24 October 2003



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

Chemical Industries

Registered by NSB 06, Manufacturing, Engineering and Technology, publishes the following qualification 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. The 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, Hatfield Forum West, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address *below and no later than* 16 November 2003. All correspondence should be marked Standards Setting – SGB for Chemical Industries 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.co.za

JOE SAM

DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



QUALIFICATION:

Established in terms of Act 58 of 1996

National Certificate: Batch Mixing

SAQA QUAL ID	QUALIFICA	TION TITLE		
24253	National Cer	ertificate: Batch Mixing		
SGB NAME	Chemical Inc	lustries SGB		
ABET BAND		PROVIDER NAME		
Undefined				
QUALIFICATIO	N CODE	QUAL TYPE	SUBFIELD	
MET-2-National	Certificate	National Certificate	Manufacturing and Assembly	
MINIMUM CREDITS NQF LEVEL		NQF LEVEL	QUALIFICATION CLASS	
120		Level 2	Regular-Unit Stds Based	
SAQA DECISIO	N NUMBER	REGISTRATION START	DATE REGISTRATION END DATE	
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PURPOSE OF THE QUALIFICATION

The purpose of this Qualification is to recognise competency in producing batches of material for further processing. The knowledge and skills learnt are applicable in glass manufacture, many chemical manufacturing and related operations. It also provides a basis for further learning in chemical related areas, which empowers the learner to develop a career.

By adding value in a process operation the learner contributes to the social, economic and strategic development of the local community and the nation at large.

Rationale of the Qualification

Batch mixing is the first step in the manufacture of glass. It is also integral to many similar chemical, metallurgical and other process related operations. This Qualification enables the learner to carry out important work in a large process. It also increases opportunities for employment within the glass manufacturing and similar industries and for advancement of careers through the National Certificate in Molten Glass Manufacturing at Level 3 or equivalent Qualifications.

RECOGNIZE PREVIOUS LEARNING?

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LEARNING ASSUMED TO BE IN PLACE

Candidates embarking on learning towards this Qualification are expected to have an understanding of technology, safety and related issues at level before commencing with this Qualification.

When a learner is not yet competent in one or more areas, appropriate adjustments, i.e. "top up" level to the learning programme are required.

Recognition of Prior Learning

This Qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out above.

Evidence can be presented in a variety of forms, including international or previous local Qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

QUALIFICATION RULES

EXIT LEVEL OUTCOMES

1. Describe and apply appropriate technology when mixing batches of (raw) materials prior to melting.

2. Operate equipment.

3. Mix batches of material.

Critical cross-field outcomes

This Qualification addresses the following critical cross-field outcomes.

a) Identifying and solving problems which show that responsible decisions using critical and creative thinking have been made that result in correctly mixed materials are available for melting/further processing in accordance with instructions in the context of executing work

b) Working effectively with others as a member of the process operating team, organizing and managing oneself and one's activities responsibly and effectively thereby ensuring that the requirements of the down stream melting operation are met in accordance with instructions

c) Collecting, analysing, organizing and critically evaluating information thereby ensuring that the mixing plant delivers the required material and equipment failure is minimised

d) Communicating effectively using the site-specific practice ensures efficiency within the batch melting operation, and enables efficient learning to take place.

e) Using science and technology effectively and critically, showing responsibility towards the environment and health of others thereby ensuring that batch mixing proceeds in accordance with instructions and industry best practice whilst empowering the individual to undertake more advanced learning and increased responsibility.

f) Demonstrating an understanding of glass manufacture as a set of related systems by recognizing that problem-solving contexts do not exist in isolation. This learning is also applicable beyond the glass industry.

Learning programmes directed towards this Qualification will also contribute to the full personal development of each learner and the social and economic development of the society at large, by making individuals aware of the importance of:

i. reflecting on and exploring a variety of strategies to learn more effectively in that the learner is required to be proactive in the work place based learning process.

ii. participating as responsible citizens in the life of local, national and global communities through the application of their increased knowledge and skill beyond their immediate workplace.

iii. being culturally and aesthetically sensitive across a range of social contexts is critical within and beyond the process plant where a systems operator must interact with people from different backgrounds who have varied beliefs and values.

iv. exploring education and career opportunities; and developing entrepreneurial opportunities is expected of people who are challenged in the learning process to reflect on the consequences and impact of their work and the opportunities identified from this thinking process.

ASSOCIATED ASSESSMENT CRITERIA

- 1.1 Appropriate technology is applied when mixing batches
- 1.2 Communications and mathematics are used in batch mixing activities.

