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**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 & Assembly Processes**

registered by Organising Field 06 – Manufacturing, Engineering and Technology, publishes the following Qualification for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the Qualification. The full Qualification 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, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the Qualification should reach SAQA at the address below and ***no later than 13 August 2007***. All correspondence should be marked **Standards Setting – Manufacturing & Assembly Processes** and addressed to

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DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**QUALIFICATION:**  
**National Certificate: Metals Processing**

SAQA QUAL ID	QUALIFICATION TITLE		
58719	National Certificate: Metals Processing		
ORIGINATOR	PROVIDER		
SGB Manufacturing and Assembly Processes			
QUALIFICATION TYPE	FIELD	SUBFIELD	
National Certificate	6 - Manufacturing, Engineering and Technology	Engineering and Related Design	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS
Undefined	120	Level 3	Regular-Unit Stds Based

**PURPOSE OF THE QUALIFICATION**

Purpose:

This qualification is designed to enhance the skills of the workforce to efficiently process a range of customer input materials and/or products, to compete in a dynamic and competitive global market.

This qualification recognises the skills, knowledge and values acquired by learners involved in setting up a metals processing operation to continuously produce a range of products using a range of often technologically advanced production equipment and/or machines, to specified customer specification. Learning to oversee the metals processing operation is dealt with in the NQF Level 4 qualification.

The chief skill learnt in this qualification is the ability to bring the production line back into specification by responding to equipment indicators when deviations occur. This capability requires a more advanced understanding of quality requirements and the metals processing/production process.

On completion, the learner will receive recognition for the ability to:

- Process a range of ferrous and non-ferrous metals products for both domestic and international markets.
- Inspect, prepare and load material.
- Inspect, monitor and adjust the operation of a metals processing/production process and report equipment operation.
- Monitor and adjust product processing.
- Solve known associated/routine problems.
- Check the processed product against quality standards.
- Function in workplaces that use such processes.

Qualified learners will also understand:

- Their role in the business, i.e. in production and related activities and how their actions affect the business.
- How they are affected by legislation, regulations, agreements and policies related to their particular working environment.

- How they should function and participate within the legislative, safety, health, environmental, quality and risk management systems that govern their workplace.
- How to apply the various organisational policies and procedures.

Qualifying in the exit level outcomes will enable learners to effectively perform a range of workplace activities. What learners achieve in this qualification will also serve as a basis for further learning within the supervisory and/or management of such Metals Processing environments. Learners will also further develop their foundational competence in mathematics, science, reading, writing and speaking relevant to the Metals Processing industry.

#### Rationale:

The Metals Processing industry is a complex and specialised industry supplying a vast range of products, currently manufactured by semi-skilled labour, primarily operating simple manually operated production machines or equipment, according to international, customer and relevant ISO standards. The processing of metals typically includes but is not limited to the treatment, conversion and finishing of ferrous and non-ferrous metal products through:

- Electroplating.
- Hot dip galvanizing.
- Powder coating.
- Enamelling.
- Anodising.
- Wire manufacturing.

This qualification follows on the NQF Level 2 qualification and further develops the skills and knowledge required in Metals Processing. At NQF Level 4 learners engage with the National Certificate: Management (ID # 23656), appropriate to first line supervisors and junior managers.

This series of qualifications will enable learners to:

- Develop their existing skills level and progress vertically in a selected career path in Metals Processing/production processes.
- Receive recognition for learning achieved.
- Obtain skills and knowledge portable within similar processing industries.
- Gain access to higher levels of learning and learning provision.
- Access opportunities to progress in their personal life and career, and add value to the operations in which they function.
- Contribute to the growth of the South African economy and the development of society.

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

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#### **LEARNING ASSUMED IN PLACE**

This qualification assumes learners have obtained a National Certificate in Metals Processing: NQF Level 2 or equivalent.

If the learner does not already have such a qualification, learning in preparation for this qualification would also have to include learning in:

- Literacy and numeracy at NQF Level 2.
- Basic concepts of science and technology related to material, machinery and equipment in use in production processes at NQF Level 2.
- Basic concepts regarding organising factors in labour, business and the economy.
- Purpose of procedures related to the workplace, governing:
  - Relationships.

- Roles.
- Responsibilities.

#### Recognition of Prior Learning:

This qualification may be obtained through a process of RPL. The learner should be thoroughly briefed prior to the assessment and support provided and guidance should be provided to assist in the process of developing a portfolio. 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.

Care should be taken that the process used provides the learner with an opportunity to demonstrate competence and is not too demanding as to prevent learners from taking up the RPL option towards gaining a qualification.

#### Access to the Qualification:

This qualification is designed for learners who:

- Are new-entry workers to a machine-based metals processing/production process.
- Preferably completed the National Certificate: Metals Processing NQF level 2.
- Have attended courses and applied the knowledge gained in the workplace.
- Are already workers and have acquired the skills and knowledge without attending formal courses.
- Are part of a learnership programme, which integrates structured learning, and work experience.

