STAATSKOERANT, 13 JULIE 2007

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 and 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 <u>www.saqa.org.za</u>. 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 and Assembly Processes** and addressed to

The Director: Standards Setting and Development SAQA Attention: Mr. D. Mphuthing Postnet Suite 248 Private Bag X06 Waterkloof 0145 or faxed to 012 – 431-5144 e-mail: dmphuthing@saqa.org.za

DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION: Further Education and Training Certificate: Production Technology

SAQA QUAL ID	QUALIFICATION TITLE			
58779	Further Education and Training Certificate: Production Technology			
ORIGINATOR		PROVIDER		
SGB Manufacturing and A	ssembly Processes			
QUALIFICATION TYPE	FIELD	SUBFIELD		
Further Ed and Training	6 - Manufacturing,	Manufacturing and Assembly		
Cert	Engineering and			
	Technology			
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS	
Undefined	143	Level 4	Regular-Unit Stds	
			Based	

PURPOSE OF THE QUALIFICATION Purpose:

The combination of learning outcomes that comprise this qualification will provide the qualifying learner with vocational knowledge and skills appropriate to the context of production technology. This qualification provides learners with the range of learning and skills required to be able to perform a series of activities to support manufacturing, engineering and technology processes. Learners will acquire a range of skills in the identification of production parameters in manufacturing, engineering and technology industries and basic strategies to achieve them.

The qualifying learner will be able to:

- Measure, control and improve factors influencing productivity.
- Contribute to budgeting processes in an operational unit to optimise resources.
- Solve operational problems in a production process.
- Promote, implement and maintain procedures that support quality assurance and control.

This qualification is the third qualification in a pathway of three (3) qualifications for learners in the production technology environment.

Rationale:

As a result of an increased need for efficient and quality production processes in the manufacturing, engineering and technology field, the demand for production technology competencies has become more evident.

This qualification contributes to the industries in manufacturing and related fields which will allow learners who achieve the qualification to contribute and function in areas such as production planning and control, optimisation, systems and maintenance, logistics, quality and occupational health and safety. Learners who will typically embark on this qualification are individuals who have an interest in a career in production technology. The production technology competencies incorporated in this qualification can also be offered as support skills programmes to incumbents in any other manufacturing, engineering and technology field qualifications.

This qualification will add value to a specific manufacturing, engineering and technology context by complementing contexts specific qualifications within these sectors. The supportive

Source: National Learners' Records Database	Qualification 58779	06/07/2007	Page 1

relationship between occupational qualifications and this suite of qualifications is embedded in the inclusion of production technology competencies that have previously not been included in mainstream production, manufacturing and technological qualifications in order to address these identified gaps.

The qualifications available in production technology are either provider-based qualifications or national qualifications at NQF Level 5. There are no lower level qualifications that allow a learner access into this specific discipline. These qualifications have therefore been designed in such a way to firstly, facilitate the building of a pool of people that can choose a career in a production, engineering, manufacturing field and secondly, to allow any of the manufacturing and related qualifications to utilise the production technology qualifications as entry qualifications in these industries, since they would include the production technology competencies that these industries require; Thirdly, the qualifying learner will also gain access to further learning as a supervisor or in a managerial position within this specific production environment; and lastly, therefore have a learning pathway to access higher education programmes in this discipline.

This qualification will facilitate the formalising, recognition and strengthening of a historically neglected discipline that will be able to contribute towards an efficient, effective, healthy, safe and productive manufacturing, engineering and technology environments, through encompassing applied knowledge, skills, attitudes and values.

RECOGNIZE PREVIOUS LEARNING?

LEARNING ASSUMED IN PLACE

Communication at NQF Level 3.

Mathematical literacy NQF Level 3.

• Apply the fundamental concepts, theories and techniques of production systems, NQF Level 3.

• Apply the fundamental concepts relating to production planning, scheduling and control, NQF Level 3.

• Apply quality control and quality assurance practices for efficient and effective production processes, NQF Level 3.

