCESSING VALUE CHAIN**

Specific Outcome 1:1 Demonstrate an understanding of sugar cane processing.

Specific Outcome 1:2 Explain sugar cane process flow

Specific Outcome 1:3 Relate the various unit operations

2. TITLE: APPLY THE TERMS POL, BRIX AND PURITY

Specific Outcome 2:1 Demonstrate working knowledge of Pol, Brix and Purity

Specific Outcome 2:2 Calculate Pol, Brix and Purity results

Specific Outcome 2:3 Evaluate Pol, Brix and Purity results

Specific Outcome 2:4 Coordinate process activities

3. TITLE: CONTROL CLARIFICATION OPERATIONS

Specific Outcome 3:1 Demonstrate an understanding of clarification operations

Specific Outcome 3:2 Evaluate clarification operations

Specific Outcome 3:3 Control clarification operations

Specific Outcome 3:4 Coordinate clarification operations

4. TITLE: CONTROL EVAPORATION OPERATIONS

Specific Outcome 4:1 Demonstrate an understanding of evaporation operations

Specific Outcome 4:2 Evaluate evaporation operations

Specific Outcome 4:3 Control evaporation operations

Specific Outcome 4:4 Coordinate evaporation operations

5. TITLE: CONTROL PAN BOILING OPERATIONS

Specific Outcome 5:1 Demonstrate an understanding of pan boiling

Specific Outcome 5:2 Evaluate pan boiling operations

Specific Outcome 5:3 Control pan boiling operation

Specific Outcome 5:4 Coordinate pan boiling operations

6. TITLE: CONTROL CENTRIFUGATION OPERATIONS

Specific Outcome 6:1 Demonstrate an understanding of centrifugation

Specific Outcome 6:2 Evaluate centrifugation operations

Specific Outcome 6:3 Control centrifugation operations

Specific Outcome 6:4 Coordinate centrifugation operations

7. TITLE: CONTROL CANE YARD OPERATIONS

Specific Outcome 7:1 Demonstrate an understanding of cane yard operations

Specific Outcome 7:2 Monitor cane yard operations

Specific Outcome 7:3 Controls cane yard operations

Specific Outcome 7:4 Coordinate cane handling operations

8. TITLE: CONTROL SUGAR EXTRACTIONS OPERATIONS

Specific Outcome 8:1 Demonstrate an understanding of extraction operations

Specific Outcome 8:2 Evaluate extraction operations

Specific Outcome 8:3 Controls extraction operations

Specific Outcome 8:4 Coordinate extraction operations

9. TITLE: CONTROL REFINERY OPERATIONS

Specific Outcome 9:1 Demonstrate an understanding of refinery operations

Specific Outcome 9:2 Evaluate refinery operations

Specific Outcome 9:3 Control refinery operation

Specific Outcome 9:4 Coordinate refinery operations

10. TITLE: CONTROL LABORATORY ACTIVITIES

Specific Outcome 10:1 Demonstrate an understanding of laboratory functions

Specific Outcome 10:2 Evaluate laboratory functions

Specific Outcome 10:3 Control laboratory function

Specific Outcome 10:1 Coordinate laboratory functions



National Certificate in Sugar Processing - NQF level 2

Field: Agriculture and Nature Conservation

Sub-field: Secondary Agriculture

NQF Level: 2

Credits: 120

Rationale for the Qualification

This Qualification is aimed at people who are working in the sugar processing industry or who would like to start a career in the industry. It is aimed at formalising the process operator skills required in the sugar processing industry to facilitate career-pathing and to provide access to new entrants. The Qualification provides learners with access to learning in specialised areas within the sugar processing industry. It also provides learners with the necessary background knowledge and skills to be portable within other Industries.

Through the above the Qualification will address one of the key priorities of the Department of Labour in the reduction of unemployment and under employment. It will assist in creating job opportunities and to create a better nation at large.

Purpose of the Qualification:

This Qualification is aimed at level 2 on the National Qualification Framework. It provides learners with the opportunity to obtain competence in general sugar processing practices and technology. It also provides the learner with the opportunity to gain competence in selected specialised fields i.e. extraction, juice preparation, crystallisation, sugar refining or laboratory practice.

The fundamental learning, which learners will acquire, will allow them to be able to compile verbal and written communications and perform basic calculations. The core learning will enable the learner to operate effectively within a manufacturing environment. This Qualification complies with the objectives of the NQF with regard to facilitating access to, mobility and progression within the sugar processing industry.

The Qualification focuses on the skills, knowledge, values and attitude required to progress in industry. The intention is to release the potential of people, in order for them to grow, develop and become more competent workers in industry and the sugar processing industry in particular. This Qualification will furthermore add value to the individuals, their workplace and the economy as a whole.

Rules of combination

This Qualification consists of a minimum of 120 credits taken from 44 Fundamental, 30 Core and a minimum of 46 credits from the Elective area of specialisation. A minimum of 72 credits is at level 2.

