



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

#### **Manufacturing and Assembly Processes**

Registered by NSB 06, Manufacturing, Engineering and Technology, 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 qualifications and unit standards. The qualification and unit standards can be accessed via the SAQA web-site at [www.saga.org.za](http://www.saga.org.za). Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, Hatfield Forum West, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address ***below and no later than 21 June 2004***. All correspondence should be marked **Standards Setting – SGB for Manufacturing and Assembly Processes** and addressed to

The Director: Standards Setting and Development  
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**JOE SAMUELS**

**DIRECTOR: STANDARDS SETTING AND DEVELOPMENT**



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUALIFICATION:

#### **National Certificate: Tyre and Tyre Component Manufacturing**

SAQA QUAL ID	QUALIFICATION TITLE	
48793	National Certificate: Tyre and Tyre Component Manufacturing	
SGB NAME	SGB Manufacturing and Assembly Processes	
ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
MET-2-National Certificate	National Certificate	Manufacturing and Assembly
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
128	Level 2	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

#### **PURPOSE OF THE QUALIFICATION**

The purpose of the qualification is to provide learners, education and training providers and employers with the standards and the range of learning required to satisfy the challenges of participating effectively in the new tyre manufacturing industry.

For those who have been in the workplace for a long time, this qualification can be used in the Recognition of Prior Learning (RPL) process to assess and recognise workplace skills acquired without the benefit of formal education or training.

For the new entrant, this qualification describes the learning outcomes (the skills, knowledge and values) required to effectively participate in a structured workplace within the tyre manufacturing industry.

For education and training providers, this qualification provides guidance for the development of appropriate learning programmes. For employers, the qualification allows skills gaps to be identified and programmes to close those skills gaps to be developed. The qualification also acts as an external benchmark for fulfilling the criteria of national and international quality standards such as ISO 9000:2000.

This qualification recognises the skills, knowledge and values acquired by learners working in enterprises that use tyre manufacturing processes.

The chief skills that are recognised in this qualification are those of selecting, loading, transporting and preparing materials, components and finished products. This capability requires an understanding of tyre construction and manufacturing principles and of related quality requirements. Qualifying learners will also be able to use tools and operate equipment with simple control systems used in the tyre and tyre component manufacturing processes. Hand skills play a small role in this qualification.

Qualifying learners will also understand:

- > The basics of how a business functions
- > Their role in the business, i.e. in production and related activities
- > How they are affected by legislation, regulations, agreements and policies related to their particular work environment.

With this understanding, qualifying learners will be able to participate actively in workplace activities. They will also understand how they should operate within the legislative, safety and quality systems that govern their workplace.

Qualifying learners will also be able to relate what they see and experience to scientific and technological principles and concepts.

What learners achieve in this qualification will also serve as a basis for further learning where they will engage more directly in tyre and tyre component manufacturing.

#### Rationale for the qualification

The tyre manufacturing process requires the preparation of a range of materials (rubber, additives, synthetic fibres, fabrics and steel wires); the manufacture of components from combinations of these materials; the assembly of the components into a "green tyre"; the curing or vulcanising of the green tyre into the finished product and the finishing of the cured tyre.

The tyre manufacturing industry combines sophisticated manufacturing processes with skilled hand assembly and fabrication within a competitive and challenging environment. The manufactured products have to respond to a wide variety of exacting customer and consumer quality requirements. In addition, the industry has to respond to competition in export and domestic markets and to ensure the on-going development of new products required by changing customer needs.

This means that people working in the tyre manufacturing industry require a range of skills and knowledge to help them respond to the exacting quality requirements, the pressures of high speed production and ongoing change.

This is the first qualification in a series for tyre and tyre component manufacturing that will enable competent learners to participate effectively in tyre manufacturing processes.

This qualification can be obtained in the following contexts:

- > Tyre component preparation processes
- > Rubber material mixing
- > Extruding
- > Calendering
- > Tyre curing (vulcanisation)

#### **RECOGNIZE PREVIOUS LEARNING?**

Y

#### **LEARNING ASSUMED TO BE IN PLACE**

This qualification assumes learners have a National Certificate in Manufacturing, Engineering and Assembly processes at NQF Level 1, or alternatively, ABET qualifications at Level 4.

Such qualifications are assumed to include:

- > Literacy
- > Numeracy
- > Basic concepts of science and technology

Recognition of prior learning:

This qualification may be obtained through the process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. While this is primarily a work-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

#### **QUALIFICATION RULES**

N/A

#### **EXIT LEVEL OUTCOMES**

1. Demonstrate an understanding of tyre and tyre component manufacturing processes and the related quality requirements, and prepare or manufacture tyre components on equipment with simple control systems
2. Demonstrate an understanding and use of appropriate tools and equipment to select, transport and load

materials onto or into tyre component manufacturing equipment

3. Demonstrate an understanding of safety, health, environmental, risk and quality policies and procedures as they relate to working safely with due care for self and fellow workers

4. Work effectively with others, demonstrating an understanding of own role in the organisation and the purpose of the organisation within the business context and economy

5. Demonstrate an understanding of options for further learning in this or a related field of learning and preparation requirements for such learning

#### **ASSOCIATED ASSESSMENT CRITERIA**

1.

- > Generation of scrap, waste or faulty components is minimised
- > Equipment malfunctions and non-conformances are recognised and appropriately responded to
- > Equipment malfunctions, non-conformances and responses are reported accurately and clearly (orally or in writing)
- > Workplace procedures are applied consistently and work is performed efficiently
- > Can respond to questions and discuss issues related to the preparation or manufacturing processes

2.

- > Correct materials or components are selected according to manufacturing requirements and schedules
- > Materials or components are handled and transported appropriately and safely according to workplace procedures
- > No material or component is damaged or its quality compromised
- > Normal production is not affected by late delivery
- > Tools and equipment are used with due care and are used, maintained and stored appropriately
- > Can respond to questions and discuss issues related to
  - > The selection, transport, handling or delivery of materials or components
  - > The requirements of the manufacturing processes
  - > The use, care and maintenance of tools and equipment

3.

- > Procedures are applied routinely and effectively
- > The nature and purpose of the procedures and safety equipment can be discussed
- > Appropriate protective equipment and clothing is selected and worn
- > A clean and tidy work area is maintained
- > Can respond to questions and discuss issues related to quality, safety, health and the environment

4.

- > Information or decisions are received and acted on
- > Relevant information is reported and relayed where appropriate
- > Contributes to the efforts and the objectives of the workgroup
- > Purpose of own role and the role of the organisation is explained, using examples from own experience

5.

- > Learning options are explained
- > Preparation requirements related to learning options are explained
- > Learning plan is developed

Integrated Assessment:

The integrated assessment must be based on a summative assessment guide. The guide must spell out how the assessor will assess different aspects of the performance and will include:

- > Evaluating projects developed during the learning programme
- > Observing (and listening to) the learner at work, both in primary activities as well as in other interactions, or in relevant simulations
- > Asking questions and initiating short discussions to test understanding
- > Looking at records and reports, including learning records

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities required for tyre manufacturing. The assessment process should also establish how the learning process has advanced the critical outcomes.

### **INTERNATIONAL COMPARABILITY**

This qualification and associated qualifications has been found comparable in terms of outcomes and duration to:

1. Qualifications in the United Kingdom: National and Scottish Vocational Qualifications (N/SVQ)
  2. Modern apprenticeship qualifications in the United Kingdom in the field of polymer processing
  3. Vocational qualifications in Germany
- In addition, the qualification design has been benchmarked against the Manufacturing Skills Standards developed by the Manufacturing Skills Standards Council in the United States.

### **ARTICULATION OPTIONS**

The qualification has been designed and structured so that qualifying learners can move from one context to another. Employers or institutions should be able to evaluate the outcomes of this qualification against the needs of their context and structure top-up learning appropriately. Equally, holders of other qualifications may be evaluated against this qualification for the purpose of RPL.

### **MODERATION OPTIONS**

Moderators for the qualification should be qualified and accredited with an appropriate ETQA. To assure the quality of the assessment process, the moderation should cover one of the following:

- > Assessor credentials
- > The assessment instrument
- > The assessment process

### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

The following criteria should be applied by the relevant ETQA:

1. Appropriate qualification in the field of tyre and tyre component manufacturing, with a minimum of 2 years' experience in a tyre-manufacturing environment. The subject matter expertise of the assessor can be established by recognition of prior learning.
2. Appropriate experience and understanding of assessment theory, processes and practices
3. Good interpersonal skills and ability to balance the conflicting requirements of:
  - > Maintaining national standards
  - > The interests of the learner
  - > The need for transformation and redressing the legacies of the past
  - > The cultural background and language of the learner
4. Registration as an assessor with the relevant ETQA
5. Any other criteria required by relevant ETQA

### **NOTES**

This qualification links to the following qualifications:

NQF Level 5

- > National Diploma in Rubber Technology (240 credits)
- > Draft) Tyre and Tyre Component Manufacturing: Optimising Tyre Manufacturing Processes and Tyre

Performance (120 credits)

> Industrial Rubber Manufacturing

NQF Level 4

> Tyre & Tyre Component Manufacturing

> Quality Assurance of Tyre Processes

> Industrial Rubber Manufacturing

NQF Level 3

> Tyre & Tyre Component Manufacturing

> Tyre Assembly

> Quality Checking of Tyres and Tyre Components Industrial

> Rubber Manufacturing

NQF Level 2

> Tyre & Tyre Component Manufacturing

> Quality Checking and Finishing of Manufactured Tyres

> Industrial Rubber Manufacturing (Mixing OR Extruding OR Moulding OR Calendaring)

NQF Level 1

> Manufacturing, Engineering, Assembly & Related Activities

#### UNIT STANDARDS

(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	LEVEL	CREDITS	STATUS
Core	12466 Explain the individual's role within business	Level 2	4	Registered
Core	13163 Use and care for services, tools and equipment in the industrial rubber manufacturing process	Level 2	10	Registered
Core	13220 Keep the work area safe and productive	Level 2	8	Registered
Core	13258 Participate in work group activities	Level 2	4	Registered
Core	115055 Transport materials, components or products in the tyre manufacturing process	Level 2	12	Draft - Prep for P Comment
Core	115111 Set and operate equipment with simple control systems	Level 2	15	Draft - Prep for P Comment
Core	9530 Manage work time effectively	Level 3	3	Reregistered
Core	12456 Explain and use organisational procedures	Level 3	6	Registered
Elective	9599 Lift and move material and equipment by means of a forklift	Level 2	3	Registered
Elective	12483 Perform basic first aid	Level 2	4	Reregistered
Elective	12484 Perform basic fire fighting	Level 2	4	Reregistered
Elective	13202 Apply study and learning techniques	Level 2	3	Registered
Elective	13222 Deal with safety, health and environmental emergencies in the workplace	Level 2	4	Registered
Fundamental	7469 Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2	Registered
Fundamental	8962 Maintain and adapt oral communication	Level 2	5	Registered
Fundamental	8963 Access and use information from texts	Level 2	5	Registered
Fundamental	8964 Write for a defined context	Level 2	5	Registered
Fundamental	8982 Demonstrate understanding of rational and irrational numbers and number systems within the context of relevant calculations	Level 2	3	Registered
Fundamental	9007 Work with a range of patterns and functions and solve problems	Level 2	5	Registered
Fundamental	9009 Apply basic knowledge of statistics and probability to influence the use of data and procedures in order to investigate life related problems	Level 2	3	Registered
Fundamental	9268 Manage basic personal finance	Level 2	6	Registered
Fundamental	12444 Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts	Level 2	3	Registered
Fundamental	12461 Communicate at work	Level 2	5	Registered

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Fundamental	12463 Understand and deal with HIV/AIDS	Level 2	3	Registered
Fundamental	12465 Develop a learning plan and a portfolio for assessment	Level 2	6	Registered
Fundamental	13217 Collect and use information	Level 2	5	Registered



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUALIFICATION:

#### **National Certificate: Quality Checking and Finishing of Manufactured Tyres**

SAQA QUAL ID	QUALIFICATION TITLE	
48800	National Certificate: Quality Checking and Finishing of Manufactured Tyres	
SGB NAME	SGB Manufacturing and Assembly Processes	
ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
MET-2-National Certificate	National Certificate	Manufacturing and Assembly
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
140	Level 2	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

#### **PURPOSE OF THE QUALIFICATION**

The purpose of the qualification is to provide learners, education and training providers and employers with the standards and the range of learning required to satisfy the challenges of participating effectively in the tyre manufacturing industry.