2.1 Different types of equipment used in batch mixing are operated according to standard operating procedures (instructions) in a process

2.2 Legal and site specific health safety and environmental requirements are complied with when operating equipment

2.3 Correct actions are taken in abnormal, hazardous and emergency situations.

03/10/08

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- 3.1 Material is weighed
- 3.2 Material is mixed
- 3.4 Batches of material are mixed using a batch mixing plant
- 3.5 Relevant quality assurance activities are conducted
- 3.6 Batches of material are handled

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 batch-mixing environment, maintain quality control practices and demonstrate knowledge of batch mixing technology.

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.

Assessment must include production of batches of material over a period of time that demonstrated consistent conformance to instruction in a production environment including changes of recipes and or rates of production. Practical assessment of abnormal and emergency actions can be carried out in a simulated environment when this is not practical in the production environment. Knowledge is to be assessed in a manner appropriate to the learner and the site where learning takes place.

INTERNATIONAL COMPARABILITY

International Comparability

This Qualification and the component Unit Standards have been compared with similar Qualifications from the following countries:

> United Kingdom - This Qualification is comparable in level of knowledge and skill with NVQ Glass Manufacturing Qualifications Q 1052035 but has more specific focus as it addresses batch mixing specifically.

> New Zealand - The fundamental and generic manufacturing components are substantially equivalent indicating comparable level but the standards do not address the detail of batch mixing.

ARTICULATION OPTIONS

As preparation of batches is a step in a number of chemical and chemically related processes, a person with the knowledge and skill described in this Qualification will be able to seek employment in other sub-sectors of the chemical industry and in related activities.

Progression starts with introduction to the chemical processing or manufacturing environment that leads to this Qualification. Progression from this certificate is facilitated in that this Qualification is intended to lead the learner into molten glass manufacturing at level 3. Further, the fundamental and core learning is applicable to further learning in chemical processing and process operation and related engineering.

MODERATION OPTIONS

Accreditation Assessment and Moderation

Providers offering learning towards achievement of any of the Unit Standards that make up this Qualification must be accredited by the relevant ETQA

The criteria for accreditation are stated in the SAQA ETQA Regulations.

Assessment must be carried out by an assessor who is:

> A subject matter expert.

> Registered by the relevant ETQA or a provider accredited by the relevant ETQA after achieving competency against the assessor Unit Standards.

> Registered as a constituent assessor by the relevant ETQA.

> Administered, advised and coached by a Constituent Moderator

Moderation of assessment will be conducted by a moderator who is:

> A subject field expert

> Registered as a Moderator by the relevant ETQA or a provider accredited by the relevant ETQA after achieving competence against the Moderator Unit Standards

> Registered as a constituent Moderator by the relevant ETQA.

Moderation will be carried out in accordance with the mechanisms specified by the relevant ETQA.

Alternative criteria, which may be or become appropriate, will be acceptable provided that these are agreed to in writing by the relevant ETQA prior to commencement of the moderation process and that they comply with the ETQA regulations (RSA, 1998b) and in Criteria and Guidelines: ETQAs (SAQA, 1999).

Particular accreditation requirements related to this Qualification are:

> Adequate exposure in an appropriate batch mixing workplace to ensure that the assessment criteria of the Unit Standards are met under typical operating conditions.

> That integrative assessment of related standards is carried out. This is of particular importance when assessing the standards relating to the operation of equipment.

> Providers offering learning towards achievement of any of the Unit Standards that make up this Qualification must be accredited by the relevant ETQA.

Verification of Moderation

Verification of moderation must be conducted in accordance with the requirements specified by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

NOTES

Notes for Assessors:

Assessors should keep the following general principles in mind when designing and conducting assessments:

> Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the Unit Standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the Qualification purpose. Where assessment across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

> Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.

UNIT STANDARDS

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

Core 8766 Mix or blend food raw materials for processing using automated equipment Level 2 4 Registered Core 14775 Transfer materials Level 2 4 Recommended	[UNIT STANDARD ID AND TITLE	LEVEL	CREDITS	STATUS
Core 14775 Transfer materials Level 2 4 Recommended	Core	8766 Mix or blend food raw materials for processing using automated equipment	Level 2	4	Registered
	Core	14775 Transfer materials	Level 2	4	Recommended

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GOVERNMENT GAZETTE, 24 OCTOBER 2003