The learner will have demonstrated an ability to make decisions and consider a range of options after completion of the following Unit Standards in three specified areas:

Fundamental learning:

- Maintain and Adapt Oral Communications (ID No 8962)
- Access and Use Information from Texts (ID No 8963)
- Write for a Defined Context (ID No 8964)
- Use Language and Communication in Occupational Learning Programmes (ID No 8967)
- Demonstrate Understanding of Rational and Irrational Numbers and Systems (ID No 8982)
- Use Mathematics to Investigate Financial Aspects of Personal and Community Life (ID No 8983)
- Apply Basic Knowledge of Statistics to Investigate Life & Work related Problems (ID No 9009)
- Describe, Represent and Informally Analyse Shape and Motion in 2- and 3-Dimensional Space (ID No 7479)
- Work With a Range of Patterns and Functions to Solve Problems (ID No 9007)
- Use and Collect Data to Establish Basic Statistical and Probabilistical Models and Solve Related Problems (ID No 7467)
- Demonstrate Knowledge of Introductory Principles of Chemistry and Physics (ID No 9122)

Core learning:

- Organise Oneself in the Workplace (ID 8618)
- Describe the Process Flow of a Sugar Cane Processing Factory
- Explain the Terms Pol, Brix and Purity
- Maintain Occupational Health & Safety (ID 8493)
- Operate in a Team (ID 8420)
- Use Personal Computer Operating System (ID 7548)
- Operate Personal Computer Peripherals (ID 7566)
- Demonstrate Knowledge of and Produce Word Processing Documents using Basic Functions (ID 7568)
- Demonstrate knowledge of mechanical and electrical equipment (ID 12037)
- Monitor Quality Control Practices in a Food Manufacturing Environment (ID 9044)

Elective learning:Extraction

- Operate a Weighbridge
- Off-load Cane Using a Spiller Unloader
- Operate Cane Feeder Table
- Operate Sugar Cane Diffuser
- Operate Milling Tandem
- Operate Dewatering Mills
- Monitor Juice Screens

Juice Preparation

- Operate Juice Heaters
- Control Juice Liming Flocculant Addition
- Control Juice Sedimentation in the Clarifier
- Process Clarifier Mud

- Concentrate Clear Juice
- Maintain Vapour Production and Condensate Removal
- Clean Evaporator Vessels

Crystallisation

- Start a Batch Pan
- Grow Sugar Crystals
- Boil a Continuous Pan
- Operate a Crystalliser
- Operate Centrifugals
- Operate Sugar Dryers

Sugar Refining

- Operate a Sugar Melter
- Operate a Carbonatation Station
- Operate a Sulphatation Station
- Operate a Phosphatation Station
- Operate Refinery Filters
- Operate Decolourisation Resin Station
- Operate Sugar Conditioning Station

Laboratory Practice

- Sample Factory Streams for Analysis
- Perform Factory Product Analysis
- Undertake Factory Performance Calculations
- Correctly use Laboratory Apparatus and Equipment

Access to the Qualification

There are no restrictions placed on learners that may prevent them from gaining access to this Qualification, besides the "Learning assumed to be in place" as outlined below

Learning assumed to be in place:

Demonstrate competence in mathematics, literacy and communication skills at NQF 1 or equivalent

Exit level outcomes and associated assessment criteria:

Exit level outcome 1

Operate equipment and machinery related to the sugar extraction process

Associated assessment criteria

- Reasons and consequences of not adhering to principles, processes and operations are identified and explained
- Machinery and equipment related to sugar extraction processes are operated according to manufacturers specifications and standard operating procedures
- Principles of safety requirements and hygiene factors are explained and applied
- Process conditions are monitored and maintained according to standard operating procedures

Exit level outcome 2

Operate equipment and machinery related to juice preparation and sugar crystallisation

Associated assessment criteria

- Basic principles, processes and operations of juice preparation are identified and explained
- Machinery and equipment related to juice preparation processes are operated according to start up, operating and shut down procedures
- Principles of safety requirements and hygiene factors, in particular the regulations related to pressure vessels, are explained and applied
- Process variables are monitored and controlled according to standard operating procedures
- Reasons and consequences of not adhering to statutory and operational requirements are identified and explained
- Machinery and equipment related to sugar crystallisation processes are operated according to start up, operating and shut down procedures
- Principles of safety requirements and hygiene factors, in particular the regulations related to pressure vessels, are explained and applied

Exit level outcome 3

Operate equipment and machinery related to sugar refining

Associated assessment criteria

- Reasons and consequences of not adhering to statutory and operational requirements are identified and explained
- Machinery and equipment related to sugar refining are operated according to manufacturers specifications and standard operating procedures
- Impact of each unit operation on subsequent processes is explained in relation to the quality of the final product
- Principles of safety requirements and hygiene factors, in particular the regulations related to pressure vessels, are explained and applied

Exit level outcome 4

Implement laboratory practices

Associated assessment criteria

- Reasons and consequences of not adhering to standard laboratory practices are identified and explained
- Factory streams are sampled for analysis for process control purposes
- Factory products are analysed according to accredited analytical methods as defined in standard operating procedures
- Factory performance calculations are performed for process control purposes
- Laboratory equipment is used according to manufacturers specifications and standard operating procedures

Exit level outcome 5

Demonstrate an understanding of the purpose and functions of mechanical and electrical equipment and the dangers inherent in using this equipment.

Associated Assessment Criteria

- Operations and functions relating to safe operation of mechanical and electrical equipment are explained and applied
- Maintenance operations and procedures are monitored to ensure compliance with standard operating procedures

Criteria for internal and external assessors

Assessors need experience in the following areas:

Interpersonal skills, subject matter and assessment.

The assessor needs to be competent in the planning and conducting of assessment of learning outcomes and design and develop assessments as described in the relevant Unit Standards. The subject matter experience must be well developed within the field of sugar processing.

The subject matter experience of the assessor can be established by recognition of prior learning.

Assessors need to be registered with the relevant Education and Training Quality Assurance Body.

International comparability

Comparisons were done against Unit Standards and the level 2 Qualification registered with the Australian National Training Authority:

- Certificate II in Sugar Milling
- National Code SUG20102

The above Qualification was used to benchmark this Qualification's Unit Standards. In general the National Certificate in Sugar Processing NQF 2 Qualification and its component Unit Standards were found to be very similar in content and scope in comparison to its international counterpart.