Recognition of Prior Learning:

The Qualification may be obtained in whole or in part through the process of Recognition of Prior Learning. Learners who may meet the requirements of any Unit Standard in this Qualification may apply for recognition of prior learning to the Relevant ETQA, and will be assessed against the assessment criteria of the exit level outcomes of this qualification and specific outcomes for the relevant Unit Standard/s.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution, which is accredited by the relevant ETQA.

Access to the qualification:

• Open access.

QUALIFICATION RULES

All fundamental units standards to the value of 56 credits must be completed. All core unit standards to the value of 67 credits must be completed. Learners must complete unit standards to the value specialisation, of at least 20 credits from the specialisation or general elective unit standards.

EXIT LEVEL OUTCOMES

Source: National Learners' Records Database

Qualification 58779

06/07/2007

1. Measure, control and improve factors influencing production.

• Range: Factors include not limited to MRP, Just in Time (JIT), logistics, supply chains, value chains, labour, materials, capacity planning, maintenance, scheduling and planning, ergonomics, capability studies, work study techniques, statistical process control, reliability studies.

2. Contribute to budgeting processes in an operational unit to optimise resources.

Solve operational problems in a production process.

4. Promote, implement and maintain procedures that support quality assurance and control.

ASSOCIATED ASSESSMENT CRITERIA

Associated Assessment Criteria for Exit Level Outcome 1:

1.1 Factors affecting production are identified and their influence explained in order to improve productivity.

1.2 Appropriate techniques for process measurement and improvement are identified and applied to contribute to process improvement.

1.3 Process control standards are monitored and adjustments are made to the process in order to meet production targets.

1.4 Process improvement interventions are evaluated for sustainability.

1.5 Opportunities for continuous improvement are identified and strategies for implementation are formulated.

Associated Assessment Criteria for Exit Level Outcome 2:

2.1 Opportunities for reducing the cost factors in a production process are identified to minimise operational costs.

2.2 Resource requirements are communicated for inclusion in budget estimations.

2.3 Expenditure is analysed in terms of budgeted costs to inform operational cost control actions.

2.4 The importance of cost control is explained and demonstrated to ensure budget adherence.

Associated Assessment Criteria for Exit Level Outcome 3:

3.1 Operational problems are identified and analysed to determine root causes.

3.2 Possible solutions are generated and evaluated using problem solving techniques.

3.3 Alternatives evaluated and appropriate remedy implemented to overcome identified problem area.

3.4 Verbal and non-verbal communication skills are used effectively in the workplace.

3.5 A range of communication strategies are identified and utilised to solve manufacturing related problems.

3.6 Conditions, evidence and incidences are reported accurately in a timely manner and discussed with peers and management.

3.7 Solutions are monitored over time to ensure their effectiveness.

Associated Assessment Criteria for Exit Level Outcome 4:

4.1 Quality costs are identified and explained to understand the economics of quality.

4.2 Explore the concept of an environmental quality system as it relates to a workplace, and conduct a basic analysis.

4.3 Deviations and non-conformances are investigated and reported on to avoid recurrences.4.4 Quality control techniques are explored and introduced to a workplace to minimise defects and wastage.

Source: National Learners' Records Database

Qualification 58779

06/07/2007

Integrated Assessment:

Formative assessments conducted during the learning process will consist of written assessments, simulation in a practical environment and a number of self-assessments.

Summative assessment consists of written assessments, assignments and simulation in a practical environment, integrating the assessment of all unit standards and embedded knowledge. Summative assessments is only conducted once the learner has demonstrated proficiency during formative assessment.

In particular assessors should check that the learner is able to demonstrate the ability to consider a range of options and make decisions about:

• The quality of the observed practical performance as well as the theory and embedded knowledge behind it.

• The different methods that can be used by the learner to display thinking and decision making in the demonstration of practical performance.

• Reflexive competencies.

INTERNATIONAL COMPARABILITY

An extensive and comprehensive internet search was conducted to compare and benchmark the proposed qualifications with any similar qualifications in the developing and developed world nations.