For those who have been in the workplace for a long time, this qualification can be used in the Recognition of Prior Learning (RPL) process to assess and recognise workplace skills acquired without the benefit of formal education or training.

For the new entrant, this qualification describes the learning outcomes (the skills, knowledge and values) required to effectively participate in a structured workplace within the tyre manufacturing industry.

For education and training providers, this qualification provides guidance for the development of appropriate learning programmes. For employers, the qualification allows skills gaps to be identified and programmes to close those skills gaps to be developed. The qualification also acts as an external benchmark for fulfilling the criteria of national and international quality standards such as ISO 9000:2000.

This qualification recognises the skills, knowledge and values acquired by learners working in enterprises that use tyre manufacturing processes.

The chief skills that are recognised in this qualification are those of recognising and responding to changes in the quality of manufactured tyres. This capability requires an understanding of quality requirements and of tyre construction and manufacturing principles. Qualifying learners will also be able to perform finishing operations on the manufactured tyres. Hand skills play a small role in this qualification.

Qualifying learners will also understand:

- > The basics of how a business functions
- > Their role in the business, i.e. in production and related activities
- > How they are affected by legislation, regulations, agreements and policies related to their particular work environment.

With this understanding, qualifying learners will be able to participate actively in workplace activities. They will also understand how they should operate within the legislative, safety and quality systems that govern their workplace.

Qualifying learners will also be able to relate what they see and experience to scientific and technological



principles and concepts.

What learners achieve in this qualification will also serve as a basis for further learning where they will engage more directly in quality checking processes.

Rationale for the qualification:

The tyre manufacturing process requires the preparation of a range of materials (rubber, additives, synthetic fibres, fabrics and steel wires); the manufacture of components from combinations of these materials; the assembly of the components into a green tyre; the curing or vulcanising of the green tyre into the finished product and the finishing of the cured tyre.

The tyre manufacturing industry combines sophisticated manufacturing processes with skilled hand assembly and fabrication within a competitive and challenging environment. The manufactured products have to respond to a wide variety of exacting customer and consumer quality requirements. In addition, the industry has to respond to competition in export and domestic markets and to ensure the on-going development of new products required by changing customer needs.

This means that people working in the tyre manufacturing industry require a range of skills and knowledge to help them respond to the exacting quality requirements, the pressures of high speed production and ongoing change.

This is the first qualification in a series for finishing and quality checking of manufactured tyres that will enable competent learners to participate effectively in the tyre manufacturing industry.

#### **RECOGNIZE PREVIOUS LEARNING?**

Y

#### **LEARNING ASSUMED TO BE IN PLACE**

This qualification assumes learners have a GETC at NQF Level 1, a National Certificate in Manufacturing, Engineering and Assembly processes at NQF Level 1, or alternatively, ABET qualifications at Level 4. Such qualifications are assumed to include:

- > Literacy
- > Numeracy
- > Basic concepts of science and technology

Recognition of prior learning

This qualification may be obtained through the process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. While this is primarily a work-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

#### **QUALIFICATION RULES**

N/A

#### **EXIT LEVEL OUTCOMES**

1. Demonstrate an understanding of tyre manufacturing processes and the related quality requirements and check the quality of manufactured tyres
2. Demonstrate an understanding and use of tools and equipment to repair, buff, lift, move and store manufactured tyres
3. Demonstrate an understanding of safety, health, environmental, risk and quality policies and procedures as they relate to working safely with due care for self and fellow workers
4. Work effectively with others, demonstrating an understanding of own role in the organisation and the purpose of the organisation within the business context and economy
5. Demonstrate an understanding of options for further learning in this or a related field of learning and preparation requirements for such learning

**ASSOCIATED ASSESSMENT CRITERIA**

1.
  - > All non-conforming products are identified and isolated
  - > Non-conformances are reported accurately and clearly (orally or in writing)
  - > Can respond to questions and discuss issues related to the quality checking process, the nature and purpose of the checks and the end-use requirements of manufactured tyres
2.
  - > Repairs conform to quality standards
  - > Repairs are performed efficiently and material wastage is minimised
  - > Transport and storage of materials is performed efficiently and safely
  - > Tools and equipment are used with due care and are maintained and stored appropriately
  - > Can report on, respond to questions about and discuss issues related to the repair process, the nature and purpose of the repairs and the end-use requirements of manufactured tyres
3.
  - > Procedures are applied routinely and effectively
  - > The nature and purpose of the procedures and safety equipment can be discussed
  - > Appropriate protective equipment and clothing is selected and worn
  - > A clean and tidy work area is maintained
  - > Can respond to questions and can discuss issues related to quality, safety, health and the environment
4.
  - > Information or decisions are received and acted on
  - > Relevant information is reported and relayed where appropriate
  - > Contributes to the efforts and the objectives of the workgroup
  - > Purpose of own role and role of organisation is explained, using examples from own experience
5.
  - > Learning options are explained
  - > Preparation requirements related to learning options are explained
  - > Learning plan is developed

**Integrated Assessment**

The integrated assessment must be based on a summative assessment guide. The guide must spell out how the assessor will assess different aspects of the performance and will include:

- > Evaluating projects developed during the learning programme
- > Observing (and listening to) the learner at work, both in primary activities as well as in other interactions, or in relevant simulations
- > Asking questions and initiating short discussions to test understanding
- > Looking at records and reports, including learning records

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities required for tyre manufacturing. The assessment process should also establish how the critical outcomes have been advanced by the learning process.

**INTERNATIONAL COMPARABILITY**

This qualification and associated qualifications has been found comparable in terms of outcomes and duration to:

1. Qualifications in the United Kingdom: National and Scottish Vocational Qualifications (N/SVQ)

2. Modern apprenticeship qualifications in the United Kingdom in the field of polymer processing
3. Vocational qualifications in Germany

In addition, the qualification design has been benchmarked against the Manufacturing Skills Standards developed by the Manufacturing Skills Standards Council in the United States.

#### **ARTICULATION OPTIONS**

The qualification has been designed and structured so that qualifying learners can move from one context to another. Employers or institutions should be able to evaluate the outcomes of this qualification against the needs of their context and structure top-up learning appropriately. Equally, holders of other qualifications may be evaluated against this qualification for the purpose of RPL.

#### **MODERATION OPTIONS**

Moderators for the qualification should be qualified and accredited with an appropriate ETQA. To assure the quality of the assessment process, the moderation should cover one of the following:

- > Assessor credentials
- > The assessment instrument
- > The assessment process

#### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

The following criteria should be applied by the relevant ETQA:

1. Appropriate qualification in the field of quality assurance, with a minimum of 2 years' experience in a tyre-manufacturing environment. The subject matter expertise of the assessor can be established by recognition of prior learning.
2. Appropriate experience and understanding of assessment theory, processes and practices
3. Good interpersonal skills and ability to balance the conflicting requirements of:
  - > Maintaining national standards
  - > The interests of the learner
  - > The need for transformation and redressing the legacies of the past
  - > The cultural background and language of the learner
4. Registration as an assessor with the relevant ETQA
5. Any other criteria required by relevant ETQA

#### **NOTES**

This qualification links to the following qualifications:

##### **NQF Level 5**

- > National Diploma in Rubber Technology (240 credits)
- > (Draft) Tyre and Tyre Component Manufacturing: Optimising Tyre Manufacturing Processes and Tyre Performance (120 credits)
- > Industrial Rubber Manufacturing

##### **NQF Level 4**

- > Tyre & Tyre Component Manufacturing
- > Quality Assurance of Tyre Processes
- > Industrial Rubber Manufacturing

##### **NQF Level 3**

- > Tyre & Tyre Component Manufacturing
- > Tyre Assembly
- > Quality Checking of Tyres and Tyre Components
- > Industrial Rubber Manufacturing

##### **NQF Level 2**

- > Tyre & Tyre Component Manufacturing
- > Quality Checking and Finishing of Manufactured Tyres

## &gt; Industrial Rubber Manufacturing (Mixing OR Extruding OR Moulding OR Calendaring)

NQF Level 1

&gt; Manufacturing, Engineering, Assembly &amp; Related Activities

**UNIT STANDARDS****(Note: A blank space after this line means that the qualification is not based on Unit Standards.)**

	<b>UNIT STANDARD ID AND TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>	<b>STATUS</b>
Core	12466 Explain the individual's role within business	Level 2	4	Registered
Core	13163 Use and care for services, tools and equipment in the industrial rubber manufacturing process	Level 2	10	Registered
Core	13220 Keep the work area safe and productive	Level 2	8	Registered
Core	13258 Participate in work group activities	Level 2	4	Registered
Core	115055 Transport materials, components or products in the tyre manufacturing process	Level 2	12	Draft - Prep for P Comment
Core	115061 Repair and buff tyres	Level 2	8	Draft - Prep for P Comment
Core	115063 Inspect, trim, balance and sort manufactured tyres	Level 2	19	Draft - Prep for P Comment
Core	9530 Manage work time effectively	Level 3	3	Reregistered
Core	12456 Explain and use organisational procedures	Level 3	6	Registered
Elective	9599 Lift and move material and equipment by means of a forklift	Level 2	3	Registered
Elective	12483 Perform basic first aid	Level 2	4	Reregistered
Elective	12484 Perform basic fire fighting	Level 2	4	Reregistered
Elective	13202 Apply study and learning techniques	Level 2	3	Registered
Elective	13222 Deal with safety, health and environmental emergencies in the workplace	Level 2	4	Registered
Fundamental	7469 Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2	Registered
Fundamental	8962 Maintain and adapt oral communication	Level 2	5	Registered
Fundamental	8963 Access and use information from texts	Level 2	5	Registered
Fundamental	8964 Write for a defined context	Level 2	5	Registered
Fundamental	8982 Demonstrate understanding of rational and irrational numbers and number systems within the context of relevant calculations	Level 2	3	Registered
Fundamental	9007 Work with a range of patterns and functions and solve problems	Level 2	5	Registered
Fundamental	9009 Apply basic knowledge of statistics and probability to influence the use of data and procedures in order to investigate life related problems	Level 2	3	Registered
Fundamental	9268 Manage basic personal finance	Level 2	6	Registered
Fundamental	12444 Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts	Level 2	3	Registered
Fundamental	12461 Communicate at work	Level 2	5	Registered
Fundamental	12463 Understand and deal with HIV/AIDS	Level 2	3	Registered
Fundamental	12465 Develop a learning plan and a portfolio for assessment	Level 2	6	Registered
Fundamental	13217 Collect and use information	Level 2	5	Registered



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## QUALIFICATION:

**National Certificate: Tyre Assembly**

SAQA QUAL ID	QUALIFICATION TITLE	
48795	National Certificate: Tyre Assembly	
SGB NAME	SGB Manufacturing and Assembly Processes	
ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
MET-3-National Certificate	National Certificate	Manufacturing and Assembly
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
131	Level 3	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

**PURPOSE OF THE QUALIFICATION**

The purpose of the qualification is to provide learners, education and training providers and employers with the standards and the range of learning required to satisfy the challenges of participating effectively in the tyre manufacturing industry.

