

Level 2 NVQ in Machine Printing - Screen (5158-21)

Standards and assessment requirements

500/1483/3

www.cityandguilds.com
February 2007
Version 1.0



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1 Introduction

About this document

This document contains the information that centres need to offer the following National Vocational Qualification (NVQ):

Level 2 NVQ in Machine Printing - Screen (5158-21)

QCA accreditation number: 500/1483/3

This document contains details and guidance on:

- centre resource requirements
- candidate entry requirements
- information about links with other qualifications
- qualification standards and specifications
- assessment requirements.

2 About the qualification

2.1 Proskills UK and the National Occupational Standards

Background to the National Occupational Standards (NOS) development

The NVQs in Printing (5158) at Levels 2 and 3 are work-based qualifications, designed for those who work in the printing industry.

For workers in the print industry, job descriptions and task lists will indicate which NVQ and which optional units within the NVQ are most suitable.

Every centre (training providers, training centres, colleges, etc) must ensure that each candidate, trainee and student is enrolled for qualifications and programmes in which they stand every reasonable chance of succeeding.

Contacting the Standards Setting Bodies

This qualification is based on the National Occupational Standards (NOS) developed by:

Sector Skills Council Proskills UK
Address Centurion Court
85b Milton Park
Abingdon
Oxfordshire
OX14 4RY
Telephone 01235 833844
URL www.proskills.co.uk

Imported units

The majority of units have been developed by the Print and Graphic Communication National Training Organisation (PGCNTO). However, some units have been imported from the other NTOs, for example: Information Technology NTO (ITNTO); National Forum for Management, Education and Development (formerly MCI); Employment NTO (ENTO); Small Firms Enterprise Development Initiative (SFEDI) and; Institute for Customer Service (CSI).

The printing industry established that these units were directly relevant to individuals who would be expected to achieve the NVQs in Printing at Levels 2 or 3 and consequently decided to adopt them into the Printing qualifications

Apprenticeship frameworks

The NVQs in Printing have been approved by the SSC Proskills UK as part of the Apprenticeship Framework in England.

Full details of the requirements of the apprenticeship frameworks for the sector are available from:

Sector Skills Council Proskills UK
Address Centurion Court
85b Milton Park
Abingdon
Oxfordshire
OX14 4RY
Telephone 01235 833844
URL www.proskills.co.uk

City & Guilds also offers the following qualifications which are also part of the Apprenticeship framework:

- City & Guilds Level 2 Certificate in Printing and Graphic Communications 5261-02
- City & Guilds Level 3 Certificate in Printing and Graphic Communications 5261-03

Accreditation details

This qualification is accredited by the Qualifications and Curriculum Authority as part of the National Qualifications Framework.

For further details about accreditation, national qualification frameworks and level descriptors please refer to Appendix 1.

2 About the qualification

2.2 Publications and sources of information

This document has been designed to be used with the City & Guilds *N/SVQ Guides*:

Publication	Content	Available from
<i>Centre guide</i>	An overview of N/SVQ assessment, delivery and quality assurance issues.	EN-12-001
<i>Candidate guide</i>	An introduction to N/SVQs, candidate responsibilities and an overview of the assessment process.	TS-12-001
<i>Recording forms</i>	Forms both centres and candidates may use to record evidence.	TS-33-0001

Visit the City & Guilds website (www.cityandguilds.com) for the latest versions of these documents.

Other essential City & Guilds documents

There are other City & Guilds documents which contain general information on City & Guilds qualifications:

- ***Providing City & Guilds qualifications – a guide to centre and qualification approval*** contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve ‘approved centre’ status, or to offer a particular qualification.
- ***Ensuring quality*** contains updates on City & Guilds assessment and policy issues.
- ***Centre toolkit*** contains additional information on *Providing City & Guilds qualifications*, in a CD-ROM, which links to the internet for access to the latest documents, reference materials and templates.
- ***Directory of qualifications*** contains details of general regulations, registration and certification procedures and fees. This information is also available online.

For the latest updates on our publications and details of how to obtain them and other City & Guilds resources, please refer to the City & Guilds website.

3 Candidate entry requirements and progression

Candidate work role requirements

The NVQs in Printing are for those working in the printing industry in the following roles:

Pathway	Job Roles
Carton Manufacture	Carton Maker Printed carton operative Carton die maker
Digital Print Production – Digital Artwork for Print	Desk Top Publisher Graphic designer Print Designer Pre-press manager
Digital Print Production – Digital Printing	Printer Digital Printer
Digital Print Production – Pre-Press	Desk Top Publisher Graphic designer Print Designer Pre-press manager
Envelope Manufacture	Envelope printer
Machine Printing – Die stamping	Printer Die stamping printer
Machine Printing – Flexography	Printer Flexographic Printer
Machine Printing – Gravure	Printer Gravure Printer
Machine Printing – Lithography	Printer Lithographic printer
Machine Printing – Pad Printing	Printer Pad printer
Machine Printing – Screen	Printer Screen printer
Machine Printing – Web offset	Printer Web offset printer
Mechanised Print – Finishing and Binding	Print finisher
Print Administration	Print Production manager Print production scheduler Print administrator

Candidate entry requirements

Candidates should **not** be entered for a qualification of the same type, content and level as that of a qualification they already hold.

Age restrictions

The NVQs in Printing are **not** approved for use by candidates under the age of 16.

For candidates above this age, there are no age limits unless this is a legal requirement of the process or the environment.

Otherwise, there are no formal entry requirements for candidates undertaking these qualifications, however centres must ensure that candidates have the potential and opportunity to gain evidence for the qualification in the work place.

For funding purposes, centres are reminded that candidates should not be entered for a qualification of the same type, level and content as that of a qualification they already hold.

4 Centre resource requirements

4.1 Centre, qualification and fast track approval

Centres not yet approved by City & Guilds

To offer this qualification, new centres will need to gain both **centre and qualification approval**. Please refer to the *Centre guide* and *Providing City & Guilds Qualifications* for further information.

Existing City & Guilds centres

To offer this qualification, centres already approved to deliver City & Guilds qualifications will need to gain **qualification approval**. Please refer to the *Centre guide* and *Providing City & Guilds Qualifications* for further information.

Centres already offering City & Guilds qualifications in this subject area

Centres approved to offer the 5157 NVQs in Printing may apply for approval for the new 5158 NVQs in Printing using the **fast track form**, available from the regional/national office or City & Guilds website.

Centres may apply to offer the new qualifications using the fast track form:

- providing there have been no changes to the way the qualifications are delivered, and
- if they meet all of the approval criteria specified in the fast track form guidance notes.

Fast track approval is available for 12 months from the launch of the qualification. After this time, the qualification is subject to the **standard** Qualification Approval Process. It is the centre's responsibility to check that fast track approval is still current at the time of application.

4 Centre resource requirements

4.2 Registration and certification

Registration and certification period

Centres should be aware of time constraints regarding the registration and certification periods for the NVQs in Printing, as specified in the City & Guilds *Directory of qualifications*.

Please check the *Directory of qualifications* for the latest information on length of registration and the last registration and certification dates.

Where the period of access to assessment offered by a centre is less than the period covered by the candidates' registration with City & Guilds, centres must ensure that this is understood by the candidates.

5 Assessment method requirements

This guidance is based on and amplifies the assessment strategy developed for the NVQs in Printing, by the Sector Skills Council for Printing Proskills UK.

External quality control

External quality control is provided by the usual City & Guilds external verification process which includes the use of the electronically scannable report form which is designed to provide an objective risk analysis of individual centre assessment and verification practice.