Articulation Possibilities

This qualification lends itself to both vertical and horizontal possibilities. These possibilities ensure both mobility and progression for the learner in other fields of learning such as the dairy, macadamia, grain and seed industries and areas where supervisory competence is required. The learning areas outlined in the purpose of the qualification indicate the horizontal and vertical articulation possibilities.

Horizontal and Vertical articulation possibilities:

- National Certificate: Seed Analysis at NQF level 3.
- National Certificate: Grain Milling at NQF level 2.

Integrated Assessment Criteria:

Unit Standards associated with this Qualification must be used to assess specific and critical cross-field outcomes. Assessment should focus in an integrated way on determining the competence of the learner in terms of the overall purpose and title of this Qualification.

The term integrated assessment also implies that the theoretical and practical components should be assessed together and assess combinations of practical, applied, foundational and reflective competencies.

Assessment activities should be done in real workplace situations and where simulations or role-plays are used, there should be supporting evidence to show that the learner is able to display the competencies to the real work situation.

All assessments should be conducted in line with the following documented principles of assessment: appropriateness, fairness, manageability, integration into work of learning, validity, direct, authentic, sufficient, systematic, open and consistent.

Learners wishing to be assessed will need to provide evidence of the following:

- Verbal and written explanations of reasons for adhering to operational and work site procedures as well as statutory requirements, adhering to specific sequence of operations, identifying deviations, taking corrective actions and recording relevant data, and reporting deviations outside the jobholder's responsibility.
- Documentation and explanation of administrative records completed during the process of sugar processing.
- Demonstrations of a range of actions in handling materials and equipment during sugar processing (i.e. startup, processing, shutdown and shift changeovers) and applying general safety in the workplace. Learners will also demonstrate an understanding of the Sugar Processing industry.
- A portfolio of evidence is required to prove the practical, applied and foundational competencies of the learner, which may include production and quality data.

Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.

Unit Standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should assess combinations of practical/applied, foundational (theory) and reflective competencies.

Recognition of prior learning (RPL)

This Qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Where RPL is required the learner will need to prove competence in that specific area in order to obtain recognition of that skill and knowledge.

Evidence can be presented in a variety of forms, including international or previous local Qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records. The assessment methods and tools to be used to assess Prior Learning shall be decided upon jointly by the assessor and the learner.

Moderation Options

Anyone assessing a learner against these unit standards must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable achievement of these unit standards or will assess these unit standards must be accredited as a provider with the relevant ETQA. Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures.

Therefore anyone wishing to be assessed against these unit standards may apply to be assessed by any assessment agency, assessor or provider institution, which is accredited by the relevant ETQA.

NEW UNIT STANDARD TITLES AT NQF LEVEL 2

1. Describing the process flow of a sugar cane processing factory
2. Explain the terms pol, brix and purity
3. Off load sugar cane using a spiller unloader
4. Operate cane feeder table
5. Operate sugar cane diffuser
6. Operate milling tandem
7. Operate dewatering mills
8. Monitor juice screens
9. Operate juice heaters
10. Control juice liming and flocculant addition
11. Control juice sedimentation in the clarifier
12. Process clarifier mud
13. Concentrate clear juice
14. Maintain vapour production and condensate removal
15. Clean evaporator vessels
16. Start a batch pan
17. Grow sugar crystals
18. Boil a continuous pan
19. Operate a crystalliser
20. Operate centrifugals
21. Operate sugar dryers
22. Operate a sugar melter
23. Operate a carbonatation station
24. Operate a sulphitation station
25. Operate a phosphatation station
26. Operate refinery filters
27. Operate decolourisation resin station
28. Operate sugar conditioning station
29. Sample factory streams for analysis
30. Perform factory product analysis
31. Undertake factory performance calculations
32. Demonstrate an understanding of laboratory apparatus & equipment

TITLES OF UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 2**1. TITLE: DESCRIBE THE WORKFLOW OF A SUGAR CANE PROCESSING FACTORY**

- | | |
|----------------------|---|
| Specific Outcome 1:1 | Demonstrate an understanding of basic sugar cane processing |
| Specific Outcome 1:2 | Describe sugar factory process flow |
| Specific Outcome 1:3 | Describe the various unit operations |

2. TITLE: EXPLAIN THE TERMS POL, BRIX AND PURITY

- | | |
|----------------------|--|
| Specific Outcome 2:1 | Demonstrate an understanding of Pol, Brix and Purity |
|----------------------|--|

- | | |
|----------------------|--|
| Specific Outcome 2:2 | Calculate Pol, Brix and Purity values |
| Specific Outcome 2:3 | Complete Pol, Brix and Purity calculations |

3. TITLE: OFF LOAD SUGAR CANE USING A SPILLER UNLOADER

- | | |
|----------------------|--|
| Specific Outcome 3:1 | Demonstrate an understanding of cane off-loading |
| Specific Outcome 3:2 | Prepare for offloading of sugar cane |
| Specific Outcome 3:3 | Off load cane consignment |
| Specific Outcome 3:4 | Complete offloading process |

4. TITLE: OPERATE CANE FEEDER TABLE

- | | |
|----------------------|---|
| Specific Outcome 4:1 | Demonstrate an understanding of feeding of sugar cane to the main carrier |
| Specific Outcome 4:2 | Prepare for feeding of sugar cane |
| Specific Outcome 4:3 | Ensure consistent feeding of cane |
| Specific Outcome 4:4 | Identify and remove rocks and tramp iron from the cane |

5. TITLE: OPERATE SUGAR CANE DIFFUSER

- | | |
|----------------------|--|
| Specific Outcome 5:1 | Demonstrate an understanding of cane diffusion |
| Specific Outcome 5:2 | Prepare for cane diffusion |
| Specific Outcome 5:3 | Maintain optimum operation |
| Specific Outcome 5:4 | Complete cane diffusion process |

