No. 1249 ***8* December *2006***

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

In accordance with regulation 24(c) of the Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Printing and Packaging

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 qualification and unit standards can be accessed via the SAQA web-site at **www.saqa.org.za**. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the qualification and unit standards should reach SAQA at the address ***below and no later than 8 January 2007.*** All correspondence should be marked **Standards Setting – SGB for Printing and Packaging** and addressed to

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SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Printing and Manufacture of Packaging

SAQA QUAL ID	*QUALIFICATION TITLE*		
57900	National Certificate: Printing and Manufacture of Packaging		
SGB NAME		***ORGANISING FIELD ID***	***PROVIDER NAME***
SGB Printing and Packaging		6	
QUAL TYPE		***ORGANISING FIELD DESCRIPTION***	***SUBFIELD***
National Certificate		Manufacturing, Engi[illegible]ring and	Ma[illegible]
ABET BAND	***CREDITS***	***NQF LEVEL***	***[illegible]SS***
Undefined	126	2	Regular-Unit Stds [illegible]d

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

This qualification will equip the individual with the skills, knowledge and values to participate effectively in workplace activities within the printing and packaging manufacturing industries. Learners achieving this qualification will be able to contribute to printing and packaging manufacturing processes **by:**

> Monitoring the production process and the quality of production.
> Understanding their role in the business, i.e. in production and related activities.
> Understanding how they are affected by legislation, regulations, agreements and policies related to their particular work environment.

Qualifying learners will also be able to relate what they see and experience to scientific and technological principles and concepts. They will also understand how they should operate within the systems which govern their workplace. What learners achieve through this qualification will also serve as a basis for further learning where they will engage more directly in the production process.

The skills, knowledge and values demonstrated within this qualification will ensure that workers and new entrants will acquire relevant skills and knowledge required by a fast-changing sector essential for economic growth and transformation. This qualification will contribute to the social upliftment *of* employees and economic growth within the printing and packaging manufacturing environment by allowing learners who are active in the industry to gain recognition for the skills and knowledge they have acquired without having to **go** through a formal apprenticeship process. Small printing and packaging manufacturing enterprises would **also** be ideal vehicles for Black Economic Empowerment.

Rationale:

This qualification and the related qualifications in this series replace a number *of* qualifications for various trades and occupations in the printing and manufacture of packaging industries. These industries are currently also undergoing significant change. These changes include:

> Changes in machine design.
> **A** shift from film and other media to digital imaging, processing and printing.
> **A** shift from hand skills to conceptual skills.
> Greater global competition and higher standards required for products designed to be exported.
> More exacting requirements from customers and consumers.

These changes require that these trades and occupations also need to incorporate new skills and knowledge to replace outdated skills and knowledge.

This and the associated qualifications in the learning pathway provide a developmental pathway for the full range of activities related to the occupation, from those of the operator of simple equipment for printing and the manufacture of packaging, to those of the tradesperson with several years' experience, with a higher level of technical knowledge and the ability to integrate new technology, materials and processes into existing operations. This is the first in a series of four qualifications in a learning pathway for high-volume printing and packaging manufacturing processes. The qualification series ends with the Certificate in Printing and Manufacture of
Packaging: NQF Level 5. Further career development after NQF Level 5 would be based on choices relating to the learner's aspirations:

> Entrepreneurial activities (starting own business).
> General or technical management.
> Quality management.
> Conceptual design of printing and packaging materials.
> Advanced technology.

Printing and packaging products have to respond to a wide variety of exacting customer and consumer requirements. In addition, the industries have to respond to environmental issues and the on-going development of new products as a result of changing customer needs.

This qualification is applicable to learners in the following contexts.

Printing:

> Letterpress.
> Screen printing.
> Flexography.
> Gravure.
> Lithography.
> Continuous stationery.
. Roll label.
> Rotary offset.

Manufacture of packaging, with or without in-line printing processes:

> Bag making.
> Sack making.
> Carton making.
> Can and end making.
> Laminating.
> Coating.
> Corrugated board manufacturing.
> Tubing.
>Wrapping.
> Over printing.
> Envelope making.
> File manufacturing.

Typical learners would be new entrants to the industry. Once qualified, they would typically tend to the printing or packaging manufacturing process, and *to* perform tasks under the direction of a more skilled person. In some instances this role represents a full-time position in the organisation; in other instances this is simply a stage in occupational development.

This qualification series recognises skills, knowledge and values relevant to a workplace. It is designed for learners who engage actively in printing and packaging manufacturing processes. It is suitable for learners who:

> Attend courses and then apply the knowledge gained to activities in the workplace (Portfolio to reflect formative assessment), OR.

> Are already workers and have acquired the skills and knowledge without attending formal courses (RPL can be done through the summative assessment and portfolio of evidence), OR.

The outcomes of this qualification combine skills and knowledge in the technical, inter-personal and business spheres, enabling the learner to perform the operational aspects of the work, function within a team context and contribute to value-adding processes in the business.

The printing and packaging manufacturing industries are essential to the supply of a wide range of processed and manufactured products, from foodstuffs to pharmaceuticals, to the consumer. These industries are also vital to the country's export markets. Printing also provides society with reading matter in a wide variety of forms from leaflets and advertising to magazines, newspapers and books. This qualification also emphasises the learner's role in conserving resources and behaving responsibly towards the environment in general.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that learners are already competent in Communication and Mathematical Literacy at NQF Level 1.

Recognition of Prior Learning

This qualification may be obtained through a process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. The guidelines for integrated assessment should be used to develop the RPL assessment process. As with integrated assessment, while this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the Exit Level Outcomes.

Access to the qualification

There is open access to this qualification. A workplace is, however, a prerequisite to obtaining the relevant work experience and evidence required for the assessment of the Exit Level Outcomes.

In most contexts colour perception is important and learners may be required to demonstrate the ability to distinguish colours, tones and shades. Some processes require the ability to lift, move and place objects of varying weight, the ability to use hand and power tools, or the ability to work in confined or elevated spaces.

QUALIFICATION RULES

The total number of credits for this qualification is 126.
> The total number of credits in the Fundamental component is 36.
> The total number of credits in the Core component is 78.
> The minimum number of Elective credits is 12.
> The elective credits should be chosen in accordance with the requirements of the selected context and the interests of the learner.

EXIT LEVEL OUTCOMES

1. Demonstrate an understanding of the production process and the quality requirements and recognise changes in the production process, which will affect safety, health, quality or efficiency and respond to them.
> Range: Production process includes routine maintenance; production process relates to any printing and mechanical conversion of materials, including subsequent printing and decorating to form packaging.
2. Demonstrate an understanding of the use of appropriate tools and equipment to make simple adjustments or changes to equipment and process and convey (move, lift) materials or products.
3. Work effectively with others, understand own role in the organisation and understand the purpose of the organisation in the economy of the country.

Critical Cross-Field Outcomes:

These are embedded in the unit standards which make up the qualification and are thus also reflected in the Exit Level Outcomes of the 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 Outcome's 1, 2, 3).
> Working effectively with others as a member of a team, group, organization and community (Exit Level Outcome 3).
> Organising and managing oneself and one's activities responsibly and effectively (Exit Level Outcome's 1, 2).

> Collecting, analysing, organising and critically evaluating information (Exit Level Outcome's 1, 2, 3).
> Communicating effectively using visual, mathematical and/or language skills (Exit Level Outcome's 3).
> Using science and technology effectively and critically, showing responsibility toward the environment and health of others (Exit Level Outcome's 1, 2).
> Demonstrating an understanding of the world as a set of related systems by recognising that problem contexts do not exist in isolation (Exit Level Outcome's 1, 2, 3).

ASSOCIATED ASSESSMENT CRITERIA

1.
> Production of scrap or faulty products is minimised in accordance with set standards.
> Responses in the production process are appropriate to the nature of the change.
> Changes and responses are reported in accordance with organisational requirements.
> Questions and issues related to the production process are responded to relevant to the outcomes of the process.
> Routine checks and maintenance tasks are performed according to requirements.
Range: Routine checks and maintenance includes quality, safety and environmental checks.

2.
> Adjustments or changes are made according *to* relevant standards or operating procedures.
Range: Tools and equipment adjustments or changes would always be limited to the learners' limits of authority.
> Downtime is minimised in accordance with set standards.
> Material or product produced conforms to set quality standards.
> Changes and adjustments are reported in accordance with organisational requirements.
> Quality, safety and environmental procedures are adhered to at all times.
> Materials and consumables are handled according to relevant standards or operating procedures.
> Tools and equipment are cared for; worn or damaged tools and equipment are reported or replaced in accordance with set standards and specifications.

3.
> Information or decisions are received and acted upon in accordance with organisational requirements.
> Questions and discussion issues related to learner's role and purpose to the organisation are responded to in accordance with organisational requirements.
Range: Questions and discussion issues includes understanding performance appraisals and their outcomes.
> The role of specifications in relation to customer and internal requirements are understood and described in accordance with set requirements.
Range: Understanding includes understanding implications *of* products not meeting customer requirements and of wastage in relation to costs.

Integrated Assessment

The integrated assessment should be based on a summative assessment guide. The guide will specify 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, 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 and summative assessment of unit standards.

Assessment of competence for this qualification is based on experience acquired by the learner in the workplace, within the particular printing of packaging manufacturing context. 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 management process. The assessment process should also establish how the learning process has advanced the Critical Cross-field Outcomes.

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.

Assessors should also evaluate evidence that the learner has been, and is, able to perform consistently over a period of time.

INTERNATIONAL COMPARABILITY

Introduction

This study incorporates an electronic search across continents for standards, trends and structure of courses in the Printing and Packaging fields. Information on industry and trade standards, curricular and syllabi from academic and industry training institutions available was compared. The depth of the search went as far as Nigeria from which a report into the industrial sectors of Nigeria led the study to the conclusion that the print and packaging industry was in its infancy stage and almost completely dependent on imports and foreign companies, implying that skills development in the sector is at best dependent on imported courses and industry training standards.

Other sub-Saharan countries reviewed included Ghana, Kenya, Malawi, Mauritius and Tanzania where a similar situation of an emerging printing and packaging sector heavily dependent on imported industry standards and accompanying education and training packages is evident. Many training initiatives are being supported by foreign donor-funding, for example, Ghana where the Regional African Development Project has been working with the emerging printing and packaging sector for a number of years to transfer skills and capacitate emerging printing and packaging companies. Moves to establish a regional printing and packaging association able to set industry standards and collaborate on training and skills development are occurring in East Africa with Tanzania hosting regional conferences for the emerging printing and packaging industry on an annual basis.

In the main, it seems that the emergence and need for industry standards and concomitant development of training courses and programmes is related to demands associated with exports and penetration of global markets, particularly in respect of packaging for processed foods (health and safety issues) as well as waste packaging (environmental issues).