Accreditation of Prior Experience and Learning (APEL)

Please refer to the City & Guilds *N/SVQ Guides* documents which can be found on our website, www.cityandguilds.com

Evidence and location of assessment

The majority of the candidate's evidence should come from direct observations of competence in the real workplace, unless specified in the unit content. Other types of acceptable evidence include, but are not limited to:

- Witness Testimony (details of acceptable witnesses are found in section 6 of this document 'Expertise of Assessors, Internal Verifiers and Witnesses')
- logs/diaries kept by the candidate
- recorded answers to questions posed by the Assessor
- recorded/transcribed interviews with the candidate
- recorded use of up-to-date commercial/industrial equipment
- e-portfolios and other forms of digital media
- works documentation attributable to the candidate
- both interim and final internal verification.

Although the majority of the candidate's evidence should come from direct observations of competence in the real work place, in exceptional circumstances simulation of the real workplace may be allowed. Occasions in which this may be approved are provided below.

Simulation

Where simulated activities are not stated within the unit, a centre **must** discuss and agree their use in advance with the external verifier. Consideration for simulation should be given to those units which have real health, safety and environment implications.

All evidence from simulated activities must result from activities that have taken place in a realistic working environment, which replicates the conditions and circumstances in which the candidate usually works and meets the following conditions:

- Working conditions should reflect those found in the workplace and include facilities, equipment and materials used in the workplace for the activities being assessed. It should also include relationships, constraints and pressures met in the workplace.
- The activity to which the candidate is required to demonstrate competence must be realistic and reasonable in terms of its scale.
- Any assessment conducted under simulated conditions must require the candidates to take into consideration what would be typical ambient conditions encountered in the normal workplace

- Information available to the candidate on the nature of the activity must be consistent with the policies and practices of typical recycling operations.

The overarching principle to be applied to units identified as suitable for simulation is that it should **only** be undertaken in a minority of cases where:

- there is a high risk to the security or safety of the candidate, individuals, key people in their lives and others
- the opportunity to present evidence from work-based practice happens infrequently and therefore insisting that candidates wait for such an occurrence would be unreasonable or create blockages in the assessment system and might carry the risk of de-motivating candidates
- there would otherwise be a breach of confidentiality or privacy.

To reiterate, any simulation **must** be approved in advance by the External Verifier, and clear reasons must be given for its intended use. If approval is given, all Awarding Body guidance and requirements must be observed. Simulation should **not** be the primary source of a candidate's claim to competence

6 Roles and occupational expertise requirements

Expertise of Assessors, Internal Verifiers and Witnesses

Assessors

Assessors must:

- be registered and recognised by an approved centre
- be competent to make qualitative judgements about the units they are assessing. Illustrations of competence include, but are not limited to, the assessor:
 - having achieved the award themselves
 - having substantial demonstrable experience in the job roles they are assessing
 - being in a day-to-day line management or quality assurance role with responsibility for the job roles they are assessing
- be in possession of or working towards the A1/A2 award or the D32/33 award, or (in Scotland only) has gained an exemption in TQFE/TQSE, as recommended by SQA/QCA and supported by an appropriate Continuing Professional Development (CPD) record
- carry out their duties in accordance with the current NOS for Assessment, and in line with current guidance on assessment practice issued by the regulatory authorities and the appropriate Awarding Body
- maintain appropriate evidence of development activities to ensure their assessment skills and occupational understanding are current (CPD)
- have a working knowledge of awards and a full understanding of that part of the award for which they have responsibility. The Awarding Body will confirm this through examination of relevant CVs supported by relevant references.
- be approved by the Awarding Body who must maintain records demonstrating how they meet the assessment strategy. The appointment of Assessors may require the prior approval of the Awarding Body
- meet any additional requirements as specified in the unit specific content.

Internal Verifiers

Internal verifiers must:

- be registered and recognised by an approved centre
- be in possession of or working towards the V1 award or the D34 award, as recommended by SQA/QCA and supported by an appropriate CPD record
- carry out their duties in accordance with the current NOS for Verification, and in line with current guidance on verification practice issued by the regulatory authorities and the appropriate Awarding Body
- maintain appropriate evidence of development activities to ensure their verification skills and occupational understanding are current (CPD)
- have expertise and knowledge of awards and a full understanding of that part of the award for which they have responsibility. The Awarding Body will confirm this through examination of relevant CVs supported by relevant references
- be approved by the Awarding Body who must maintain records demonstrating how they meet the assessment strategy. The appointment of Internal Verifiers may require the prior approval of the Awarding Body
- meet any additional requirements as specified in the award specific annex.

Enhanced Quality Control

All Internal Verifiers must provide evidence of having verified:

- evidence supporting any key units (where specified in the award specific guidance) and evidence supporting at least one other unit from the award

or

- the evidence supporting at least two distinct units (or as documented in the Award Specific Guidance) for each award per annum.

As well as:

- all evidence from all simulations/simulators
- over time, an example of each unit the Assessor is qualified to assess
- over time, an example of each assessment method used in the centre
- evidence of internal verification.

Witnesses

There are no specific occupational expertise requirements for witnesses. Witness testimony can provide evidence to establish consistency in a candidate's practice and/or to evidence events which are difficult to plan to observe.

As the assessment decision lies with the Assessor, it is their responsibility to verify this and, where challenged, to justify their acceptance of third party 'witness testimony' to the Internal Verifier.

In order that the assessor may make an informed judgement about the contribution of the witness' testimony to the overall evidence presented for a unit or qualification, a statement of the witness' status should be included in the candidate's portfolio of evidence. This can be done by using the Witness Status list (form N/SVQ5) or including it as part of the witness testimony itself.

The statement should indicate the relationship between the candidate and the witness and should enable the assessor, by defining the role that the witness has played in the gathering of evidence (ie as colleague, worker from another organisation) to judge the extent of the witness' knowledge of the National Occupational Standards and understanding of the work roles involved.

Please note: The use of witness testimony from relatives or those with whom the candidate has a significant personal relationship is **not** acceptable.

Continuous Professional Development requirements

City & Guilds expects all those with formal roles in the assessment or verification process to participate in a minimum of two CPD activities per annum. This can be to update either vocational skills/knowledge or assessment/verification skills/knowledge.

7 Recording assessment and evidence

7.1 Data protection and confidentiality

Data protection and confidentiality

Data protection and confidentiality must not be overlooked when assessing candidates.

Centres offering the NVQs in Printing may need to provide City & Guilds with personal data for staff and candidates. Guidance on data protection and the obligations of City & Guilds and centres are explained in *Providing City & Guilds qualifications*.

Protecting identity

It is extremely important to protect the identity of the service users encountered by candidates in the work setting, eg customers, clients and patients.

Confidential information must **not** be included in candidate portfolios or assessment records. Confidential information should remain in its usual location, and a reference should be made to it in the portfolio or assessment records.

When recording evidence towards these qualifications, candidates are expected in particular to protect the identity of children in their care by disguising their names and that of the placement nursery.

Images of minors being used as evidence

If videos or photographs of minors (those under 18) are used as the medium to present evidence as part of the qualification, **both centre and candidate** have responsibilities for meeting child protection legislation.

It is the responsibility of the centre to inform the candidate of the:

- need to obtain permission from the minor's parent/guardian prior to collecting the evidence
- reasons and restrictions for using photographs or video recordings as evidence
- period of time for which the photographs or video recordings may be kept
- obligation to keep photographs or video recordings secure from unauthorised access
- secure electronic storage requirements of photographs or video recordings
- associated child protection legislation.

7 Recording assessment and evidence

7.2 Recording forms to use

City & Guilds has developed a set of *Recording forms* including examples of completed forms, for new and existing centres to use as appropriate (see *NVQ Guide for centres and candidates - Recording forms*, available on the City & Guilds website).