Core	14782 Apply process chemistry and related technology in the chemical industry	Level 2	10	Registered
Core	110007 Weigh raw materials for product manufacture in a chemical manufacturing environment	Level 2	4	Public Comment
Core	110012 Operate Equipment	Level 2	10	Public Comment
Core	14774 Prepare batches of material using an integrated batch mixing plant	Level 3	20	Recommended
Elective	9357 Develop and use keyboard skills to enter text	Level 1	3	Registered
Elective	9324 Communicate with fellow workers and supervisors	Level 2	4	Registered
Elective	9599 Lift and move material and equipment by means of a forklift	Level 2	3	Registered
Elective	14784 Apply sampling theory and practice	Level 2	5	Registered
Elective	110011 Handle and use chemicals safely in a manufacturing environment	Level 2	5	Public Comment
Elective	110016 Hand over responsibility for a manufacturing operation	Level 2	5	Public Comment
Elective	110018 Organize and maintain work station in a continuous improvement environment	Level 2	5	Public Comment
Elective	110022 Receive and store hazardous chemicals	Level 2	2	Public Comment
Elective	110299 Transfer bulk solids	Level 2	4	Public Comment
Elective	110300 Clean inspect and lubricate a production machine, and repair minor faults	Level 2	9	Public Comment
Elective	7786 Operate a Computer	Level 3	8	Registered
Elective	8038 Operating lift trucks	Level 3	6	Registered
Fundamental	7479 Describe, represent and informally analyse shape and motion in 2- and 3- dimensional space	Level 2	4	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	8967 Use language and communication in occupational learning programmes	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	7454 Collect and use data to establish statistical and probability models and solve related problems	Level 3	5	Registered
Fundamental	7457 Work with a wide range of patterns and transformations of functions and solve related problems	Level 3	8	Registered



UNIT STANDARD:

1

Weigh raw materials for product manufacture in a chemical manufacturing environment

SAQA US ID	UNIT STANDARD TITLE					
110007	Weigh raw materia	Veigh raw materials for product manufacture in a chemical manufacturing environment				
SGB NAME AB			ABET BAND	PROVIDER NAME		
Chemical Industries SGB			Undefined			
FIELD DESCRIPTION			SUBFIELD DESCRIPTION			
Manufacturing, Engineering and Technology			Manufacturi	ng and Assembly		
UNIT STANDA	ARD CODE	UNIT STAND	ARD TYPE	NQF LEVEL	CREDITS	
MET-MNA-0-S	GB MAP	Regular		Level 2	4	

Specific Outcomes:

SPECIFIC OUTCOME 1

Prepare to weigh raw materials.

SPECIFIC OUTCOME 2

Weigh and label raw materials.

SPECIFIC OUTCOME 3

Transfer weighed material and maintain supply to production line.

SPECIFIC OUTCOME 4

Conduct post weighing processes.



UNIT STANDARD:

2

Operate Equipment

SAQA US ID	UNIT STANDARD TITLE				
110012	Dperate Equipment				
SGB NAME			ABET BAND	PROVIDER NAME	
SGB Manufact	uring and Assemb	ly Processes	Undefined		
FIELD DESCR	RIPTION		SUBFIELD	DESCRIPTION	
Manufacturing, Engineering and Technology			Manufacturing and Assembly		
UNIT STANDA	ARD CODE	UNIT STAND	DARD TYPE	NQF LEVEL	CREDITS
MET-MNA-0-S	GB MAP	Regular		Level 2	10

Specific Outcomes:

SPECIFIC OUTCOME 1

Prepare for start up.

SPECIFIC OUTCOME 2

Start up equipment.

SPECIFIC OUTCOME 3

Operate manufacturing equipment.

SPECIFIC OUTCOME 4

Shut down manufacturing equipment.

SPECIFIC OUTCOME 5

Conduct post-operating processes.



UNIT STANDARD:

3

Handle and use chemicals safely in a manufacturing environment

SAQA US ID	UNIT STANDARD TITLE					
110011	Handle and us	landle and use chemicals safely in a manufacturing environment				
SGB NAME ABET BAND PROVIDER NAME						
Chemical Industries SGB			Undefined			
FIELD DESCRIPTION			SUBFIELD DESCRIPTION			
Manufacturing, Engineering and Technology			Manufactu	Manufacturing and Assembly		
UNIT STANDA	ARD CODE	UNIT STAN	DARD TYPE	NQF LEVEL	CREDITS	
MET-FBE-0-S	GB MAP	Regular		Level 2	5	

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate knowledge of chemicals used in a working environment.

SPECIFIC OUTCOME 2

Prepare to handle chemicals safely.

SPECIFIC OUTCOME 3

Handle chemicals safely.

SPECIFIC OUTCOME 4

Conduct post-handling processes.