For those who have been in the workplace for a long time, this qualification can be used in the Recognition of Prior Learning (RPL) process to assess and recognise workplace skills acquired without the benefit of formal education or training.

For the new entrant, this qualification describes the learning outcomes (the skills, knowledge and values) required to effectively participate in a structured workplace within the tyre manufacturing industry.

For education and training providers, this qualification provides guidance for the development of appropriate learning programmes. For employers, the qualification allows skills gaps to be identified and programmes to close those skills gaps to be developed. The qualification also acts as an external benchmark for fulfilling the criteria of national and international quality standards such as ISO 9000:2000.

The chief skills that are recognised in this qualification are those required to assemble tyre components into a final form that is ready for curing. Assembling a tyre consists of turning a variety of mostly flat components into a complex three-dimensional product. The skills involve laying up the components, but also cutting, splicing and stitching them. The skills and knowledge will include the capacity to use and look after machinery and equipment and to implement procedures related to various aspects of the assembly process. Qualifying learners will be able to produce tyres in a variety of styles and sizes. Hand skills, hand-eye co-ordination and fine judgement play a major role in this qualification.

Qualifying learners will also understand:

- > How to relate what they see and experience to scientific and technological principles and concepts
- > How to maintain and support the various policies and procedures related to the safety, health, environment and quality systems that govern their workplace

With this understanding, learners will be able to participate actively in workplace activities.

What learners achieve in this qualification will also serve as a basis for further learning where they will engage more directly in controlling tyre assembly processes and troubleshooting non-conformances experienced.

### Rationale for the qualification

The tyre manufacturing process requires the preparation of a range of materials (rubber, additives, synthetic fibres, fabrics and steel wires); the manufacture of components from combinations of these materials; the assembly of the components into a green tyre; the curing or vulcanising of the green tyre into the finished product and the finishing of the cured tyre.

The tyre manufacturing industry combines sophisticated manufacturing processes with skilled hand assembly and fabrication within a competitive and challenging environment. The manufactured products have to respond to a wide variety of exacting customer and consumer quality requirements. In addition, the industry has to respond to competition in export and domestic markets and to ensure the on-going development of new products required by changing customer needs.

This means that people working in the tyre manufacturing industry require a range of skills and knowledge to help them respond to the exacting quality requirements, the pressures of high speed production and ongoing change.

This is the second qualification in a series for tyre manufacturing within the context of assembling a full (green) tyre that will enable competent learners to participate effectively in the tyre manufacturing industry.

This qualification covers the following range of tyres:

Passenger (radial)

Truck

Earthmoving

Tractor

### **RECOGNIZE PREVIOUS LEARNING?**

Y

### **LEARNING ASSUMED TO BE IN PLACE**

It is assumed that learners entering a programme towards this qualification have achieved a qualification in tyre and tyre component manufacturing at NQF Level 2, or have the relevant experience.

### Recognition of prior learning

This qualification may be obtained through the process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. While this is primarily a work-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

### **QUALIFICATION RULES**

N/A

### **EXIT LEVEL OUTCOMES**

1. Assemble components to make a tyre casing and consolidate to form a green tyre, ensuring the quality and safety of the final product
2. Understand, use and apply policies and procedures to maintain materials, equipment, work-place relations, safety, quality and the environment
3. Understand organisational structures and relationships and participate actively in workgroup discussions, in workgroup problem solving activities and in the implementation of solutions
4. Demonstrate an understanding of options for further learning in this or a related field of learning and of preparation requirements for such learning

### **ASSOCIATED ASSESSMENT CRITERIA**

1.
  - > The green tyres conform to all quality, safety and environmental standards

- > Output rates meet production standards
- > The assembly process is performed confidently and consistently, following all relevant procedures
- > Equipment malfunctions and component faults are recognised and responded to
- > Equipment and tools are cared for, maintained and stored appropriately, and work area is kept clean and tidy
- > Can respond to questions and discuss issues related to the tyre assembly process

2.

- > Procedures can be explained and are applied routinely and effectively
- > Appropriate procedures are selected to solve problems in an efficient and effective manner
- > Recording and reporting of conditions, outputs and incidents is done accurately and in a timely manner
- > Can discuss and explain issues related to product liability and traceability

3.

- > Relationships with peers, supervisory and management levels are established and functioning
- > Can respond to questions and discuss issues at the level of the qualification related to own role and purpose in the organisation
- > Problems are identified in a timely manner, reported and discussed and the agreed corrective action is implemented

4.

- > Career path and qualification options are identified and explained
- > Learning assumptions and preparation requirements are described
- > Learning options are discussed
- > A learning plan is developed

#### Integrated Assessment

The integrated assessment must be based on a summative assessment guide. The guide must spell out how the assessor will assess different aspects of the performance and will include:

- > Evaluating projects developed during the learning programme
- > Observing (and listening to) the learner at work, both in primary activities as well as in other interactions, or in relevant simulations
- > Asking questions and initiating short discussions to test understanding
- > Looking at records and reports, including learning records

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities required for tyre manufacturing. The assessment process should also establish how the learning process has advanced the critical outcomes.

#### **INTERNATIONAL COMPARABILITY**

##### International comparability

This qualification and associated qualifications has been found comparable in terms of outcomes and duration to:

1. Qualifications in the United Kingdom: National and Scottish Vocational Qualifications (N/SVQ)
2. Modern apprenticeship qualifications in the United Kingdom in the field of polymer processing
3. Vocational qualifications in Germany

In addition, the qualification design has been benchmarked against the Manufacturing Skills Standards developed by the Manufacturing Skills Standards Council in the United States.

#### **ARTICULATION OPTIONS**

The qualification has been designed and structured so that qualifying learners can move from one context to another. Employers or institutions should be able to evaluate the outcomes of this qualification against the needs of their context and structure top-up learning appropriately. Equally, holders of other qualifications may be evaluated against this qualification for the purpose of RPL.

#### **MODERATION OPTIONS**

Moderators for the qualification should be qualified and accredited with an appropriate ETQA. To assure the quality of the assessment process, the moderation should cover one of the following:

- > Assessor credentials
- > The assessment instrument
- > The assessment process

#### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

The following criteria should be applied by the relevant ETQA

1. Appropriate qualification in the field of tyre assembly, with a minimum of 2 years' experience in a tyre-manufacturing environment. The subject matter expertise of the assessor can be established by recognition of prior learning.
2. Appropriate experience and understanding of assessment theory, processes and practices
3. Good interpersonal skills and ability to balance the conflicting requirements of:
  - > Maintaining national standards
  - > The interests of the learner
  - > The need for transformation and redressing the legacies of the past
  - > The cultural background and language of the learner
4. Registration as an assessor with the relevant ETQA
5. Any other criteria required by the relevant ETQA

#### **NOTES**

##### NQF Level 5

- > National Diploma in Rubber Technology (240 credits)
- > (Draft) Tyre and Tyre Component Manufacturing: Optimising Tyre Manufacturing Processes and Tyre Performance (120 credits)
- > Industrial Rubber Manufacturing

##### NQF Level 4

- > Tyre & Tyre Component Manufacturing
- > Quality Assurance of Tyre Processes
- > Industrial Rubber Manufacturing

##### NQF Level 3

- > Tyre & Tyre Component Manufacturing
- > Tyre Assembly
- > Quality Checking of Tyres and Tyre Components
- > Industrial Rubber Manufacturing

##### NQF Level 2

- > Tyre & Tyre Component Manufacturing
- > Quality Checking and Finishing of Manufactured Tyres
- > Industrial Rubber Manufacturing (Mixing OR Extruding OR Moulding OR Calendaring)

##### NQF Level 1

- > Manufacturing, Engineering, Assembly & Related Activities



**UNIT STANDARDS***(Note: A blank space after this line means that the qualification is not based on Unit Standards.)*

	<b>UNIT STANDARD ID AND TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>	<b>STATUS</b>
Core	9526 Manage basic business finance	Level 3	6	Registered
Core	9531 Show understanding of diversity in the workplace	Level 3	3	Registered
Core	9533 Use communication skills to handle and resolve conflict in the workplace	Level 3	3	Registered
Core	12457 Develop learning strategies and techniques	Level 3	3	Registered
Core	13234 Apply quality procedures	Level 3	8	Registered
Core	115058 Assemble tyres	Level 3	48	Draft - Prep for P Comment
Core	12455 Perform the role of a safety, health and environmental protection representative	Level 4	3	Registered
Elective	9268 Manage basic personal finance	Level 2	6	Registered
Elective	12463 Understand and deal with HIV/AIDS	Level 2	3	Registered
Elective	12465 Develop a learning plan and a portfolio for assessment	Level 2	6	Registered
Elective	12483 Perform basic first aid	Level 2	4	Reregistered
Elective	12484 Perform basic fire fighting	Level 2	4	Reregistered
Elective	13202 Apply study and learning techniques	Level 2	3	Registered
Elective	8038 Operating lift trucks	Level 3	6	Reregistered
Elective	8039 Operating cranes	Level 3	10	Registered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	9010 Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	Level 3	2	Registered
Fundamental	9012 Investigate life and work related problems using data and probabilities	Level 3	5	Registered
Fundamental	9528 Communicate with clients	Level 3	3	Registered
Fundamental	9529 Compile feasibility and commissioning reports	Level 3	3	Registered
Fundamental	12429 Develop a personal financial plan	Level 3	2	Registered
Fundamental	14108 Measure, estimate, calculate physical quantities, explore, describe and represent, interpret, justify geometrical relationships in 2 & 3-dimensional space relevant to the life or workplace of the comm	Level 3	4	Registered
Fundamental	9014 Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 4	6	Registered



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUALIFICATION:

#### **National Certificate: Tyre and Tyre Component Manufacturing**

SAQA QUAL ID	QUALIFICATION TITLE	
48798	National Certificate: Tyre and Tyre Component Manufacturing	
SGB NAME	SGB Manufacturing and Assembly Processes	
ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
MET-3-National Certificate	National Certificate	Manufacturing and Assembly
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
134	Level 3	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

#### **PURPOSE OF THE QUALIFICATION**

The purpose of the qualification is to provide learners, education and training providers and employers with the standards and the range of learning required to satisfy the challenges of participating effectively in the tyre manufacturing industry.

For those who have been in the workplace for a long time, this qualification can be used in the Recognition of Prior Learning (RPL) process to assess and recognise workplace skills acquired without the benefit of formal education or training.

For the new entrant, this qualification describes the learning outcomes (the skills, knowledge and values) required to effectively participate in a structured workplace within the tyre manufacturing industry.

For education and training providers, this qualification provides guidance for the development of appropriate learning programmes. For employers, the qualification allows skills gaps to be identified and programmes to close those skills gaps to be developed. The qualification also acts as an external benchmark for fulfilling the criteria of national and international quality standards such as ISO 9000:2000.

This qualification recognises the skills, knowledge and values acquired by learners working in enterprises that use tyre manufacturing processes.

The chief skills that are recognised in this qualification are those of setting, adjusting and monitoring the equipment used to manufacture a variety of tyre components and tyres. This will typically involve the changeover from one product to another in which the changeover is relatively simple and routine. Hand skills play a minor role in this qualification.