Although it is expected that new centres will use these forms, centres may devise or customise alternative forms, which must be approved for use by the external verifier, before they are used by NVQ candidates and assessors at the centre. City & Guilds also endorses the electronic recording systems *Quick Step* and *Paper Free*.

Amendable (MS Word) versions of the forms are available on the City & Guilds website.

8 The qualification structure

Level 2 NVQ in Machine Printing - Screen (5158-21)

To achieve the Level 2 NVQ in Machine Printing - Screen (5158-21) candidates must achieve **all three** mandatory common units, plus **two** mandatory technical units. Candidates must also choose **one** optional technical unit.

Mandatory common units

- 201 Comply with Health and Safety Requirements in the Workplace
- 202 Improve your performance at work
- 208 Contribute to maintaining equipment in working order

Mandatory technical units

- 226 Prepare equipment and machines for screen printing
- 227 Operate screen printing machines

Optional technical units

- 211 Operate in-line converting equipment
- 212 Operate ink drying equipment
- 213 Prepare inks
- 228 Prepare stencils for printing

9 Relationships to other qualifications

9.1 Relationship to previous versions of the qualifications

City & Guilds has identified the connections to the NVQ previously offered by City & Guilds in this subject area.

This mapping is provided as guidance and suggests areas of overlap and commonality between the qualifications. It does **not** imply that candidates completing units in the forerunner qualification are automatically covering all of the content of the new NVQs listed in the mapping.

Relationship between this Level 2 NVQ in Machine Printing - Screen (5158-21) and the forerunner Level 2 NVQ in Machine Printing - Screen (5157-05)

Level 2 NVQ in Machine Printing - Screen (5158-21)		Level 2 NVQ in Machine Printing - Screen (5157-05)	
Unit Number/Title		Related units	
201	Comply with Health and Safety Requirements in the Workplace	001	Reduce risks to health and safety in your workplace
202	Improve your performance at work	002	Develop yourself in your job
208	Contribute to maintaining equipment in working order	003	Contribute to maintaining equipment in working order
211	Operate in-line converting equipment	203	Operate in-line converting equipment
212	Operate ink drying equipment	204	Operate ink drying equipment
213	Prepare inks	206	Prepare inks
226	Prepare equipment and machines for screen printing	217	Prepare equipment and machines for screen printing
227	Operate screen printing machines	218	Operate screen printing machines
228	Prepare stencils for printing	219	Prepare stencils for printing

9 Relationships to other qualifications

9.2 Key skills

This qualification includes opportunities to develop and practise many of the underlying skills and techniques described in Part A of the standard for each key skills qualification in England, Northern Ireland and Wales.

Where candidates are working towards any key skills alongside this qualification they will need to be registered with City & Guilds for the key skills qualifications.

The ‘signposts’ below identify the **potential** for key skills portfolio evidence gathering that can be naturally incorporated into the completion of each unit. Any key skills evidence needs to be separately assessed and must meet the relevant standard defined in the QCA document ‘Key skills qualifications standards and guidance’.

Unit number	Communication	Application of Number	Information Technology
201	✓		
202	✓		✓
208	✓		
211	✓		
212	✓		
213	✓	✓	
226	✓		
227	✓		
228	✓	✓	
Unit number	Problem Solving	Improving own learning and performance	Working With Others
201	✓	✓	✓
202	✓	✓	✓
208	✓	✓	✓
211	✓	✓	✓
212	✓	✓	✓
213	✓	✓	✓
226	✓	✓	✓
227	✓	✓	✓
228	✓	✓	✓

10 About the National Occupational Standards (NOS)

Availability of standards

The units for the qualification follow.

They may also be obtained from the Printing and Graphic Communications industry section of the City & Guilds website.

11 The units

Unit 201

Comply with the health and safety requirements in the workplace

Introduction

Workplaces and work activities contain risks to the health and safety of workers and visitors. Health and Safety laws and regulations are intended to prevent injuries or ill health as a result of work. It is the duty of both employers and employees to follow the law and to comply with health and safety requirements.

This unit requires the candidate to show understanding and compliance with health and safety requirements and emergency and accident procedures in the workplace.

Users of this unit must refer to the Knowledge and Understanding Glossary for the Printing suite of NOS for important definitions of terms used in this unit. Text in bold in this unit is defined more fully in the glossary.

There are **two** elements in this unit:

- 1 201.1 Comply with workplace health and safety policies and procedures
- 2 201.2 Comply with workplace emergency and accident procedures

This is what the unit covers

You need to know and to follow the workplace policies for the work which you do. Some recommended working practices and codes of practice for the printing industry are published by the Health and Safety Executive (HSE) and the Printing Industry Advisory Committee (PIAC). You need to know what these say in relation to your job role.

You also need to know what manufacturers or suppliers say about the use of equipment, materials and products that you use at work.

Many risks in the workplace are 'low level' – poor housekeeping, for example, may lead to trips or slips that cause injury. You are expected to be aware of typical hazards and risks in your workplace and to take action to remove the hazard if it is within your capability. If you frequently work in an untidy or unsafe environment and do nothing to reduce the risks, then you will not be able to demonstrate that you comply with health and safety requirements.

You need to know, ideally from your first day in a new workplace, what emergency arrangements exist in your workplace and work area – for example, how to raise the alarm and what to do in the event of an accident or emergency. You must know who the responsible person is for reporting health and safety problems, accidents or emergencies in your workplace. Should the event ever arise, you must be able to show that you have followed the correct procedures.

To demonstrate competence, you must show compliance in your day to day working over a significant period of time – it is not sufficient to show occasional observation or knowledge of health and safety issues.

Element 201.1 Comply with workplace health and safety policies and procedures

Performance criteria

This is what you have to do:

- 1 carry out your working practices in accordance with legal requirements
- 2 follow the most recent workplace policies and procedures for your job role. These should include any relevant guidance produced by the HSE or PIAC
- 3 immediately rectify any health and safety risks within your capability
- 4 make sure that your personal conduct around the workplace does not endanger the health and safety of yourself or others
- 5 follow suppliers' and manufacturers' instructions for the safe use of equipment, materials and products
- 6 make sure your personal presentation at work:
 - a ensures the health and safety of yourself and others
 - b meets any legal duties
 - c is in accordance with workplace policies and procedures.

Element 201.2 Comply with workplace emergency and accident procedures

Performance criteria

This is what you need to do:

- 1 make sure you know what the workplace emergency procedure is for your working area
- 2 if an accident or emergency should occur, raise the alarm and / or find and inform the responsible / appropriate person
- 3 if an accident or emergency should occur, take prompt and appropriate action to minimise risk of personal injury
- 4 when required, follow the emergency procedure promptly, calmly and correctly
- 5 report any accident or dangerous occurrence to the responsible / appropriate person.

Unit 201 Comply with the health and safety requirements in the workplace

Knowledge and understanding

This is the knowledge and understanding you need to complete this unit successfully. For further detail you must refer to the Knowledge and Understanding Glossary for the Printing suite of National Occupational Standards.

K3 Health and Safety

- 1 Legal duties for health and safety in the workplace as defined by the relevant health and safety legislation
- 2 Your duties and responsibilities for health and safety as defined by any specific legislation covering your job role
- 3 Workplace policies and procedures
- 4 Working Practices
- 5 Manufacturers' and suppliers' health and safety instructions / advice
- 6 Personal Presentation
- 7 How to stop a machine in the event of an emergency

K6 Communication

- 1 With colleagues
- 2 With visitors

K7 Workplace policy and practice

- 1 The working practices existing in the workplace

K21 Environmental

- 1 The legal requirements for the classification, storage, carriage and disposal of waste
- 2 Any specific environmental legislation that covers processes in your company
- 3 Control of pollution

K25 Cleaning, Lubrication and Maintenance

- 1 What is meant by the phrase 'safe system of work' and how it applies to cleaning, lubrication and maintenance activities

Unit 202 Improve your performance at work

Introduction

In order to compete successfully, commercial businesses have to continuously improve their products and services; other kinds of organisations need to keep up to date with technology and best practice. One of the ways in which organisations improve is by helping their people to acquire new skills and knowledge.