Access for learners with physical disabilities is dependant:

- On the type and severity of disability.
- On the nature of Metals Processing and the requirements of equipment operation.

#### **QUALIFICATION RULES**

In order to be awarded this qualification, learners have to be declared competent in:

- All listed unit standards in the Fundamental category of the qualification totalling 40 credits.
- All listed unit standards in the Core category of the qualification totalling 74 credits.
- A choice of unit standards from the Elective category of the qualification totalling a minimum of 6 credits.

#### **EXIT LEVEL OUTCOMES**

1. Demonstrate an ability to prepare and set up the process for metals processing, working safely and with due care for fellow workers and the environment.
2. Demonstrate the ability to monitor and control a ferrous and/or non-ferrous metal processing operation.
3. Select appropriate procedures to solve familiar problems within Metals Processing operations and operate within clearly defined contexts, with some scope for personal decision-making and responsibility.
4. Communicate with team members, internal customers and members of supervisory/management levels by demonstrating the ability to gather and summarise relevant information from a range of sources and report this information.
5. Handle and resolve interpersonal conflict in the workplace.

**ASSOCIATED ASSESSMENT CRITERIA**

## Associated Assessment Criteria for Exit Level Outcome 1:

- Appropriate materials/consumables tools and instruments are used to make adjustments or changes to process equipment set up.
- Equipment specifications and manufacturing requirements are complied throughout the process.
- Process equipment availability and readiness for manufacturing processes is maintained in accordance with specifications.
- A clean and safe work area is maintained in accordance with requirements.
- Applicable policies and procedures are applied and adhered to at all times.
- Questions are responded to and issues related to process equipment set up activities relevant to the outcomes are discussed in relation to metals processing.

## Associated Assessment Criteria for Exit Level Outcome 2:

- The production line is brought back into specification by responding to equipment indicators when deviations occur.
  - Includes monitoring and controlling of the operation.
- Quality, safety, health, environmental and risk management specifications are adhered to throughout the metal processing operation.
- Production processes are selected and used in accordance with specifications.

## Associated Assessment Criteria for Exit Level Outcome 3:

- Appropriate procedures are selected to solve problems in an efficient and effective manner.
- Unfamiliar problems are accurately reported to appropriate personnel.
- Questions and issues related to familiar problems in the setting up, monitoring and control of process equipment for metals processing are discussed with examples.

## Associated Assessment Criteria for Exit Level Outcome 4:

- Relevant information is gathered from a range of sources and accurately summarised and reported in an appropriate and timely manner to relevant parties.
- Production issues in work area discussed and resolved on a regular basis with other team members, internal customers and supervisors/management.

## Associated Assessment Criteria for Exit Level Outcome 5:

- Information is collected from a range of role-players, considering feelings and the actual problem.
- A range of conflict resolution methods and behaviour of different people in a conflict situation is considered, choosing that most appropriate to the situation.
- The conflict situation is resolved in accordance with organizational standards.

## Integrated Assessment:

Integrated assessment at the level of the qualification provides an opportunity for learners to show they are able to integrate concepts, actions and ideas achieved across a range of unit standards and contexts.

Integrated assessment must evaluate the quality of observable performance as well as the thinking behind the performance, and must be based on a summative assessment guide. The guide will spell out how the assessor will assess different aspects of the performance and will include:

- Observing the learner at work (both in the primary activity as well as other interactions).
- Asking questions and initiating short discussions to test understanding.
- Looking at records and reports in the portfolio and reviewing previous assessments.

In some cases inference will be necessary to determine competence depending on the nature and context within which performance takes place.

It is necessary to ensure that the fundamental part of the qualification is also targeted to ensure that while the competence may have been achieved in a particular context, learners are able to apply it in a range of other contexts and for further learning. The assessment should also ensure that all the critical cross-field outcomes have been achieved.

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 both the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities associated with Metals Processing.

#### **INTERNATIONAL COMPARABILITY**

Extensive use was made of the links to other international qualification authorities provided on SAQA's website. Further to this, Internet searches using a range of search engines were conducted for any reference to standards, unit standards, competency standards, qualifications and skills programmes. Relatively little sources of outcomes-based, standards-based and/or learning material could be found during Internet searches.

The only information found was on the New Zealand Qualifications Authority website, through a link on the website of EXITO Training Organisation situated in Christchurch, New Zealand. At the time of finalising this qualification EXITO had not yet responded to our request for information on the curriculum of their learning programmes towards the National Certificate in Hot Dip Galvanizing: NQF Levels 2, 3 and 4.

The comparison was made difficult because neither the fundamental learning elements nor some of the generic core elements are specified. A further complication is brought about by the fact that the learning required crosses several levels. Further to this, the New Zealand qualification does not specify the level of complexity that has to be achieved. The applied competence in the South African qualification focuses on achieving a specific level of competence required by a person working in a real-world metals processing context in which a degree of specialisation, experience and problem-solving ability is required.

Further comparison elements are highlighted below.