Of the developing economies in the world, India is particularly advanced in the sector as far as training and development is concerned with courses offered ranging from certificate level of 3 month duration to Masters in Business Administration with a specialization in printing and packaging. The prospectus from one institution emphasizes the need for this specialization in training mentioning the important contribution of packaging and printing to export and marketing which is a direct contributor to the growth of their economy. Information on the content of printing trades and crafts in India does not reveal much information, except for those associated with the development of handcrafts and the announcement of a new printing trade for desktop publishing operator. It would seem that the printing trades have not changed significantly.

Of the countries with established qualifications frameworks, information from institutions in Australia, Ireland, New Zealand, England-Wales and Scotland was sought and found to be very informative in this context.

Of particular note is Australia, where a new set of training course standards were published during October 2005. This allowed the SGB to compare their perception of new trends with those of another country.

> In addition, as preparation for the development process some of the SGB members reviewed the 'bible' of printing the Handbook of Print Media - Technologies and Production Methods, edited by Prof. Dr.-Ing. Habil, Helmut Kipphan for the Heidelberger Druckmaschinen AG, one of the best-known names amongst printing equipment manufacturers.

Comparison:

Kipphan and his fellow writers note that changing technology is impacting dramatically on the nature of equipment and the type of work that is being done. Traditional photolithography and all the skills associated with film have given way to digital computer-to-plate and computer-to-press processes. In addition new non-impact printing processes such as laser and ink jet have also changed the type and nature of printed products. New substrates are also influencing the printing and packaging processes. This is leading to the "one-ma press" working environment, where one person will now do what was the work of a team previously. He goes on to note:

> Printing processes are being increasingly controlled and adjusted electronically, which leads to consistent high quality and greater productivity. Digital workflow also means that productions are completed more rapidly. Hence more than half of the orders for commercial printers arrive in digital form. By the year 2002

this figure is expected to be over 65%. This is the only way of shortening delivery times for print products and meeting the high customer demand for quality. All printing companies are expected to offer greater flexibility in the processing of a large variety of substrates, inks, and methods of print finishing. This means that there is a visible trend for all print products to employ multicolor as well as decorative and special colors. In addition, run lengths are getting shorter since experts believe that the greatest chance of growth lies in the market for small. color work with a fast turnaround time.

Finally hard copy is slowly giving way or being augmented by multi-media, digital products such as CDs and the World Wide Web. While Kipphan expects these to impact on traditional print media he does not expect them to be replaced by digital multi-media.

These developments have a clear impact on the type and nature of the training that people in the printing and packaging industry will undergo. A survey of qualifications, standards, courses, apprenticeships, occupational outlooks and industry websites reveals changes taking place but at an uneven and inconclusive way. Some of these issues are discussed below.

In the study it was clear that the structure and duration of courses would differ from the outcomes-based standards based on applied competence designed for South Africa, since their credit systems and syllabi differs in so far as knowledge acquisition and practical training is concerned. Many of the courses are particularly designed for the vocational context especially in Australia, Ireland, England and Scotland. The Lead Employer Council for Printing and Packaging in the United Kingdom, the British Printing Industries Federation, has adopted the Scottish-National Vocational Qualifications (S/NVQs) as the training and development framework and learning achievement outcomes for their industry sector. This suggest that the quality of the Scottish solution is a clear benchmark implication.

Countries with outcomes based systems still remain the best source of information when doing this research. Hence we have drawn a comparison between South Africa, Australia, Ireland, New Zealand, Scotland (and the UK). There is insufficient information on printing apprenticeships in other countries to make valid comparisons in the same way. The following table indicates the broad fit of the proposed qualifications into overseas schemes.

Australia

> Programmes designed toward industry needs.
> Programmes include broader knowledge base for personal development, including customer relations and innovation.
> Programme structure consists of fundamental and core and referred to as compulsory and a group of electives. Elective = 40% of programme.
> Modules are industry process specific broadening on communication, health and safety, customer orientation and business skills.
> Almost 70% of programme is based in industry.
> Certificates, Diplomas, Advanced Diplomas and Degrees in Printing and Packaging.

Ireland

> Programmes designed towards industry needs.
> Programmes specific to occupation or tasks associated with job competence or specific skills certificates.
> Programme structure determined by specific skill set.
> Modules are industry process specific.
> Awards for acquisition of skills sets at 4 levels on the Awards Framework (Levels 3, 4, 5 and 6).

New Zealand

> Programmes designed towards industry needs.
> Programmes include broader knowledge.
> Modules are industry process specific broadening on communication, health and safety.
> National Certificates at levels 2, 3 and 4.

Scotland and UK

> Programmes designed towards industry needs.
> Programmes specific to occupation and include education and training and self-development.
> Programme structure consists of mandatory common and technical and a small group of options - 2 technical and 1 general with a strong skills development focus. Optional = 27%.
> Modules are industry process specific and include self and other development in the optional choices.
> S/NVQ qualifications at levels 2 and 3.

South Africa

> Programmes designed towards industry needs.
> Programmes include broader knowledge for lifelong learning and personal development.
> Electives = 10%.
> Unit standards based on a combination of fundamental and core which is a mix of the other approaches.
> Certificates and Diplomas.

The following section details some examples of the structure of printing and packaging qualifications in other countries

Australian Printing Qualification

> Cert I Pre-Vocational Printing 7793 (The program structure below was last updated on 13/09/2005.)
> Compulsory Courses Group A. (Select 6 Courses)

Name:

> NcsOOl Workplace Communication, 40 credits.
> Work Environ - Print Ind, 40 credits.
> O H & Safety PV1, 10 credits.
> Intro - Computers - G Arts PV1, 40 credits.
> Intro To Electronic Printing, 10 credits.
> Industry Visits PV1, 20 credits.

> Model 1 (Press) Compulsory Courses Group A. (Select 5 Courses)

Name:

> Print Machine & Material Product Support 1, 40 credits.
> Print Machine Wash Up & Maintain, 40 credits.
> Sheet-Fed Litho 1 (PV1), 40 credits.
> Guillotining 1 (PV1), 20 credits.
> Packaging And Dispatch, 20 credits.

Model 1 (Press) Elective Courses Group A. (Select 3 Courses)

Name:

> Man Combin 1 (Mon/Bas Col), 40 credits.
> Litho Platemaking & Step & Repeat, 40 credits.
> Hand Binding And Finishing PV1, 40 credits.

Model 2 (Prepress) Compulsory Courses Group A. (Select 3 Courses)

Name:

> Print Processes And Materials, 40 credits.
> Packaging And Dispatch, 20 credits.
> Guillotining 1 (PV1), 20 credits.

Model 2 (Prepress) Elective Courses Group A. (Select 5 Courses)

Name:

> Typography 1, 40 credits.
> Scanning 1, 40 credits.
> Image Output Electronic, 40 credits.
> Electronic Image Assembly 1, 40 credits.
> Colour Theory and Proofing, 40 credits.

Desktop Publishing - Level 3 - Overview

Mandatory Common Units:

> 001, Reduce risks *to* health and safety in your workplace.
> 002, Develop yourself in your job.

Mandatory Technical Units:

> 705, Plan datafile production.
> 706, Create and apply typographical specifications to meet customer requirements.
> 305IT, Design and produce documents using word processing software (IT).
> 312IT, Design and produce documents using graphics (ITNTO).
> 302IT, Maintain the software environment (ITNTO).
> 3CS, Develop customer relationships (ICS).

Optional Technical Units: (Choose 2)

> 707, Calibrate and control colour in Desk Top publishing.
> 708, Produce aeronautical documentation.
> 709, Produce graphical representations of aeronautical spatial data.
> 33D, Develop and present suitable design responses (SFEDI).
> 34D, Produce and present detailed design proposals (SFEDI).
> 212IT, Maintain and use databases (ITNTO).

General Optional Unit: (Choose 1)

> B1, Support the efficient use of resources (MCI).
> C1, Manage yourself (MCI).
> C9, Contribute *to* the development of teams and individuals (MCI).
> C12, Lead the work of teams and individuals *to* achieve their objectives (MCI).
> 032, Assess candidate performance (ENTO).
> C24, Facilitate learning through demonstration and instruction (ENTO).
> C25, Facilitate individual learning through coaching (ENTO).
> 005, Train new operators.

Mandatory Common Units:

> 001, Reduce risks to health and safety in your workplace.
> 002, Develop yourself in your job.

Mandatory Technical Units:

> 705, Plan datafile production.
> 706, Create & apply typographical specifications to meet customer requirements.
> 305IT, Design and produce documents using word processing software (IT).

The above examples demonstrate the shift *to* IT skills, team - and customer relationships, digital workflow and the development of skills in others.

Apprenticeship

In general, training for printing and the manufacture *of* packaging occupations is still traditionally done through apprenticeships even where other system occur. Countries which have apprenticeships from the countries surveyed include the UK, German, the United States, India, Australia.

Apprenticeships follow a fairly similar pattern. They last approximately three years, they comprise a combination of theory and practice in a ratio of approximately 1:2. The theory component also includes broader business and quality. Latterly however, some have been stretched to include broader issues such environment, entrepreneurship and information technology subjects or topics.

Apprenticeships, in general, are aimed at particular printing techniques and processes, although there are now indications, e.g. in Germany, where the range of trade qualifications is being reduced to four core processes:

> Flexography.
> Gravure.
> Lithography.
> Digital.

One apprenticeship surveyed (in Switzerland) stretches into a fourth year and includes great emphasis on quality, troubleshooting, safety and environmental systems and practices as well as greater technical ability in terms of pre-press and print process including issues related to efficiency, productivity and lean manufacturing.

Some apprenticeships are shorter than this norm, ef screen printing handicraft apprenticeships in India last 6 months and include:

> Basic training of one week.
> Practical trade training.
> Trade theory.

Screen printing on, for instance, tee shirts lends itself to entrepreneurship. Hence this apprenticeship is really aimed at SME-Development.

Many countries also include in their occupational profile printing assistances or operators who have not formally been through an apprenticeship and have learned largely on-the-job.

In a number of countries (e.g. India, Germany, Australia) there is now a new trade qualification emerging, one for digital printing. The impact of information technology has also meant a change in the way people work and the demise of old trade qualifications such as photo lithographer.

Apart from the changes to training courses the delivery of new equipment into companies also affects that nature and type of skills required by practitioner. Computer technology has also affected the control systems of printing and packaging equipment. The impact of this still lies, to large extent, in the future.

Conclusion

The South Africa qualifications developed for printing and packing had taken the above factors into account and included them in the qualifications at different levels and in different ways. The qualifications and standards have been constructed to be:

> Flexible in terms of levels and include options for both apprentices as well as those who advance more slowly.
> Generic so that they can be applied to any sophisticated printing and packing process.
> Future-orientated so that the qualifications do not have to be revised frequently as technology changes.
> Skill-based so that those who still interface with older equipment are not marginalized.
> Linked to business drivers such as global competition, cost reduction, environmental impact, SMME development as well as recognition of prior learning.
> Broad skills sets, not only for printing and packaging but also for team building, customer handling, coaching, mentoring and assessing.
> Stretches beyond the traditional craft or trade qualification to included advanced technical skills as well as the basics of production and business management skills.