This unit is about working with your employer and / or a trainer to acquire new skills and knowledge that will enable you to improve your performance at work.

Candidates working towards this unit need to find out from their work colleagues and customers* how their performance could be improved, and to share responsibility with their employer or trainer for preparing and reviewing personal development plans.

This unit consists of **three** elements:

- 1 Element 202.1 Use an action plan to develop your own skills and knowledge
- 2 Element 202.2 Improve your service to customers
- 3 Element 202.3 Improve your productivity and the quality of your work

This is what the unit covers

Before making a plan, it is essential to review the current situation. This could involve asking for advice from colleagues at work, from managers or from customers to find out how your performance at work could be developed and improved. You will need to keep notes of their comments to help identify where improvements to your skills and knowledge would help.

Once you have collected useful and constructive advice, you will need to discuss it with your manager and identify the priorities. It is important to make sure that any objectives agreed are achievable.

The objectives that you agree with your manager should enable specific targets to be identified that can be written into an action plan. There must be a way of measuring any targets that you set and you should agree how they will be. It is also important to set realistic timescales for the achievement of each target.

Once agreed, your action plan should become a 'working' document – not one which is put away and forgotten about. You should frequently check your progress towards achievement of the targets and make a note of any changes to the timescales that were previously agreed.

If your plan soon becomes out of date because, for example:

- you achieve your targets very quickly or
- it proves impossible to make progress towards any of the targets
- there is a change of strategy within your organisation
- operational changes affect you or your team

You must go back to your manager and revise the plan as soon as it becomes apparent that major changes are necessary.

It is perfectly normal to achieve some things in an action plan and not others. What is important is to honestly evaluate the progress made towards the entire plan at reasonable intervals – at least every three months, but more often if you wish - and then create a revised or a new plan for the next period.

Scope

To achieve this unit, it is not necessary to show that all your objectives or targets have been met.

However, you must be able to show that:

- you periodically consult colleagues about how you can improve your performance at work
- you periodically ask customers whether the service you have given has met their needs or expectations.
- you review with your manager or trainer how the quality of your work and your productivity might be improved by acquiring new skills and understanding.
- you take shared responsibility for producing written action plans that contain measurable and achievable targets with realistic timescales
- you use actions plans as ‘working’ documents and make amendments where necessary to targets and timescales
- you undertake evaluations with your manager or trainer to measure the success of your action plan and update it accordingly.

In order to show that the standard has been met, there must be sufficient evidence to show that personal development planning and review is a continuing activity. The evidence should show that action plans have been used as working documents and updated regularly. A single action plan with little evidence of the cycle of review through to evaluation is insufficient.

* **Note:** Customer, in the context of this unit, can be either an internal or external customer.

Element 202.1 Use an action plan to develop your own skills and knowledge

Performance criteria

This is what you need to do:

- 1 seek constructive feedback from others, including colleagues, customers and your manager, on how your performance at work could be improved
- 2 having regard to the feedback, plan improvements to your skills and knowledge which are specific and achievable
- 3 agree a personal action plan with your manager that includes realistic timescales and measurable targets.
- 4 implement your action plan and use it as a 'working document' by making notes and amendments where necessary as you work toward the targets
- 5 periodically, with the help of a manager or trainer, evaluate the progress made toward the entire plan and update or renew the action plan as appropriate.

Element 202.2 Improve your service to customers*

Performance criteria

This is what you need to do:

- 1 regularly check whether the service you have given meets your customers' needs and expectations
- 2 where you could have given better service to your customers, identify the way in which your service could have been improved
- 3 include in your personal action plan improvements to your skills and knowledge that should result in better customer service
- 4 provide evidence that the service you give to customers has improved over time.

* **Note:** Customers, in this context, may be 'internal' or 'external' to the workplace.

Element 202.3 Improve your productivity and the quality of your work

Performance criteria

This is what you need to do:

- 1 periodically consider what improvements to your skills and knowledge would help you to:
 - a deliver better quality products and / or services
 - b improve your productivity
- 2 include in your personal action plan improvements to your skills and knowledge that should enable you to produce better quality products and / or services and higher productivity
- 3 provide evidence that your productivity and the quality of your work has improved over time.

Unit 202 Improve your performance at work

Knowledge and understanding

This is the knowledge and understanding you need to complete this unit successfully. For further detail you must refer to the Knowledge and Understanding Glossary for the Printing suite of National Occupational Standards.

K6 Communication

- 1 With colleagues
- 2 With customers

K7 Workplace policy and practice

- 1 Workplace objectives, priorities, standards and procedures
- 2 The range of work carried out in the workplace
- 3 The working practices existing in the workplace
- 4 The key job roles within the printing and graphic communications industry and their main purposes

K8 The identification and assessment of printing options

- 1 The reasons for selecting one process over another
- 2 The stages in the printing process from pre-press to printed product

K9 Time and Resources

- 1 The different types of resource, including labour, materials, machinery, etc
- 2 The relationship between resource usage and profitability
- 3 How to maximise productivity
- 4 The relationship between productivity and competitiveness

K22 Quality Assurance and Control

- 1 The main features of quality assurance and quality control
- 2 Techniques for controlling quality

K27 Personal Development

- 1 The principles of personal development planning and training
- 2 and how it applies to cleaning, lubrication and maintenance activities

Unit 208

Contribute to maintaining equipment in working order

Introduction

To achieve your unit certificate, you must show that you can:

- 1 Element 208.1 Clean down equipment
- 2 Element 208.2 Replace defective components

This involves:

- using safe methods and appropriate materials and equipment to clean machines
- lubricating machines at the required times
- identifying defective or worn components
- replacing or realigning defective or worn components, when it is your job to do so
- reporting faults and excessive wear to the responsible person
- restoring cleaned and lubricated machines to a safe operating condition
- accurately updating records of machine maintenance.

Collecting the evidence for this unit

Your performance evidence must show that you have covered all of the statements in each element, and must be the result of real work activities in actual production situations. Simulation is **not** acceptable for this unit.

Your assessor will need to be satisfied that you have the necessary understanding specified in each 'K' list. Where this is not evident from your performance, you may be asked oral or written questions, or to write a short report.

The equipment you clean is the equipment for which you are responsible in your job. This will depend on your area of work and the specific type of equipment you use. For example:

- machine printing – web offset machine
- print finishing – inserting machine
- carton manufacture – folding and gluing machine
- envelope manufacture –reel-fed envelope machine.

The components you are expected to replace may be machine parts or consumables, depending on your job responsibilities.

You may need to provide other information to support your performance evidence. Here are some examples:

- updated records of machine maintenance
- updated records of components removed or replaced
- written or spoken reports describing
- how you selected cleaning methods, equipment and materials
- the type of faults which you have reported to the responsible person.

Element 208.1 Clean down equipment

Performance criteria

You must show that you can:

- 1 safely switch off the machinery before you start cleaning
- 2 use the cleaning equipment and materials most suitable for the machine
- 3 use cleaning methods which are safe, avoid harm to the environment and which follow the manufacturer's instructions
- 4 clean and lubricate machines at the times you are instructed to do so
- 5 dispose of used cleaning agents and waste materials safely
- 6 check that the machine is safe to operate, when you have finished cleaning
- 7 accurately update records of machine maintenance.

