

No. 1247

28 December 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

Plastics Manufacturing

registered by Organising Field 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 full Qualification and Unit Standards can be accessed via the SAQA web-site at www.saqqa.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 Standards should reach SAQA at the address below and **no later than 1 February 2008**. All correspondence should be marked **Standards Setting – Plastics Manufacturing** 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: dmpmuthing@saqa.org.za

DR. S. BHIKHA

DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:**National Diploma: Inspection and Assessment (Non-Metallics)**

SAQA QUAL ID	QUALIFICATION TITLE		
60072	National Diploma: Inspection and Assessment (Non-Metallics)		
ORIGINATOR		PROVIDER	
SGB Plastics Manufacturing			
QUALIFICATION TYPE	FIELD	SUBFIELD	
National Diploma	6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS
Undefined	241	Level 5	Regular-Unit Stds Based

This qualification does not replace any other qualification and is not replaced by another qualification.

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

This qualification is the third in a series of qualifications which recognise learning in respect of skills and knowledge needed to carry out inspection and assessment of thermoplastic and polymer composite (non-metallic) components and installations.

People who have achieved this qualification are able to verify the design and development of manufactured components, the quality of the quality documentation and manufacturers' or end-users' quality management systems against the requirements of the relevant code; evaluate non-conformances, approve concessions and recommend process rectification; and participate in dispute resolution processes.

This qualification represents the skills, knowledge and understanding required by competent practitioners to:

- Assure that the component design, drawings and calculations comply with the relevant code.
- Monitor and verify manufacturers' quality assurance systems and practices.
- Evaluate non-conformances, approve concessions and recommend process rectification.
- Communicate with a variety of parties to influence quality, present technical information and engage interactively with all role players in the field.
- Compile quality plans and associated documentation, monitor and verify manufacturing and installation process and conduct third party inspections.

The achievement of this qualification would be an indicator that a candidate has the requisite knowledge and skills in order to engage in inspection and assessment activities. The practitioner at this level would typically carry out the duties of a competent person. The designation competent person may only be awarded by an accredited inspection authority. A competent person assures the quality of the design process and the quality assurance practices. The competent person would also evaluate non-conformances and play a role in dispute resolution.

The requirements for licensing of such a competent person, eg a number of inspections conducted under the supervision of a qualified inspector, would continue to be the responsibility of the bodies accredited to do this.

This series of qualifications builds the required manufacturing, inspection and assessment skills and knowledge in a systematic way. The three qualifications in the series correspond broadly to the different grades of inspectors, ie in-house inspector, competent person and inspector of pressure vessels. But they also go beyond the licensing requirements and develop the competence for a broader quality assurance function.

This and the related qualifications will act as a framework for providers, assessors and learners to plan, implement and measure the outcomes of suitable learning programmes, or the recognition of prior learning. These qualifications can also be used by the relevant accreditation authority to licence and register inspectors.

This qualification will also assist manufacturers, end-users and inspection authorities to inspect manufacturing processes and installations and to assess these against quality standards, especially where there is a need for an independent person to perform these activities. This qualification will also provide status for people involved in this function and will build a greater awareness of the need for quality assurance amongst manufacturing staff, customers and end-users.

This qualification forms the second stage of a qualification that begins with, and includes, the credits for the National Certificate in Inspection and Assessment (Non-Metallics): NQF Level 5.

The qualification is also designed to align with:

- Draft Pressure Equipment Regulations, 2004, Government Gazette No 26794 on 17 September 2004.
- Draft South African National Standard SANS 00347: Categorization and conformity assessment criteria for all pressure equipment.
- Draft South African National Standard 519: Management and implementation requirements for projects that use non-metallic materials in dangerous or pressurized applications.

Rationale:

This qualification has been developed to address the lack of qualifications for the inspection and assessment of non-metallics. Non-metallics are relatively new polymeric materials. They are being increasingly used in the manufacture of installations, plant and equipment, including systems under pressure. These materials include thermoplastics, thermosets (including polymer composites) and elastomers which are used in a range of applications, in particular for their resistance to corrosion and a variety of chemicals. Applications include plant, equipment, vessels, piping, valves, linings, coatings, insulations and attachments. Complex installations are assembled from a variety of components and include systems under pressure.