Qualifying learners will also understand:

- > How to implement procedures related to various aspects of the production process.
- > How to relate what they see and experience to scientific and technological principles and concepts.
- > How to maintain and support the various policies and procedures related to the safety, health, environment and quality systems that govern their workplace.

With this understanding, learners will be able to participate actively in workplace activities.

What learners achieve in this qualification will also serve as a basis for further learning where they will engage more directly in controlling tyre and tyre component manufacturing processes and troubleshooting

non-conformances experienced.

#### Rationale

The tyre manufacturing process requires the preparation of a range of materials (rubber, additives, synthetic fibres, fabrics and steel wires); the manufacture of components from combinations of these materials; the assembly of the components into a green tyre; the curing or vulcanising of the green tyre into the finished product and the finishing of the cured tyre.

The tyre manufacturing industry combines sophisticated manufacturing processes with skilled hand assembly and fabrication within a competitive and challenging environment. The manufactured products have to respond to a wide variety of exacting customer and consumer quality requirements. In addition, the industry has to respond to competition in export and domestic markets and to ensure the on-going development of new products required by changing customer needs.

This means that people working in the tyre manufacturing industry require a range of skills and knowledge to help them respond to the exacting quality requirements, the pressures of high speed production and ongoing change.

This is the second qualification in a series for tyre and tyre component manufacturing that will enable competent learners to participate effectively in the tyre manufacturing industry.

This qualification can be obtained in the following contexts:

- > Tyre component manufacturing processes
- > Rubber material preparation
- > Extruding
- > Calendering
- > Tyre curing (vulcanisation)

#### **RECOGNIZE PREVIOUS LEARNING?**

Y

#### **LEARNING ASSUMED TO BE IN PLACE**

It is assumed that learners entering a programme towards this qualification have achieved a qualification in tyre and tyre component manufacturing at NQF Level 2 or have the relevant experience.

Recognition of prior learning:

This qualification may be obtained through the process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. While this is primarily a work-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

#### **QUALIFICATION RULES**

N/A

#### **EXIT LEVEL OUTCOMES**

1. Demonstrate an understanding of tyre and tyre manufacturing processes, the ability to set and operate equipment to manufacture components and the ability to maintain the quality and efficiency of the process.
2. Demonstrate an understanding of the quality requirements of tyres and tyre components, and the ability to ensure ongoing quality by identifying and responding to faults in manufactured products and by performing tests on tyres or tyre components.
3. Understand, use and apply policies and procedures to maintain materials, equipment, work-place relations, safety, health, quality and the environment.
4. Understand organisational structures and relationships and participate actively in workgroup discussions,

in workgroup problem solving activities and in the implementation of solutions.

5. Demonstrate an understanding of options for further learning in this or a related field of learning and of preparation requirements for such learning.

#### **ASSOCIATED ASSESSMENT CRITERIA**

1.
  - > The manufacturing process and the manufactured products conform to specifications.
  - > Manufacturing output meets production targets and schedules.
  - > Product changeover, (installation, set up and start up) processes are planned, organised and carried out efficiently, safely and within standard times.
  - > Materials, equipment and tools are used, cared for and maintained in accordance with good practice and workplace procedures.
  - > Can discuss and explain product changeover and set up processes and their impact on the quality of the produced product.
  
2.
  - > All material and manufacturing faults and equipment malfunctions are recognised and responded to appropriately.
  - > All records related to maintaining quality standards are up-to-date and are kept meticulously and accurately.
  - > All tests conform to standardised testing procedures.
  - > All materials, equipment and tools related to testing and quality are used, cared for and maintained according to good practice and company procedures.
  - > Can respond to questions and discuss issues related to quality and demonstrate an understanding of the underlying principles.
  
3.
  - > Procedures can be explained and are applied routinely and effectively.
  - > Appropriate procedures are selected to solve problems in an efficient and effective manner.
  - > Recording and reporting of conditions, outputs and incidents is done accurately and in a timely manner.
  - > Can discuss and explain issues related to product liability and traceability.
  
4.
  - > Relationships with peers, supervisory and management levels are established and functioning
  - > Can respond to questions and discuss issues at the level of the qualification related to own role and purpose in the organisation.
  - > Problems are identified in a timely manner, reported and discussed and the agreed corrective action is implemented.
  
5.
  - > Options are explained.
  - > Preparation requirements are explained.
  - > Learning plan is developed.

#### **Integrated Assessment**

The integrated assessment must be based on a summative assessment guide. The guide must spell out how the assessor will assess different aspects of the performance and will include:

- > Evaluating projects developed during the learning programme.
- > Observing (and listening to) the learner at work, both in primary activities as well as in other interactions, or in relevant simulations.
- > Asking questions and initiating short discussions to test understanding.
- > Looking at records and reports, including learning records.

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities required for tyre and tyre component manufacturing. The assessment process should also establish how the critical outcomes have been advanced by the learning process.

### **INTERNATIONAL COMPARABILITY**

This qualification and associated qualifications has been found comparable in terms of outcomes and duration to:

1. Qualifications in the United Kingdom: National and Scottish Vocational Qualifications (N/SVQ)
2. Modern apprenticeship qualifications in the United Kingdom in the field of polymer processing
3. Vocational qualifications in Germany

In addition, the qualification design has been benchmarked against the Manufacturing Skills Standards developed by the Manufacturing Skills Standards Council in the United States.

For the detailed comparison, see the Executive Summary of the SGB Process Report.

### **ARTICULATION OPTIONS**

The qualification has been designed and structured so that qualifying learners can move from one context to another. Employers or institutions should be able to evaluate the outcomes of this qualification against the needs of their context and structure top-up learning appropriately. Equally, holders of other qualifications may be evaluated against this qualification for the purpose of RPL.

### **MODERATION OPTIONS**

Moderators for the qualification should be qualified and accredited with an appropriate ETQA.

To assure the quality of the assessment process, the moderation should cover one of the following:

- > Assessor credentials
- > The assessment instrument
- > The assessment process

### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

The following criteria should be applied by the relevant ETQA:

1. Appropriate qualification in the field of tyre and tyre component manufacturing, with a minimum of 2 years' experience in a tyre-manufacturing environment. The subject matter expertise of the assessor can be established by recognition of prior learning.
2. Appropriate experience and understanding of assessment theory, processes and practices.
3. Good interpersonal skills and ability to balance the conflicting requirements of:
  - > Maintaining national standards
  - > The interests of the learner
  - > The need for transformation and redressing the legacies of the past
  - > The cultural background and language of the learner
4. Registration as an assessor with the relevant ETQA.
5. Any other criteria required by the other relevant ETQA.

### **NOTES**

This qualification links to the following qualifications:

## NQF Level 5:

- > National Diploma in Rubber Technology (240 credits)
- > (Draft) Tyre and Tyre Component Manufacturing: Optimising Tyre Manufacturing Processes and Tyre Performance (120 credits)
- > Industrial Rubber Manufacturing

## NQF Level 4:

- > Tyre & Tyre Component Manufacturing
- > Quality Assurance of Tyre Processes
- > Industrial Rubber Manufacturing

## NQF Level 3:

- > Tyre & Tyre Component Manufacturing
- > Tyre Assembly
- > Quality Checking of Tyres and Tyre Components
- > Industrial Rubber Manufacturing

## NQF Level 2:

- > Tyre & Tyre Component Manufacturing
- > Quality Checking and Finishing of Manufactured Tyres
- > Industrial Rubber Manufacturing (Mixing OR Extruding OR Moulding OR Calendaring)

## NQF Level 1:

- > Manufacturing, Engineering, Assembly & Related Activities

**UNIT STANDARDS**

*(Note: A blank space after this line means that the qualification is not based on Unit Standards.)*

	UNIT STANDARD ID AND TITLE	LEVEL	CREDITS	STATUS
Core	9526 Manage basic business finance	Level 3	6	Registered
Core	9531 Show understanding of diversity in the workplace	Level 3	3	Registered
Core	9533 Use communication skills to handle and resolve conflict in the workplace	Level 3	3	Registered
Core	12457 Develop learning strategies and techniques	Level 3	3	Registered
Core	13223 Apply safety, health and environmental protection procedures	Level 3	6	Registered
Core	13234 Apply quality procedures	Level 3	8	Registered
Core	115057 Prepare tyre fabrics for coating	Level 3	18	Draft - Prep for P Comment
Core	115059 Operate tyre-curing presses	Level 3	18	Draft - Prep for P Comment
Core	115062 Test tyre related products and identify faults	Level 3	27	Draft - Prep for P Comment
Core	115066 Operate and monitor compounding equipment for tyre component manufacturing	Level 3	18	Draft - Prep for P Comment
Core	115067 Set up, operate and monitor extrusion equipment for tyre component manufacturing	Level 3	18	Draft - Prep for P Comment
Core	115113 Liaise with workgroup members to set up equipment and for production runs in tyre component manufacturing	Level 3	7	Draft - Prep for P Comment
Core	115114 Set up and operate calendaring equipment to produce tyre components	Level 3	18	Draft - Prep for P Comment
Elective	7547 Operate a personal computer system	Level 2	6	Reregistered
Elective	9268 Manage basic personal finance	Level 2	6	Registered
Elective	12463 Understand and deal with HIV/AIDS	Level 2	3	Registered
Elective	12465 Develop a learning plan and a portfolio for assessment	Level 2	6	Registered
Elective	12483 Perform basic first aid	Level 2	4	Reregistered
Elective	12484 Perform basic fire fighting	Level 2	4	Reregistered
Elective	13202 Apply study and learning techniques	Level 2	3	Registered
Elective	8038 Operating lift trucks	Level 3	6	Reregistered

Elective	8039 Operating cranes	Level 3	10	Registered
Elective	12455 Perform the role of a safety, health and environmental protection representative	Level 4	3	Registered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	9010 Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	Level 3	2	Registered
Fundamental	9012 Investigate life and work related problems using data and probabilities	Level 3	5	Registered
Fundamental	9528 Communicate with clients	Level 3	3	Registered
Fundamental	9529 Compile feasibility and commissioning reports	Level 3	3	Registered
Fundamental	12429 Develop a personal financial plan	Level 3	2	Registered
Fundamental	14108 Measure, estimate, calculate physical quantities, explore, describe and represent, interpret, justify geometrical relationships in 2 & 3-dimensional space relevant to the life or workplace of the comm	Level 3	4	Registered
Fundamental	9014 Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 4	6	Registered



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUALIFICATION:

#### *National Certificate in Quality Checking of Tyres and Tyre Components*

SAQA QUAL ID	QUALIFICATION TITLE	
48794	National Certificate in Quality Checking of Tyres and Tyre Components	
SGB NAME	SGB Manufacturing and Assembly Processes	
ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
MET-3-National Certificate	National Certificate	Manufacturing and Assembly
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
134	Level 3	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

#### **PURPOSE OF THE QUALIFICATION**

The purpose of the qualification is to provide learners, education and training providers and employers with the standards and the range of learning required to satisfy the challenges of participating effectively in the tyre manufacturing industry.

For those who have been in the workplace for a long time, this qualification can be used in the Recognition of Prior Learning (RPL) process to assess and recognise workplace skills acquired without the benefit of formal education or training.

For the new entrant, this qualification describes the learning outcomes (the skills, knowledge and values) required to effectively participate in a structured workplace within the tyre manufacturing industry.

For education and training providers, this qualification provides guidance for the development of appropriate learning programmes. For employers, the qualification allows skills gaps to be identified and programmes to close those skills gaps to be developed. The qualification also acts as an external benchmark for fulfilling the criteria of national and international quality standards such as ISO 9000:2000.