The South African qualifications measure up well in terms of the above trends to the recently revised printing qualifications developed in Australia.

Resources

All websites were visited between 1 April and 30 November 2005.

Kipphan, Helmut ed, 2001. Handbook *of* print media: technologies and production methods Berlin: Springer.

Websites:

Germany
> http:/linfobub.arbeitsagentur.de/berufelstart?dest=profession&prof-id=l495

India

> http://texmin.nic.in/annualrep/arch09.htm
> http://www.tn.gov.in/gorders/labemp-e-66-2003.htm
> http://dget.nic.in/lisdapp/Trade/syllabus/pdf/TTSCR.pdf
> http://yavatmal.nic.in/ITI.htm

Ireland

> http://wwwncva.ie/exist_legacy_awards

Switzerland
> http://www.bbt.admin.ch/berufsbi/bildungse/d/34117_d.pdf

UK

>
http://www.apprenticeships.org.uk/list/apprenticeshipsdirectory/mediaandprinting/printandprintpackaging.htm
> http://www.printnto.org/ (presently under re-construction)
> http://www.petf.org.uk/content_nvq
> http:l/www.britishprint.com/training/nvqpathways.asp

USA

> http://www.bls.gov/ocolocos231.htm
> http:/lwww.gciu.org
> http://www.gatf.org
> http:llwww.ncssgc.org

ARTICULATION OPTIONS

> This qualification articulates vertically with the National Certificate in Printing and Manufacture of Packaging: NQF Level 3 ID: **57899.**
> This qualification articulates horizontally with the National Certificate in Metals Production at NQF Level 2 ID: **49018.**

MODERATION OPTIONS

> Anyone assessing a learner or moderating the assessment of a learner against this unit standard must be registered as an assessor with the relevant Education, Training, Quality, Assurance (ETQA) Body, or with an ETQA that has a Memorandum of Understanding with the relevant ETQA.

> Any institution offering learning that will enable the achievement of this unit standard must be accredited as a provider with the relevant Education, Training, Quality, Assurance (ETQA) Body, or with an ETQA that has a Memorandum of Understanding with the relevant ETQA.

> Assessment and moderation of assessment will be overseen by the relevant Education, Training, Quality, Assurance (ETQA) Body, or by an ETQA that has a Memorandum of Understanding with the relevant ETQA, according to the ETQA's policies and guidelines for assessment and moderation.

> Moderation must include both internal and external moderation of assessments, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described in the unit standard.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

The following criteria should be applied by the relevant ETQA:
> Appropriate qualification with a minimum of 3 years' experience of a relevant process of printing or packaging manufacture. The subject matter expertise of the assessor can also be established by recognition of prior learning.
> Registration as an assessor with a relevant ETQA.

NOTES

N/A

	UNIT STANDARD ID AND TITLE	*LEVEL*	*CREDITS*	*STATUS*
Core	12463 Understand and deal with HIV/AIDS	Level 2	3	Reregistered

Core	13217 Collect and use information	Level 2	5	Reregistered
Core	13220 Keep the work area safe and productive	Level 2	8	Reregistered
core	119744 Select, use and care for engineering hand tools	Level 2	8	Registered
Core	119913 Use a personal budget to manage own money	Level 2	3	Registered
	and packaging manufacturing processes			Comment
Core	243186 Monitor the quality of the input materials and the manufactured packaging or printed product	Level 2	10	Draft - Prep for P Comment
Core	243187 Respond to changes in printing or production processes	Level 2	8	Draft - Prep for P Comment
Elective	14445 Frame and implement an individual action plan to improve productivity within an organisational unit	Level 1	3	Registered
Elective	9909 Identify and process waste	Level 2	4	Reregistered
Elective	12207 Operate moving equipment to stack, de-stack and position materials	Level 2	4	Registered
Elective	12219 Select use and care for engineering power tools	Level 2	6	Reregistered
Elective	12484 Perform basic tire fighting	Level 2	4	Reregistered
Elective	13221 Perform routine maintenance	Level 2	8	Registered
Elective	114957 Contribute to the health, safety and security of a financial services workplace	Level 2	2	Registered
Elective	243178 Prepare processed product for the next stage or for storage	Level 2	5	Draft - Prep for P Comment
	and community life			
Fundamental	7480 Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3	Reregistered
Fundamental	9007 Work with a range of patterns and functions and solve problems	Level 2	5	Reregistered
Fundamental	12461 Communicate at work	Level 2	5	Reregistered
Fundamental	119454 Maintain and adapt orallsigned communication	Level 2	5	Registered
Fundamental	119456 Write/present for a defined context			

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 1

SAQA US ID	*UNIT STANDARD TITLE*
243178	Prepare processed product for the next stage or for storage

SGB NAME	*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging	***6***	
UNIT STANDARD TYPE	***ORGANISING FIELD DESCRIPTION***	***SUBFIELD DESCRIPTION***
Regular	Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND ***CREDITS***	***NQF LEVEL***	***UNIT STANDARD TYPE***
2		

SPECIFIC OUTCOME 1

Determine requirements for manufactured product or components and prepare working area.

SPECIFIC OUTCOME 2

Perform packing and transport operations.

SPECIFIC OUTCOME 3

Carry out post-production operations to the finished product or related materials.

SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 2

SAQA US ID	*UNIT STANDARD TITLE*		
243185	Use and care for materials, services, tools and equipment required for printing and packaging manufacturing processes		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging		*6*	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	12	Level 2	Regular

SPECIFIC OUTCOME 1

Select and use tools to perform a range of functions as required by the process.

SPECIFIC OUTCOME 2

Adjust and maintain equipment.

SPECIFIC OUTCOME 3

Prepare, lift, load and unload products, equipment and containers.

SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORJTY

UNIT STANDARD: **3**

SAQA US ID	*UNIT STANDARD TITLE*
243186	Monitor the quality of the input materials and the manufactured packaging or printed product

SGB NAME	*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging	*6*	

UNIT STANDARD TYPE	*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular	Manufacturing, Engineering and Technology	Manufacturing and Assembly

ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	10	Level *2*	Regular

SPECIFIC OUTCOME 1

Conduct visual checks on incoming materials and components and the manufactured product.

SPECIFIC OUTCOME 2

Measure products, components and materials and conduct operational on-line tests.

SPECIFIC OUTCOME 3

Recognise defects and mark or remove defective materials, products or components.

SPECIFIC OUTCOME 4

Record production and defects and report incidents.

SPECIFIC OUTCOME 5

Receive and respond to instructions, information or communications.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: **4**

Respond to changes in printing or production processes

SAQA US ID	*UNIT STANDARD TITLE*		
243187	Respond to changes in printing or production processes		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging		*6*	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	*8*	Level *2*	Regular

SPECIFIC OUTCOME 1

Monitor the printing or packaging equipment and respond to changes.

SPECIFIC OUTCOME 2

Carry out housekeeping and simple maintenance processes as required by the process.

SPECIFIC OUTCOME 3

Record processing conditions, outputs, stoppages and changes and determine output figures.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Printing and Manufacture of Packaging

SAQA QUAL ID	QUALIFICATION TITLE
57899	National Certificate: Printing and Manufacture of Packaging

SGB NAME	ORGANISING FIELD ID	PROVIDER NAME
SGB Printing and Packaging	6	
QUAL TYPE	**ORGANISING FIELD DESCRIPTION**	**SUBFIELD**
National Certificate	Manufacturing, Engineering and Technology	Manufacturing and Assembly

ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
Undefined	128	Level 3	Regular-Unit Stds Based

This qualification will equip the individual with the skills, knowledge and values to participate effectively in workplace activities within the printing and packaging manufacturing industries. Learners achieving this qualification will be able to contribute to printing and packaging manufacturing processes by:

> Understanding and implementing basic approaches to using and looking after machinery and equipment.
> Understanding and implementing basic procedures related to various aspects of the production process.
> Relating principles and concepts to workplace activities, materials and equipment.

Qualifying learners will also be able to relate what they see and experience to scientific and technological principles and concepts. They will also understand how they should operate within the systems which govern their workplace. What learners achieve through this qualification will also serve ***as*** a basis for further learning where they will engage more directly in operating and adjusting the production process.

The skills, knowledge and values demonstrated within this qualification will ensure that workers and new entrants will acquire relevant skills and knowledge required by a fast-changing sector essential for economic growth and transformation. This qualification will contribute *to* the social upliftment of employees and economic growth within the printing and packaging manufacturing environment by allowing learners who are active in the industry to gain recognition for the skills and knowledge they have acquired without having to go through a formal apprenticeship process. Small printing and packaging manufacturing enterprises would also be ideal vehicles for Black Economic Empowerment.

Rationale:

This qualification and the related qualifications in this series replace a number of qualifications for various trades and occupations in the printing and manufacture of packaging industries.

These industries are currently also undergoing significant change. These changes include:

> Changes in machine design.
> A shift from film and other media to digital imaging, processing and printing.
> A shift from hand skills to conceptual skills.
> Greater global competition and higher standards required for products designed to be exported.
> More exacting requirements from customers and consumers.

These changes require that these trades and occupations also need to incorporate new skills and knowledge to replace outdated skills and knowledge.

This qualification and the associated qualifications in the learning pathway provide a developmental pathway for the full range of activities related to the occupation, from those of the operator of simple equipment for printing and the manufacture of packaging, to those of the tradesperson with several years' experience, with a higher level of technical knowledge and the ability to integrate new technology, materials and processes into existing operations. This is the second in a series of four qualifications in a learning pathway for high-volume printing and packaging manufacturing processes. The qualification series ends with the Certificate in Printing and Manufacture of Packaging: NQF Level 5. Further career development after NQF 5 would be based on choices relating to the learner's aspirations:

> Entrepreneurial activities (starting own business)
> General or technical management
> Quality management
> Conceptual design of printing and packaging materials
> Advanced technology

Printing and packaging products have to respond to a wide variety of exacting customer and consumer requirements. In addition, the industries have to respond to environmental issues and the on-going development of new products as a result of changing customer needs.

This qualification is applicable to learners in the following contexts.

Printing:

> Letterpress
> Screen printing
> Flexography
> Gravure
> Lithography
> Continuous stationery
> Roll label
> Rotary offset

Manufacture of packaging, with or without in-line printing processes:

> Bag making (flat bag)
> Sack making (tubing)
> Sack making (Bottoming)
> Carton making
> Can and end making
> Laminating
> Coating
> Corrugated board manufacturing
> Tubing
> Wrapping
> Over printing
> Envelope making
> File manufacturing

Typical learners would already have acquired elementary skills and knowledge relevant to the printing or packaging manufacturing process and substrates. Once qualified, they would be able to perform routine equipment operations and adjustments, and to perform tasks semi-autonomously within the context of an overall team. In some instances this role represents a full-time position in the organisation; in other instances this is simply a stage in occupational development.