Since these applications are generally safety critical in nature, quality assurance is required in the whole life cycle of the manufactured items, from their design to their disposal. Such quality assurance processes require qualified people to perform the inspections and assessments.

While the activity of inspection and assessment is an important component of quality assurance in the manufacturing field generally, it is particularly important for the manufacture of installations, including systems under pressure. Inspection and assessment is required during the design, manufacture, testing, installation and service life of the manufactured items.

The lack of suitably qualified people has resulted in numerous problems in the field, ranging from poor design to inadequate maintenance. Of particular concern is the fact that, because of

the shortage of specialised inspectors for non-metallics, inspectors qualified in other materials or other industries are making judgements about materials of which they have little knowledge. As a result, non-metallic materials and the non-metallic manufacturing industry have suffered a loss of credibility.

This qualification, which is part of a series, is therefore designed to provide recognition for the skills, knowledge and values required for this important function of performing inspections and assessment in order to assure the quality of items manufactured from non-metallic materials.

At the time of development of this qualification there were no qualifications registered on the National Qualifications Framework for inspection and assessment activities. Since inspection and assessment are fairly generic activities found in a variety of industries, this qualification has been designed in such a way that it can also act as the basis for the development of qualifications for inspection and assessment in other contexts.

RECOGNIZE PREVIOUS LEARNING?

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LEARNING ASSUMED IN PLACE

It is assumed that learners are already competent in Communication and Mathematical Literacy at NQF Level 4.

The design of this qualification, the credits allocated to this qualification and the related unit standards are based on the assumption that the learner has already achieved the outcomes of the National Certificate in Inspection and Assessment (Non-Metallics): NQF Level 5.

This means that it is assumed that the learner will already have had extensive experience in, and be able to:

- Conduct third-party inspections, interpret results and write inspection reports.
- Gather, summarise and analyse information from a range of sources in order to identify problems and determine trends in the manufacturing processes, changing quality assurance and inspection processes, changing technology, changes in the legislative and regulatory environment, and best practices.
- Compile quality plans and produce documentation for a variety of purposes.

Recognition of Prior Learning:

This qualification may be obtained through the process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. While this is primarily a work-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit level outcomes.

Access to the Qualification:

There is open access to this qualification. While a component of the learning can be obtained through courses, the largest amount of learning in this qualification is based on real-life, real-time work experience, specialising in a particular manufacturing process and range of products in the non-metallic field. A workplace is, therefore, a prerequisite to obtaining the relevant work experience and evidence required for the Exit Level Outcomes.

QUALIFICATION RULES

- All the Fundamental Unit Standards (30 Credits) are compulsory.
- All the Core Unit Standards (104 Credits) are compulsory.
- A minimum of 12 Credits is to be selected from unit standards in the Elective category.

- 95 Credits are to be included from the National Certificate in Inspection and Assessment (Non-Metallics) NQF Level 5.
- A minimum 241 Credits is required to obtain the qualification.

EXIT LEVEL OUTCOMES

1. Assure that the component design, drawings and calculations comply with the relevant code.

- Range: It is important to note that this outcome is not interpreted as fulfilling the role or functions of the professional engineer.

2. Monitor and verify manufacturers' quality assurance systems and practices.

- Range: Monitor and verify includes monitoring the consistency of the manufacturing system; auditing compliance with quality management systems.

3. Evaluate non-conformances, approve concessions and recommend process rectification.

- Range: Resolve disputes; approve concessions on acceptability reports (safety critical, arbitration), and respond to non-conformances; specify range of concessions, configuration management.

4. Communicate with a variety of parties to influence quality, present technical information and engage interactively with all role players in the field.

- Range: Conversations, meetings, presentations, hearings, court proceedings; records, minutes, reports, correspondence. Communication includes the listening and reading skills required to gather information and form opinions.

5. Compile quality plans and associated documentation, monitor and verify manufacturing and installation process and conduct third party inspections.

- Range: These outcomes refer to the Exit Level Outcomes of the National Certificate in Inspection and Assessment NQF Level 5. Only if these have not already been assessed and accredited should the assessor formally assess this outcome, since the skills and knowledge are embedded and built upon in the above Exit Level Outcomes.

Critical Cross-field Outcomes:

These are embedded in the unit standards which make up this qualification and are thus also reflected in the Exit Level Outcomes and Associated Assessment Criteria for this qualification.