The search focussed on a number of specific geographical regions which included Africa, the Americas, Western Europe, Asia and the countries south of the southern tip of Africa including New Zealand and Australia.

The search was conducted using key words or phrases that included production technologist, production technology, production qualifications, qualifications manufacturing, engineering, production and/ assembly, as well as search within the various aspects of each qualification.

No comparisons could be found which indicates that South Africa is leading the field in this particular line of study. Factors featured in the qualifications were evident in some cases but not in the encompassing format that is being proposed.

The factors detected were restricted to part of:

- Operations Management.
- Logistics.
- Quality.
- Productivity.
- Safety.

Based on the above it is thus evident that it will be impossible to provide an extensive list of relational material and what follows is a comprehensive and encompassing list of search conducted.

The following qualification authorities were searched:

- Scottish Qualifications Authority.
- New Zealand Qualifications Authority.
- United Kingdom Qualifications and Curriculum Authority.
- National Qualifications Authority of Ireland.
- Victorian Qualifications Authority (Australia).
 Source: National Learners' Records Database
 Qualification 58779

06/07/2007

Page 4

- Tasmanian Qualifications Authority.
- Mauritius Qualifications Authority*.
- Australian Qualifications Framework.
- Botswana Training Authority*.
- National Training Agency Trinidad and Tobago.

Other sites:

- Kenya Education Network*.
- Department of Education Philippines (Technical Skills Development).
- Department of Technical Education India.
- Ministry of Education Egypt*.
- Ministry of Education Ethiopia*.
- Ministry of Education Zimbabwe*.
- Ministry of Education Israel.
- Ministry of Education France.
- Ministry of Education Peru.
- Ministry of Education Sri Lanka.
- Ministry of Education Taiwan.
- • Indicates Africa.

The following qualifications were found which have reference to the proposed interventions:

Institution; Qualification; Related NQF Level; Finding:

• New Zealand Qualifications Authority; National Certificate Manufacturing and Engineering; Level 2; Expired, only relative to safety aspects.

• New Zealand Qualifications Authority; National Certificate Manufacturing and Engineering; Level 3; Expired, only focuses on machinery.

• United Kingdom Qualifications and Curriculum Authority (Wales); Certificate Production Line Control; Level 4; Focuses only on Production Technology.

• Tasmanian Qualifications Authority; Manufacturing Studies; Level 3/4; Focuses on materials process, methodologies and statistical process control.

• Australian Qualifications Framework; Certificate iv (Pre apprenticeship); Level 4; Workplace Technology.

The following unit standards were sourced which resemble components of the proposed qualifications:

Level 2:

- PRSS0101A/01; Follow workplace safety procedures; Australia.
- ZWAWSM32A/05; Follow workplace quality procedures; Australia.
- AUR61510A/02; Implement procedures to improve productivity; Australia.

Level 3:

- ARU39508A; Carry out Warehousing Procedures; Australia.
- MEAC06A; Apply quality standards to manufacturing process; Australia.
- RUAAG5300CTA; Implement and maintain quality assurance procedures; Australia.
- BSBFFLM506A; Manage workplace information system; Australia.
- ICS1A; Contribute to workplace improvements; Australia.
- ZWAGEN305A; Solve workplace problems; Australia.
- MEM14.2BA; Basic process planning; Australia.

Source: National Learners' Records Database

Qualification 58779

• D/103/0746; Configure and set processing systems to meet production requirements; United Kingdom.

- Y/101/1063; Production planning and scheduling; United Kingdom.
- Y/101/1063; Production planning and scheduling; United Kingdom.

Level 4:

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- Plan and Organise Production; AUM3401A; Australia.
- Compile a production schedule; CUFP0P03B; Australia.
- Control Production; ICPSU56EA; Australia.
- Contribute to production control tasks; 137; Australia.
- Compile a production schedule; CUFP0P03B; Australia.
- Contribute to production planning; LMTPRGN06A; Australia.
- Plan production; LMTPRGN07A; Australia.
- Prepare a simple production schedule; MEM 30; Australia.
- Participate in improving workplace productivity; AUR61447A; Australia.
- FDFOPTSPC2A; Apply principals of Statistical Process Control; Australia.
- MNC.045.A; Apply and Monitor environmental Management policies, plans and procedures; Australia.
- MCMT452A; Apply statistics to processes in Manufacturing; Australia.
- Coordinate improvement of workplace productivity; AUR61510A; Australia.