This qualification series recognises skills, knowledge and values relevant to a workplace. It is designed for learners who engage actively in printing and packaging manufacturing processes. It is suitable for learners who:

> Attend courses and then apply the knowledge gained to activities in the workplace (Portfolio to reflect formative assessment).
> Are already workers and have acquired the skills and knowledge without attending formal courses (RPL can be done through the summative assessment and portfolio of evidence).

The outcomes of this qualification combine skills and knowledge in the technical, inter-personal and business spheres, enabling the learner to perform the operational aspects of the work, function within a team context and contribute to value-adding processes in the business.

The printing and packaging manufacturing industries are essential to the supply of a wide range of processed and manufactured products, from foodstuffs to pharmaceuticals, to the consumer. These industries are also vital to the country's export markets. Printing also provides society with reading matter in a wide variety of forms from leaflets and advertising to magazines, newspapers and books. This qualification also emphasises the learner's role in conserving resources and behaving responsibly towards the environment in general.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that learners are already competent in:
> Communication and Mathematical Literacy at NQF Level 2.

Recognition of Prior Learning:

This qualification may be obtained through a process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. The guidelines for integrated assessment should be used to develop the RPL assessment process. As with integrated assessment, while this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the Exit Level Outcomes.

Access to the qualification:

There is open access to this qualification. However it is preferable that learners have completed the National Certificate in Printing and Manufacture of Packaging: NQF Level 2.

QUALIFICATION RULES

> The total number of credits for this qualification is 128
> The total number of credits in the Fundamental component is 46
> The total number of credits in the Core component is 70
> The minimum number of Elective credits is 12

The elective unit standard - Make and work with printing plates must be selected for printing contexts.

EXIT LEVEL OUTCOMES

The Exit Level Outcomes for this qualification reflect a combination of Specific Outcomes and Critical Cross-field Education and Training Outcomes.

1. Perform routine operations on printing and packaging equipment using related information.
> Range: Routine operations include any machine operations before, during and after the production process, include basic setting operations.

2. Understand, use and apply policies and procedures to maintain materials, equipment, work-place relations, safety and quality.
> Range: Policies and procedures relate to all organisational policies and procedures.

3. Contribute to workgroup efforts.

Critical Cross-field Outcomes:

These are embedded in the unit standards which make up the qualification and are thus also reflected in the Exit Level Outcomes of the 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 (ELO's 1, 2).
> Working effectively with others as a member of a team, group, organization and community (ELO 3).
> Organising and managing oneself and one's activities responsibly and effectively (ELO 1,2,3).
> Collecting, analyzing, organizing and critically evaluating information (ELO's 1, 2).
> Communicating effectively using visual, mathematical and/or language skills (ELO's 1, 2, 3).
> Using Science and technology effectively and critically, showing responsibility toward the environment

and health of others (ELO's 1, 2, 3).
> Demonstrating an understanding of the world as a set of related systems by recognising that problem contexts do not exist in isolation (ELO's 2, 3).

ASSOCIATED ASSESSMENT CRITERIA

1.
> Materials, tooling, consumables and finished product are transported and stored safely and effectively.
> Range: Tooling includes printing and former plates, cylinders, rollers, gears, knives, blades, and ancillary and auxiliary equipment related to the specific process or context.
> Routine operations, are carried out safely, effectively and together with other team members.
> Range: Routine operations includes cleaning, starting and stopping processes, lockout, inching and assisting with the installation and removal of tooling, inspecting safety devices.
> Operations are performed according to relevant standards, operating procedures or instructions.

2.
> Procedures are explained and applied routinely and effectively.
> Reports, recording of conditions, outputs and incidents are done accurately and timeously.
> Range: Conditions related to any aspect of the equipment, the production environment, materials or services.
> Consequences of not applying policies and procedures are discussed and explained.
> Routine maintenance activities are carried out on tools and equipment according to relevant standards or procedures.
> Materials in various stages of the process are kept in an optimum condition.
> Range: Materials include consumables and cleaning materials, sub-standard materials, rejects; handling includes receiving, loading, storage and disposal.

3.
> Production schedules and assignments are met in accordance with performance standards.
> Production workflow is managed in accordance with organisational standards.
> Workgroup goals are met in accordance with performance standards.
> Active participation in workgroup discussions, in workgroup problem solving activities and in the implementation of solutions is demonstrated.
> Range: Problem solving includes sustainable cost saving.
> Relevant information is received and processed as per instructions.

Integrated Assessment:

The integrated assessment should be based on a summative assessment guide. The guide will specify 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, 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 and summative assessment of unit standards.

Assessment of competence for this qualification is based on experience acquired by the learner in the workplace, within the particular printing of packaging manufacturing context. 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 management process. The assessment process should also establish how the learning process has advanced the Critical Cross-field Outcomes.

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.

Assessors should also evaluate evidence that the learner has been, and is, able to perform consistently over a period of time.

INTERNATIONAL COMPARABILITY

Introduction

This study incorporates an electronic search across continents for standards, trends and structure of courses in the Printing and Packaging fields. Information on industry and trade standards, curricular and syllabi from academic and industry training institutions available was compared. The depth of the search went as far as Nigeria from which a report into the industrial sectors of Nigeria led the study to the conclusion that the print and packaging industry was in its infancy stage and almost completely dependent on imports and foreign companies, implying that skills development in the sector is at best dependent on imported courses and industry training standards.

Other sub-Saharan countries reviewed included Ghana, Kenya, Malawi, Mauritius and Tanzania where a similar situation of an emerging printing and packaging sector heavily dependent on imported industry standards and accompanying education and training packages is evident. Many training initiatives are being supported by foreign donor-funding, for example, Ghana where the Regional African Development Project has been working with the emerging printing and packaging sector for a number of years to transfer skills and capacitate emerging printing and packaging companies. Moves to establish a regional printing and packaging association able to set industry standards and collaborate on training and skills development are occurring in East Africa with Tanzania hosting regional conferences for the emerging printing and packaging industry on an annual basis.

In the main, it seems that the emergence and need for industry standards and concomitant development *of* training courses and programmes is related to demands associated with exports and penetration of global markets, particularly in respect of packaging for processed foods (health and safety issues) as well as waste packaging (environmental issues).

Of the developing economies in the world, India is particularly advanced in the sector as far as training and development is concerned with courses offered ranging from certificate level of 3 month duration to Masters in Business Administration with a specialization in printing and packaging. The prospectus from one institution emphasizes the need for this specialization in training mentioning the important contribution of packaging and printing to export and marketing which is a direct contributor to the growth of their economy. Information on the content of printing trades and crafts in India does not reveal much information, except for those associated with the development of handcrafts and the announcement of a new printing trade for desktop publishing operator. It would seem that the printing trades have not changed significantly.

Of the countries with established qualifications frameworks, information from institutions in Australia, Ireland, New Zealand, England-Wales and Scotland was sought and found to be very informative in this context.

Of particular note is Australia, where a new set of training course standards were published during October 2005. This allowed the SGB to compare their perception of new trends with those of another country.

> In addition, as preparation for the development process some of the SGB members reviewed the 'bible' of printing the Handbook of Print Media - Technologies and Production Methods, edited by Prof. Dr.-Ing. habil. Helmut Kipphan for the Heidelberger Druckmaschinen AG, one of the best-known names amongst printing equipment manufacturers.

Comparison

Kipphan and his fellow writers note that changing technology is impacting dramatically on the nature of equipment and the the type of work that is being done. Traditional photolithography and all the skills associated with film have given way to digital computer-to-plate and computer-to-press processes. In addition new non-impact printing processes such as laser and ink jet have also changed the type and nature of printed products. New substrates are also influencing the printing and packaging processes. This is leading to the "one-ma press" working environment, where one person will now do what was the work of a team previously. He goes on to note:

Printing processes are being increasingly controlled and adjusted electronically, which leads to consistent high quality and greater productivity. Digital workflow also means that productions are completed more rapidly. Hence more than half of the orders for commercial printers arrive in digital form. By the year 2002 this figure is expected to be over 65%. This is the only way of shortening delivery times for print products and meeting the high customer demand for quality. All printing companies are expected to offer greater flexibility in the processing of a large variety of substrates, inks, and methods of print finishing. This means that there is a visible trend for all print products to employ multicolor as well as decorative and special colors. In addition, run lengths are getting shorter since experts believe that the greatest chance of growth

lies in the market for small. color work with a fast turnaround time.

Finally hard copy is slowly giving way or being augmented by multi-media, digital products such as CDs and the World Wide Web. While Kipphan expects these to impact on traditional print media he does not expect them to be replaced by digital multi-media.

These developments have a clear impact on the type and nature of the training that people in the printing and packaging industry will undergo. A survey of qualifications, standards, courses, apprenticeships, occupational outlooks and industry websites reveals changes taking place but at an uneven and inconclusive way. Some of these issues are discussed below.

In the study it was clear that the structure and duration of courses would differ from the outcomes-based standards based on applied competence designed for South Africa, since their credit systems and syllabi differs in so far as knowledge acquisition and practical training is concerned. Many of the courses are particularly designed for the vocational context especially in Australia, Ireland, England and Scotland. The Lead Employer Council for Printing and Packaging in the United Kingdom, the British Printing Industries Federation, has adopted the Scottish-National Vocational Qualifications (S/NVQs) as the training and development framework and learning achievement outcomes for their industry sector. This suggest that the quality of the Scottish solution is a clear benchmark implication.
Countries with outcomes based systems still remain the best source of information when doing this research. Hence we have drawn a comparison between South Africa, Australia, Ireland, New Zealand, Scotlant (and the UK). There is insufficient information on printing apprenticeships in other countries to make valid comparisons in the same way. The following table indicates the broad fit of the proposed qualifications into overseas schemes.

Australia:

> Programmes designed toward industry needs.
> Programmes include broader knowledge base for personal development, including customer relations and innovation.
> Programme structure consists of fundamental and core and referred to as compulsory and a group *of* electives. Elective = **40%** of programme.
> Modules are industry process specific broadening on communication, health and safety, customer orientation and business skills.
> Almost 70% of programme is based in industry.
> Certificates, Diplomas, Advanced Diplomas and Degrees in Printing and Packaging.

Ireland:

> Programmes designed towards industry needs.
> Programmes specific to occupation or tasks associated with job competence or specific skills certificates.
> Programme structure determined by specific skill set.
> Modules are industry process specific.
> Awards for acquisition of skills sets at **4** levels on the Awards Framework (levels 3, **4, 5** and 6).