6. TITLE: OPERATE MILLING TANDEM

- | | |
|----------------------|---|
| Specific Outcome 6:1 | Demonstrate an understanding of milling |
| Specific Outcome 6:2 | Preparing for cane milling |
| Specific Outcome 6:3 | Assess mill performance |
| Specific Outcome 6:4 | Ensure best operating practices |
| Specific Outcome 6:5 | Minimise microbiological activity |
| Specific Outcome 6:6 | Complete cane milling process |

7. TITLE: OPERATE DEWATERING MILLS

- | | |
|----------------------|--|
| Specific Outcome 7:1 | Demonstrate an understanding of bagasse dewatering |
| Specific Outcome 7:2 | Preparing for bagasse dewatering |
| Specific Outcome 7:3 | Assess dewatering mill performance |

8. TITLE: MONITOR JUICE SCREENS

- | | |
|----------------------|---|
| Specific Outcome 8:1 | Demonstrate an understanding of juice screens |
| Specific Outcome 8:2 | Prepare for juice screening |
| Specific Outcome 8:3 | Assess juice screen performance |
| Specific Outcome 8:4 | Apply the post juice screening process |

9. TITLE: OPERATE JUICE HEATERS

- | | |
|----------------------|---|
| Specific Outcome 9:1 | Demonstrate an understanding of juice heating |
| Specific Outcome 9:2 | Prepare for juice heating |
| Specific Outcome 9:3 | Assess juice heater performance |
| Specific Outcome 9:4 | Apply the post juice heating process |

10. TITLE: CONTROL JUICE LIMING AND FLOCCULANT ADDITION

- | | |
|-----------------------|---|
| Specific Outcome 10:1 | Demonstrate an understanding of juice liming |
| Specific Outcome 10:2 | Prepare for juice liming |
| Specific Outcome 10:3 | Prepare for juice flocculant addition |
| Specific Outcome 10:4 | Assess juice liming & flocculant addition |
| Specific Outcome 10:5 | Apply the post juice liming & flocculant addition |

11. TITLE: CONTROL JUICE SEDIMENTATION IN THE CLARIFIER

- | | |
|-----------------------|---|
| Specific Outcome 11:1 | Demonstrate an understanding of juice sedimentation |
| Specific Outcome 11:2 | Prepare for juice sedimentation |

- Specific Outcome 11:3 Assess juice sedimentation
- Specific Outcome 11:4 Apply the post juice sedimentation process

12. TITLE: PROCESS CLARIFIER MUD

- Specific Outcome 11:5 Demonstrate an understanding of mud treatment
- Specific Outcome 11:2 Preparing for mud treatment
- Specific Outcome 11:3 Condition mud
- Specific Outcome 11:4 Monitor mud filtration process
- Specific Outcome 11:5 Minimize microbiological activity
- Specific Outcome 11:6 Apply the post filtration process

13. TITLE: CONCENTRATE CLEAR JUICE

- Specific Outcome 12:1 Demonstrate an Understanding of evaporation
- Specific Outcome 12:2 Prepare for evaporation
- Specific Outcome 12:3 Monitor evaporation performance
- Specific Outcome 12:4 Minimise inversion
- Specific Outcome 12:5 Apply the post evaporation process

14. TITLE: MAINTAIN VAPOUR PRODUCTION AND CONDENSATE REMOVAL

- Specific Outcome 14:1 Demonstrate an understanding of vapour production
- Specific Outcome 14:2 Monitor vapour production
- Specific Outcome 14:3 Monitor condensate removal
- Specific Outcome 14:4 Monitor condensate quality

15. TITLE: CLEAN EVAPORATOR VESSELS

- Specific Outcome 15:1 Demonstrate an understanding of evaporator cleaning
- Specific Outcome 15:2 Prepare for evaporator cleaning
- Specific Outcome 15:3 Mechanically clean evaporator vessels

Specific Outcome 15:4 Chemically clean evaporator vessels

Specific Outcome 15:5 Complete cleaning evaporator vessels

16. TITLE: START A BATCH PAN

Specific Outcome 16:1 Demonstrate an understanding of starting a batch pan

Specific Outcome 16:2 Prepare a pan for boiling

Specific Outcome 16:3 Charge pan

Specific Outcome 16:4 Commence boiling

17. TITLE: GROW SUGAR CRYSTALS

Specific Outcome 17:1 Demonstrate an understanding of growing crystals

Specific Outcome 17:2 Concentrate the charge in the case of asyrup, molasses and grain

Specific Outcome 17:3 Condition the charge in the case of a magma

Specific Outcome 17:4 Control liquor feed

Specific Outcome 17:5 Completing the pan boiling cycle

18. TITLE: BOIL A CONTINUOUS PAN

Specific Outcome 18:1 Demonstrate an understanding of a continuous pan

Specific Outcome 18:2 Starting a continuous pan

Specific Outcome 18:3 Boil a continuous pan

Specific Outcome 18:4 Stopping a continuous pan

19. TITLE: OPERATE A CRYSTALLISER

Specific Outcome 19:1 Demonstrate an understanding of cooling crystallisation

Specific Outcome 19:2 Preparing for cooling crystallisation

Specific Outcome 19:3 Control cooling crystallisation

Specific Outcome 19:4 Completing cooling crystallisation process

20. TITLE: OPERATE CENTRIFUGALS

Specific Outcome 20:1	Demonstrate an understanding of centrifugation
Specific Outcome 20:2	Preparing for centrifugation
Specific Outcome 20:3	Control centrifugation
Specific Outcome 20:4	Completing centrifugation