The Critical Cross-Field Outcomes are supported by the Exit Level Outcomes as follows:

- Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made (Exit Level Outcomes 1, 2, 3, 4, 5).
- Working effectively with others as a member of a team, group, organization and community (Exit Level Outcomes 1, 2, 3, 4, 5).
- Organising and managing oneself and one's activities responsibly and effectively (Exit Level Outcomes 1, 2, 3, 4, 5).
- Collecting, analyzing, organizing and critically evaluating information (Exit Level Outcomes 1, 2, 3, 4, 5).
- Communicating effectively using visual, mathematical and/or language skills (Exit Level Outcomes 1, 2, 3, 4, 5).
- Using science and technology effectively and critically, showing responsibility toward the environment and health of others (Exit Level Outcomes 1, 2, 3, 4, 5).
- Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation (Exit Level Outcomes 1, 2, 3, 4, 5).

ASSOCIATED ASSESSMENT CRITERIA

Associated Assessment Criteria for Exit Level Outcome 1:

1. Design is signed off.
2. Verification of compliance is performed thoroughly and calculations are accurate.
3. Discussion and response to questioning demonstrates understanding of design principles and in-service stresses and strains.
 - Range: Understanding refers to the knowledge of design principles and strength of materials, the ability to predict the performance and what will affect the performance of the components and installations, the differences and applicability of various codes of practice and quality standards.

Associated Assessment Criteria for Exit Level Outcome 2:

1. Compliance to auditing procedures and quality documentation is confirmed.
2. A review or audit report is signed.
3. Discussion and response to questioning demonstrates understanding of the implications and consequences of the monitoring and verification and auditing process.

Associated Assessment Criteria for Exit Level Outcome 3:

1. Positive or negative recommendations of concessions are made.
 - Range: Concessions should cover a range of minor and major cases.
2. Reports documenting and justifying decisions are clear and succinct.
3. Disputes are resolved.
4. Discussion and response to questioning demonstrates understanding of the legal and financial implications of such decisions and the use of documents for legal processes.

Associated Assessment Criteria for Exit Level Outcome 4:

1. Communication style and content is adjusted to the level of the audience and the context.
 - Range: Audience includes the recipients of written communications.
2. Technical issues are explained in simple language.
 - Range: Simple language means reducing the use of technical terms and jargon wherever possible; allowing for diverse languages and cultures; use of headers and other devices to increase accessibility of texts.
3. Written materials and formal presentations make use of appropriate formats and effective lay out of the information.
4. Numerical and statistical data is presented in appropriate formats.
5. Active listening and focused reading and writing techniques are used to gather, record and summarise relevant information.

Associated Assessment Criteria for Exit Level Outcome 5:

1. State of inspected installation either correlates with specifications, or non-conformances are identified.
2. Production is certified in accordance with mandatory and statutory provisions and regulations.
3. The quality documentation leads to conformance with specification throughout the manufacturing process.

Integrated Assessment:

The integrated assessment must be based on a summative assessment guide. The guide must spell out how the assessor will assess different aspects of the performance and will include:

- Evaluating evidence in a portfolio of evidence, particularly projects which integrate various aspects of the qualification and which demonstrate the integration of all aspects of learning: fundamental and core; knowledge and skills and values; the development of the critical outcomes.

- Observing and listening to the learner at work, both in primary activities as well as in other interactions, or in relevant simulations.
- Asking questions and initiating short discussions to test understanding and to verify other evidence.
- Looking at records and reports.
- Formative assessment.

The learner may choose in which language he/she 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 presented if pertinent to any of the Exit Level Outcomes.

The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities. The assessment process should also establish how the learning process has advanced the Critical Cross-field Outcomes.

Assessors should also evaluate evidence that the learner has been performing consistently over a period of time.

INTERNATIONAL COMPARABILITY

The competence profile for which this series of qualifications is designed, is aligned with local and international pressure equipment directives and regulations. The United States has a very mature inspection and assessment system and provides information for making the comparison. In addition an international organisation (the World Health Organisation) has also been chosen to provide additional information based on the fact that such competence profiles transcend national boundaries. In the absence of information for relatively new materials such as fabricated polymers and polymer composites, the following provide guidance and a basis for comparison:

- Inspection and assessment qualifications are closely related to quality assurance qualifications and share many elements with them.
- Inspection and assessment qualifications for traditional materials such as steel or for other industries such as the manufacture of pharmaceuticals contain many similar elements.