New Zealand:

> Programmes designed towards industry needs.
> Programmes include broader knowledge.
> Modules are industry process specific broadening on communication, health and safety.
> National Certificates at levels 2, 3 and **4.**

Scotland and UK:

> Programmes designed towards industry needs.
> Programmes specific to occupation and include education and training and self-development.
> Programme structure consists of mandatory common and technical and a small group of options - 2 technical and 1 general with a strong skills development focus. Optional = 27%.
> Modules are industry process specific and include self and other development in the optional choices.
> S/NVQ qualifications at levels **2** and 3.

South Africa:

> Programmes designed toward industry and occupational needs.
> Programmes include broader knowledge for lifelong learning and personal development.
> Electives = 10%.

> Unit standards based on a combination of fundamental and core which is a mix of the other approaches.
> Certificates and Diplomas.

Australian Printing Qualification:

> Cert I Pre-Vocational Printing 7793. (The program structure below was last updated on 13/09/2005)

Compulsory Courses Group A
> Select 6 Courses:

Name: Credit

> NcsOOl Workplace Communication: 40
> Work Environ - Print Ind: 40
> O H and Safety PV1: 10
> Intro - Computers - G Arts PV1: 40
> Intro To Electronic Printing: 10
> Industry Visits PV1: 20

Model 1 (Press) Compulsory Courses Group A
> Select 5 Courses:

Name: Credit

> Print Machine and Material Product Support 1: 40
> Print Machine Wash Up and Maintain: 40
> Sheet-Fed Litho 1 (PV1): 40
> Guillotining 1 (PV1): 20
> Packaging and Dispatch: 20

Model 1 (Press) Elective Courses Group A
> Select 3 Courses:

Name: Credit

> Man Combin 1 (Mon/Bas Col): 40
> Litho Platemaking and Step and Repeat: 40
> Hand Binding and Finishing PV1: 40

Model 2 (Prepress) Compulsory Courses Group A
> Select 3 Courses:

Name: Credit

> Print Processes And Materials: 40
> Packaging And Dispatch: 20
> Guillotining 1 (PV1): 20

Model 2 (Prepress) Elective Courses Group A
> Select 5 Courses:

Name: Credit

> Typography 1: 40
> Scanning 1: 40
> Image Output Electronic: 40
> Electronic Image Assembly 1: 40
> Colour Theory and Proofing: 40

Scottish National Vocational Qualification example: Level 3

> Desktop Publishing - Level 3 - Overview

Mandatory Common Units:

> 001: Reduce risks to health and safety in your workplace

> 002: Develop yourself in your job

Mandatory Technical Units:

> 705: Plan datafile production
> 706: Create and apply typographical specifications to meet customer requirements
> 305IT: Design and produce documents using word processing software (IT)
> 312IT: Design and produce documents using graphics (ITNTO)
> 302IT: Maintain the software environment (ITNTO)
> 3CS: Develop customer relationships (ICS)

Optional Technical Units (Choose 2):

> 707: Calibrate and control colour in Desk Top publishing
> 708: Produce aeronautical documentation
> 709: Produce graphical representations of aeronautical spatial data
> 33D: Develop and present suitable design responses (SFEDI)
> 34D: Produce and present detailed design proposals (SFEDI)
> 212IT: Maintain and use databases (ITNTO)

General Optional Unit (Choose 1):

> B1: Support the efficient use of resources (MCI)
> C1: Manage yourself (MCI)
> C9: Contribute to the development of teams and individuals (MCI)
> C12: Lead the work of teams and individuals to achieve their objectives (MCI)
> D32: Assess candidate performance (ENTO)
> C24: Facilitate learning through demonstration and instruction (ENTO)
> C25: Facilitate individual learning through coaching (ENTO)
> 005: Train new operators

The above examples demonstrate the shift to IT skills, team - and customer relationships, digital workflows and the development of skills in others.

Apprenticeship:

In general, training for printing and the manufacture of packaging occupations is still traditionally done through apprenticeships even where other system occur. Countries which have apprenticeships from the countries surveyed include the UK, German, the United States, India, Australia.

Apprenticeships follow a fairly similar pattern. They last approximately three years, they comprise a combination of theory and practice in a ratio of approximately 1:2. The theory component also includes broader business and quality. Latterly however, some have been stretched to include broader issues such environment, entrepreneurship and information technology subjects or topics.

Apprenticeships, in general, are aimed at particular printing techniques and processes, although there are now indications, eg in Germany, where the range of trade qualifications is being reduced to four core processes:

> Flexography
> Gravure
> Lithography
> Digital

One apprenticeship surveyed (in Switzerland) stretches into a fourth year and includes great emphasis on quality, troubleshooting, safety and environmental systems and practices as well as greater technical ability in terms of pre-press and print process including issues related to efficiency, productivity and lean manufacturing.

Some apprenticeships are shorter than this norm, ef screen printing handicraft apprenticeships in India last 6 months and include:

> Basic training of one week
> Practical trade training
> Trade theory

Screen printing on, for instance, tee shirts lends itself to entrepreneurship. Hence this apprenticeship is really aimed at SME-Development.

Many countries also include in their occupational profile printing assistances or operators who have not formally been through an apprenticeship and have learned largely on-the-job.

In a number of countries (e.g. India, Germany, Australia) there is now a new trade qualification emerging, one for digital printing. The impact of information technology has also meant a change in the way people work and the demise of old trade qualifications such as photo lithographer.

Apart from the changes to training courses the delivery of new equipment into companies also affects that nature and type of skills required by practitioner. Computer technology has also affected the control systems of printing and packaging equipment. The impact of this still lies, to large extent, in the future.

Conclusion

The South Africa qualifications developed for printing and packing had taken the above factors into account and included them in the qualifications at different levels and in different ways. The qualifications and standards have been constructed to be:

> Flexible in terms of levels and include options for both apprentices as well as those who advance more slowly
> Generic so that they can be applied to any sophisticated printing and packing process
> Future-orientated so that the qualifications do not have to be revised frequently as technology changes
> Skill-based so that those who still interface with older equipment are not marginalized
> Linked to business drivers such as global competition, cost reduction, environmental impact, SMME development as well as recognition of prior learning
> Broad skills sets, not only for printing and packaging but also for team building, customer handling, coaching, mentoring and assessing
> Stretches beyond the traditional craft or trade qualification to included advanced technical skills as well as the basics of production and business management skills

The South African qualifications measure up well in terms of the above trends to the recently revised printing qualifications developed in Australia.

Resources:

All websites were visited between 1 April and 30 November 2005

Kipphan, Helmut ed, 2001. Handbook of print media : technologies and production methods Berlin: Springer

Websites

Germany:
http://infobub.arbeitsagentur.de/berufe/start?dest=profession&prof-id=1495

India:
http://texmin.nic.in/annualrep/arch09.htm
http://www.tn.gov.in/gorders/labemp-e-66-2003.htm
http://dget.nic.in/lisdapp/Trade/syllabus/pdf/TTSCR.pdf
http://yavatmal.nic.in/ITI.htm

Ireland:
http://www.ncva.ie/exist_legacy_awards

Switzerland:
http://www.bbt.admin.ch/berufsbi/bildungse/d/34117_d.pdf

UK:
http://www.apprenticeships.org.uk/list/apprenticeshipsdirectory/mediaandprinting/printandprintpackaging.htm
http://www.printnto.org/ (presently under re-construction)
http://www.petf.org.uk/content_nvq
http://www.britishprint.com/training/nvqpathways.asp

USA:
http://www.bls.gov/oco/ocos231.htm

http://www.gciu.org
http:llwww.gatf.org
http:/lwww.ncssgc.orgl

ARTICULATION OPTIONS

This qualification has been designed and structured so that qualifying learners can move from one context within the printing and packaging manufacturing fields to another. They would have to acquire the specific knowledge related to the new context and adjust their skills and values accordingly.

Employers or institutions should be able to evaluate the outcomes of this qualification against the needs of their context and structure top-up learning appropriately. Holders of other qualifications may be evaluated against this qualification for the purpose of RPL and placement in learning programmes.

This qualification articulates vertically with the National Certificate in Printing and Manufacture of Packaging: NQF Level **4,** 57898. This qualification articulates horizontally with other manufacturing qualifications at this level.

MODERATION OPTIONS

> Anyone assessing a learner or moderating the assessment of a learner against this Qualification must be registered **as** an assessor with an appropriate Education, Training, Quality Assurance (ETQA) Body or with an ETQA that has a Memorandum of Understanding 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 or with an ETQA that has a Memorandum of Understanding with the relevant ETQA.

> Moderation of assessment will be overseen by the relevant ETQA or by an ETQA that has a Memorandum of Understanding with the relevant ETQA, according to the ETQA`s policies and guidelines for assessment and moderation.

> 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 in the exit level outcomes described in the Qualification.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

The following criteria should be applied by the relevant **ETQA:**

> Appropriate qualification at one level higher than the level of the qualification.
> A minimum of 3 years' experience of a relevant process of printing or packaging manufacture.
> Registration as an assessor with a relevant ETQA.

NOTES

NIA

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

	UNIT STANDARD ID AND TITLE	LEVEL	CREDITS	STATUS
core	9530 Manage work time effectively	Level 3	3	Reregistered
core	9533 Use communication skills to handle and resolve conflict in the workplace	Level 3	3	Reregistered
core	12456 Explain and use organisational procedures	Level 3	6	Reregistered
core	12457 Develop learning strategies and techniques	Level 3	3	Reregistered
core	13223 Apply safety, health and environmental protection procedures	Level 3	6	Reregistered
core	13234 Apply quality procedures	Level 3	8	Reregistered
Core	116720 Show understanding of diversity in the workplace	Level 3	3	Registered
core	243120 Perform routine maintenance tasks on printing or packaging production equipment	Level 3	8	Draft - Prep for P Comment
core	243177 Perform routine operations on printing or packaging production equipment	Level 3	10	Draft - Prep for P Comment
core	243181 Transport, care for and install interchangeable machine parts in pnnting or packaging equipment	Level 3	15	Draft - Prep for P Comment

Core	**243183** Work with and look after materials in the printing or packaging production process	Level 3	5	Draft - Prep for P Comment
Elective	**117867** Managing files in a Graphical User Interface (GUI) environment	Level I	3	Registered
Elective	**114104** Handle production waste	Level 2	3	Registered
Elective	**8038** Operating lift trucks	Level 3	6	Reregistered
Elective	**8039** Operating cranes	Level 3	10	Registered
Elective	**12455** Perform the role of a safety, health and environmental protection representative	Level 3	4	Reregistered
Elective	**119179** Conduct simple tests during the plastics manufacturing process	Level 3	4	Registered
Elective	**119182** Control materials and consumables for plastics manufacturing processes	Level 3	4	Registered
Elective	**243179** Make and work with printing plates	Level 3	8	Draft - Prep for P Comment
Fundamental	**9357** Develop and use keyboard skills to enter text	Level 1	4	Reregistered
Fundamental	**7456** Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	5	Reregistered
	9010 Demonstrate an understanding of the use of different number bases and	Level 3	2	Reregistered
Fundamental	**119457** Interpret and use information from texts	Level 3	5	Registered
Fundamental	**119465** Write/present/sign texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	**119472** Accommodate audience and context needs in oral/signed communication	Level 3	5	Registered
Fundamental	**119915** Manage personal expenditure	Level 3	3	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 1

Perform routine maintenance tasks on printing or packaging production equipment

SAQA US ID	*UNIT STANDARD TITLE*		
243120	Perform routine maintenance tasks on printing or packaging production equipment		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging		6	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND	*CREDITS*		
Undefined	8	Level 3	Regular

SPECIFIC OUTCOME 1

Carry out routine checks on production machines and operations.