21. TITLE: OPERATE SUGAR DRYERS

Specific Outcome 21:1	Demonstrate an understanding of sugar drying
Specific Outcome 21:2	Prepare for sugar drying
Specific Outcome 21:3	Control sugar drying
Specific Outcome 21:4	Complete sugar drying process

22. TITLE: OPERATE A SUGAR MELTER

Specific Outcome 22:1	Demonstrate an understanding of sugar melting
Specific Outcome 22:2	Prepare for melting
Specific Outcome 22:3	Control melting
Specific Outcome 22:4	Complete the melting process

23. TITLE: OPERATE A CARBONATATION STATION

Specific Outcome 23:1	Demonstrate an understanding of the carbonatation process
Specific Outcome 23:2	Prepare for carbonatation
Specific Outcome 23:3	Control carbonatation
Specific Outcome 23:4	Complete the carbonatation process

24. TITLE: OPERATE A SULPHITATION STATION

Specific Outcome 24:1	Demonstrate an understanding of the sulphitation Process
Specific Outcome 24:2	Prepare for sulphitation

Specific Outcome 24:3 Control sulphitation

Specific Outcome 24:4 Complete the sulphitation process

25. TITLE: OPERATE A PHOSPHATATION STATION

Specific Outcome 25:1 Demonstrate an understanding of the phosphatation process

Specific Outcome 25:2 Prepare for phosphatation

Specific Outcome 25:3 Control phosphatation

Specific Outcome 25:4 Complete the phosphatation process

26. TITLE: OPERATE REFINERY FILTERS

Specific Outcome 26:1 Demonstrate an understanding of the refinery filter station

Specific Outcome 26:2 Prepare for refinery filter station operation

Specific Outcome 26:3 Control refinery filter station

Specific Outcome 26:4 Complete the refinery filter station process

27. TITLE: OPERATE DECOLOURISATION RESIN STATION

Specific Outcome 27:1 Demonstrate an understanding of the resin decolourisation process

Specific Outcome 27:2 Prepare for the resin decolourisation process

Specific Outcome 27:3 Control the resin decolourisation process

Specific Outcome 27:4 Complete the resin decolourisation process

28. TITLE: OPERATE SUGAR CONDITIONING STATION

Specific Outcome 28:1 Demonstrate an Understanding of sugar conditioning

Specific Outcome 28:2 Prepare for sugar conditioning

Specific Outcome 28:3 Control the sugar conditioning process

Specific Outcome 28:4 Complete the sugar conditioning process

29. TITLE: SAMPLE FACTORY STREAMS FOR ANALYSIS

Specific Outcome 29:1 Demonstrate an understanding of sampling techniques

- | | |
|-----------------------|-------------------------------|
| Specific Outcome 29:2 | Prepare for sampling |
| Specific Outcome 29:3 | Collect the sample |
| Specific Outcome 29:4 | Complete the sampling process |

30. TITLE: ANALYSE FACTORY PRODUCTS

- | | |
|-----------------------|--|
| Specific Outcome 30:1 | Demonstrate an understanding of analytical methods |
| Specific Outcome 30:2 | Prepare sample for analysis |
| Specific Outcome 30:3 | Analyse sample |
| Specific Outcome 30:4 | Complete the analysis |

31. TITLE: CALCULATE FACTORY PERFORMANCE

- | | |
|-----------------------|--|
| Specific Outcome 31:1 | Demonstrate an understanding of factory performance calculations |
| Specific Outcome 31:2 | Prepare for factory performance calculations |
| Specific Outcome 31:3 | Perform the calculations |
| Specific Outcome 31:4 | Complete the factory performance calculations |

32. TITLE: DEMONSTRATE AN UNDERSTANDING OF LABORATORY APPARATUS & EQUIPMENT

- | | |
|-----------------------|--|
| Specific Outcome 32:1 | Demonstrate an understanding of laboratory apparatus and equipment |
| Specific Outcome 32:2 | Prepare apparatus and equipment |
| Specific Outcome 32:3 | Calibrate laboratory equipment and instrumentation |
| Specific Outcome 32:4 | Apply apparatus and equipment |

National Certificate: Sugar Processing at NQF level 2				
NQF Level 2				
		ID No	Credits	Total
Fundamental	Maintain and adapt oral communication	8962	5	
	Access and use information from texts	8963	5	
	Write for a defined context	8964	5	
	Use language and communication in occupation learning programmes	8967	5	
	Language/Communication		20	
	Demonstrate an understanding of rational and irrational numbers, and number systems within the context of relevant calculations	8982	3	
	Use mathematics to investigate financial aspects of personal and community life	8983	2	
	Apply basic knowledge of statistics in order to investigate life and work related problems	9009	3	
	Describe, represent and informally analyse shape and motion in 2 and 3 dimensional space	7479	4	
	Work with a range of patterns and functions to solve problems	9007	3	
Core	Use and collect data to establish basic statistical and probabilistic models and solve related problems	7467	5	
	Demonstrate knowledge of introductory principles of Chemistry and Physics	9122	4	
	Mathematics and Science		24	44
	Operate in a team	8420	4	
	Demonstrate an understanding of HIV/Aids and its implications	8494	4	
	Organise oneself in the workplace	8618	3	
	Maintain occupational health and safety	8493	2	
	Use a personal computer operating system	7548	3	
	Operate personal computer peripherals	7566	3	
	Demonstrate knowledge of and produce word processing documents using basic functions	7568	3	
Electives	Demonstrate knowledge of mechanical and electrical equipment	12037	4	
	Describe the process flow of a sugar cane processing factory		2	
	Explain the terms Pol, Brix and purity		2	
			30	30
	EXTRACTION			
	Off-load cane using a spiller unloader		6	
	Operate cane feeder table		4	
	Operate sugar cane diffuser		16	
	Operate milling tandem		16	
	Operate dewatering mills		2	
Monitor Juice screens		2	46	
Electives	JUICE PREPARATION			
	Operate juice heaters		7	
	Control juice liming and flocculant addition		4	
	Control juice sedimentation in the clarifier		8	
	Process clarifier mud		11	
	Concentrate clear juice		7	
	Maintain vapour production and condensate removal		7	
	Clean evaporator vessels		6	50