Element 208.1 Clean down equipment

Knowledge and understanding

You must understand:

- K1 your responsibilities for cleaning machines - what you are allowed to do, and what you must not do
- K2 the current legal requirements and industry guidelines for the safe handling and use of hazardous substances
- K3 the risks of handling cleaning materials and lubricants
- K4 what the maintenance plan for the machine is
- K5 what the production schedule is and how this affects cleaning operations
- K6 why it is important to use cleaning methods which are safe, avoid harming the environment and meet manufacturers' requirements
- K7 what cleaning agents and lubricants are suitable for use
- K8 your company's procedures for the safe disposal of waste
- K9 what records need to be kept.

Element 208.1 Clean down equipment

Performance evidence

You must show that you can clean down equipment consistently, over a period of time. Your performance will be observed on at least **four** occasions. Your evidence must show that you can:

- R1 dispose of the following waste materials:
- a used cleaning agents
 - b solvents and lubricants
 - c production debris
 - d soiled materials.

Element 208.2 Replace defective components

Performance criteria

You must show that you:

- 1 routinely examine machinery for defective components or excessive wear
- 2 accurately identify components which need replacing
- 3 remove and replace components using safe and approved methods
- 4 accurately identify and report machine faults which are not your job to correct, to the responsible person
- 5 restore machines to a safe operating condition after replacing components
- 6 keep accurate records of the components you have removed and replaced.

Element 208.2 Replace defective components

Knowledge and understanding

You must understand:

- K1 the risks of handling machinery and replacing components
- K2 your responsibilities for replacing components - what you are allowed to do, and what you must not do
- K3 what kinds of fault you are likely to find in the equipment you operate, and what to do about them
- K4 the procedures for removing, replacing and realigning components safely
- K5 why it is important to report unexpected wear or damage to components
- K6 who to report unexpected wear, damage or machine faults to
- K7 what records need to be kept, and their format.

Element 208.2 Replace defective components

Performance evidence

You must show that you can replace defective components consistently, over a period of time. Your performance will be observed on at least **four** occasions. Your evidence must show that:

- R1 you identify defective components:
 - a during scheduled maintenance
 - b during normal operations.

Unit 211 Operate in-line converting equipment

Introduction

To achieve your unit certificate, you must show that you can:

- 1 Element 211.1 Run in-line converting equipment
- 2 Element 211.2 Maintain the quality of output from in-line converting equipment

This involves:

- identifying the output required
- maintaining the quality and quantity of output required
- operating equipment safely
- using safe and efficient working methods
- identifying faults and taking action to deal with them
- disposing of waste safely
- keeping accurate records.

Note: In-line converting equipment is any unit which is run in line with the printing machine, and which is used to cut, fold or enhance the product, including:

- trimming
- in-line slitting
- die cutting
- punching
- perforating
- creasing
- folding
- laminating
- embossing - foil blocking
- varnishing.

Collecting the evidence for this unit

Your performance evidence must show that you have covered all of the statements in each element, and must be the result of real work activities in actual production situations. Simulation is **not** acceptable for this unit.

Your assessor will need to be satisfied that you have the necessary understanding specified in each 'K' list. Where this is not evident from your performance, you may be asked oral or written questions, or to write a short report.

You may need to provide other information to support your performance evidence. Here are some examples:

- a photocopy of the job instructions
- a photocopy of the documentation confirming all the materials used in the production of the job
- samples of the job including a signed pass copy
- samples of running faults as they arise
- written or spoken reports describing faults, their causes and how you corrected them.

Element 211.1 Run in-line converting equipment

Performance criteria

You must show that you:

- 1 check that you have all the details you need for the job
- 2 run the in-line converting equipment:
 - a at the required speed
 - b safely and efficiently
- 3 keep up the supply of materials throughout the run
- 4 accurately identify and correct mechanical faults which it is your job to rectify
- 5 accurately identify and promptly report any mechanical faults which it is not your job to correct
- 6 keep downtime to the minimum necessary to rectify faults
- 7 check that machines are safe to operate, once faults are corrected
- 8 accurately record production and quality assurance details
- 9 follow the correct procedures for the removal of waste
- 10 stack converted materials safely, using the approved method.

Element 211.1 Run in-line converting equipment

Knowledge and understanding

You must understand:

- K1 what details you need for the job
- K2 your company's quality standards
- K3 the principles of in-line converting
- K4 the common types of cutting, folding and enhancing processes
- K5 the risks associated with in-line converting equipment and the material used in the converting process, and how to avoid them
- K6 the common in-line converting faults, what causes them and how to correct them
- K7 how to recognise when you should correct faults yourself and when you should ask for help
- K8 to whom you must report faults
- K9 what production and quality assurance records you are required to keep.

Element 211.1 Run in-line converting equipment

Performance evidence

You must show that you can run in-line converting equipment consistently, over a period of time. Your evidence must show that:

- R1 you maintain the throughput of at least **one** of the following types of material:
 - a printed coated papers
 - b printed uncoated papers
 - c printed card
 - d printed sheets
- R2 ... by operating at least **one** of the following types of in-line converting processes:
 - a cutting
 - b folding
 - c enhancing
- R3 you determine action to remedy faults:
 - a to be taken by yourself
 - b to be taken by others
- R4 ... and you can identify faults in:
 - a the operation of equipment
 - b the substrate.

Element 211.2 Maintain the quality of output from in-line converting equipment

Performance criteria

You must show that you:

- 1 regularly check that quality standards are met
- 2 inspect finished materials sufficiently to check that they meet the requirements of the job
- 3 clearly mark waste materials for disposal
- 4 follow the correct procedures for the removal of waste
- 5 stack work safely, using the approved method
- 6 forward converted materials to the correct location
- 7 accurately record the production and quality assurance details.

Element 211.2 Maintain the quality of output from in-line converting equipment

Knowledge and understanding

You must understand:

- K1 the principles of in-line converting
- K2 your company's quality standards
- K3 why it is important to maintain quality throughout the run
- K4 the procedures for the removal of waste from your machine
- K5 what production and quality assurance records you are required to keep.

Element 211.2 Maintain the quality of output from in-line converting equipment

Performance evidence

You must show that you can maintain the quality of output from in-line converting equipment consistently, over a period of time. Your evidence must show that:

- R1 you maintain quality when by operating at least **one** of the following types of in-line converting processes:
- a cutting
 - b folding
 - c enhancing.

Unit 212 Operate ink drying equipment

Introduction

To achieve your unit certificate, you must show that you can:

- 1 Element 212.1 Run ink drying equipment
- 2 Element 212.2 Maintain the quality of output from ink drying equipment

This involves:

- finding out what production is required
- getting the materials you need
- operating drying machines safely
- checking that the output meets quality requirements
- identifying faults and taking action to deal with them.

Collecting the evidence for this unit

Your performance evidence must show that you have covered all of the statements in each element, and must be the result of real work activities in actual production situations. Simulation is **not** acceptable for this unit.

Your assessor will need to be satisfied that you have the necessary understanding specified in each 'K' list. Where this is not evident from your performance, you may be asked oral or written questions, or to write a short report.

You may need to provide other information to support your performance evidence. Here are some examples:

- a photocopy of the job instructions
- a photocopy of the documentation confirming all the materials used in the production of the job
- samples of the job including a signed pass copy
- samples of running faults as they arise
- written or spoken reports describing faults, their causes and how you corrected them.

Element 212.1 Run ink drying equipment

Performance criteria

You must show that you:

- 1 check that you have all the details you need for the job
- 2 keep the drying temperature at the level required
- 3 run the machine at the required speed, safely and efficiently
- 4 keep up the supply of materials throughout the run
- 5 accurately identify and correct mechanical faults which it is your job to rectify
- 6 accurately identify and promptly report mechanical faults, which it is not your job to correct
- 7 check that equipment is safe to operate, once faults are corrected
- 8 accurately record production and quality assurance details.