SPECIFIC OUTCOME 2

Explain and perform routine maintenance activities.

SPECIFIC OUTCOME 3

Complete maintenance records.

SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: **2**

Perform routine operations on printing or packaging production equipment

SAQA US ID	*UNIT STANDARD TITLE*
243177	Perform routine operations on printing or packaging production equipment

SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging		6	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	10	Level **3**	Regular

SPECIFIC OUTCOME 1

Monitor equipment and material, conduct quality checks and resolve problems.

SPECIFIC OUTCOME 2

Perform make ready, start up and shutdown procedures on the printing or packaging equipment.

SPECIFIC OUTCOME 3

Prepare for and perform changeover procedures.

SPECIFIC OUTCOME **4**

Discuss and explain issues related to printing or packaging equipment and operations.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: **3**

Make and work with printing plates

SAQA US ID	*UNIT STANDARD TITLE*
243179	Make and work with printing plates

SGB NAME	*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging	**6**	

UNIT [illegible]*PE*	*ORGANISING FIELD DESCRIPTI*	*S IBFIEL D DESCRIPTION*
Regular	factuiing, Engineering and [illegible] r	Manufacturing and [illegible]

BAND	*CREDI S*	*N EVEL*	*UNI ST*
[illegible]	8	[illegible] 3	R [illegible]

SPECIFIC OUTCOME 1

Determine print requirements, select appropriate type of plate and related materials.

SPECIFIC OUTCOME 2

Check film negatives for conformance to specification and process plates.

SPECIFIC OUTCOME 3

Clean up working area and equipment and handle and store plates appropriately.

SPECIFIC OUTCOME 4

Explain and apply principles related to plate making, handling and storage.

SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: **4**

SAQA US ID	*UNIT STANDARD TITLE*		
243181	Transport, care for and install interchangeable machine parts in printing or packaging equipmen		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging		6	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	15	Level 3	Regular

SPECIFIC OUTCOME 2

Prepare and transport interchangeable machine parts.

SPECIFIC OUTCOME 3

Install interchangeable machine parts and equipment.

SPECIFIC OUTCOME 4

Maintain the condition of interchangeable machine parts and equipment during production.

SPECIFIC OUTCOME 5

Complete records; recognise and report problems.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: ***5***

SAQA US ID	*UNIT STANDARD TITLE*		
243183	Work with and look after materials in the printing or packaging production process		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging		6	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	*5*	Level 3	Regular

SPECIFIC OUTCOME 2

Plan and arrange transport of materials to the workstation.

SPECIFIC OUTCOME 3

Transport and safely store materials.

SPECIFIC OUTCOME 4

Prepare materials and components for the production and post-production processes.

SPECIFIC OUTCOME 5

Record material quantities, report material usage and explain and discuss material-related issues and variances.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

Further Education and Training Certificate: Printing and Manufacture of Packaging

SAQA QUAL ID	*QUALIFICATION TITLE*		
57898	Further Education and Training Certificate: Printing and Manufacture of Packaging		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging		6	
QUAL TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD*
Further Ed and Training Cert		Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUALIFICATION CLASS*
Undefined	146	Level 4	Regular-Unit Stds Based

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

This qualification will equip the individual with the skills, knowledge and values to participate effectively in workplace activities within the printing and packaging manufacturing industries. Learners achieving this qualification will be able to contribute to printing and packaging manufacturing processes by:

> Setup production equipment and set processes to manufacture good quality products.
> Solving common problems to produce quality products to meet customer or organisational needs.
> Interacting with others to achieve production objectives.

Qualifying learners will also be able to relate what they see and experience to scientific and technological principles and concepts. They will also understand how they should operate within the systems which govern their workplace. What learners achieve through this qualification will also serve as a basis for further learning where they will set up or make ready the manufacturing or printing process.

The skills, knowledge and values demonstrated within this qualification will ensure that workers and new entrants will acquire relevant skills and knowledge required by a fast-changing sector essential for economic growth and transformation. This qualification will contribute to the social upliftment of employees and economic growth within the printing and packaging manufacturing environment by allowing learners who are active in the industry to gain recognition for the skills and knowledge they have acquired without having to go through a formal apprenticeship process. Small printing and packaging manufacturing enterprises would also be ideal vehicles for Black Economic Empowerment.

Rationale:

This qualification and the related qualifications in this series replace a number of qualifications for various trades and occupations in the printing and manufacture of packaging industries.

These industries are currently also undergoing significant change. These changes include:

> Changes in machine design.
> A shift from film and other media to digital imaging, processing and printing.
> A shift from hand skills to conceptual skills.
> Greater global competition and higher standards required for products designed to be exported.
> More exacting requirements from customers and consumers.

These changes require that these trades and occupations also need to incorporate new skills and knowledge to replace outdated skills and knowledge.

This qualification and the associated qualifications in the learning pathway provide a developmental pathway

for the full range of activities related to the occupation, from those of the operator of simple equipment for printing and the manufacture of packaging, to those of the tradesperson with several years' experience, with a higher level of technical knowledge and the ability to integrate new technology, materials and processes into existing operations. This is the third in a series of four qualifications in a learning pathway for high-volume printing and packaging manufacturing processes. The qualification series ends with the Certificate in Printing and Manufacture of Packaging: NQF Level *5*. Further career development after NQF *5* would be based on choices relating to the leaner's aspirations:

> Entrepreneurial activities (starting own business).
> General or technical management.
> Quality management.
> Conceptual design of printing and packaging materials.
> Advanced technology.

Printing and packaging products have to respond to a wide variety of exacting customer and consumer requirements. In addition, the industries have to respond to environmental issues and the on-going development of new products as a result of changing customer needs.

This qualification is applicable to learners in the following contexts.

> Printing:

> Letterpress.
> Screen printing.
> Flexography.
> Gravure.
> Lithography.
> Continuous stationery.
> Roll label.
> Rotary offset.

> Manufacture of packaging, with or without in-line printing processes:

> Bag making (self opening bag).
> Sack making (both tubing & bottoming).
> Carton making.
> Can and end making.
> Laminating.
> Coating.
> Corrugated board manufacturing.
> Tubing.
> Wrapping.
> Over printing.
> Envelope making.
> File manufacturing.

Typical learners would already have acquired skills and knowledge relevant to routine operations related to the printing or packaging manufacturing process. Once qualified, they would be able to perform work related to the occupation autonomously and to direct the activities of the team.

This qualification series recognises skills, knowledge and values relevant to a workplace. It is designed for learners who engage actively in printing and packaging manufacturing processes. It is suitable *for* learners who:

> Attend courses and then apply the knowledge gained to activities in the workplace (Portfolio to reflect formative assessment).
> Are already workers and have acquired the skills and knowledge without attending formal courses (RPL can be done through the summative assessment and portfolio of evidence).

The outcomes of this qualification combine skills and knowledge in the technical, inter-personal and business spheres, enabling the learner to perform the operational aspects of the work, function within a team context and contribute to value-adding processes in the business.

The printing and packaging manufacturing industries are essential *to* the supply of a wide range of processed and manufactured products, from foodstuffs to pharmaceuticals, to the consumer. These industries are also vital to the country's export markets. Printing also provides society with reading matter in

a wide variety of forms from leaflets and advertising to magazines, newspapers and books. This qualification also emphasises the learner's role in conserving resources and behaving responsibly towards the environment in general.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that learners are already competent in Communication and Mathematical Literacy at NQF Level 3.

Recognition of Prior Learning:

This qualification may be obtained through a process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. The guidelines for integrated assessment should be used to develop the RPL assessment process. As with integrated assessment, while this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the Exit Level Outcomes.

Access to the qualification:

There is open access to this qualification. However, it is preferable that learners have just completed the National Certificate in Printing and Manufacture of Packaging: NQF Level 3.

QUALIFICATION RULES

> The total number of credits for this qualification is 146.
> The total number of credits in the Fundamental component is 58.
> The total number of credits in the Core component is 70.
> The minimum number of Elective credits is 18.

The elective credits should be chosen in accordance with the requirements of the selected context and the interests of the learner.

EXIT LEVEL OUTCOMES

1. Install required tooling, setup and start up the production or printing process.
 > Range: Tooling includes any exchangeable components, including printing plates.

2. Solve printing and packaging process problems and identify areas for improvement.
 > Range: Areas for improvement include efficiencies, cost, training, quality, safety, maintenance, cleaning and housekeeping and security work.

3. Maintain a safe, effective and efficient workplace, developing the skills and performance of workgroup members.
 > Range: Safe includes issues of health and issues relating to reducing negative impacts on the environment.

4. Understand and work with internal customers and partners.
 > Range: Internal customers and partners include those with roles relating to material preparation and supply, quality assurance, safety, health and the environment, sales and marketing, management, unions or workers representatives and any others who interact with the production environment; In small, medium and micro enterprises the internal customer could include external customers and partners.

Critical Cross-Field Outcomes:

These are embedded in the unit standards, which make up the qualification and are thus also reflected in the Exit Level Outcomes of the 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.
 > Refer to Exit Level Outcome **2.**

> Working effectively with others as a member of a team, group, organization and community.

> Refer to Exit Level Outcomes 1, 2, 3, 4.

> Organising and managing oneself and one's activities responsibly and effectively.
> Refer to Exit Level Outcomes 1, 2, 3, 4.

> Collecting, analyzing, organizing and critically evaluating information.
> Refer to Exit Level Outcomes 1, 2, 3, 4.

> Communicating effectively using visual, mathematical and/or language skills.
> Refer to Exit Level Outcomes 1, 2, 3, 4.

> Using science and technology effectively and critically, showing responsibility toward the environment and health of others.
> Refer to Exit Level Outcomes 1, 2, 3.

> Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation.
> Refer to Exit Level Outcomes 1, 2, 3.