The chief skills that are recognised in this qualification are those of testing for and identifying non-conforming products, ensuring production meets and maintains quality standards and working with others to ensure that this happens.

Qualifying learners will also understand:

- > how to implement procedures related to various aspects of the production process
- > how to relate what they see and experience to scientific and technological principles and concepts
- > how to maintain and support the various policies and procedures related to the safety, health, environment and quality systems that govern their workplace

With this understanding, learners will be able to participate actively in workplace activities.

What learners achieve in this qualification will also serve as a basis for further learning where they will engage more actively in quality assurance processes.

Rationale for the qualification:

The tyre manufacturing process requires the preparation of a range of materials (rubber, additives, synthetic fibres, fabrics and steel wires); the manufacture of components from combinations of these materials; the assembly of the components into a green tyre; the curing or vulcanising of the green tyre into the finished product and the finishing of the cured tyre.



The tyre manufacturing industry combines sophisticated manufacturing processes with skilled hand assembly and fabrication within a competitive and challenging environment. The manufactured products have to respond to a wide variety of exacting customer and consumer quality requirements. In addition, the industry has to respond to competition in export and domestic markets and to ensure the on-going development of new products required by changing customer needs.

This means that people working in the tyre manufacturing industry require a range of skills and knowledge to help them respond to the exacting quality requirements, the pressures of high speed production and ongoing change.

This is the second qualification in a series for quality checking of manufactured tyres that will enable competent learners to participate effectively in the tyre manufacturing industry. This qualification may be obtained in the following contexts:

- > Final fishing
- > Testing laboratories

#### **RECOGNIZE PREVIOUS LEARNING?**

Y

#### **LEARNING ASSUMED TO BE IN PLACE**

It is assumed that learners entering a programme towards this qualification have achieved a qualification in quality checking of manufactured tyres on NQF Level 2, or have the relevant experience.

Recognition of prior learning:

This qualification may be obtained through the process of RPL. The learner should be thoroughly briefed prior to the assessment and support provided to assist in the process of developing a portfolio. While this is primarily a work-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

#### **QUALIFICATION RULES**

N/A

#### **EXIT LEVEL OUTCOMES**

1. Identify non-conformances in tyres and tyre related products and determine and implement necessary corrective action
2. Verify the quality and the conformance of manufactured tyres to ensure user safety and satisfaction
3. Understand, use and apply policies and procedures to maintain materials, equipment, work-place relations, safety, quality and the environment
4. Understand organisational structures and relationships and participate actively in workgroup discussions, in workgroup problem solving activities and in the implementation of solutions
5. Demonstrate an understanding of options for further learning in this or a related field of learning and of preparation requirements for such learning

#### **ASSOCIATED ASSESSMENT CRITERIA**

1.
  - > All checks and tests are conducted according to appropriate procedures
  - > All non-conformances are identified
  - > Appropriate procedures for responding to and instituting changes to the manufacturing processes are implemented and followed
  - > Can discuss and explain issues related to non-conformances in the manufacturing environment
2.
  - > Quality issues are identified and resolved speedily and effectively
  - > Appropriate data is collected and checked for non-conformances

- > Appropriate conclusions are drawn from the data
  - > Appropriate consultations and discussions are held to communicate conclusions
- 3.
- > Procedures can be explained and are applied routinely and effectively
  - > Appropriate procedures are selected to solve problems in an efficient and effective manner
  - > Recording and reporting of conditions, outputs and incidents is done accurately and in a timely manner
  - > Can discuss and explain issues related to product liability and traceability
- 4.
- > Relationships with peers, supervisory and management levels are established and functioning
  - > Respond to questions and discuss issues at the level of the qualification related to own role and purpose in the organisation
  - > Problems are identified in a timely manner, reported and discussed and the agreed corrective action is implemented
- 5.
- > Career path and qualification options are identified and explained
  - > Learning assumptions and preparation requirements are described
  - > Learning options are discussed
  - > A learning plan is developed

#### Integrated Assessment:

The integrated assessment must be based on a summative assessment guide. The guide must spell out how the assessor will assess different aspects of the performance and will include:

- > Evaluating projects developed during the learning programme
- > Observing (and listening to) the learner at work, both in primary activities as well as in other interactions, or in relevant simulations
- > Asking questions and initiating short discussions to test understanding
- > Looking at records and reports, including learning records

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities required for tyre manufacturing. The assessment process should also establish how the learning process has advanced the critical outcomes.

#### **INTERNATIONAL COMPARABILITY**

This qualification and associated qualifications has been found comparable in terms of outcomes and duration to:

1. Qualifications in the United Kingdom: National and Scottish Vocational Qualifications (N/SVQ)
2. Modern apprenticeship qualifications in the United Kingdom in the field of polymer processing
3. Vocational qualifications in Germany

In addition, the qualification design has been benchmarked against the Manufacturing Skills Standards developed by the Manufacturing Skills Standards Council in the United States.

For the detailed comparison, see the Executive Summary of the SGB Process Report.

#### **ARTICULATION OPTIONS**

The qualification has been designed and structured so that qualifying learners can move from one context to another. Employers or institutions should be able to evaluate the outcomes of this qualification against the needs of their context and structure top-up learning appropriately. Equally, holders of other qualifications may

be evaluated against this qualification for the purpose of RPL.

### **MODERATION OPTIONS**

Moderators for the qualification should be qualified and accredited with an appropriate ETQA. To assure the quality of the assessment process the moderation should cover one of the following:

- > Assessor credentials
- > The assessment instrument
- > The assessment process

### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

The following criteria should be applied by the relevant ETQA:

1. Appropriate qualification in the field of quality assurance, with a minimum of 2 years' experience in a tyre manufacturing environment. The subject matter expertise of the assessor can be established by recognition of prior learning.
2. Appropriate experience and understanding of assessment theory, processes and practices
3. Good interpersonal skills and ability to balance the conflicting requirements of:
  - > Maintaining national standards
  - > The interests of the learner
  - > The need for transformation and redressing the legacies of the past
  - > The cultural background and language of the learner
4. Registration as an assessor with the relevant ETQA
5. Any other criteria required by the relevant ETQA

### **NOTES**

This qualification links to the following qualifications:

NQF Level 5:

- > National Diploma in Rubber Technology (240 credits)
- > (Draft) Tyre and Tyre Component Manufacturing: Optimising Tyre Manufacturing Processes and Tyre Performance (120 credits)
- > Industrial Rubber Manufacturing

NQF Level 4:

- > Tyre & Tyre Component Manufacturing
- > Quality Assurance of Tyre Processes
- > Industrial Rubber Manufacturing

NQF Level 3:

- > Tyre & Tyre Component Manufacturing
- > Tyre Assembly
- > Quality Checking of Tyres and Tyre Components
- > Industrial Rubber Manufacturing

NQF Level 2:

- > Tyre & Tyre Component Manufacturing
- > Quality Checking and Finishing of Manufactured Tyres
- > Industrial Rubber Manufacturing (Mixing OR Extruding OR Moulding OR Calendaring)

NQF Level 1:

- > Manufacturing, Engineering, Assembly & Related Activities

### **UNIT STANDARDS**

**(Note: A blank space after this line means that the qualification is not based on Unit Standards.)**

	<b>UNIT STANDARD ID AND TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>	<b>STATUS</b>
Core	9526 Manage basic business finance	Level 3	6	Registered
Core	9531 Show understanding of diversity in the workplace	Level 3	3	Registered

Core	9533 Use communication skills to handle and resolve conflict in the workplace	Level 3	3	Registered
Core	12457 Develop learning strategies and techniques	Level 3	3	Registered
Core	13223 Apply safety, health and environmental protection procedures	Level 3	6	Registered
Core	13234 Apply quality procedures	Level 3	8	Registered
Core	115060 Monitor the quality of manufactured tyres	Level 3	24	Draft - Prep for P Comment
Core	115062 Test tyre related products and identify faults	Level 3	27	Draft - Prep for P Comment
Elective	7547 Operate a personal computer system	Level 2	6	Reregistered
Elective	9268 Manage basic personal finance	Level 2	6	Registered
Elective	12463 Understand and deal with HIV/AIDS	Level 2	3	Registered
Elective	12465 Develop a learning plan and a portfolio for assessment	Level 2	6	Registered
Elective	12482 Join metals using the resistance welding process	Level 2	4	Registered
Elective	12483 Perform basic first aid	Level 2	4	Reregistered
Elective	13202 Apply study and learning techniques	Level 2	3	Registered
Elective	8038 Operating lift trucks	Level 3	6	Reregistered
Elective	8039 Operating cranes	Level 3	10	Registered
Elective	12455 Perform the role of a safety, health and environmental protection representative	Level 4	3	Registered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	9010 Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	Level 3	2	Registered
Fundamental	9012 Investigate life and work related problems using data and probabilities	Level 3	5	Registered
Fundamental	9528 Communicate with clients	Level 3	3	Registered
Fundamental	9529 Compile feasibility and commissioning reports	Level 3	3	Registered
Fundamental	14108 Measure, estimate, calculate physical quantities, explore, describe and represent, interpret, justify geometrical relationships in 2 & 3-dimensional space relevant to the life or workplace of the comm	Level 3	4	Registered
Fundamental	9014 Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 4	6	Registered



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUALIFICATION:

#### National Certificate: Quality Assurance of Tyre Manufacturing Processes

SAQA QUAL ID	QUALIFICATION TITLE	
48796	National Certificate: Quality Assurance of Tyre Manufacturing Processes	
SGB NAME	SGB Manufacturing and Assembly Processes	
ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
MET-4-National Certificate	National Certificate	Manufacturing and Assembly
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
122	Level 4	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

#### PURPOSE OF THE QUALIFICATION

The purpose of the qualification is to provide learners, education and training providers and employers with the standards and the range of learning required to satisfy the challenges of participating effectively in the tyre manufacturing industry.

For those who have been in the workplace for a long time, this qualification can be used in the Recognition of Prior Learning (RPL) process to assess and recognise workplace skills acquired without the benefit of formal education or training.

For the new entrant, this qualification describes the learning outcomes (the skills, knowledge and values) required to effectively participate in a structured workplace within the tyre manufacturing industry.

For education and training providers, this qualification provides guidance for the development of appropriate learning programmes. For employers, the qualification allows skills gaps to be identified and programmes to close those skills gaps to be developed. The qualification also acts as an external benchmark for fulfilling the criteria of national and international quality standards such as ISO 9000:2000.

This qualification recognises the skills, knowledge and values acquired by learners to assure the quality of tyre and tyre components during the manufacturing processes by testing materials and products, analysing data and verifying causes of problems.

Qualified learners will also understand:

- > How to cope with the pressures of manufacturing
- > How to plan, schedule and evaluate their own work
- > How to interact with and develop the capacity of team members to maintain and support quality, safety and health systems.

What learners achieve in this qualification will also serve as a basis for further learning where they will engage in maintaining production efficiencies, optimising product quality and measuring the performance of tyres.

Rationale for the qualification:

The tyre manufacturing process requires the preparation of a range of materials (rubber, additives, synthetic fibres, fabrics and steel wires); the manufacture of components from combinations of these materials; the assembly of the components into a green tyre; the curing or vulcanising of the green tyre into the finished

product and the finishing of the cured tyre.

The tyre manufacturing industry combines sophisticated manufacturing processes with skilled hand assembly and fabrication within a competitive and challenging environment. The manufactured products have to respond to a wide variety of exacting customer and consumer quality requirements. In addition, the industry has to respond to competition in export and domestic markets and to ensure the on-going development of new products required by changing customer needs.