Element 212.1 Run ink drying equipment

Knowledge and understanding

You must understand:

- K1 what details you need for the job
- K2 the principles of ink curing and drying
- K3 the risks associated with ink drying units and how to avoid them
- K4 your company's safety procedures for operating ink drying equipment
- K5 common faults which can occur when operating ink drying equipment, what causes them and how to correct them
- K6 how to recognise when you should correct faults yourself and when you should ask for help
- K7 to whom you must report faults
- K8 what production and quality assurance records you are required to keep.

Element 212.1 Run ink drying equipment

Performance evidence

You must show that you can run ink drying equipment consistently, over a period of time. Your evidence must show that:

- R1 you maintain the throughput of at least **one** of the following types of ink drying processes:
 - a jet air drying
 - b UV curing
 - c catalytic curing
 - d evaporation
- R2 you determine action to remedy faults:
 - a to be taken by yourself
 - b to be taken by others
- R3 ... and you can identify faults in:
 - a the operation of equipment
 - b the substrate
 - c the drying rate of the ink.

Element 212.2 Maintain the quality of output from ink drying equipment

Performance criteria

You must show that you:

- 1 check regularly that:
 - a the quality of the image meets the required standard during drying activities
 - b drying is achieved in the expected time
- 2 clearly mark waste materials for disposal
- 3 follow the correct procedures for the removal of waste
- 4 stack work safely, using the approved method
- 5 forward finished work to the correct location
- 6 accurately record the production and quality assurance details.

Element 212.2 Maintain the quality of output from ink drying equipment

Knowledge and understanding

You must understand:

- K1 the principles of ink curing and drying
- K2 your company's quality standards
- K3 why it is important to maintain the quality of the image throughout the run
- K4 the procedures for the removal of waste from your machine
- K5 what production and quality assurance records you are required to keep.

Element 212.2 Maintain the quality of output from ink drying equipment

Performance evidence

You must show that you can maintain the quality of output from ink drying equipment consistently, over a period of time. Your evidence must show that:

- R1 you maintain quality when operating at least **one** of the following processes:
 - a jet air drying
 - b UV curing
 - c catalytic curing
 - d evaporation
- R2 you determine action to remedy faults:
 - a to be taken by yourself
 - b to be taken by others
- R3 ... and you can identify faults in:
 - a the operation of equipment
 - b the substrate
 - c the drying rate of the ink.

Unit 213 Prepare inks

Introduction

To achieve your unit certificate, you must show that you can:

- 1 Element 213.1 Identify the mix required
- 2 Element 213.2 Produce mixes to meet production requirements
- 3 Element 213.3 Store inks

This involves:

- identifying the mix you have to prepare
- obtaining the materials required
- producing a ink to a formula and testing it against the specification
- producing the quantity of ink required for production
- maintaining the quality of the mix from batch to batch
- storing inks securely.

Collecting the evidence for this unit

Your performance evidence must show that you have covered all of the statements in each element, and must be the result of real work activities in actual production situations. Simulation is **not** acceptable for this unit.

Your assessor will need to be satisfied that you have the necessary understanding specified in each 'K' list. Where this is not evident from your performance, you may be asked oral or written questions, or to write a short report.

You may need to provide other information to support your performance evidence. Here are some examples:

- a photocopy of the job instructions
- a photocopy of the documentation confirming all the ink requirements for the production of the job
- samples of the mix including a signed specimen
- records of the type of storage container, quantity, formulae and storage location.

Element 213.1 Identify the mix required

Performance criteria

You must show that you:

- 1 accurately identify the mix and the inks required from your job instructions
- 2 apply approved procedures for estimating and measuring the quantities required to produce the required mix
- 3 check that you have enough materials of the right type for the job
- 4 handle inks and solvents safely
- 5 use safe and efficient methods to produce a mix
- 6 check, through correctly using an approved test, that the mix meets the specification
- 7 produce the sample with the minimum wastage
- 8 accurately record the details of the mix.

Element 213.1 Identify the mix required

Knowledge and understanding

You must understand:

- K1 what details you need for the job
- K2 your company's procedures for obtaining the materials you need
- K3 the types of ink used in your company, and their features, including adhesion, resistance, flow characteristics and solvent addition
- K4 colour and the visible spectrum
- K5 light sources and colour temperature
- K6 how to estimate ink quantities
- K7 the compatibility of inks with the substrate and the plate
- K8 BSI or other standard viewing conditions
- K9 your company's quality control procedures and approved tests for assessing mixes
- K10 the risks of handling materials and those within the working environment
- K11 how to handle inks and solvents safely, and what to do when there are spillages or contamination
- K12 the Technical Data Sheets and Health and safety Data Sheets which apply to the inks and solvents you are using.

Element 213.1 Identify the mix required

Performance evidence

You must show that you can identify the mix required consistently, over a period of time. Your evidence must show that:

- R1 you identify from the specification:
 - a the ink required
 - b the substrate
 - c the drying rate and method
- R2 you can prepare a formula for printing on at least **one** of the following types of material:
 - a coated paper
 - b uncoated paper
 - c cartridge paper
 - d corrugated and plain board
 - e rigid and flexible plastic
 - f metals
 - g wood
 - h glass
 - i textiles
 - j ceramics
- R3 ... and you can test the mix by using at least **one** of the following procedures:
 - a visual inspection
 - b matching to a Pantone or other standard reference
 - c automated digital matching.

Element 213.2 Produce mixes to meet production requirements

Performance criteria

You must show that you:

- 1 produce mixes which:
 - a have the consistency required
 - b conform to the required formula
 - c meet the requirements for batch size
- 2 maintain batch to batch consistency within the tolerance level allowed by your company
- 3 produce the number of batches required in time to meet production needs
- 4 keep waste to a minimum
- 5 use safe working practices and efficient working methods
- 6 accurately record the production and quality assurance details required.

Element 213.2 Produce mixes to meet production requirements

Knowledge and understanding

You must understand:

- K1 the risks which can arise when handling materials
- K2 the batch sizes required and their intended uses
- K3 the make up of the different types of inks
- K4 light sources and colour temperature
- K5 how to estimate ink quantities
- K6 the compatibility of inks with substrate and image carrier
- K7 BSI or other standard viewing conditions
- K8 your company's quality control procedures
- K9 methods of matching colours and maintaining batch to batch consistency
- K10 the colour book matching system used in your company
- K11 the approved conditions needed for colour matching
- K12 how to estimate and measure quantities.

Element 213.2 Produce mixes to meet production requirements

Performance evidence

You must show that you can produce mixes to meet production requirements consistently, over a period of time. Your evidence must show that:

R1 you can produce mixes for printing on at least **two** of the following types of material:

- a coated paper
- b uncoated paper
- c cartridge paper
- d corrugated and plain board
- e rigid and flexible plastic
- f metals
- g wood
- h glass
- i textiles
- j ceramics

R2 ... and you can match batches by at least **one** of the following procedures:

- a visual inspection
- b matching to a Pantone or other standard reference
- c automated digital matching

R3 ... and maintain the quality of:

- a hue
- b saturation
- c lightness.

Element 213.3 Store inks

Performance criteria

You must show that you:

- 1 clearly and correctly mark the containers in accordance with your company's procedures
- 2 store inks and coatings in the approved containers
- 3 keep storage areas safe to use and easy to access
- 4 store inks and coatings in conditions which minimise deterioration in quality
- 5 dispose of any stock that is no longer fit for purpose safely and in a way which avoids harm to the environment
- 6 accurately record the stock control details required by your company.