ASSOCIATED ASSESSMENT CRITERIA

1.
> The production process and the manufactured products conform to specifications or standards.
> Range: Specifications include customer and organisational requirements, standard rates of output, waste limits, downtime, set up or make ready times, internal quality processes, eg SPC.
> Installation, setup and start up process are planned, organised and carried out efficiently and safely and within standard times.
> Range: Installation, setup and start up processes includes make ready activities.
> Instructions to workgroup members are clear and records and instructions are maintained.
> All information and data related to the production process are recorded and relevant reports are compiled and presented.
> Issues relating to product design, the production process and the materials used are discussed and resolved.

2.
> Problems are identified and resolved quickly, systematically and in such a way as to minimise recurrence.
> Range: Problems includes problems related to staff absence.
> Machinery and equipment problems are identified and responded to in accordance with set standards.
> Range: Responded to includes performing part replacement and repairs within the limits of own authority and calling on relevant expertise where and when required: includes resolving problems experienced by customers.
> Problems and solutions are recorded and monitored for recurrence.
> Problems and solutions and opportunities for improvement are discussed and resolved with workgroup members and internal customers and partners.
> Range: Problems and solutions includes evidence of continuing development, keeping up to date with changes or the implications of changes.
> The underlying causes and related issues are explained within the printing or packaging context.
> Range: Explanations and discussion include and understanding of the relevant science and technology, impact of poor quality and cost implications and any changes that take place in the market place.

3.
> The conditions in the workplace and the condition of the tools and equipment, safety equipment and services are safe and arranged to reduce waste.
> Hazards are dealt with quickly and effectively.
> Workgroup members are supported, coached and influenced to work effectively, efficiently and safely.
> Contributions made by workgroup members are recognised and acknowledged.

4.
> Key issues are identified, discussed and resolved in accordance with organisational procedures.
> Actions, responsibilities, timeframes and reporting issues are clarified and carried out in accordance with instructions.
> Key ideas, decisions and plans are recorded and carried out in accordance with set timelines.
> Changes are monitored and evaluated according to specifications.

Integrated Assessment:

The integrated assessment should be based on a summative assessment guide. The guide will specify 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, 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 and summative assessment of unit standards.

Assessment of competence for this qualification is based on experience acquired by the learner in the workplace, within the particular printing of packaging manufacturing context. 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 management process. The assessment process should also establish how the learning process has advanced the Critical Cross-field Outcomes.

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.

Assessors should also evaluate evidence that the learner has been, and is, able to perform consistently over a period of time.

INTERNATIONAL COMPARABILITY

Introduction

This study incorporates an electronic search across continents for standards, trends and structure of courses in the Printing and Packaging fields. Information on industry and trade standards, curricular and syllabi from academic and industry training institutions available was compared. The depth of the search went as far as Nigeria from which a report into the industrial sectors of Nigeria led the study to the conclusion that the print and packaging industry was in its infancy stage and almost completely dependent on imports and foreign companies, implying that skills development in the sector is at best dependent on imported courses and industry training standards.

Other sub-Saharan countries reviewed included Ghana, Kenya, Malawi, Mauritius and Tanzania where a similar situation of an emerging printing and packaging sector heavily dependent on imported industry standards and accompanying education and training packages is evident. Many training initiatives are being supported by foreign donor-funding, for example, Ghana where the Regional African Development Project has been working with the emerging printing and packaging sector for a number of years to transfer skills and capacitate emerging printing and packaging companies. Moves to establish a regional printing and packaging association able to set industry standards and collaborate on training and skills development are occurring in East Africa with Tanzania hosting regional conferences for the emerging printing and packaging industry on an annual basis.

In the main, it seems that the emergence and need for industry standards and concomitant development of training courses and programmes is related to demands associated with exports and penetration of global markets, particularly in respect of packaging for processed foods (health and safety issues) as well as waste packaging (environmental issues).

Of the developing economies in the world, India is particularly advanced in the sector as far as training and development is concerned with courses offered ranging from certificate level of 3 month duration to Masters in Business Administration with a specialization in printing and packaging. The prospectus from one institution emphasizes the need for this specialization in training mentioning the important contribution of packaging and printing to export and marketing which is a direct contributor to the growth of their economy. Information on the content of printing trades and crafts in India does not reveal much information, except for those associated with the development of handcrafts and the announcement of a new printing trade for desktop publishing operator. It would seem that the printing trades have not changed significantly.

Of the countries with established qualifications frameworks, information from institutions in Australia, Ireland, New Zealand, England-Wales and Scotland was sought and found to be very informative in this

context.

Of particular note is Australia, where a new set of training course standards were published during October 2005. This allowed the SGB to compare their perception of new trends with those of another country.

> In addition, as preparation for the development process some of the SGB members reviewed the 'bible' of printing the Handbook of Print Media - Technologies and Production Methods, edited by Prof. Dr.-Ing. habil. Helmut Kipphan for the Heidelberger Druckmaschinen AG, one of the best-known names amongst printing equipment manufacturers.

Comparison

Kipphan and his fellow writers note that changing technology is impacting dramatically on the nature of equipment and the the type of work that is being done. Traditional photolithography and all the skills associated with film have given way to digital computer-to-plate and computer-to-press processes. In addition new non-impact printing processes such as laser and ink jet have also changed the type and nature of printed products. New substrates are also influencing the printing and packaging processes. This is leading to the "one-ma press" working environment, where one person will now do what was the workof ateam previously. He goes on to note:

Printing processes are being increasingly controlled and adjusted electronically, which leads to consistent high quality and greater productivity. Digital workflow also means that productions are completed more rapidly. Hence more than half of the orders for commercial printers arrive in digital form. By the year 2002 this figure is expected to be over 65%. This is the only way of shortening delivery times for print products and meeting the high customer demand for quality. All printing companies are expected to offer greater flexibility in the processing of a large variety of substrates, inks, and methods of print finishing. This means that there is a visible trend for all print products to employ multicolor as well as decorative and special colors. In addition, run lengths are getting shorter since experts believe that the greatest chance of growth lies in the market for small, color work with a fast turnaround time.

Finally hard copy is slowly giving way or being augmented by multi-media, digital products such as CDs and the World Wide Web. While Kipphan expects these to impact on traditional print media he does not expect them to be replaced by digital multi-media.

These developments have a clear impact on the type and nature of the training that people in the printing and packaging industry will undergo. A survey of qualifications, standards, courses, apprenticeships, occupational outlooks and industry websites reveals changes taking place but at an uneven and inconclusive way. Some of these issues are discussed below.

In the study it was clear that the structure and duration of courses would differ from the outcomes-based standards based on applied competence designed for South Africa, since their credit systems and syllabi differs in so far as knowledge acquisition and practical training *is* concerned. Many of the courses are particularly designed for the vocational context especially in Australia, Ireland, England and Scotland. The Lead Employer Council for Printing and Packaging in the United Kingdom, the British Printing Industries Federation, has adopted the Scottish-National Vocational Qualifications (S/NVQs) as the training and development framework and learning achievement outcomes for their industry sector. This suggests that the quality of the Scottish solution is a clear benchmark implication.

Countries with outcomes based systems still remain the best source of information when doing this research. Hence we have drawn a comparison between South Africa, Australia, Ireland, New Zealand, Scotlant (and the UK). There is insufficient information on printing apprenticeships in other countries to make valid comparisons in the same way. The following table indicates the broad fit of the proposed qualifications into overseas schemes.

Australia:

> Programmes designed toward industry needs.
> Programmes include broader knowledge base for personal development, including customer relations and innovation.
> Programme structure consists of fundamental and core and referred to as compulsory and a group of electives. Elective = 40% of programme.
> Modules are industry process specific broadening on communication, health and safety, customer orientation and business skills.
> Almost *70%* of programme is based in industry.
> Certificates, Diplomas, Advanced Diplomas and Degrees in Printing and Packaging.

Ireland:

> Programmes designed towards industry needs.
> Programmes specific to occupation or tasks associated with job competence or specific skills certificates.
> Programme structure determined by specific skill set.
> Modules are industry process specific.
> Awards for acquisition of skills sets at 4 levels on the Awards Framework (levels 3, 4, 5 and 6).

New Zealand:

> Programmes designed towards industry needs.
> Programmes include broader knowledge.
> Modules are industry process specific broadening on communication, health and safety.
> National Certificates at levels 2, 3 and 4.

Scotland and UK:

> Programmes designed towards industry needs,
> Programmes specific to occupation and include education and training and self-development.
> Programme structure consists of mandatory common and technical and a small group of options - 2 technical and 1 general with a strong skills development focus. Optional = 27%.
> Modules are industry process specific and include self and other development in the optional choices.
> S/NVQ qualifications at levels 2 and 3.

South Africa:

> Programmes designed toward industry and occupational needs.
> Programmes include broader knowledge for lifelong learning and personal development.
> Electives = 10%.
> Unit standards based on a combination of fundamental and core which is a mix of the other approaches.
> Certificates and Diplomas.

The following section details some examples of the structure of printing and packaging qualifications in other countries.

Australian Printing Qualification

Cert I Pre-Vocational Printing 7793. (The program structure below was last updated on 13/09/2005)

Compulsory Courses Group A
> Select 6 Courses:

Name; Credit

> NcsOOl Workplace Communication; 40
> Work Environ - Print Ind; 40
> O H 8 Safety PV1; 10
> Intro - Computers - G Arts PV1; 40
> Intro To Electronic Printing; 10
> Industry Visits PV1; 20

Model 1 (Press) Compulsory Courses Group A
> Select 5 Courses:

Name: Credit

> Print Machine & Material Product Support 1; 40
> Print Machine Wash Up and Maintain; 40
> Sheet-Fed Litho 1 (PV1); 40
> Guillotining 1 (PV1); 20
> Packaging And Dispatch; 20

Model 1 (Press) Elective Courses Group A
> Select 3 Courses:

Name; Credit

> Man Combin 1 (Mon/Bas Col); 40
> Litho Platemaking & Step & Repeat; 40
> Hand Binding And Finishing PV1; 40

Model 2 (Prepress) Compulsory Courses Group A
> Select 3 Courses:

Name; Credit

> Print Processes And Materials; 40
> Packaging And Dispatch; 20
> Guillotining 1 (PV1); 20

Model *2* (Prepress) Elective Courses Group A
> Select *5* Courses:

Name; Credit

> Typography 1; 40
> Scanning 1; 40
> Image Output Electronic; 40
> Electronic Image Assembly 1; 40
> Colour Theory and Proofing; 40

Scottish National Vocational Qualification example: Level 3

> Desktop Publishing - Level 3 - Overview

Mandatory Common Units:

> 001: Reduce risks to health and safety in your workplace
> 002: Develop yourself in your job

Mandatory Technical Units:

> 705: Plan datafile production
> 706: Create and apply typographical specifications to meet customer requirements
> 305IT: Design and produce documents using word processing software (IT)
> 312IT: Design and produce documents using graphics (ITNTO)
> 302IT: Maintain the software environment (ITNTO)
> 3CS: Develop customer relationships (ICS)

Optional Technical Units (Choose 2):

> 707: Calibrate and control colour in Desk Top publishing
> 708: Produce aeronautical documentation
> 709: Produce graphical representations of aeronautical spatial data
> 33D: Develop and present suitable design responses (SFEDI)
> 34D: Produce and present detailed design proposals (SFEDI)
> 212IT: Maintain and use databases (ITNTO)

General Optional Unit (Choose 1):

> B1: Support the efficient use of resources (MCI)
> C1: Manage yourself (MCI)
> C9: Contribute to the development of teams and individuals (MCI)
> C12: Lead the work of teams and individuals to achieve their objectives (MCI)
> D32: Assess candidate performance (ENTO)
> C24: Facilitate learning through demonstration and instruction (ENTO)
> C25: Facilitate individual learning through coaching (ENTO)
> 005: Train new operators

The above examples demonstrate the shift to IT skills, team - and customer relationships, digital workflows and the development of skills in others.