Electives		CRYSTALLISATION			
		Start a batch pan		10	
		Grow sugar crystals		15	
		Boil a continuous pan		10	
		Operate a crystalliser		3	
		Operate centrifugals		10	
		Operate sugar dryers		2	50
		SUGAR REFINING			
		Operate a sugar miller		4	
		Operate a carbonatation station		8	
		Operate a sulphitation station		8	
		Operate a phosphatation station		8	
		Operate refinery fillers		9	
		Operate decolourisation resin station		8	
		Operate sugar conditioning station		5	50
		LABORATORY PRACTICE			
		Sample factory streams for analysis		4	
		Perform factory product analysis		15	
		Undertake factory performance calculations		16	
		Correctly use laboratory apparatus and equipment		15	50
		<i>Select one area of electives from the above list</i>			
		Minimum Total Credits for Qualification - 120			

**National Certificate: Sugar Technology - NQF level 5**

Field: Agriculture and Nature Conservation

Sub-field: Secondary Agriculture

NQF Level: 5

Credits: 138

Rationale for the Qualification

This Qualification is aimed at people who are working in the sugar industry or who would like to start a career in the sugar industry. It is aimed at providing the necessary skills required for achieving professional engineer level within the sugar industry. The Qualification provides learners with access to advanced learning in specialised areas within the sugar processing industry. It also provides learners with the necessary background knowledge and skills to be portable within other Industries.

Through the above the Qualification will address one of the key priorities of the Department of Labour in the reduction of unemployment and under employment.

Purpose of the Qualification:

This Qualification is aimed at level 5 on the National Qualification Framework. It provides learners with the opportunity to obtain competence in advanced sugar processing practices and technology. It also provides the learner with the opportunity to gain competence in selected specialised fields i.e. sugar refining or laboratory practice.

The fundamental learning, which learners will acquire, will allow them to contribute to the management of HIV/AIDS in the workplace. The core learning will enable the learner optimise unit operations in a sugar processing factory. This Qualification complies with the objectives of the NQF with regard to facilitating access to, mobility and progression within the sugar processing industry.

The Qualification focuses on the skills, knowledge, values and attitude required to progress in industry. The intention is to release the potential of people, in order for them to grow, develop and become more competent workers in industry and the sugar processing industry in particular. This Qualification will furthermore add value to the individuals, their workplace and the economy as a whole.

Rules of Combination

This Qualification consists of a minimum of 138 credits taken from 24 Fundamental, 98 Core and 16 credits from the Elective area of specialisation. A minimum of 72 credits is at level 5.

The learner will have demonstrated an ability to make decisions and consider a range of options after completion of the following Unit Standards in three specified areas:

Fundamental learning:

- Implement Policies Regarding HIV/AIDS in the Workplace (ID No 9224)
- Plan and Conduct a Research Project (ID 8663)
- Assess and Control Pollution (ID 12376)
- Supervise Work Unit To Achieve Work Unit Objectives (Individual and Teams) (ID 10981)

Core learning:

- Explain the Sugar Cane Processing Value Chain
- Apply the Terms Pol, Brix & Purity
- Optimise Cane Yard Operations
- Optimise Sugar Extraction Operations
- Optimise Juice Clarification
- Optimise Juice Evaporation
- Optimise Pan Boiling
- Optimise Centrifugation Operations
- Interpret Factory Performance Figures to Optimise Operations

Elective learning:

- Optimise Refinery Operations
- Optimise Laboratory Activities
- Identify, Organise and Co-Ordinate Project Life Cycle Phases for Control purposes (ID No 10131)
- Prepare & Maintain Financial Records (ID 7878)
- Operationalise Productivity Improvement Strategy, Objectives and Processes
- Maintain food production quality control systems, procedures and specifications (ID 7851)
- Facilitate the Resolution of Employee Grievances (ID 12139)

Access to the Qualification

There are no further restrictions placed on learners that may prevent them from gaining access to this Qualification other than those outlined below in the "Learning assumed to be in place".

Learning assumed to be in place:

It is assumed that learners wishing to enter a programme leading to this qualification have demonstrated competence in mathematics, languages and communication at NQF level 4.

Exit level outcomes and associated assessment criteria:

Exit Level Outcome 1

Configure the Work Flow of a Sugar Cane Processing Factory and Discuss Typical Pol, Brix and Purity Values for the Various Process Streams

Associated Assessment Criteria

- The various unit operations used in a sugar factory are explained and their interrelationships identified
- The terms Pol, Brix and Purity are explained and related to the co-ordination of sugar process activities

Exit Level Outcome 2**Optimise Cane Yard and Extraction Operations****Associated Assessment Criteria**

- An understanding of vehicle scheduling practices is demonstrated through the application of delivery models
- Cane yard operations are monitored and assessed
- Cane yard operations are controlled and coordinated to ensure required cane supply to the mill whilst minimising cane delay
- An understanding of extraction operations is demonstrated through the application of mass and energy balances and extraction models
- Extraction operations are monitored and assessed
- Extraction operations are controlled and coordinated to maximise sugar recovery

Outcome 4**Optimise Juice Clarification and Juice Evaporation Operations****Associated Assessment Criteria**