ARTICULATION OPTIONS

This qualification has been developed as the third qualification in Production Technology and is intended to provide a career in its own right, as well as to facilitate progression to other manufacturing and assembly qualifications. Learners can move horizontally or vertically between related qualifications, although in most cases, some standards will be required horizontally before moving to another qualification vertically.

This qualification articulates horizontally with any Level 4 qualification in the broad manufacturing, engineering and technology related sectors such as:

- Metal.
- Tyre.
- Auto.
- Motor.
- Plastics.
- Mining.
- Chemical.

This qualification articulates vertically with any Level 5 qualification in the broad manufacturing, engineering and technology related sectors such as:

- Metal.
- Tyre.
- Auto.
- Motor.
- Plastics.
- Foodbev.
- Mining.
- Chemical.
- Certificate: Production Technology.
- Certificate: Productions and Operations Management.
- Diploma: Production Technology.

MODERATION OPTIONS

Moderation of learner achievements takes place at providers accredited by the applicable ETQA for the provision of programmes that result in the outcomes specified for the Further Education and Training Certificate: Production Technology NQF Level 4.

Anyone moderating the assessment of a learner against this Qualification must be registered as a moderator with the relevant ETQA. Any institution offering learning that will enable the achievement of this Qualification must be accredited as a provider with the relevant ETQA.

Moderation must include both internal and external moderation of assessments at exit points of the Qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described both in individual Unit Standards as well as the integrated competence described in the Qualification.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

For an applicant to register as an assessor, the applicant needs:

- A minimum of two years relevant occupational experience.
- Proven interpersonal skills, subject matter and assessment experience.
- Proven subject matter expertise within production technology.

 Competent in manufacturing, engineering and technology sector occupational qualifications at a higher education level.

To be a registered assessor with the relevant Education and Training Quality Assurance Body.

• Detailed documentary proof of educational qualification, practical training undergone, and experience gained by the applicant must be provided (Portfolio of evidence). Assessment competencies and subject matter experience of the assessor can be established by recognition of prior learning.

NOTES N/A

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	243025	Monitor machining process, interpret statistical process control charts, and rectify production problems	Levei 3	7
Core	114884	Co-ordinate the improvement of productivity within a functional unit	Level 4	8
Core	13952	Demonstrate basic understanding of the Primary labour legislation that impacts on a business unit	Level 4	8
Core	114877	Formulate and implement an action plan to improve productivity within an organisational unit	Level 4	8
Core	14586	Monitor and control quality control practices in a manufacturing/engineering environment	Level 4	8
Core	120375	Participate in the estimation and preparation of cost budget for a project or sub project and monitor and contro actual cost against budget	Level 4	6
Core	116287	Schedule and monitor production	Level 4	12
Core	116284	Solve operational problems in a manufacturing / assembly context	/ Level 4	10
Elective	8023	Applying basic principles of local and international trade	Level 3	4
Elective	114946	Identify causes of stress and techniques to manage it in the workplace	Level 3	2
Elective	242812	Induct a member into a team	Level 3	4
Elective	242820	Maintain records for a team	Level 3	4
Elective	113829	Operate within a logistics environment	Level 3	10
Elective	10954	Understand the road transport industry in South Africa	Level 3	5
Elective	242816	Conduct a structured meeting	Level 4	5
Elective	120376	Conduct project documentation management to support project processes	Level 4	6
Elective	7117	Contribute to and improve on the operation of a quality	Level 4	6
Source: Nation	nal Learners' Records	Database Qualification 58779	06/07/2007	Page 7

