No. 593 **13 July 2007**

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 and Unit Standard for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the Qualification and Unit Standard. The full Qualification and Unit Standard can be accessed via the SAQA web-site at **www.saqa.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 and Unit Standard 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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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
National Certificate: Metals Processing

SAQA QUAL ID	*QUALIFICATION TITLE*		
58718	National Certificate: Metals Processing		
ORIGINATOR		*PROVIDER*	
SGB Manufacturing and Assembly Processes			
QUALIFICATION TYPE	*FIELD*	*SUBFIELD*	
National Certificate	6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly	
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUAL CLASS*
Undefined	120	Level 2	Regular-Unit Stds Based

PURPOSE OF THE QUALIFICATION
Purpose:

This qualification is designed to empower learners to operate efficiently in a Metals Processing environment supplying quality product to a highly competitive global market.

This qualification recognises the skills, knowledge and values acquired by learners involved in the continuous and repetitive processing of a range of products, with little variation.

The chief skills learnt in this qualification are recognising and responding to observable changes that happen during Metals Processing. This capability requires a fundamental understanding of quality requirements and of metals processing. Hand skills play a large role in this qualification as evident through operating a production process and selecting, using and caring for engineering measuring equipment.

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

- Prepare material, equipment and/or process in line with product and scheduling requirements.
- Operate simple manually operated production machines.
- Inspect and report equipment operation.
- Monitor and adjust equipment operation and process.
- Solve known associated/routine problems.
- Process a limited range of products/metals.
- Check the processed metals/product against quality standards.
- Function in workplaces that use such processes.

Qualified 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 working environment.
- How they should function within the legislative, safety, health, environmental, quality and risk management systems that govern their workplace.
- How to apply the various policies and procedures related to these systems.

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 Metals Processing. Learners will also have 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 is the first in a series of qualifications in metals processing starting at NQF Level 2 and progressing to NQF Level 3. 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.
- 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?
Y

LEARNING ASSUMED IN PLACE
This qualification assumes learners have a National Certificate (GETC) in Manufacturing, Engineering and Related Activities: NQF Level 1 or equivalent.

If the learner does not already have such a qualification, learning in preparation for this qualification would also have to include NQF Level 1 learning in:

- Literacy and numeracy.
- Basic concepts of science and technology.

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 Metals Processing.
- 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 dependent:

- 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 45 credits.
- All listed unit standards in the Core category of the qualification totalling 42 credits.
- A choice of unit standards from the Elective category of the qualification totalling a minimum of 33 credits.

EXIT LEVEL OUTCOMES

1. Understand the production process and the quality requirements and recognise and respond to changes in the production process that will result in reduced levels of safety, health, quality or efficiency.

2. Demonstrate an ability to prepare and process/surface finish ferrous and/or non-ferrous materials and/or products.

3. Apply appropriate procedures to solve familiar problems and emergencies within Metals Processing and operate within clearly defined contexts, with limited scope for personal decision-making and responsibility.

4. Communicate and work effectively with peers and members of supervisory/management levels.
   - Range: This includes understanding the purpose of the organization, own role in organization and explains options for further learning.

ASSOCIATED ASSESSMENT CRITERIA

Associated Assessment Criteria for Exit Level Outcome 1:

- Production of scrap or faulty product is minimised in accordance with quality requirements.
- Changes and responses are accurately and clearly (orally or in writing) reported in accordance with organizational requirements.
- A clean and safe work area is maintained in relation to procedures.
- Questions are responded to and issues related to production and relevant to the outcomes are discussed with examples.
- Applicable policies and procedures are applied and adhered to at all times.

Associated Assessment Criteria for Exit Level Outcome 2:

- Production equipment and/or process is prepared, started up and shut down.
- Materials and/or product is prepared and processed in accordance with specifications.
- Simple adjustments or changes are made to equipment and process.
- Product quality is monitored throughout the process.
- Applicable policies and procedures are applied and adhered to at all times.
- Problems, changes and/or malfunctions are recognised and reported in accordance with organizational requirements.
- Questions are responded to and issues related to preparing and processing/surface finishing ferrous and/or non-ferrous materials and/or products are discussed with examples.