UNIT STANDARD:

4

Hand over responsibility for a manufacturing operation

SAQA US ID	UNIT STANDARD TITLE					
110016	Hand over resp	land over responsibility for a manufacturing operation				
SGB NAME ABET BAND PROVIDER NAME						
SGB Manufact	uring and Asser	mbly Processes	Undefined			
FIELD DESCRIPTION			SUBFIELD DESCRIPTION			
Manufacturing, Engineering and Technology			Manufactu	Manufacturing and Assembly		
UNIT STANDA	ARD CODE	UNIT STANE	OARD TYPE	NQF LEVEL	CREDITS	
MET-MNA-0-S	GB MAP	Regular		Level 2	5	

Specific Outcomes:

SPECIFIC OUTCOME 1

Prepare to hand over responsibility for a manufacturing operation.

SPECIFIC OUTCOME 2

Communicate relevant information when handing over responsibility for a manufacturing operation.

SPECIFIC OUTCOME 3

Confirm that responsibility has been accepted by the person accepting responsibility.

SPECIFIC OUTCOME 4

Accept responsibility for a manufacturing operation.

5



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Organize and maintain work station in a continuous improvement environment

SAQA US ID	UNIT STANDARD TITLE					
110018	Organize and mai	organize and maintain work station in a continuous improvement environment				
SGB NAME ABET BAND PROVIDER NAME						
SGB Manufacturing and Assembly Processes Undefined						
FIELD DESCRIPTION			SUBFIELD	DESCRIPTION		
Manufacturing	, Engineering and T	Fechnology	Manufactur	ing and Assembly		
UNIT STAND	ARD CODE	UNIT STAND	ARD TYPE	NQF LEVEL	CREDITS	
MET-MNA-0-S	GB MAP	Regular		Level 2	5	

Specific Outcomes:

SPECIFIC OUTCOME 1

Sort work station and reposition required articles in their designated place.

SPECIFIC OUTCOME 2

Shine and sweep the work station.

SPECIFIC OUTCOME 3

Demonstrate understanding of standardized and continuous improvement systems.



UNIT STANDARD:

6

Receive and store hazardous chemicals

SAQA US ID	UNIT STANDAR	UNIT STANDARD TITLE				
110022	Receive and stor	Receive and store hazardous chemicals				
SGB NAME	SGB NAME ABET BA			PROVIDER NAME		
Chemical Indu	Chemical Industries SGB					
FIELD DESCR	FIELD DESCRIPTION			DESCRIPTION		
Manufacturing, Engineering and Technology			Manufactu	ing and Assembly		
UNIT STANDA	ARD CODE	UNIT STANDARD TYPE		NQF LEVEL	CREDITS	
MET-MNA-0-S	GB MAP	Regular		Level 2	2	

Specific Outcomes:

SPECIFIC OUTCOME 1

Receive hazardous chemicals for production against planned orders.

SPECIFIC OUTCOME 2

Store hazardous chemicals for production requirements.

SPECIFIC OUTCOME 3

Supply up to date information on chemicals available for production.



UNIT STANDARD:

7

Transfer bulk solids

SAQA US ID	UNIT STANDARI	NIT STANDARD TITLE				
110299	Transfer bulk solid	ansfer bulk solids				
SGB NAME			ABET BAND	PROVIDER NAME		
Chemical Indu	stries SGB		Undefined			
FIELD DESCRIPTION			SUBFIELD	DESCRIPTION		
Manufacturing, Engineering and Technology			Manufacturing and Assembly			
UNIT STANDARD CODE UNIT STAND		ARD TYPE	NQF LEVEL	CREDITS		
MET-MNA-0-S	GB MAP	Regular		Level 2	4	

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate knowledge of transferring materials.

SPECIFIC OUTCOME 2

Prepare to transfer bulk material.

SPECIFIC OUTCOME 3

Transfer product and or materials to vessels and containers.

SPECIFIC OUTCOME 4

Carryout the post transferring activities.



UNIT STANDARD:

8

Clean inspect and lubricate a production machine, and repair minor faults

SAQA US ID	UNIT STAND	INIT STANDARD TITLE				
110300	Clean inspect	Clean inspect and lubricate a production machine, and repair minor faults				
SGB NAME			ABET BAN	D PROVIDE	RNAME	
SGB Manufacturing and Assembly Processes			Undefined			
FIELD DESCRIPTION			SUBFIELI	DESCRIPTION	N	
Manufacturing, Engineering and Technology			Manufacturing and Assembly			
UNIT STANDARD CODE UNIT STANDA		ARD TYPE	NQF LEVEL	CREDITS		
MET-MNA-0-S	GB MAP	Regular		Level 2	9	

Specific Outcomes:

SPECIFIC OUTCOME 1

Clean and tag production machinery.

SPECIFIC OUTCOME 2

Inspect machinery and analyse causes of poor equipment performance.

SPECIFIC OUTCOME 3

Lubricate machinery.

SPECIFIC OUTCOME 4

Conduct post-cleaning and inspection activities.