In general these qualifications (ie 1 and 2, above) are not well-specified to enable comparisons of qualifications developed to meet SAQA requirements. They do, however, in general conform to the pattern described for the Certified Quality Technician (CQT) Program of the American Society for Quality. The applied competence is described as:

- First, a candidate must have at least 4 years of on-the-job experience in one or more "body of knowledge" areas that make up the primary work of the quality technician. These areas include quality control concepts, techniques, and applications; fundamentals of practical statistical methods; and applications of sampling principles. If a candidate has completed a degree program from a university, college, or technical school with accreditation accepted by ASQ, part of the 4 year experience requirement will be waived as follows: 3 years for a bachelor's, master's or doctorate degree in any field; 2 years for an associate degree; and 1 year for completing a "quality technology program" in a community college or technical school. In addition, a candidate previously certified under most of the other ASQ programs may use the same experience time to qualify for the CQT certification.
- Second, a candidate must demonstrate to ASQ "proof of professionalism". This may be done in one of three ways:

- Membership in ASQ or one of its foreign affiliates, or another society that belongs to the American Association of Engineering Societies or Accreditation Board for Engineering and Technology.
- Registration as a professional engineer; or c) obtaining the signatures of two persons -- either ASQ, foreign affiliate, other recognized professional society members -- verifying that the candidate is "a qualified practitioner of the quality sciences".
- Third, a candidate must pass the CQT certification examination that measures comprehension of quality control concepts, principles, and practices. This quality control body of knowledge is constantly evolving as a result of new technologies, policies, and the changing dynamics of manufacturing and service industries.

This submission deals with the first and third criteria discussed above. The inspection authority would take these into account when deciding on the second criterion.

This extract demonstrates, too, that this is a qualification for occupational competence. While courses play a role in the awarding of such a qualification, experience in a field or sub-field is an essential ingredient of the overall applied competence. A written examination is not enough on its own to prove competence.

As this extract demonstrates, there is little evidence of progression or career pathing for inspection and assessment practitioners.

A career path can be constructed using the different levels of inspection described by the World Health Organisation for inspection of pharmaceutical manufacturers:

Level Descriptors:

The Boiler and Pressure Vessel Inspector job family has three levels of work which are distinguished by the complexity of job assignments, the extent of responsibility assigned and the level of expertise required for completion of assigned tasks.

Level I; Code: J16A; Salary Band: I.

This is the basic level where employees perform inspection and compliance duties with close supervision and receive specialized training on boilers, pressure vessels, steam lines, weld procedures and applicable rules, methods and techniques. Performs inspection and compliance duties with close supervision.

Knowledge, Skills and Abilities required at this level are knowledge of pressure retaining items such as boilers, pressure vessels and steam lines, of basic mechanical apparatus/equipment theory and operation, of inspection and investigative methods and procedures, of report writing, and of the application of safety concepts, rules and codes. Ability to conduct inspections and investigations; to write reports; to apply safety codes and standards; to establish and maintain effective working relationships with others; and to communicate effectively, both orally and in writing. Ability to learn complex mathematical formula. Ability to work in close, confined spaces and to work in high places.

Education And Experience requirements at this level consist of sixty semester hours of college, including twelve hours of mathematics or physical science and one year of experience in the construction, operation or inspection of boilers or pressure vessels, or production experience in the oil and gas industry or physical plant operation; or an equivalent combination of education and experience, substituting one year of experience in the construction, operation or inspection of pressure retaining items such as boilers, air tanks or pressure vessels for the sixty semester hours of college.

Level II; Code: J16B; Salary Band: J.

This is the career level where tasks are performed independently and incumbents are given some latitude technically with freedom to develop their own work sequence under established guidelines and policies. Incumbents also inspect and review quality control and safe operation standards evaluation and assessment, and evaluate the engineering and design capabilities as well as the configuration of the environment in which installation and operation occurs, using a variety of applicable standards and calculations.