This means that people working in the tyre manufacturing industry require a range of skills and knowledge to help them respond to the exacting quality requirements, the pressures of high speed production and ongoing change.

This is the third qualification in a series related to the quality of manufactured tyres and tyre components that will enable competent learners to participate effectively in the tyre manufacturing industry.

### **RECOGNIZE PREVIOUS LEARNING?**

Y

### **LEARNING ASSUMED TO BE IN PLACE**

It is assumed that learners entering a programme towards this qualification have achieved a qualification in quality checking of manufactured tyres and tyre components at NQF Level 3, or have the relevant experience.

Recognition of prior learning:

This qualification may be obtained through the process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. While this is primarily a work-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

### **QUALIFICATION RULES**

N/A

### **EXIT LEVEL OUTCOMES**

1. Verify the quality of manufacturing processes and products and collect and analyse data to identify problems, trends and potential trouble spots.
2. Understand and apply rubber technology and tyre construction principles in order to identify, formulate and recommend solutions to common manufacturing process problems and areas for improvement
3. Ensure efficient and seamless production by co-ordinating activities in the workgroup and with other departments
4. Maintain a safe, productive workplace, developing the efficiency and effectiveness of the workgroup

Range:

Safety also includes issues of health and issues relating to reducing negative impacts on the environment

5. Demonstrate an understanding of options for further learning in this or a related field of learning and preparation requirements for such learning

### **ASSOCIATED ASSESSMENT CRITERIA**

1. > Quality issues are identified and analysed and recommendations are made
  - > The testing of processes and products conforms to specifications
  - > Testing equipment is set up, cared for, calibrated and maintained to ensure accuracy and consistency
  - > Testing and recommendations provide a support for decision making and changes to manufacturing processes and materials
  - > Issues related to quality assurance of the manufacturing process and the materials used are discussed and resolved
2. > Solutions are formulated and proposed in such a way as to minimize the reoccurrence of problems or inefficiencies
  - > Solutions are implemented, recorded and monitored for the reoccurrence of problems
  - > Operating procedures, manuals, quality standards and other documents are updated to reflect the changes
  - > Problems, solutions and opportunities for improvement are discussed and resolved with workgroup

members and internal customers and partners

> The underlying scientific and technological causes of problems, basis for improvements, and related issues are explained and discussed.

3. > Problems, plans and actions are discussed with relevant personnel and agreement is obtained

> Work is organised and planned and communicated clearly

> Interpersonal interactions and processes are managed to achieve the required outputs

> Procedures are used to ensure consistency of effort and outcomes

> Achievements of work unit objectives are evaluated and suggestions for improvements are implemented

4. > The workplace is safe and free of hazards

> Tools, equipment and services are cared for, maintained and stored according to good practice and to workplace procedures

> Workgroup members are assisted and influenced to work effectively, efficiently and safely

> Interpersonal interactions and processes are managed to achieve required outputs

> Procedures are used to ensure consistency of effort and outcomes

5. > Options are explained

> Preparation requirements are explained

> Learning plan is developed

**Integrated Assessment:**

The integrated assessment must be based on a summative assessment guide. The guide must spell out how the assessor will assess different aspects of the performance and will include:

> Observing (and listening to) the learner at work, both in primary activities as well as in other interactions, or in relevant simulations

> Asking questions and initiating short discussions to test understanding

> Looking at records and reports

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities required for tyre manufacturing. The assessment process should also establish how the critical outcomes have been advanced by the learning process.

Assessors should also evaluate evidence that the learner has been performing consistently over a period of time. The assessment can include a small project or projects that need more time to complete than is practical in a live assessment session.

### **INTERNATIONAL COMPARABILITY**

This qualification and associated qualifications have been found comparable in terms of outcomes and duration to:

1. Qualifications in the United Kingdom: National and Scottish Vocational Qualifications (N/SVQ)
2. Modern apprenticeship qualifications in the United Kingdom in the field of polymer processing
3. Vocational qualifications in Germany

In addition, the qualification design has been benchmarked against the Manufacturing Skills Standards developed by the Manufacturing Skills Standards Council in the United States.

For the detailed comparison see the Executive Summary of the SGB Process Report.

### **ARTICULATION OPTIONS**

This qualification has been designed and structured so that qualifying learners can move from one context to another. Employers or institutions should be able to evaluate the outcomes of this qualification against the needs of their context and structure top-up learning appropriately. Equally, holders of other qualifications may be evaluated against this qualification for the purpose of RPL.

#### **MODERATION OPTIONS**

Moderators for the qualification should be qualified and accredited with an appropriate ETQA. To assure the quality of the assessment process, the moderation should cover one of the following:

- > Assessor credentials
- > The assessment instrument
- > The assessment process

#### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

The following criteria should be applied by the relevant ETQA:

1. Appropriate qualification in the field of quality assurance, with a minimum of 2 years' experience in a tyre-manufacturing environment. The subject matter expertise of the assessor can be established by recognition of prior learning.
2. Appropriate experience and understanding of assessment theory, processes and practices
3. Good interpersonal skills and ability to balance the conflicting requirements of:
  - > Maintaining national standards
  - > The interests of the learner
  - > The need for transformation and redressing the legacies of the past
  - > The cultural background and language of the learner
4. Registration as an assessor with the relevant ETQA
5. Any other criteria required by the relevant ETQA

#### **NOTES**

This qualification links to the following qualifications:

##### NQF level 5

- > National Diploma in Rubber Technology (240 credits)
- > (Draft) Tyre and Tyre Component Manufacturing: Optimising Tyre Manufacturing Processes and Tyre Performance (120 credits)
- > Industrial Rubber Manufacturing

##### NQF level 4

- > Tyre & Tyre Component Manufacturing
- > Quality Assurance of Tyre Processes
- > Industrial Rubber Manufacturing

##### NQF level 3

- > Tyre & Tyre Component Manufacturing
- > Tyre Assembly
- > Quality Checking of Tyres and Tyre Components
- > Industrial Rubber Manufacturing

##### NQF level 2

- > Tyre & Tyre Component Manufacturing
- > Quality Checking and Finishing of Manufactured Tyres
- > Industrial Rubber Manufacturing (Mixing OR Extruding OR Moulding OR Calendaring)

##### NQF level 1

- > Manufacturing, Engineering, Assembly & Related Activities



**UNIT STANDARDS***(Note: A blank space after this line means that the qualification is not based on Unit Standards.)*

	<b>UNIT STANDARD ID AND TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>	<b>STATUS</b>
Core	13194 Perform statistical process control	Level 4	12	Registered
Core	13198 Formulate and recommend solutions to common industrial rubber manufacturing problems	Level 4	20	Registered
Core	13224 Monitor the application of safety, health and environmental protection procedures	Level 4	4	Registered
Core	13235 Maintain the quality assurance system	Level 4	5	Registered
Core	13254 Contribute to the implementation and maintenance of business processes	Level 4	10	Registered
Core	115112 Plan and set up testing programme to investigate quality issues and recommend changes	Level 4	20	Draft - Prep for P Comment
Elective	7567 Produce and use spreadsheets for business	Level 3	5	Reregistered
Elective	7570 Produce word processing documents for business	Level 3	5	Reregistered
Elective	7854 Provide First Aid	Level 4	4	Registered
Elective	8555 Contribute to information distribution regarding HIV/AIDS in the workplace	Level 4	4	Registered
Elective	13203 Counsel workgroup members in respect of HIV/AIDS	Level 5	3	Registered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	8973 Use language and communication in occupational learning programmes	Level 3	5	Registered
Fundamental	8974 Engage in sustained oral communication and evaluate spoken texts	Level 4	5	Registered
Fundamental	8975 Read analyse and respond to a variety of texts	Level 4	5	Registered
Fundamental	8976 Write for a wide range of contexts	Level 4	5	Registered
Fundamental	9014 Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 4	6	Registered
Fundamental	9015 Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems	Level 4	6	Registered
Fundamental	9502 Write a technical report	Level 4	4	Registered
Fundamental	9506 Communicate in an assertive manner with clients and fellow workers	Level 4	4	Registered
Fundamental	12417 Measure, estimate & calculate physical quantities & explore, critique & prove geometrical relationships in 2 and 3 dimensional space in the life and workplace of adult with increasing responsibilities	Level 4	4	Reregistered



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUALIFICATION:

#### *National Certificate: Tyre and Tyre Component Manufacturing*

SAQA QUAL ID	QUALIFICATION TITLE	
48799	National Certificate: Tyre and Tyre Component Manufacturing	
SGB NAME	SGB Manufacturing and Assembly Processes	
ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
MET-4-National Certificate	National Certificate	Manufacturing and Assembly
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
137	Level 4	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

#### **PURPOSE OF THE QUALIFICATION**

The purpose of the qualification is to provide learners, education and training providers and employers with the standards and the range of learning required to satisfy the challenges of participating effectively in the tyre manufacturing industry.

For those who have been in the workplace for a long time, this qualification can be used in the Recognition of Prior Learning (RPL) process to assess and recognise workplace skills acquired without the benefit of formal education or training.

For the new entrant, this qualification describes the learning outcomes (the skills, knowledge and values) required to effectively participate in a structured workplace within the tyre manufacturing industry.

For education and training providers, this qualification provides guidance for the development of appropriate learning programmes. For employers, the qualification allows skills gaps to be identified and programmes to close those skills gaps to be developed. The qualification also acts as an external benchmark for fulfilling the criteria of national and international quality standards such as ISO 9000:2000.

This qualification recognises the skills, knowledge and values acquired by learners to perform more complex product, tooling and equipment changeovers, to co-ordinate the production of more complex components and to troubleshoot in order to maintain quality and production outputs.

Qualified learners will also understand:

- > How to plan, schedule and evaluate their own work
- > How to interact with others and co-ordinate the activities of a workgroup
- > How to interact with and develop the capacity of team members to maintain and support quality, safety and health systems.

What learners achieve in this qualification will also serve as a basis for further learning where they will engage in maintaining production efficiencies and optimising production processes in tyre and tyre component manufacturing.

#### Rationale

The tyre manufacturing process requires the preparation of a range of materials (rubber, additives, synthetic fibres, fabrics and steel wires); the manufacture of components from combinations of these materials; the

assembly of the components into a green tyre; the curing or vulcanising of the green tyre into the finished product and the finishing of the cured tyre.

The tyre manufacturing industry combines sophisticated manufacturing processes with skilled hand assembly and fabrication within a competitive and challenging environment. The manufactured products have to respond to a wide variety of exacting customer and consumer quality requirements. In addition, the industry has to respond to competition in export and domestic markets and to ensure the on-going development of new products required by changing customer needs.

This means that people working in the tyre manufacturing industry require a range of skills and knowledge to help them respond to the exacting quality requirements, the pressures of high speed production and ongoing change.

This is the third qualification in a series for tyre and tyre component manufacturing that will enable competent learners to participate effectively in the tyre manufacturing industry.

This qualification can be obtained in the following contexts:

- > Material preparation
- > Component manufacturing processes
- > Tyre assembly
- > Tyre curing (vulcanisation)

#### **RECOGNIZE PREVIOUS LEARNING?**

Y

#### **LEARNING ASSUMED TO BE IN PLACE**

It is assumed that learners entering a programme towards this qualification have achieved a qualification in tyre and tyre component manufacturing at NQF Level 3 or have the relevant experience.