Element 213.3 Store inks

Knowledge and understanding

You must understand:

- K1 your company's quality control procedures
- K2 what records your company requires you to keep
- K3 the types of inks used in your company, their features and how to store them safely
- K4 what can cause deterioration in ink stocks, and how to prevent it
- K5 your company's quality control procedures
- K6 the risks which can arise when handling inks
- K7 what to do when there are spillages or contamination
- K8 your company's procedures for the safe handling, storage and disposal of inks
- K9 why it is important to prevent environmental harm, when you dispose of stock no longer required.

Element 213.3 Store inks

Performance evidence

You must show that you can store inks consistently, over a period of time. Your evidence must show that:

- R1 you identify stock by the following:
 - a content specification
 - b batch number
 - c volume
 - d date of storage
 - e hazard label
- R2 you meet storage conditions for:
 - a safety and security
 - b preferred environment
 - c location space requirements
 - d duration of storage
- R3 you can use the following types of equipment:
 - a moving
 - b lifting
 - c handling
- R4 you can keep records of:
 - a incoming inks and coatings and their location
 - b requisitions
 - c stock movement
 - d contaminated or damaged items.

Unit 226 Prepare equipment and machines for screen printing

Introduction

To achieve your unit certificate, you must show that you can:

- 1 Element 226.1 Prepare equipment and the screen printing machine for production
- 2 Element 226.2 Set the screen printing machine for production

This involves:

- identifying the job requirements
- checking that the image size and substrate are suitable for the machine
- checking that you have the materials required and that they are of suitable quality
- checking that the machine is safe to operate
- setting the machine ready for production.

Collecting the evidence for this unit

Your performance evidence must show that you have covered all of the statements in each element, and must be the result of real work activities in actual production situations. Simulation is not acceptable for this unit.

Your assessor will need to be satisfied that you have the necessary understanding specified in each 'K' list. Where this is not evident from your performance, you may be asked oral or written questions, or to write a short report.

You may need to provide other information to support your performance evidence. Here are some examples:

- a photocopy of the job instructions
- a photocopy of the documentation confirming all the material requirements for the production of the job
- a photocopy of the documentation confirming all the screen requirements for the production of the job
- a signed pass sheet ready for running.

Element 226.1 Prepare equipment and the screen printing machine for production

Performance criteria

You must show that you:

- 1 check that you have all the details required for the job
- 2 check that you have enough materials of the right type for the job
- 3 promptly report to your manager, if the material provided is not correct or sufficient
- 4 check that your work area is safe and ready for the work you have to do
- 5 select the correct screen
- 6 check that:
 - a the stencil is free from faults and blemishes
 - b screen tension is suitable for the application
 - c tapes are in the correct position
- 7 check that the squeegee is suitable and dressed properly
- 8 check that the flood coater is suitable and fit for purpose
- 9 check that ink is ready for use and suitable for the substrate
- 10 check that the substrate is suitable for the job
- 11 when required:
 - a set dryer, feeder and stacker units
 - b condition the substrate.

Element 226.1 Prepare equipment and the screen printing machine for production

Knowledge and understanding

You must understand:

- K1 what details you need for the job
- K2 the principles of screen printing
- K3 the types of inks and solvents in use in your company, and their characteristics
- K4 your company's procedures for checking equipment
- K5 the sequence of set up tasks for screen printing
- K6 how to prepare equipment for different types of job
- K7 the risks of handling equipment, inks and solvents and how to handle them safely
- K8 what the common faults are when preparing equipment for production, and how to prevent them
- K9 the emergency shutdown procedures.

Element 226.1 Prepare equipment and the screen printing machine for production

Performance evidence

You must show that you can prepare equipment and the screen printing machine for production consistently over a period of time. Your evidence must show that:

- R1 you can prepare screens for the following types of image:
 - a coarse line, fine line and solid
 - b multicolour.

Element 226.2 Set the screen printing machine for production

Performance criteria

You must show that you:

- 1 load the correct substrate
- 2 set the lays correctly for the substrate's size and thickness
- 3 set the image in position on the substrate accurately, so that:
 - a the set-up sheet clearly shows the image position
 - b all of the required image falls squarely into position on the sheet
- 4 accurately set the snap distance and, when required, the peel off
- 5 position the squeegee at the correct angle and set its speed and pressure correctly
- 6 set up the flood coater correctly
- 7 apply sufficient ink to the screen to pass over the stencil and pull a first off print
- 8 adjust the machine as necessary to meet the quality standards
- 9 complete your set up work in the time allowed.

Element 226.2 Set the screen printing machine for production

Knowledge and understanding

You must understand:

- K1 your company's quality standards
- K2 the principles of screen printing
- K3 the sequence of set up tasks for your machine
- K4 the settings required for the job
- K5 the risks associated with setting up screen printing machines and how to avoid them
- K6 how to load feeders, when they are used
- K7 how to set the lays, the image and the snap distance
- K8 how to position and set the squeegee
- K9 how to set up the flood coater
- K10 how to apply ink and pull a first off print
- K11 what the common screen printing faults are and how to prevent them during set up
- K12 the emergency shutdown procedures.

Element 226.2 Set the screen printing machine for production

Performance evidence

You must show that you can set the screen printing machine for production consistently over a period of time. Your evidence must show that:

- R1 you can set up the machine in the time allowed for the following images:
 - a coarse line and solid
 - b multicolour
- R2 ... using at least **one** of the following types of substrates:
 - a paper
 - b corrugated and plain board
 - c rigid and flexible plastic
 - d metals
 - e wood
 - f glass
 - g textiles
 - h ceramics.

Unit 227 Operate screen printing machines

Introduction

To achieve your unit certificate, you must show that you can:

- 1 Element 227.1 Run screen printing machines
- 2 Element 227.2 Assist in fault finding and correction

This involves:

- operating the machine safely and efficiently
- producing the required quantity of work
- checking that output meets quality requirements
- removing finished work safely
- identifying faults which affect the quality of the image, produce a shortfall, affect the operation of equipment or create risks to health and safety
- correcting or reporting faults
- checking that machines are safe to operate after faults have been corrected
- keeping accurate records of fault correction.

Collecting the evidence for this unit

Your performance evidence must show that you have covered all of the statements in each element, and must be the result of real work activities in actual production situations. Simulation is **not** acceptable for this unit.

Your assessor will need to be satisfied that you have the necessary understanding specified in each 'K' list. Where this is not evident from your performance, you may be asked oral or written questions, or to write a short report.

You may need to provide other information to support your performance evidence. Here are some examples:

- a photocopy of the job instructions
- a photocopy of the documentation confirming all the material requirements for the production of the job
- a photocopy of the documentation confirming all the screen requirements for the production of the job
- samples of the job taken at various stages in the run
- samples of running faults as they arise
- a written or spoken report describing faults, their causes and how you corrected them.

Element 227.1 Run screen printing machines

Performance criteria

You must show that you:

- 1 run the screen printing machine:
 - a at the required speed
 - b with minimum rejects
 - c without unnecessary downtime
 - d safely and efficiently
- 2 keep up the supply of materials throughout the run
- 3 regularly check that quality standards are met
- 4 maintain the condition of:
 - a ink
 - b the squeegee
 - c stencil(s)
- 5 accurately record production and quality assurance details
- 6 follow the correct procedure for the removal of waste
- 7 stack work safely, using the approved method.

Element 227.1 Run screen printing machines

Knowledge and understanding

You must understand:

- K1 what details you need for the job
- K2 your company's quality standards
- K3 the risks associated with running screen printing machines and how to avoid them
- K4 how the ink systems you use perform on the press
- K5 the operation of the squeegee and the flood coater
- K6 the emergency shutdown procedures
- K7 how to use quality control guides
- K8 the image viewing conditions for inspecting output
- K9 the procedures for the removal of waste from your machine
- K10 what production and quality assurance records you are required to keep.