Knowledge, Skills and Abilities required at this level include those identified in Level I, plus knowledge of quality control methods and procedures; and of mechanical engineering and scientific formula and their specific application to a variety of sophisticated devices and complex installations. Ability is required to provide consultation and advice; and to discern appropriate formulas and codes for complex applications.

Education and Experience requirements at this level consist of those included in Level I and possession of a valid Commission issued by the National Board of Boiler and Pressure Vessel Inspectors. (No substitution will be allowed for the valid Commission).

Level III; Code: J16C; Salary Band: L.

This is the leadership level of the job family where employees are assigned responsibility for planning, directing and supervising the work activities of inspectors who are conducting boiler and pressure vessel inspections and investigations. Positions are assigned responsibility for the supervision of Boiler and Pressure Vessel Inspectors, including reviewing and assigning work, providing training and evaluating performance. Some positions may provide direct supervision which includes responsibilities for employee development, approving leave and initiating disciplinary actions, as well as performing related administrative functions.

Knowledge, Skills and Abilities required at this level include those identified in Level II plus knowledge of supervisory principles and practices. Ability is required to direct the work of others and to conduct multiple projects simultaneously.

Education and Experience requirements at this level consist of those identified in Level II plus four years of experience in the inspection of boilers and pressure vessels to also include in-service inspections, accident and incident investigations and review of repair and alteration plans and computations, substituting the successful completion of the "B" endorsement examination, offered by the National Board of Boiler and Pressure Vessel Inspectors, for twelve months of the required experience.

The following table illustrates how the levels described above compare with our South African NQF Levels:

Level of inspector; NQF Level:

- Self-inspection or internal audit of a factory or a part of it carried out by personnel of the company; NQF Level 4.
- Inspection by an independent person or group of persons as a review of the quality system of a company in compliance with the standards issued by the International Organization for Standardization (ISO 9000-9004 (4)) or the British Standards Institution (BS 5750 (5)) or with other equivalent national standards; NQF Level 5 - Certificate.
- Audit of a manufacturer or supplier by authorized agents of the customer; NQF Level 5 - Diploma.

Courses for the inspection component range, for example, from:

- Two weeks full time covering the following:
 - Basic aspects of inspection, Inspector's responsibilities, duties, attributes and the understanding of legislation, Boilers and Pressure equipment, Safety during Inspection, Methods of inspection, pressure equipment Inspection, Assessment of pressure equipment integrity, Materials, Manufacture, Common modes and causes of deterioration and failure, Repairs, alterations (modification), replacement and rerating, Documentation, Inspection and repair of specific pressure equipment (to AS/NZS3788).

To:

4 semesters for a diploma or 8 semesters for a Bachelor of Science degree which cover all aspects of design, manufacturing and quality as a basis for career in inspection and assessment and result in the following outcomes:

- Develop students' intellectual, scientific, technical, practical, communication, interpersonal and social skills, in an integrated fashion, in preparation for practice at the entry-level position in the major areas representing practice in the mechanical engineering technology field:
 - Mechanical Design; where knowledge and skill are required to conceive requirements, provide analysis, integrated design solutions, testing and verification of concept, and the ability to present the design using acceptable methods.
 - Manufacturing; where knowledge and skill are required to develop manufacturing plans, design integrated production systems with quality, cost and safety requirements, and considering operation in national and global environments.
 - Applied Thermal Science; where knowledge and skill are required to analyze, design, test and correct fluid and thermal systems involved in various industrial conversion processes, and in comfort control.
 - Plastics and Composites; where knowledge and skill are required to establish design requirements, provide manufacturing plans and systems for optimized performance.
 - Communication Skills; requiring the use of various media to communicate concepts, technical assessments and design solutions to a variety of audience including those with limited engineering knowledge.
 - Ethics, Interpersonal and Social Skills; expected for professional practice in an environment requiring team effort, where decisions and actions can affect citizens and communities.
- Instill in graduates the ability to further their knowledge through continuing and self directed studies.
- Maintain technological currency of the program and prepare graduates to practice in a technologically dynamic environment.
- Maintain interaction with the local and regional industrial and commercial community where the program graduates are expected to practice.

This latter qualification indicates some of the difficulties in designing a qualification for inspection and assessment. The inspection process is buried deep within the overall qualification which may have other purposes besides inspection. There are generally two routes to acquiring the competencies to perform inspection and assessment activities:

- Based on extensive experience in the manufacturing industry and quality assurance processes.
- Professional engineers and technicians who perform inspection and assessment as part of their professional function.