- An understanding of Juice Clarification operations is demonstrated through the application of mass and energy balances and clarification models
- Juice clarification operations are monitored and assessed
- Juice clarification operations are controlled and co-ordinated to minimise turbidity and sucrose losses
- An understanding of juice evaporation operations is demonstrated through the application of mass and energy balances and evaporation models
- Juice evaporation operations are monitored and assessed
- Juice evaporation operations are controlled and co-ordinated to satisfy factory requirements

Outcome 6**Optimise Pan Boiling and Centrifugation Operations****Associated Assessment Criteria**

- An understanding of Pan Boiling operations is demonstrated through the application of mass and energy balances and crystallisation models
- Pan Boiling operations are monitored and assessed
- Pan Boiling operations are controlled and coordinated to produce sugar of consistent quality within specification and to minimise sugar losses in molasses
- An understanding of Centrifugation operations is demonstrated through the application of mass balances and separation models
- Centrifugation operations are monitored and assessed
- Centrifugation operations are controlled and coordinated to achieve the required sugar and molasses quality

Outcome 8**Interpret Factory Performance Figures to Optimise Operations****Associated Assessment Criteria**

- An understanding of the application of mass and energy balances to sugar factory operations
- An understanding of the derivations/calculation of factory performance figures

- Factory performance figures are monitored, assessed and used to optimise factory operations through liaison with relevant parties

Outcome 9

Optimise Sugar Refinery Operations and Laboratory Activities

Associated Assessment Criteria

- An understanding of sugar refinery operations is demonstrated through the application of mass and energy balances and relevant process models
- Sugar refinery operations are monitored and assessed
- Sugar refinery operations are controlled and coordinated to achieve the required sugar quality
- An understanding of the various analytical methods
- Laboratory activities are monitored and assessed
- Laboratory activities are integrated with process requirements through liaison with relevant parties

Exit Level Outcome 12

Plan and Conduct a Research Project

Associated Assessment Criteria

- A research project is planned and a proposal produced
- Data is collected and analysed
- A written report of the research is produced

Outcome 13

Identify, Organise and Coordinate Project Life Cycle Phases for Control Purposes

Associated Assessment Criteria

- The major phases of a project are recognized and described
- Sub-processes are selected to meet project objectives
- A schedule is compiled which assigns the responsible person(s) to the individual project activities
- Processes are documented and communicated

Outcome 14

Prepare and Maintain Financial Records and Statements related to the sugar manufacturing process

Associated Assessment Criteria

- The flow of data from source documents to statements is described and explained
- Financial entries are described and explained
- Financial reports are compiled and distributed to the appropriate people
- Financial statements are interpreted and used as a tool to monitor business performance

Criteria for internal and external assessors

Assessors need experience in the following areas:

Interpersonal skills, subject matter and assessment.

The assessor needs to be competent in the planning and conducting of assessment of learning outcomes and design and develop assessments as described in the relevant Unit Standards. The assessors must have achieved a qualification in sugar technology or in a related field at a minimum of NQF Level 6.

The subject matter experience of the assessor can be established by recognition of prior learning.

Assessors need to be registered with the Education and Training Quality Assurance Body.

International comparability

Comparisons were done against the Sugar Milling Unit Standards registered with the Australian National Training Authority. However, this Qualification does not have an Australian or other foreign counterpart/equivalent. This Qualification is specifically intended to fulfill a particular need within the South African Sugar industry.

Integrated Assessment Criteria:

Unit Standards associated with this Qualification must be used to assess specific and critical cross-field outcomes. Assessment should focus in an integrated way on determining the competence of the learner in terms of the overall purpose and title of this Qualification.

The term integrated assessment also implies that the theoretical and practical components should be assessed together and assess combinations of practical, applied, foundational and reflective competencies.

Assessment activities should be done in real workplace situations and where simulations or role-plays are used, there should be supporting evidence to show that the learner is able to display the competencies to the real work situation.

All assessments should be conducted in line with the following documented principles of assessment: appropriateness, fairness, manageability, integration into work of learning, validity, direct, authentic, sufficient, systematic, open and consistent.

Learners wishing to be assessed will need to provide evidence of the following:

- Verbal and written explanations of reasons for adhering to operational and work site procedures as well as statutory requirements, adhering to specific sequence of operations, identifying deviations, taking corrective actions and recording relevant data, and reporting deviations outside the jobholder's responsibility.
- Documentation and explanation of administrative records completed during the process of sugar processing optimisation.
- Demonstrations of a range of actions in co-ordinating and integrating the various factory unit operations to optimize performance. Learners will also demonstrate an understanding of the various options available to maintain adequate production during periods of major operational problems/malfunxions.
- A portfolio of evidence is required to prove the practical, applied and foundational competencies of the learner, which may include production and quality data.

Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.

Unit Standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should assess combinations of practical/applied, foundational (theory) and reflective competencies.

Recognition of prior learning (RPL)

This Qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Where RPL is required the learner will need to prove competence in that specific area in order to obtain recognition of that skill and knowledge.

Evidence can be presented in a variety of forms, including international or previous local Qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records. The assessment methods and tools to be used to assess Prior Learning shall be decided upon jointly by the assessor and the learner.

Moderation Options

Moderation includes internal and external moderation of assessments. Internal and external moderation systems must ensure that all assessors produce assessments that are credible, fair, reliable, consistent, adequate and practical.

Internal and external moderation systems must provide learning opportunities that are transparent, affordable and enhancing development in the field and sub-field of the National Qualifications Framework.

The accredited provider with the relevant ETQA must be able to provide internal moderation.

