STAATSKOERANT, 21 FEBRUARIE 2003

No. 24478 15

SOUTH AFRICAN QUALIFICATIONS AUTHORITY SUID-AFRIKAANSE KWALIFIKASIE-OWERHEID

21 February 2003



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

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 qualification and unit standards upon which qualifications are based. The full qualification and unit standards 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, 659 Pienaar street, Brooklyn, Pretoria.

Comment on the unit standards should reach SAQA at the address **below and no later than** 23 March 2003. All correspondence should be marked **Standards Setting – SGB for** Manufacturing and Assembly 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 – 482 0907

SAMUEL B.A. ISAACS EXECUTIVE OFFICER

No. 260

GOVERNMENT GAZETTE, 21 FEBRUARY 2003

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Title:	National Certificate in Chemical Manufacturing Operations Level 2
Field:	Manufacturing, Engineering and Technology
Sub-field:	Manufacturing and Assembly
Level:	2
Credit:	120
Issue date:	
Review date:	

Rationale of the qualification

This qualification reflects the need in the chemical industries for a person with the knowledge and skills required to assist with the manufacturing and or packaging of chemical products. Operating equipment typically does this. This is a need expressed by employers and employees to address current and future needs. This qualification enables the learner to access employment within several sub-sectors of the chemical industries. The qualification further provides the flexibility to articulate to other manufacturing sectors, for example, the food and beverage manufacturing and packaging environments.

The level of flexibility within the range of electives will enable the individual to pursue a career in manufacturing operations, mechanical machine maintenance, or leadership.

The qualification is appropriate for people who have an understanding of the chemical industry and intend to follow a technical career within this sector.

Purpose of the qualification

The understanding of the technology is required to empower the learner to make decisions and take responsibility for work in the operation of equipment in a chemical manufacturing environment. The learner will also maintain quality control practices and perform basic maintenance functions. It also forms the basis for more advanced learning. As such, this qualification will contribute to the full development of the learner, providing recognition within the chemical manufacturing environment, and the potential mobility and transportability to other manufacturing fields such as Food and Beverage.

The skills, knowledge and understanding demonstrated within this qualification are essential to achieve the increased employability and productivity needed for social and economic transformation, upliftment and economic growth in the chemical industries.

The manner in which this is achieved is described in the exit level outcomes below.

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Access to the Qualification

Access is open.

This is subject to the proviso that learners may have to comply with site-specific legislation and regulations regarding health and safety where these are applicable.

Learning assumed to be in place

At NQF level 1 or equivalent:

Knowledge, comprehension and application of language, mathematics, natural science.

Some basic understanding of the chemical or related industries.

Technology, safety health environment, quality, housekeeping, hygiene practices and procedures will assist the learner to achieve this qualification.

Where this learning is lacking appropriate additional learning interventions will be needed.

Exit level Outcomes

Exit level 1: Operate equipment in a chemical manufacturing environment

Associated Assessment Criteria

- Start up, shut down and monitor manual and semi-automated equipment according to Company standard operating procedures
- Clean and perform minor adjustments on equipment
- Conduct basic maintenance on equipment
- Explain and apply safety health and environmental practices that are relevant to the manufacturing operation where learning takes place

Exit level 2: Maintain quality practices in a chemical manufacturing environment

Associated Assessment Criteria

- Apply sampling theory & practice in the chemical industry
- Maintain quality practices in a manufacturing environment

Exit level 3: Understand and apply appropriate technology

Associated Assessment Criteria

- Apply technology that is appropriate within a chemical manufacturing operation
- Demonstrate knowledge of product specific technology
- Handle and use chemicals safely in a manufacturing environment

Exit level 4: Demonstrate understanding of fundamental knowledge in a chemical manufacturing environment

- Use mathematics within the chemical manufacturing context
- Communicate within the chemical manufacturing context

International comparability

Benchmarking was done against the NVQ from Britain, SVQ from Scotland as well as Australian and New Zealand qualifications. The following results were found for a qualification on this level:

<u>New Zealand</u>: Energy and Chemical Plant: The National Certificate in Energy and Chemical Plant at Level 2 of the NZQA is suitable for large energy and chemical plants such as petroleum refineries. There are no possible comparisons.

However, the Food and Related Products Processing at Level 2 have similar qualifications because (a) food is produced through batch processes and (b) Food is packaged. There is evidence, also, that chemically-related Fast Moving Consumer Goods were included in the Food and Related Products domain initially, and have used these qualifications. (Reference: Lever Rexona, New Zealand).

<u>UK</u>: NVQ Level 2 in Packaging Operations: This qualification is currently under review, and an update is expected during 2003. It is comparable to the proposed qualification.

<u>Australia</u>: No exact comparison has been found, but a number of competency units at Level 2 are similar to the unit standards proposed within this qualification.

Integrated Assessment

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to operate equipment in a chemical manufacturing environment, maintain quality control practices, demonstrate knowledge of chemical operations technology and perform basic maintenance functions.

Appropriate methods and tools must be used to assess practical, foundational and reflexive competence of the learner in all the exit level outcomes listed above, as well as to determine a learner's ability to solve problems, work in a team, organize him/herself, use applied science, and understand the implications of actions and reactions in the world as a set of related systems. Such an assessment process will determine development of the whole person, and the integration of applied knowledge and skills.

Assessors should develop, conduct, and ensure integration of, assessment by making use of a range of formative and summative assessment methods against the unit standards that make up the qualification. Combinations of applied, foundational and reflective competencies, including critical cross-field outcomes, should be assessed wherever possible.

Moderators should ensure that assessment is valid, consistent and integrated into work or learning, and that there is sufficient and authenticated evidence of learner competence against the whole qualification.