Recognition of prior learning:

This qualification may be obtained through the process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. While this is primarily a work-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

#### **QUALIFICATION RULES**

N/A

#### **EXIT LEVEL OUTCOMES**

1. Co-ordinate changeover, set up and adjustments to complex tyre and tyre component manufacturing equipment.
2. Make adjustments to materials or equipment to maintain the efficiency of the process and the quality of the manufactured product.
3. Understand and apply rubber technology and tyre construction principles in order to identify, formulate and recommend solutions to common manufacturing process problems and areas for improvement.
4. Ensure efficient and seamless production by co-ordinating activities in workgroup and with other departments.
5. Maintain a safe, productive workplace, developing the efficiency and effectiveness of the workgroup.  
(Range: Safety also includes issues of health and issues relating to reducing negative impacts on the environment)
6. Demonstrate an understanding of options for further learning in this or a related field of learning and preparation requirements for such learning.

**ASSOCIATED ASSESSMENT CRITERIA**

1.
  - > The manufacturing process and the manufactured products conform to specifications.
  - > Changeovers are planned and carried out efficiently and safely.
  - > Handover to operators is clear and pertinent.
  - > Issues relating to the changeover, the manufacturing process and the materials used are discussed and resolved.
2.
  - > The manufacturing process and the manufactured products conform to specifications.
  - > All faults, malfunctions and other changes to the process or the outputs are identified and responded to.
  - > Continuous quality checks are performed and settings are reviewed.
  - > Issues related to running faults or malfunctions, the efficiency of the manufacturing process and the quality of the manufactured product are discussed and resolved.
3.
  - > Solutions are formulated and proposed in such a way as to minimize the reoccurrence of problems or inefficiencies.
  - > Solutions are implemented, recorded and monitored for the reoccurrence of problems.
  - > Operating procedures, manuals, quality standards and other documents are updated to reflect the changes.
  - > Problems, solutions and opportunities for improvement are discussed and resolved with workgroup members and internal customers and partners.
  - > The underlying scientific and technological causes of problems, basis for improvements, and related issues are explained and discussed.
4.
  - > Problems, plans and actions are discussed with relevant personnel and agreement is obtained.
  - > Work is organised and planned and communicated clearly.
  - > Interpersonal interactions and processes are managed to achieve the required outputs.
  - > Procedures are used to ensure consistency of effort and outcomes.
  - > Achievements of work unit objectives are evaluated and suggestions for improvements are implemented.
5.
  - > The workplace is safe and free of hazards.
  - > Tools, equipment and services are cared for, maintained and stored according to good practice and to workplace procedures.
  - > Workgroup members are assisted and influenced to work effectively, efficiently and safely.
  - > Interpersonal interactions and processes are managed to achieve required outputs.
  - > Procedures are used to ensure consistency of effort and outcomes.
6.
  - > Career path and qualification options are identified and explained.
  - > Learning assumptions and preparation requirements are described.
  - > Learning options are discussed.
  - > A learning plan is developed.

**Integrated Assessment**

The integrated assessment must be based on a summative assessment guide. The guide must spell out how the assessor will assess different aspects of the performance and will include:

- > Observing (and listening to) the learner at work, both in primary activities as well as in other interactions, or in relevant simulations.
- > Asking questions and initiating short discussions to test understanding.
- > Looking at records and reports.

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities required for tyre manufacturing. The assessment process should also establish how the learning process has advanced the critical outcomes.

Assessors should also evaluate evidence that the learner has been performing consistently over a period of time. The assessment can include a small project or projects that need more time to complete than is practical in a live assessment session.

### **INTERNATIONAL COMPARABILITY**

This qualification and associated qualifications have been found comparable in terms of outcomes and duration to:

1. Qualifications in the United Kingdom: National and Scottish Vocational Qualifications (N/SVQ)
2. Modern apprenticeship qualifications in the United Kingdom in the field of polymer processing
3. Vocational qualifications in Germany

In addition, the qualification design has been benchmarked against the Manufacturing Skills Standards developed by the Manufacturing Skills Standards Council in the United States.

For the detailed comparison see the Executive Summary of the SGB Process Report.

### **ARTICULATION OPTIONS**

The qualification has been designed and structured so that qualifying learners can move from one context to another. Employers or institutions should be able to evaluate the outcomes of this qualification against the needs of their context and structure top-up learning appropriately. Equally, holders of other qualifications may be evaluated against this qualification for the purpose of RPL.

### **MODERATION OPTIONS**

Moderators for the qualification should be qualified and accredited with an appropriate ETQA.

To assure the quality of the assessment process, the moderation should cover one of the following:

- > Assessor credentials
- > The assessment instrument
- > The assessment process

### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

The following criteria should be applied by the relevant ETQA:

1. Appropriate qualification in the field of tyre and tyre component manufacturing, with a minimum of 2 years' experience in a tyre-manufacturing environment. The subject matter expertise of the assessor can be established by recognition of prior learning.
2. Appropriate experience and understanding of assessment theory, processes and practices.
3. Good interpersonal skills and ability to balance the conflicting requirements of:
  - > Maintaining national standards
  - > The interests of the learner
  - > The need for transformation and redressing the legacies of the past
  - > The cultural background and language of the learner
4. Registration as an assessor with the relevant ETQA.

5. Any other criteria required by the relevant ETQA.

### NOTES

This qualification links to the following qualifications:

NQF Level 5:

- > National Diploma in Rubber Technology (240 credits)
- > (Draft) Tyre and Tyre Component Manufacturing: Optimising Tyre Manufacturing Processes and Tyre Performance (120 credits)
- > Industrial Rubber Manufacturing

NQF Level 4:

- > Tyre & Tyre Component Manufacturing
- > Quality Assurance of Tyre Processes
- > Industrial Rubber Manufacturing

NQF Level 3:

- > Tyre & Tyre Component Manufacturing
- > Tyre Assembly
- > Quality Checking of Tyres and Tyre Components
- > Industrial Rubber Manufacturing

NQF Level 2:

- > Tyre & Tyre Component Manufacturing
- > Quality Checking and Finishing of Manufactured Tyres
- > Industrial Rubber Manufacturing (Mixing OR Extruding OR Moulding OR Calendaring)

NQF Level 1:

- > Manufacturing, Engineering, Assembly & Related Activities

### UNIT STANDARDS

*(Note: A blank space after this line means that the qualification is not based on Unit Standards.)*

	UNIT STANDARD ID AND TITLE	LEVEL	CREDITS	STATUS
Core	13194 Perform statistical process control	Level 4	12	Registered
Core	13198 Formulate and recommend solutions to common industrial rubber manufacturing problems	Level 4	20	Registered
Core	13224 Monitor the application of safety, health and environmental protection procedures	Level 4	4	Registered
Core	13235 Maintain the quality assurance system	Level 4	5	Registered
Core	13254 Contribute to the implementation and maintenance of business processes	Level 4	10	Registered
Core	115064 Change tooling and set up tyre component and tyre manufacturing equipment	Level 4	29	Draft - Prep for P Comment
Core	115065 Co-ordinate tyre manufacturing activities	Level 4	8	Draft - Prep for P Comment
Elective	12463 Understand and deal with HIV/AIDS	Level 2	3	Registered
Elective	7567 Produce and use spreadsheets for business	Level 3	5	Reregistered
Elective	7570 Produce word processing documents for business	Level 3	5	Reregistered
Elective	7854 Provide First Aid	Level 4	4	Registered
Elective	8555 Contribute to information distribution regarding HIV/AIDS in the workplace	Level 4	4	Registered
Elective	13203 Counsel workgroup members in respect of HIV/AIDS	Level 5	3	Registered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	8973 Use language and communication in occupational learning programmes	Level 3	5	Registered
Fundamental	8974 Engage in sustained oral communication and evaluate spoken texts	Level 4	5	Registered
Fundamental	8975 Read analyse and respond to a variety of texts	Level 4	5	Registered

Fundamental	8976	Write for a wide range of contexts	Level 4	5	Registered
Fundamental	9014	Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 4	6	Registered
Fundamental	9015	Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems	Level 4	6	Registered
Fundamental	9502	Write a technical report	Level 4	4	Registered
Fundamental	9506	Communicate in an assertive manner with clients and fellow workers	Level 4	4	Registered
Fundamental	12417	Measure, estimate & calculate physical quantities & explore, critique & prove geometrical relationships in 2 and 3 dimensional space in the life and workplace of adult with increasing responsibilities	Level 4	4	Reregistered



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

1

## Inspect, trim, balance and sort manufactured tyres

SAQA US ID	UNIT STANDARD TITLE		
115063	Inspect, trim, balance and sort manufactured tyres		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 2	19

**Specific Outcomes:****SPECIFIC OUTCOME 1**

Load tyre onto machine and trim vents and flash.

**SPECIFIC OUTCOME 2**

Load tyres onto inspection stand, inspect tyres and identify any defects.

**SPECIFIC OUTCOME 3**

Inflate tyre and check for bulges.

**SPECIFIC OUTCOME 4**

Load and balance tyre on static balancing machine and apply mark.

**SPECIFIC OUTCOME 5**

Sort and stack tyres, separating out those which require buffing and repair.

**SPECIFIC OUTCOME 6**

Apply operator code to inspected tyres, record data, classify defects and report.

**SPECIFIC OUTCOME 7**

Care for tools and equipment.





## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

2

## Repair and buff tyres

SAQA US ID	UNIT STANDARD TITLE		
115061	Repair and buff tyres		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 2	8

**Specific Outcomes:****SPECIFIC OUTCOME 1**

Identify type of repair required and select appropriate tools, equipment and materials.

**SPECIFIC OUTCOME 2**

Prepare defective area for repair.

**SPECIFIC OUTCOME 3**

Repair defective area.

**SPECIFIC OUTCOME 4**

Cure the applied material.

**SPECIFIC OUTCOME 5**

Remove tyre from autoclave or mould, buff, sort and palletize.

**SPECIFIC OUTCOME 6**

Replace used repair material, clean work area and care for tools and equipment.

**SPECIFIC OUTCOME 7**

Record data on repaired tyres and report incidents and faults.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

3

#### Set and operate equipment with simple control systems

SAQA US ID	UNIT STANDARD TITLE		
115111	Set and operate equipment with simple control systems		
SGB NAME		ABET BAND	PROVIDER NAME
SGB Manufacturing and Assembly Processes		Undefined	
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 2	15

#### **Specific Outcomes:**

##### **SPECIFIC OUTCOME 1**

Prepare and load material.

##### **SPECIFIC OUTCOME 2**

Adjust settings and start and operate equipment.

##### **SPECIFIC OUTCOME 3**

Monitor and adjust the process as required.

##### **SPECIFIC OUTCOME 4**

Record settings and outputs.

##### **SPECIFIC OUTCOME 5**

Discuss and explain incidents and problems related to the equipment.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

4

## Transport materials, components or products in the tyre manufacturing process

SAQA US ID	UNIT STANDARD TITLE		
115055	Transport materials, components or products in the tyre manufacturing process		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION	SUBFIELD DESCRIPTION		
Manufacturing, Engineering and Technology	Manufacturing and Assembly		
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 2	12

**Specific Outcomes:****SPECIFIC OUTCOME 1**

Determine requirements from schedule and identify, collect and load materials onto equipment.

**SPECIFIC OUTCOME 2**

Check materials before and after storage and transport and identify damaged, contaminated.

**SPECIFIC OUTCOME 3**

Transport and load materials, components or products onto or into processing equipment.

**SPECIFIC OUTCOME 4**

Check condition of lifting and transport equipment.

**SPECIFIC OUTCOME 5**

Lift, transport and move materials, components or products after processing.

**SPECIFIC OUTCOME 6**

Record material quantities, report material usage and take corrective action on defective items.