Apprenticeship

In general, training for printing and the manufacture of packaging occupations is still traditionally done through apprenticeships even where other system occur. Countries which have apprenticeships from the countries surveyed include the UK, German, the United States, India, Australia.

Apprenticeships follow a fairly similar pattern. They last approximately three years, they comprise a combination of theory and practice in a ratio of approximately 1:2. The theory component also includes broader business and quality. Latterly however, some have been stretched to include broader issues such environment, entrepreneurship and information technology subjects or topics.

Apprenticeships, in general, are aimed at particular printing techniques and processes, although there are now indications, eg in Germany, where the range of trade qualifications is being reduced to four core processes:

> Flexography
> Gravure
> Lithography
> Digital

One apprenticeship surveyed (in Switzerland) stretches into a fourth year and includes great emphasis on quality, troubleshooting, safety and environmental systems and practices as well as greater technical ability in terms of pre-press and print process including issues related to efficiency, productivity and lean manufacturing.

Some apprenticeships are shorter than this norm, ef screen printing handicraft apprenticeships in India last 6 months and include:

> Basic training of one week
> Practical trade training
> Trade theory

Screen printing on, for instance, tee shirts lends itself to entrepreneurship. Hence this apprenticeship is really aimed at SME-Development.

Many countries also include in their occupational profile printing assistances or operators who have not formally been through an apprenticeship and have learned largely on-the-job.

In a number of countries (eg India, Germany, Australia) there is now a new trade qualification emerging, one for digital printing. The impact of information technology has also meant a change in the way people work and the demise of old trade qualifications such as photo lithographer.

Apart from the changes to training courses the delivery of new equipment into companies also affects that nature and type of skills required by practitioner. Computer technology has also affected the control systems of printing and packaging equipment. The impact of this still lies, to large extent, in the future.

Conclusion

The South Africa qualifications developed for printing and packing had taken the above factors into account and included them in the qualifications at different levels and in different ways. The qualifications and standards have been constructed to be:

The South Africa qualifications developed for printing and packing had taken the above factors into account and included them in the qualifications at different levels and in different ways. The qualifications and standards have been constructed to be:

> Flexible in terms of levels and include options for both apprentices as well as those who advance more slowly.
> Generic so that they can be applied to any sophisticated printing and packing process.
> Future-orientated so that the qualifications do not have to be revised frequently as technology changes.
> Skill-based so that those who still interface with older equipment are not marginalized.
> Linked to business drivers such as global competition, cost reduction, environmental impact, SMME development as well as recognition of prior learning.
> Broad skills sets, not only for printing and packaging but also for team building, customer handling, coaching, mentoring and assessing.
> Stretches beyond the traditional craft or trade qualification to included advanced technical skills as well as

the basics of production and business management skills

The South African qualifications measure up well in terms of the above trends to the recently revised printing qualifications developed in Australia.

Resources

All websites were visited between 1 April and 30 November 2005.

Kipphan, Helmut ed, 2001. Handbook of print media: technologies and production methods Berlin: Springer.

Websites

Germany

> http://infobub.arbeitsagentur.de/berufe/start?dest=profession&prof-id=1495

India

> http://texmin.nic.in/annualrep/arch09.htm
> http://www.tn.gov.in/gorders/labemp-e-66-2003.htm
> http://dget.nic.in/lisdapp/Trade/syllabus/pdf/TTSCR.pdf
> http://yavatmal.nic.in/ITI.htm

Ireland

> http://www.ncva.ie/exist_legacy_awards

Switzerland

> http://www.bbt.admin.ch/berufsbi/bildungse/d/34117_d.pdf

UK

> http://www.apprenticeships.org.uk/list/apprenticeshipsdirectory/mediaandprinting/printandprintpackaging.htm
> http://www.printnto.orgl(presently under re-construction)
> http://www.petf.org.uklcontent–nvq
> http:l/www.britishprint.com/training/nvqpathways.asp

USA

> http://www.bls.gov/oco/ocos231.htm
> http://www.gciu.org
> http://www.gatf.org
> http://www.ncssgc.org

ARTICULATION OPTIONS

This qualification articulates vertically with the National Certificate in Printing and Manufacture of Packaging: NQF Level 5, SAQA ID 57122.

This qualification articulates horizontally with the FETC: Metals Production, SAQA ID 49020.

MODERATION OPTIONS

> Anyone assessing a learner or moderating the assessment of a learner against this Qualification must be registered as an assessor with an appropriate Education, Training, Quality Assurance (ETQA) Body or with an ETQA that has a Memorandum of Understanding 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 or with an ETQA that has a Memorandum of Understanding with the relevant ETQA.

> Moderation of assessment will be overseen by the relevant ETQA or by an ETQA that has a Memorandum of Understanding with the relevant ETQA, according to the ETQA's policies and guidelines

for assessment and moderation.

> 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 in the exit level outcomes described in the Qualification.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

The following criteria should be applied by the relevant ETQA:

> Appropriate qualification at one level higher than the level of the qualification.
> A minimum of 3 years' experience of a relevant process of printing or packaging manufacture.
> Registration as an assessor with a relevant ETQA.

NOTES

N/A

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

	UNIT STANDARD ID AND TITLE	LEVEL	CREDITS	STATUS
core	13224 Monitor the application of safety, health and environmental protection procedures	Level 4	4	Reregistered
Core	13235 Maintain the quality assurance system	Level 4	5	Reregistered
core	13254 Contribute to the implementation and maintenance of business processes	Level 4	10	Reregistered
Core	13941 Apply the budget function in a business unit	Level 4	5	Reregistered
Core	119186 Prepare and process plastics materials for manufacturing	Level 4	12	Registered
Core	243180 Make ready or change over and set up equipment for printing and converting processes	Level 4	16	Draft - Prep for P Comment
Core	243182 Monitor maintenance of printing and packaging manufacturing equipment, tooling and services	Level 4	4	Draft - Prep for P Comment
	243184 Set and adjust printing and conversion process machine conditions *to* produce quality finished product	Level 4	10	Draft - Prep for P Comment
Elective	9885 Read and interpret engineering drawings	Level 3	12	Reregistered
Elective	12455 Perform the role of a safety, health and environmental protection representative	Level 3	4	Reregistered
Elective	114984 Manage electronic mail in a business environment	Level 3	2	Registered
Elective	119078 Use a GUI-based word processor to enhance a document through the use of tables and columns	Level 3	5	Registered
Elective	119915 Manage personal expenditure	Level 3	3	Reaistered
Elective	113830 Conduct costing and budgeting	Level 4	9	Registered
Elective	119184 Conduct laboratory tests on plastic raw materials and manufactured products	Level 4	10	Registered
Elective	119185 Maintain calibrated equipment and standards for plastics manufacturing processes	Level 4	6	Registered
Elective	119188 Set up ancillary process equipment for plastics manufacturing operations	Level 4	4	Registered
Elective	242810 Manage Expenditure against a budget	Level 4	6	Recommended
Fundamental	9303 Communicate verbally with clients in a financial environment	Level 3	3	Reregistered
Fundamental	12488 Complete feasibility and commissioning reports	Level 3	3	Registered
Fundamental	119457 Interpret and use information from texts	Level 3	5	Registered
Fundamental	119465 Write/present/sign texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	119472 Accommodate audience and context needs in oral/signed communication	Level 3	5	Registered
Fundamental	119459 Write/present/sign for a wide range of contexts	Level 4	5	Registered

Fundamental	119462 Engage in sustained oral/signed communication and evaluate spoken/signed texts	Level 4	5	Registered
Fundamental	119469 Read/view, analyse and respond to a variety of texts	Level 4	5	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 1

SAQA US ID	*UNIT STANDARD TITLE*		
243180	Make ready or change over and set up equipment for printing and converting processes		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging		***6***	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	16	Level **4**	Regular

SPECIFIC OUTCOME 1

Determine product and process requirements and plan the make ready or change over process.

SPECIFIC OUTCOME 2

Inspect and prepare tools, materials and equipment.

SPECIFIC OUTCOME 3

Co-ordinate the storing and transporting of tools, materials and equipment.

SPECIFIC OUTCOME 4

Recognise and respond to problems related *to* the equipment, settings or the condition of machinery and equipment.

SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 2

SAQA US ID	*UNIT STANDARD TITLE*		
243182	Monitor maintenance of printing and packaging manufacturing equipment, tooling and services		
SGB Printing and Packaging		**6**	
UNIT STANDARD TYPE		***ORGANISING FIELD DESCRIPTION***	***SUBFIELD DESCRIPTION***
Regular		Manufacturing, Engineering and Technology	Manufacturing **and** Assembly
ABET BAND	***CREDITS***	***NQF LEVEL***	***UNIT STANDARD TYPE***
Undefined	**4**	Level **4**	Regular

SPECIFIC OUTCOME 1

Monitor the functioning of equipment, tooling and services during printing and packaging operations and identify problems.

SPECIFIC OUTCOME 2

Discuss maintenance requirements; evaluate options and agree maintenance requirements with appropriate maintenance personnel.

SPECIFIC OUTCOME 3

Check maintenance documentation.

SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: **3**

Set and adjust printing and conversion process machine conditions to produce quality finished product

SAQA US ID	*UNIT STANDARD TITLE*
243184	(Set and adjust printing and conversion process machine conditions to produce quality finished product

SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Printing and Packaging		6	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	10	Level 4	Regular

SPECIFIC OUTCOME 1

Determine product and process requirements, plan the setting process and collect the necessary tools, instruments and materials.

SPECIFIC OUTCOME 2

Set process parameters and start up printing and packaging equipment to make first-offs or pass sheets.

SPECIFIC OUTCOME 3

Conduct quality checks on manufactured products, determine conformance to standards and adjust machine settings for any deviations.

SPECIFIC OUTCOME 4

Hand-over the process, complete all relevant documentation and report incidents or issues.

SPECIFIC OUTCOME 5

Discuss with other parties on issues related to the production and quality