UNIT STANDARDS TITLES AT NQF LEVEL 4

1. Configure the sugar cane processing value chain
2. Apply the terms pol, brix and purity

UNIT STANDARDS TITLES AT NQF LEVEL 5

1. Optimise cane yard operations
2. Optimise sugar extractions operations
3. Optimise juice clarification
4. Optimise juice evaporation
5. Optimise pan boiling
6. Optimise centrifugation operations
7. Interpret factory performance figures to optimise operations
8. Optimise refinery operations
9. Optimise laboratory operations

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 4**1. TITLE: CONFIGURE THE SUGAR CANE PROCESSING VALUE CHAIN**

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|----------------------|--|
| Specific Outcome 1:1 | Demonstrate an understanding of sugar cane processing. |
| Specific Outcome 1:2 | Explain sugar cane process flow |
| Specific Outcome 1:3 | Relate the various unit operations |

2. TITLE: APPLY THE TERMS POL, BRIX AND PURITY

- | | |
|----------------------|--|
| Specific Outcome 2:1 | Demonstrate a detailed knowledge of Pol, Brix and Purity |
| Specific Outcome 2:2 | Calculate Pol, Brix and Purity results |
| Specific Outcome 2:3 | Evaluate Pol, Brix and Purity results |
| Specific Outcome 2:4 | Co-ordinate process activities |

UNIT STANDARDS AND SPECIFIC OUTCOMES AT NQF LEVEL 5**1. TITLE: OPTIMISE CANE YARD OPERATIONS**

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|----------------------|-------------------------------------|
| Specific Outcome 1:1 | Explain extraction operations |
| Specific Outcome 1:2 | Monitor cane yard operations |
| Specific Outcome 1:3 | Controls cane yard operations |
| Specific Outcome 1:4 | Coordinate cane handling operations |
| Specific Outcome 1:5 | Optimise cane handling operations |

2. TITLE: OPTIMISE SUGAR EXTRACTIONS OPERATIONS

Specific Outcome 2:1	Define extraction operations
Specific Outcome 2:2	Evaluate extraction operations
Specific Outcome 2:3	Coordinate extraction operations
Specific Outcome 2:4	Optimise extraction operations

3. TITLE: OPTIMISE JUICE CLARIFICATION

Specific Outcome 3:1	Monitor clarification operations
Specific Outcome 3:2	Evaluate clarification operations
Specific Outcome 3:3	Coordinate clarification operations
Specific Outcome 3:4	Optimise clarification operations

4. TITLE: OPTIMISE JUICE EVAPORATION

Specific Outcome 4:1	Explain evaporation operations
Specific Outcome 4:2	Evaluate evaporation operations
Specific Outcome 4:3	Coordinate evaporation operations
Specific Outcome 4:4	Optimise evaporation operations

5. TITLE: OPTIMISE PAN BOILING

Specific Outcome 5:1	Monitor pan boiling operations
Specific Outcome 5:2	Evaluate pan boiling operations
Specific Outcome 5:3	Coordinate pan boiling operations
Specific Outcome 5:4	Optimise pan boiling operations

6. TITLE: OPTIMISE CENTRIFUGATION OPERATIONS

Specific Outcome 6:1	Explain centrifugation operations
Specific Outcome 6:2	Evaluate centrifugation operations
Specific Outcome 6:3	Coordinate centrifugation operations

Specific Outcome 6:4 Optimise centrifugation operations

7. TITLE: INTERPRET FACTORY PERFORMANCE FIGURES TO OPTIMISE OPERATIONS

Specific Outcome 7:1 Demonstrate an understanding of the source of and need for factory performance figures

Specific Outcome 7:2 Evaluate Factory Performance figures

Specific Outcome 7:3 Coordinate calculation of performance figures

Specific Outcome 7:4 Optimise factory operations

8. TITLE: OPTIMISE REFINERY OPERATIONS

Specific Outcome 8:1 Explain refinery operations

Specific Outcome 8:2 Evaluate refinery operations

Specific Outcome 8:3 Coordinate refinery operations

Specific Outcome 8:4 Optimise refinery operations

9. TITLE: OPTIMISE LABORATORY OPERATIONS

Specific Outcome 9:1 Monitor laboratory operations

Specific Outcome 9:2 Evaluate laboratory functions

Specific Outcome 9:3 Coordinate laboratory functions

Specific Outcome 9:4 Optimise laboratory function

National Certificate: Sugar Technology at NQF level 5											
	NQF Level 4	ID No	Credits	NQF Level 5	ID	Credits	NQF Level 6	ID	Credits	Total	
Fundamental	Implement policies regarding HIV/Aids in the workplace	9224	4	Plan and conduct a research project	8663	6					
	Supervise work unit to achieve work unit objectives (individual and team)	10981	12	Assess and control pollution	12376	2					
			16			8				24	
Core	Explain the sugar cane processing value chain		2	Optimise cane yard operations		12					
	Apply the terms Pol, Brix and Purity		2	Optimise sugar extraction operations		16					
				Optimise juice clarification		16					
				Optimise juice evaporation		16					
				Optimise pan boiling		16					
				Optimise centrifugation operations		16					
Elective				Manage factory performance figures		2					
			4			94				98	
	Identify, organise and co-ordinate project life cycle phases for control purposes	10131	5	Optimise refinery operations		16	Maintain food production quality control systems, procedures and specifications	7851	6		
				Optimise laboratory activities		16	Facilitate the resolution of employee grievances	12139	5		
				Prepare and maintain financial records and statements	7878	12					
				Operationalise productivity improvement strategy, objectives and processes	To be registered	13					
			5						57	11	16
A selection of elective unit standards for a minimum of 16 Credits must be made											
Minimum Total Credits for Qualification = 138											