As a general rule, to gain experience and to qualify for registration, inspectors would have to perform inspections under the guidance of an experienced registered person at the same level or above. This is explained in relation to the pharmaceutical industry:

- Inspectors should have previous training and practical experience in the manufacture and/or quality control of pharmaceutical products. Graduate pharmacists, chemists, or scientists with an industrial background in pharmaceutical production would qualify for consideration.
- In-post training should include an element of apprenticeship gained by accompanying experienced inspectors on site visits as well as participation in courses and seminars on relevant subjects including modern pharmaceutical technology, microbiology, and the statistical aspects of quality control.

Embedded in the inspection and assessment competencies is the notion of maturity, as indicated by the American Society for Quality in relation to environmental analysts (who perform an inspection and assessment role in order to maintain safe and healthy working environments in factories, etc):

- In actuality, participants in Environmental Analyst Apprenticeship programs tend to be older individuals, reflecting the fact that employers and employees both tend to agree that experienced workers - those with at least several years of day-to-day, hands on pragmatic knowledge of the hazards and problems of a particular manufacturing industry - often make the best environmental analysts.

As part of the development of these qualifications, the contents of two local courses were reviewed and incorporated into the qualifications. These courses, which are run at the Vaal University of Technology and the Durban Institute of Technology, have also been benchmarked against similar international courses.

Conclusion:

The comparison demonstrates that the competence profile of the South African qualification conforms to various similar inspection and assessment profiles internationally.

ARTICULATION OPTIONS

This qualification articulates vertically with the National Diploma in Plastics Technology.

This qualification represents an end-point for the particular category of skills and knowledge it describes. It therefore does not have a direct vertical articulation with another qualification.

MODERATION OPTIONS

Moderators for the qualification should be registered as assessors with the relevant ETQA.

To assure the quality of the assessment process, the moderation should cover the following:

- Assessor credentials.
- The assessment instrument.
- The assessment process.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

The following criteria should be applied by the relevant ETQA:

- Appropriate qualification in the field of non-metallic fabrication with a minimum of 3 years' experience in an inspection and assessment (non-metallics) environment. The subject matter expertise of the assessor can be established by recognition of prior learning.
- Appropriate experience and understanding of assessment theory, processes and practices.
- Good interpersonal skills and the ability to balance the conflicting requirements of:
 - Maintaining national standards.
 - The interests of the learner.
 - The need for transformation and redressing the legacies of the past.
 - The cultural background and language of the learner.

- Registration as an assessor with a relevant ETQA.
- Any other criteria required by a relevant ETQA.

NOTES

N/A

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	252027	Devise and apply strategies to establish and maintain workplace relationships	Level 5	6
Fundamental	117854	Facilitate meetings to deal with conflict situations	Level 5	8
Fundamental	15226	Implement systems to meet the flow of information in a team, department or division	Level 5	3
Fundamental	252025	Monitor, assess and manage risk	Level 5	8
Fundamental	115790	Write and present for a wide range of purposes, audiences and contexts	Level 5	5
Core	9904	Coordinate work group to produce product	Level 5	8
Core	254034	Ensure design proposals, design realisation and installation operations meet standards	Level 5	10
Core	252024	Evaluate current practices against best practice	Level 5	4
Core	254014	Evaluate non-conformances, approve concessions and recommend process rectification	Level 5	12
Core	13256	Maintain business processes	Level 5	10
Core	253994	Monitor and verify adherence to quality documentation	Level 5	12
Core	13237	Optimise the quality assurance system	Level 5	6
Core	12459	Optimise the safety, health and environmental protection system	Level 5	6
Core	253997	Perform a procedures audit	Level 5	10
Core	116787	Plan, monitor and control the financial resources for a small company or business unit	Level 5	10
Core	254015	Resolve manufacturing and quality-related disputes	Level 5	16
Elective	120128	Apply the law of contract to insurance	Level 4	3
Elective	15231	Create and use a range of resources to effectively manage teams, sections, departments or divisions	Level 5	4
Elective	116781	Develop and implement sustainable processes and procedures	Level 5	10
Elective	117391	Investigate an incident	Level 5	8
Elective	15136	Manage health and safety on a construction project	Level 5	6
Elective	114716	Manage installation and maintenance contractors	Level 5	16

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION

None



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Monitor and verify adherence to quality documentation

SAQA US ID		UNIT STANDARD TITLE	
253994		Monitor and verify adherence to quality documentation	
ORIGINATOR		PROVIDER	
SGB Plastics Manufacturing			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 5	12

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1

Identify the objectives of the monitoring process and develop a surveillance plan.