Source: National Learners' Records Database

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
		assurance system		
Elective	114737	Cost and price a product	Level 4	6
Elective	116086	Demonstrate an understanding of the factors influencing the quality of measurement	Level 4	3
Elective	116292	Demonstrate an understanding of the principles of manufacturing and assembly logistics planning	Level 4	12
Elective	120366	Demonstrate understanding of the implementation of occupational health, safety and environmental legislation in the work place	Level 4	9
Elective	116280	Demonstrate understanding of warehouse manufacturing and inventory assembly	Level 4	20
Elective	116294	Determine manufacturing and assembly material	Level 4	12
Elective	114878	Identify and measure the factors that influence	Level 4	10
Elective	120377	Identify, suggest and implement corrective actions to improve quality of project work	Level 4	7
Elective	123369	Implement environmental improvements to a site, facility, operation or process	Level 4	16
Elective	117156	Interpret basic financial statements	Level 4	4
Elective	13235	Maintain the quality assurance system	Level 4	5
Elective	11473	Manage individual and team performance	Level 4	8
Elective	113835	Manage logistics operations	Level 4	12
Elective	114589	Manage time productively	Level 4	4
Elective	7997	Managing self-development	Level 4	12
Elective	13194	Perform statistical process control	Level 4	12
Elective	120386	Provide procurement administration support to a project	Level 4	7
Elective	8019	Schedule transport	Level 4	18
Elective	10981	Supervise work unit to achieve work unit objectives (individuals and teams)	Level 4	12
Elective	120379	Work as a project team member	Level 4	8
Elective	120476	Adhere to professional conduct and organisational ethics	Level 5	4
Elective	120300	Analyse leadership and related theories in a work context	Level 5	8
Elective	120305	Analyse the role that emotional intelligence plays in leadership	Level 5	8
Elective	11277	Apply Principles of Supply Chain Management in a Freight Forwarding Operation	Level 5	6
Elective	15234	Apply efficient time management to the work of a department/division/section	Level 5	4
Elective	117988	Apply the Strategic Process during Planning	Level 5	3
Elective	15237	Build teams to meet set goals and objectives	Level 5	3 .
Elective	7876	Conduct on-the-Job-Training	Level 5	8
Elective	115753	Conduct outcomes-based assessment	Level 5	15
Elective	12665	Control production and resource scheduling and planning Level 5 in a manufacturing environment		8
Elective	9895	Coordinate predictive and preventive maintenance	Level 5	12
Elective	120492	Demonstrate the application of performance management	Level 5	6
Elective	15224	Empower team members through recognising strengths, encouraging participation in decision making and delegating tasks	Level 5	4
Elective	9897	Manage inventory	Level 5	3
Elective	15230	Monitor team members and measure effectiveness of performance	Level 5	4
Elective	14609	Participate in management of conflict	Level 5	4
Fundamental	119472	Accommodate audience and context needs in oral/signed	Level 3	5
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	119467	Use language and communication in occupational learning programmes	Level 3	5
Fundamental	119465	Write/present/sign texts for a range of communicative contexts	Level 3	5
Fundamentai	9015	Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems	Level 4	6
Fundamental	119462	Engage in sustained oral/signed communication and evaluate spoken/signed texts	Level 4	5
Fundamental	119469	Read/view, analyse and respond to a variety of texts	Level 4	5
Source: National Le	arners' Records	Database Qualification 58779	06/07/2007	Page 8

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	9016	Represent analyse and calculate shape and motion in 2- and 3-dimensional space in different contexts	Level 4	4
Fundamental	119471	Use language and communication in occupational learning programmes	Level 4	5
Fundamental	7468	Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	6
Fundamental	119459	Write/present/sign for a wide range of contexts	Level 4	5

Qualification 58779



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Describe and explain the principles of logistics support in a specific context

SAQA US ID	UNIT STANDARD TITLE			
244504	Describe and explain the principles of logistics support in a specific context			
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 3	6	

SPECIFIC OUTCOME 1

Explain the role of logistics as they apply to a specific operation.

SPECIFIC OUTCOME 2

Describe logistics activities in a specific operation.

SPECIFIC OUTCOME 3

Describe the concepts relating to inventory that are applicable to a specific operation.