Associated Assessment Criteria for Exit Level Outcome 3:

- Procedures to solve problems and deal with emergencies are applied in accordance with requirements.
- Problems are accurately reported to appropriate personnel.
- Questions are responded to and issues related to familiar problems are discussed within metals processing context.

Associated Assessment Criteria for Exit Level Outcome 4:

- Regular and ongoing communication is conducted.
- Daily work schedules and production issues are discussed on a regular basis with other team members.
- Information relevant to own work context and production process are gathered, recorded and reported when required and in an appropriate manner.
- Options for further learning in this or a related field of learning are identified and preparation requirements for such learning are explained with examples.

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.

Since this is a foundational qualification, 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); NQF Level 2, 3 and 4; NQF 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 21011: National Certificate: Power and Telecommunication Cable Manufacturing: NQF Level 2.

This qualification articulates vertically with the following qualifications:

- ID 58719: National Certificate: Metals Processing at NQF Level 3.
- ID 21012: National Certificate: Power and Telecommunication Cable Manufacturing at NQF Level 3.

The qualification should also, in terms of the fundamental, non-manufacturing unit standards and other portable skills, articulate with any other qualification at NQF Level 2 in the fields of:

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

The qualification has been designed so that the learner can meaningfully articulate into the Higher Education and Training band once s/he has obtained a NQF Level 3 qualification in Metals Processing, supported by further learning at NQF Level 4 in the National 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 this 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 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	13222	Deal with safety, health and environmental emergencies in the workplace	Level 2	4
Core	120402	Demonstrate an understanding of introductory principles of chemistry and physics	Level 2	5
Core	12466	Explain the individual's role within business	Level 2	4
Core	244338	Operate a production process	Level 2	15
Core	13258	Participate in work group activities	Level 2	4
Core	12476	Select, use and care for engineering measuring equipment	Level 2	4
Core	12456	Explain and use organisational procedures	Level 3	6
Elective	117867	Managing files in a Graphical User Interface (GUI) environment	Level 1	3
Elective	116932	Operate a personal computer system	Level 1	3
Elective	117902	Use generic functions in a Graphical User Interface (GUI)-environment	Level 1	4
Elective	9909	Identify and process waste	Level 2	4
Elective	9268	Manage basic personal finance	Level 2	6
Elective	242976	Operate overhead/gantry cranes	Level 2	5
Elective	12484	Perform basic fire fighting	Level 2	4
Elective	12483	Perform basic first aid	Level 2	4
Elective	9919	Prepare metal surfaces	Level 2	6
Elective	12481	Sling loads	Level 2	4
Elective	12463	Understand and deal with HIV/AIDS	Level 2	3
Elective	13223	Apply safety, health and environmental protection procedures	Level 3	6
Elective	115093	Control workplace hazardous substances	Level 3	4
Elective	117171	Manage time effectively to enhance productivity and enable a balanced lifestyle	Level 3	2
Elective	242974	Operate counter-balanced lift truck	Level 3	7
Fundamental	119463	Access and use information from texts	Level 2	5
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
Fundamental	12461	Communicate at work	Level 2	5
Fundamental	7480	Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3
Fundamental	12465	Develop a learning plan and a portfolio for assessment	Level 2	6
Fundamental	9008	Identify, describe, compare, classify, explore shape and motion in 2-and 3-dimensional shapes in different contexts	Level 2	3
Fundamental	119454	Maintain and adapt oral/signed communication	Level 2	5
Fundamental	12444	Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts	Level 2	3
Fundamental	119460	Use language and communication in occupational learning programmes	Level 2	5
Fundamental	7469	Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2
Fundamental	9007	Work with a range of patterns and functions and solve problems	Level 2	5

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UNIT STANDARD:

Operate a production process

SAQA US ID	*UNIT STANDARD TITLE*		
244338	Operate a production process		
ORIGINATOR		*PROVIDER*	
SGB Manufacturing and Assembly Processes			
FIELD		*SUBFIELD*	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	15

SPECIFIC OUTCOME 1
Prepare for start up.

SPECIFIC OUTCOME 2
Start equipment and/or process.

SPECIFIC OUTCOME 3
Operate manufacturing equipment and/or process.

SPECIFIC OUTCOME 4
Shut down manufacturing equipment and/or process.

SPECIFIC OUTCOME 5
Conduct post-operating processes.