SPECIFIC OUTCOME 2

Review and evaluate process control documentation.

SPECIFIC OUTCOME 3

Verify the validity of the process control measurements and data.

SPECIFIC OUTCOME 4

Examine materials, tools and equipment and determine whether they meet the requirements of the quality documentation.

SPECIFIC OUTCOME 5

Evaluate effectiveness of overall quality documentation, report on the validity of the information and recommend modifications or improvements to the quality documentation.

SPECIFIC OUTCOME 6

Establish and maintain contact between client, manufacturer and inspection authority.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	60072	National Diploma: Inspection and Assessment (Non-Metallics)	Level 5



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:**Perform a procedures audit**

SAQA US ID	UNIT STANDARD TITLE		
253997	Perform a procedures audit		
ORIGINATOR		PROVIDER	
SGB Plastics Manufacturing			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 5	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1

Identify the objectives of the audit, select audit criteria and plan the audit process.

SPECIFIC OUTCOME 2

Select the auditing tools and prepare the audit documentation.

SPECIFIC OUTCOME 3

Conduct the audit, evaluate the evidence and record findings.

SPECIFIC OUTCOME 4

Identify typical areas for non-compliance and check them for compliance.

SPECIFIC OUTCOME 5

Summarise findings, compile report and make recommendations.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	60072	National Diploma: Inspection and Assessment (Non-Metallics)	Level 5



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Evaluate non-conformances, approve concessions and recommend process rectification

SAQA US ID	UNIT STANDARD TITLE		
254014	Evaluate non-conformances, approve concessions and recommend process rectification		
ORIGINATOR		PROVIDER	
SGB Plastics Manufacturing			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 5	12

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1

Collect, evaluate and test evidence related to the identified non-conformances.

SPECIFIC OUTCOME 2

Assess the consequences of the identified non-conformances.

SPECIFIC OUTCOME 3

Determine and make judgements on the criticality of non-conformances.

SPECIFIC OUTCOME 4

Approve concessions and compile justifications.

SPECIFIC OUTCOME 5

Recommend changes or rectifications.

SPECIFIC OUTCOME 6

Assess new technology for adoption into current practice.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	60072	National Diploma: Inspection and Assessment (Non-Metallics)	Level 5



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:***Resolve manufacturing and quality-related disputes***

SAQA US ID	UNIT STANDARD TITLE		
254015	Resolve manufacturing and quality-related disputes		
ORIGINATOR	PROVIDER		
SGB Plastics Manufacturing			
FIELD	SUBFIELD		
6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly		
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 5	16

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1

Liaise with parties concerned and collect relevant information and evidence.

SPECIFIC OUTCOME 2

Evaluate information and evidence, determine solution and advise parties of decisions or recommendations.

SPECIFIC OUTCOME 3

Document findings of the dispute resolution process.

SPECIFIC OUTCOME 4

Present information and evidence in court as required.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	60072	National Diploma: Inspection and Assessment (Non-Metallics)	Level 5



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Ensure design proposals, design realisation and installation operations meet standards

SAQA US ID	UNIT STANDARD TITLE		
254034	Ensure design proposals, design realisation and installation operations meet standards		
ORIGINATOR		PROVIDER	
SGB Plastics Manufacturing			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 5	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1

Ensure that design proposals meet the requirements of relevant standards.

SPECIFIC OUTCOME 2

Ensure that design realisation meet safety, health and operability requirements.

SPECIFIC OUTCOME 3

Ensure safe, effective and efficient operation of installations.

SPECIFIC OUTCOME 4

Audit and check installations and operations for compliance.

SPECIFIC OUTCOME 5

Raise findings and issues and resolve these with relevant personnel.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	60072	National Diploma: Inspection and Assessment (Non-Metallics)	Level 5