Comparison Element; New Zealand Metals Finishing qualifications; This Metals Finishing qualifications suite:

- Scope; Nominal competence in a wide range of processing methods; Mastery of specific fabrication methods in context.
- Approach; Task based; Skills development-based.
- Level(s); Level 2, 3 and 4; Level 2, 3 and 4.
- Context; Partly contextualised; Contextual.
- Assessment; Institution or work-based; Work-based and portfolio-based.
- Essential embedded knowledge; Not clear; Specified.
- Credits; 49, 82 and 144 respectively; 120, 120 and 139 respectively.
- Fundamental learning; Not formally specified; Specified.

- Business relations; Not formally specified; Specified.
- Working with and developing others; Not formally specified; Specified.
- Life skills; Not formally specified; Specified.

There are considerable similarities in the competencies required but the approach of the South African qualification looks at whole-person development in not only technological, but also in team- and business-related skills and makes explicit assumptions related to level of schooling and life skills.

Additional to this, subject matter experts in this field contacted their international counterparts to establish what learning processes they have available. There is evidence of training material, although not aligned to any formal qualification framework. This material is however, available at a cost. Comparison between this qualification and any other international model was therefore not possible. Due to their uniqueness, Metals Processing operations situated in other African countries could utilise and benefit from these qualifications.

It was evident that the technical content of this qualification for Metals Processing is of similar quality and value to learners and the provision of learning according to NQF principles.

### **ARTICULATION OPTIONS**

The qualification has been designed and structured so that qualifying learners can move both horizontally from one area of specialisation to another, and vertically, further specialising in a particular skills area.

This qualification articulates horizontally with the following qualifications:

- ID 21012: National Certificate: Power and Telecommunication Cable Manufacturing, NQF Level 3.

This qualification articulates vertically with the following qualifications:

- ID 23656: Further Education and Training Certificate: Management, NQF Level 4.
- ID 21013: National Certificate: Power and Telecommunication Cable Manufacturing, NQF Level 4.

The qualification should also, in terms of the fundamental, non-manufacturing unit standards and other portable skills, articulate with any other qualification at level 3 in the fields of:

- Engineering.
- Machine-based production processes such as Product Coating and Metal Production.

This qualification has been designed so that the learner can meaningfully articulate into the Higher Education and Training band once s/he has obtained the NQF Level 4 qualification, Further Education and Training Certificate: Management (ID 23656).

Employers, learners and/or institutions should be able to evaluate the outcomes of these qualifications against the needs of a production 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 or more of the following:

- Assessor credentials.
- The assessment instrument(s).
- The assessment process (including preparation and post-assessment feedback).

### CRITERIA FOR THE REGISTRATION OF ASSESSORS

The following criteria should be applied by the relevant ETQA:

1. At least the NQF Level 3 Metals Processing qualification, supplemented by the NQF Level 4 Management qualification ID 23656, with relevant workplace experience of at least 12 months in the field of Metals Processing. The subject matter experience 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 the ability to balance the conflicting requirements of:
  - Maintaining national standards.
  - The interests of the organisation.
  - 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

N/A

### UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	9883	Adjust and maintain production machinery	Level 3	30
Core	13234	Apply quality procedures	Level 3	8
Core	9914	Handle and care for materials	Level 3	12
Core	13918	Manage time and the work process in a business environment	Level 3	4
Core	9913	Perform first line maintenance	Level 3	14
Core	116720	Show understanding of diversity in the workplace	Level 3	3
Core	9533	Use communication skills to handle and resolve conflict in the workplace	Level 3	3
Elective	116024	Operate an effluent treatment plant	Level 2	12
Elective	13912	Apply knowledge of self and team in order to develop a plan to enhance team performance	Level 3	5
Elective	13223	Apply safety, health and environmental protection procedures	Level 3	6
Elective	9887	Coat material and components	Level 3	4
Elective	12429	Develop a personal financial plan	Level 3	2
Elective	12457	Develop learning strategies and techniques	Level 3	3
Elective	242820	Maintain records for a team	Level 3	4
Elective	13260	Perform non-destructive tests on metal parts and components	Level 3	6
Elective	12455	Perform the role of a safety, health and environmental protection representative	Level 3	4
Elective	242816	Conduct a structured meeting	Level 4	5
Elective	242821	Identify responsibilities of a team leader in ensuring that organisational standards are met	Level 4	6
Fundamental	119472	Accommodate audience and context needs in oral/signed communication	Level 3	5
Fundamental	9010	Demonstrate an understanding of the use of different number bases and measurement units and an awareness	Level 3	2



	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
		of error in the context of relevant calculations		
Fundamental	13915	Demonstrate knowledge and understanding of HIV/AIDS in a workplace, and its effects on a business sub-sector, own organisation and a specific workplace	Level 3	4
Fundamental	9013	Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	9012	Investigate life and work related problems using data and probabilities	Level 3	5
Fundamental	119467	Use language and communication in occupational learning programmes	Level 3	5
Fundamental	7456	Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	5
Fundamental	119465	Write/present/sign texts for a range of communicative contexts	Level 3	5