**SPECIFIC OUTCOME 7**

Interact with other team members to clarify schedules and co-ordinate activities.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

5

#### Assemble tyres

SAQA US ID	UNIT STANDARD TITLE		
115058	Assemble tyres		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION	SUBFIELD DESCRIPTION		
Manufacturing, Engineering and Technology	Manufacturing and Assembly		
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 3	48

#### **Specific Outcomes:**

##### **SPECIFIC OUTCOME 1**

Check the condition, safety devices and availability of equipment, tools and components.

##### **SPECIFIC OUTCOME 2**

Prepare tools and equipment for operation and keep work area and equipment clean.

##### **SPECIFIC OUTCOME 3**

Assemble the first stage tyre.

##### **SPECIFIC OUTCOME 4**

Assemble the second stage tyre.

##### **SPECIFIC OUTCOME 5**

Identify defects, take corrective action or mark and place defective product in quarantine area.

##### **SPECIFIC OUTCOME 6**

Record and report incidents and problems.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

6

Liase with workgroup members to set up equipment and for production runs in tyre component manufacturing

SAQA US ID	UNIT STANDARD TITLE		
115113	Liase with workgroup members to set up equipment and for production runs in tyre component manufacturing		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION	SUBFIELD DESCRIPTION		
Manufacturing, Engineering and Technology	Manufacturing and Assembly		
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 3	7

**Specific Outcomes:****SPECIFIC OUTCOME 1**

Plan the production run and equipment set-up process.

**SPECIFIC OUTCOME 2**

Liase with workgroup members to co-ordinate and hand over activities.

**SPECIFIC OUTCOME 3**

Monitor activities against production requirements, identify problems and take corrective action.

**SPECIFIC OUTCOME 4**

Process applicable documentation.

**SPECIFIC OUTCOME 5**

Liase with fellow workers in terms of safety, housekeeping and environmental procedures.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

7

#### Monitor the quality of manufactured tyres

SAQA US ID	UNIT STANDARD TITLE		
115060	Monitor the quality of manufactured tyres		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 3	24

#### **Specific Outcomes:**

##### **SPECIFIC OUTCOME 1**

Determine type of test and the size and type of tyre and select appropriate test specifications.

##### **SPECIFIC OUTCOME 2**

Select and load tyres on quality testing equipment.

##### **SPECIFIC OUTCOME 3**

Set operating parameters and start and run the quality testing equipment.

##### **SPECIFIC OUTCOME 4**

Monitor testing process and unload tyres.

##### **SPECIFIC OUTCOME 5**

Collate and summarise data and compile reports.

##### **SPECIFIC OUTCOME 6**

Report, discuss and explain incidents and problems related to the quality testing process.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

8

## Operate and monitor compounding equipment for tyre component manufacturing

SAQA US ID	UNIT STANDARD TITLE		
115066	Operate and monitor compounding equipment for tyre component manufacturing		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 3	18

**Specific Outcomes:****SPECIFIC OUTCOME 1**

Check production schedules, determine compounds to be prepared and advise workgroup members.

**SPECIFIC OUTCOME 2**

Set the scale, check and weigh the received materials.

**SPECIFIC OUTCOME 3**

Set the mixer, start up, load the materials and monitor the compounding process.

**SPECIFIC OUTCOME 4**

Set the mill and process the mix to achieve the required thickness, consistency and temperature.

**SPECIFIC OUTCOME 5**

Carry out quality checks related to the material.

**SPECIFIC OUTCOME 6**

Label and store materials.

**SPECIFIC OUTCOME 7**

Care for and store material preparation tools and equipment.

**SPECIFIC OUTCOME 8**

Complete all applicable documentation and report on material quantities and tool and equipment.

**SPECIFIC OUTCOME 9**

Discuss and explain incidents and problems related to the material preparation process.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

9

#### Operate tyre-curing presses

SAQA US ID	UNIT STANDARD TITLE		
115059	Operate tyre-curing presses		
SGB NAME		ABET BAND	PROVIDER NAME
SGB Manufacturing and Assembly Processes		Undefined	
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 3	18

#### **Specific Outcomes:**

##### **SPECIFIC OUTCOME 1**

Inspect green tyres for defects and determine size and style.

##### **SPECIFIC OUTCOME 2**

Clean and spray mould and shape bladder.

##### **SPECIFIC OUTCOME 3**

Load and align green tyres and lay serial numbers in mould.

##### **SPECIFIC OUTCOME 4**

Set moulding parameters, activate curing equipment and monitor curing process.

##### **SPECIFIC OUTCOME 5**

Read and complete relevant documents and report and discuss incidents and problems.

##### **SPECIFIC OUTCOME 6**

Visually check cured tyres for defects and respond appropriately to any problems identified





## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

10

## Prepare tyre fabrics for coating

SAQA US ID	UNIT STANDARD TITLE		
115057	Prepare tyre fabrics for coating		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 3	18

**Specific Outcomes:****SPECIFIC OUTCOME 1**

Set up the equipment, splice roll to leader, start, run and adjust the process.

**SPECIFIC OUTCOME 2**

Load following rolls, splice to existing fabric and monitor the process.

**SPECIFIC OUTCOME 3**

Unload bag and seal rolls.

**SPECIFIC OUTCOME 4**

Lift, transport and store sealed rolls.

**SPECIFIC OUTCOME 5**

Determine the mix required, set mixing equipment and make dip coating solution.

**SPECIFIC OUTCOME 6**

Test and replenish dip coating solutions.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

11

#### Set up and operate calendring equipment to produce tyre components

SAQA US ID	UNIT STANDARD TITLE		
115114	Set up and operate calendring equipment to produce tyre components		
SGB NAME		ABET BAND	PROVIDER NAME
SGB Manufacturing and Assembly Processes		Undefined	
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 3	18

#### **Specific Outcomes:**

##### **SPECIFIC OUTCOME 1**

Determine quality & type of product required, plan the production run & liaise with workgroup.

##### **SPECIFIC OUTCOME 2**

Co-ordinate and check the supply of the required materials.

##### **SPECIFIC OUTCOME 3**

Prepare, load and attach the substrate.

##### **SPECIFIC OUTCOME 4**

Carry out equipment-related operations to achieve required quality and output rates.

##### **SPECIFIC OUTCOME 5**

Carry out quality checks related to the material, equipment and finished product.

##### **SPECIFIC OUTCOME 6**

Unload, label and store products.

##### **SPECIFIC OUTCOME 7**

Complete all applicable documentation and report on related matters.

##### **SPECIFIC OUTCOME 8**

Discuss and explain incidents and problems related to the component manufacturing.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

12

## Set up, operate and monitor extrusion equipment for tyre component manufacturing

SAQA US ID	UNIT STANDARD TITLE		
115067	Set up, operate and monitor extrusion equipment for tyre component manufacturing		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 3	18

**Specific Outcomes:****SPECIFIC OUTCOME 1**

Determine the quality and type of product required and plan the production run.

**SPECIFIC OUTCOME 2**

Co-ordinate the supply of the required materials, set the scale and check and weigh the received.

**SPECIFIC OUTCOME 3**

Remove, care for and store the tooling from the previous run; check and install new tooling.

**SPECIFIC OUTCOME 4**

Carry out equipment-related operations to achieve required quality and output rates.

**SPECIFIC OUTCOME 5**

Carry out quality checks related to the material, equipment and finished product.

**SPECIFIC OUTCOME 6**

Label and store products.

**SPECIFIC OUTCOME 7**

Complete all applicable documentation and report on matters related to.

**SPECIFIC OUTCOME 8**

Discuss and explain incidents and problems related to component manufacturing.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

13

#### Test tyre related products and identify faults

SAQA US ID	UNIT STANDARD TITLE		
115062	Test tyre related products and identify faults		
SGB NAME		ABET BAND	PROVIDER NAME
SGB Manufacturing and Assembly Processes		Undefined	
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 3	27

#### **Specific Outcomes:**

##### **SPECIFIC OUTCOME 1**

Determine priorities and test requirements and plan work accordingly.

##### **SPECIFIC OUTCOME 2**

Prepare samples, work area and equipment for the required tests.

##### **SPECIFIC OUTCOME 3**

Test samples and record data.

##### **SPECIFIC OUTCOME 4**

Evaluate test results, identify problems and respond appropriately.

##### **SPECIFIC OUTCOME 5**

Care for and store sample preparation and testing tools and equipment and follow quality procedures.

##### **SPECIFIC OUTCOME 6**

Complete and process all applicable documentation.

##### **SPECIFIC OUTCOME 7**

Discuss and explain incidents and problems related to product testing.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

14

## Change tooling and set up tyre component and tyre manufacturing equipment

SAQA US ID	UNIT STANDARD TITLE		
115064	Change tooling and set up tyre component and tyre manufacturing equipment		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION	SUBFIELD DESCRIPTION		
Manufacturing, Engineering and Technology	Manufacturing and Assembly		
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 4	29

**Specific Outcomes:****SPECIFIC OUTCOME 1**

Check production schedules and establish requirements from specifications.

**SPECIFIC OUTCOME 2**

Remove clean, service and return used tooling to the store.

**SPECIFIC OUTCOME 3**

Install and fit new tooling to the machine.

**SPECIFIC OUTCOME 4**

Set up equipment, load materials and co-ordinate activities.

**SPECIFIC OUTCOME 5**

Run first off, verify product quality, liaise with supervisor and handover to equipment operator.

**SPECIFIC OUTCOME 6**

Identify and correct problems, check manufacturing quality and equipment performance.

**SPECIFIC OUTCOME 7**

Complete relevant documentation, report and discuss problems and incidents with personnel.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

15

## Co-ordinate tyre manufacturing activities

SAQA US ID	UNIT STANDARD TITLE		
115065	Co-ordinate tyre manufacturing activities		
SGB NAME		ABET BAND	PROVIDER NAME
SGB Manufacturing and Assembly Processes		Undefined	
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 4	8

**Specific Outcomes:****SPECIFIC OUTCOME 1**

Read production schedules and determine production priorities and requirements.

**SPECIFIC OUTCOME 2**

Plan and determine material and equipment requirements.

**SPECIFIC OUTCOME 3**

Communicate requirements and confirm delivery time.

**SPECIFIC OUTCOME 4**

Check received materials.

**SPECIFIC OUTCOME 5**

Report delays and material and equipment related problems and complete applicable documentation.

**SPECIFIC OUTCOME 6**

Evaluate effectiveness and efficiency of activities and resolve conflicts, complaints and problems.

**SPECIFIC OUTCOME 7**

Inform workgroup of issues and discuss these with workgroup.

**SPECIFIC OUTCOME 8**

Explain procedures and encourage workgroup members to follow them.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

16

## Plan and set up testing programme to investigate quality issues and recommend changes

SAQA US ID	UNIT STANDARD TITLE		
115112	Plan and set up testing programme to investigate quality issues and recommend changes		
SGB NAME	ABET BAND	PROVIDER NAME	
SGB Manufacturing and Assembly Processes	Undefined		
FIELD DESCRIPTION		SUBFIELD DESCRIPTION	
Manufacturing, Engineering and Technology		Manufacturing and Assembly	
UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-SGB MAP	Regular	Level 4	20

**Specific Outcomes:****SPECIFIC OUTCOME 1**

Determine the testing requirements and plan the testing programme and the required changes.

**SPECIFIC OUTCOME 2**

Liaise with workgroup members and co-ordinate changes to testing machines.

**SPECIFIC OUTCOME 3**

Verify the test settings, brief the responsible operator and monitor testing process.

**SPECIFIC OUTCOME 4**

Analyse test results and identify faults, trends and patterns.

**SPECIFIC OUTCOME 5**

Compile reports, make recommendations and discuss with appropriate personnel.