Recognition of prior learning

This qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning, and work experience.

Articulation possibilities

This qualification will enable the qualifying candidate to progress to learning for manufacturingrelated National Certificates at NQF Levels 3 and 4, and further, on to relevant National Diplomas and degrees as indicated in the table below.

Technical (chemical related) sales/dis-		Various sales/mar- keting related	developed in conjunction	SGBs	
Laboratory Assistant (Chemical analysis)	National Diploma in Analytical Chemistry	NC in laboratory practice 3	NC in laboratory practice 2	NC in laboratory practice 1	
Pharmaceuticals	ND Pharmacy developed in Pharmacy SGB	NC Pharmacist's Assistant – post basic	NC Pharmacist's Assistant - Basic	SE	
Production Management	ND Production Management from Management SGB	Aanufacturing	Aanufacturing	lanufacturing Operatio	
Chemical Manufacturing	National Diploma in Chemical Engineering	NC in Chemical M Supervision	NC in Chemical M Processes	NC in Chemical M	
Chemical Process Operations	NC in Chemical Process development or chemical product <i>or chemical</i> <i>process</i> <i>supervision</i> <i>(not yet</i> <i>mandated)</i>	NC in chemical process operations	NC in chemical systems operation	NC in chemical equipment operation	nical operations
lass iffications	NC in Ex- plosives gy	NC in Explosive s plant operation III	NC in Ex- plosives plant operation II	NC in Explosive s plant ope- rationl	ficate in chen
Explosives G Specific Qual	NC in Ceramic Technology or new diploma	NC in glass production	NC in molten glass production	NC in batch mixing	National Certi
Process related engineerin g artisans	NC (NQF 5) or ND (NQF 5/6) in En- gineering	Various en- gineering artisan related qualificatio	ns to be developed in conjunction with other	SGBs	
Level	5/6	4 .	£	2	F

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Articulation is also practical between this qualification and manufacturing environments outside the chemical industries such as the food and beverage environments and chemical analysis.

Moderation Options

- Anyone moderating the assessment of learners 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 or recognized as a provider with the relevant ETQA.
- Assessment and moderation will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.
- 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, exit level outcomes as well as the integrated competence described in the qualification.
- Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

Criteria for registration of assessors

In order to assess this qualification, the assessor needs:

- Well developed interpersonal skills, personal credibility, and a record of ethical behaviour
- Registration with the Education, Training and Development Practitioners' ETQA as a generic assessor.
- Competence against the unit standard "Plan and conduct assessment of learning outcomes."
- Detailed documentary proof of educational qualification, practical training undergone, and/or experience gained at an appropriate level of manufacturing operations, as per the relevant ETQA policies and guidelines. The subject matter expertise of the assessor can be established through the recognition of prior learning.
- Registration with, or recognition by, the Chemical Industries Education and Training Quality Assurance Body and uMalusi.

UNIT STANDARDS MAKING UP THE NATIONAL CERTIFICATE IN CHEMICAL MANUFACTURING OPERATIONS - NQF LEVEL 2

FUNDAMENTAL				CORE				ELECTIVE			
			NLRD				NLRD				NLRD
TITLE	LEVEL	CREDIT	₽	TITLE	LEVEL	CREDIT	٩	TITLE	LEVEL	CREDIT	۵
Maintain and adapt face-to-face				Apply process chemistry and related technology in							
language	2	5	7488	the chemical industry	2	10		Electives (General)			
Access and use information				Operate equipment in a				Receive and store			
from texts	2	5	8963	manufacturing environment	2	10		hazardous chemicals	2	2	
				Communicate effectively in				Hand over responsibility in			
Write for a defined context	2	5 2	8964	leams	2	5		manufacturing operations	2	5	
Use language and				Handle and use chemicals				Maintain quality practices			
communication in occupational				safely in a manufacturing				lin a manufacturing			
learning programs	2	5	8967	environment	2	5		environment	2	9	
Demonstrate understanding of											
rational and irrational numbers											-
and numbering systems, within											
the contexts of relevant								Shift loads using lifting			
calculations	2	2	8982					equipment (Max 2,5 tons)	2	5	9599
Work in a wide range of											
patterns and transformations of											
functions and solve related											•
problems	2	8	7457					Mix or blend materials	2	4	
Describe, represent and								Clean and sanitise food			
informally analyse shape and								processing systems using			
motion in 2 and 3 dimensional								an in place cleaning			
space	2	4	7479					system	2	9	
Collect and use data to											
establish basic statistical and											
probability models and solve								Operate a personal			
related problems	2	ۍ	7454					computer	-	3	

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FUNDAMENTAL			CORE				ELECTIVE			
							Develop and use keyboardskills to enter text	2	4	1
							Weigh raw materials for product manufacture in a	2	4	
							chemical manufacturing environment			
							Transfer bulk liquids	2	4	
							Apply sampling theory &	2	5	
							practice in the chemical			
							industry	_		
							Electives (Packaging)			: 69 26
							Produce extruded and	2	9	
							packaged product			
							Operate shrink wrapping on a	2	12	
							food bev automated packaging			
							line			
							Fill and cap containers using	2	80	
					i		automated filling equipment			
							Label product containers using	7	æ	
				_			automated labeling equipment			
							Package products in amanual	2	9	
							or semin-automated packaging			
							operation			
							Electives (Basic Maintenance)			5
							Organise and maintain works	2	5	
							station in a continuous			
							improvement environment			
				<u> </u>			Clean inspect and lubricqte a	2	5	
							production machine, and repair		<u></u>	
-	-			1		1	minor faults		-	
I otal	2	39		2	30	_	Minimum of	2	51	

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