Element 227.1 Run screen printing machines

Performance evidence

You must show that you can maintain the throughput of screen printing machines consistently over a period of time. Your evidence must show that:

- R1 you can maintain the supply of:
 - a substrate
 - b ink
- R2 you can operate screen printing machines producing the following images:
 - a coarse line, fine line and solid
 - b multicolour
- R3 ... on at least **one** of the following:
 - a paper
 - b corrugated and plain board
 - c rigid and flexible plastic
 - d metals
 - e wood
 - f glass
 - g textiles
 - h ceramics
- R4 ... when the register is **one** of the following:
 - a close register spot colour
 - b fine register multicolour.

Element 227.2 Assist in fault finding and correction

Performance criteria

You must show that you:

- 1 accurately identify faults which:
 - a affect the quality of the image
 - b produce a shortfall in output
 - c create risks to health and safety
 - d create unnecessary downtime on the machine
- 2 accurately identify and correct mechanical faults which it is your job to correct
- 3 promptly report faults which are not your job to correct or are not corrected by the action you take
- 4 give constructive help to colleagues who are correcting faults on your machine
- 5 check that the machine is safe to operate, once faults are corrected.

Element 227.2 Assist in fault finding and correction

Knowledge and understanding

You must understand:

- K1 your company's procedures for dealing with faults
- K2 the types of screens, stencils and inks used by your company
- K3 the image viewing conditions for inspecting output
- K4 the common screen printing faults, what causes them and how to correct them
- K5 how to recognise when you should correct faults yourself and when you should ask for help
- K6 to whom you must report faults
- K7 your company's reporting procedures, and sources of assistance
- K8 how to assist others who are rectifying faults on your machines
- K9 the implications of down time on the overall production schedule.

Element 227.2 Assist in fault finding and correction

Performance evidence

You must show that you can assist in fault finding and correction consistently over a period of time. Your evidence must show that:

- R1 you can take the following types of action to identify problems:
 - a examining materials supplied
 - b examining printed output
 - c checking machine settings
 - d checking the condition and operation of the machine
- R2 you can use the at least **two** of the following methods to test output:
 - a visual
 - b touch
 - c electronically aided
- R3 you help people correcting faults on your machine by at least **one** of the following methods:
 - a providing information about the fault and its effects
 - b assisting in removing parts
 - c making sure the machine and work are safe for fault correction to proceed.

Unit 228 Prepare stencils for printing

Introduction

To achieve your unit certificate, you must show that you can:

- 1 Element 228.1 Prepare the mesh
- 2 Element 228.2 Prepare stencils

This involves:

- identifying the mesh type and frame size
- selecting and preparing the frame
- stretching the mesh and checking the tension
- checking the condition of mesh material
- roughening and degreasing mesh material
- applying and drying emulsion
- positioning the photo-positive
- exposing, developing and drying the stencil.

Collecting evidence for this unit

Your performance evidence must show that you have covered all of the statements in each element, and must be the result of real work activities in actual production situations. Simulation is **not** acceptable for this unit.

Your assessor will need to be satisfied that you have the necessary understanding specified in each 'K' list. Where this is not evident from your performance, you may be asked oral or written questions, or to write a short report.

You may need to provide other information to support your performance evidence. Here are some examples:

- a photocopy of the job instructions
- a photocopy of the layout
- a sample of the printed job.

Element 228.1 Prepare the mesh

Performance criteria

You must show that you:

- 1 confirm that the job sheet is accurate
- 2 identify and select the mesh type and frame size
- 3 select and prepare the correct frame to accept the mesh, when this is required
- 4 stretch the mesh onto the frame to the required tension, when this is required
- 5 when the mesh is already on the frame, check that the tension is correct
- 6 check that the condition of new and used mesh is suitable for use
- 7 where necessary, select, apply and remove a roughening agent to the mesh
- 8 degrease the mesh so that it will accept the stencil
- 9 promptly report when the frame or mesh is no longer suitable for use.

Element 228.1 Prepare the mesh

Knowledge and understanding

You must understand:

- K1 how to identify the image size
- K2 how to identify the machine to be used
- K3 how to select the frame
- K4 how to identify the required mesh material
- K5 why it is important that reclaimed mesh is free from stains and ghost images and how to confirm this
- K6 why pre-treatment is necessary for new screen meshes and how to select treatments
- K7 how to treat mesh material
- K8 why it is necessary to degrease the screen mesh and how to do this
- K9 how to check that stencil residue has been completely removed from reclaimed screens
- K10 the health and safety requirements when using chemicals and what personal protective equipment to use
- K11 to whom to report unsuitable frames and meshes.

Element 228.1 Prepare the mesh

Performance evidence

You must show that you can prepare the mesh consistently over a period of time. Your evidence must show that:

- R1 you can prepare the mesh for the following types of image:
 - a line
 - b line and half tone
 - c mono and multicolour
- R2 you can identify and select mesh according the following requirements:
 - a thread count
 - b mesh thickness
 - c weave
- R3 you can pre-treat the following types of mesh material:
 - a nylon
 - b polyester
 - c steel
- R4 you can prepare screens for the following coating systems:
 - a direct
 - b direct/indirect
 - c indirect.

Element 228.2 Prepare stencils

Performance criteria

You must show that you:

- 1 accurately identify the job details
- 2 obtain a positive and check that it is fit for use
- 3 apply the emulsion to the screen and dry it correctly
- 4 position the photo-positive accurately on the screen
- 5 confirm that the exposure is correct to suit the stencil system
- 6 develop the stencil using the correct water temperature and pressure
- 7 dry stencils at the correct temperature and check that drying is even over the entire surface.

Element 228.2 Prepare stencils

Knowledge and understanding

You must understand:

- K1 the methods to use in the production of the different types of stencil
- K2 how to choose the type of stencil to use
- K3 how the stencil type affects the quality of print
- K4 the materials available for the production of stencils
- K5 what safe light colours are
- K6 how to determine the resolving power of materials
- K7 why it is important to position the photo-positive correctly and how the machine affects positioning
- K8 how to achieve the optimum exposure
- K9 the effects of under- and over-exposure.
- K10 how the condition of the stencil affects the printed image
- K11 what the critical parameters of the stencil are.

Element 228.2 Prepare stencils

Performance evidence

You must show that you can prepare stencils consistently over a period of time. Your evidence must show that:

- R1 you can prepare **one** of the following types of coating methods:
 - a indirect
 - b direct/indirect
 - c direct

- R2 you can apply emulsion to the screen using **one** of the following methods:
 - a capillary film
 - b direct emulsion

- R3 you can use **one** of the following types of stencil imaging systems:
 - a direct projection
 - b direct to screen
 - c conventional.

Appendix 1 Accreditation, national frameworks and qualification level descriptors

Please visit the following websites to find information on accreditation, national frameworks and qualification level descriptors in each country.

Nation	Who to contact	Website
England	The Qualifications and Curriculum Authority	www.qca.org.uk
Scotland	The Scottish Qualifications Authority	www.sqa.org.uk
Wales	The Department for Education, Lifelong Learning and Skills Wales	www.new.wales.gov.uk
Northern Ireland	The Council for Curriculum, Examinations and Assessment	www.ccea.org.uk

Appendix 2 The qualification structure

This section of the document outlines the qualification structure for the full suite of Printing NVQs at Levels 2 and 3. Please refer to the tables on the following pages.

Qualification	Complex	QCA reference
Level 2 NVQ in Digital Print Production	5158-20 and -80	500/1488/2
Level 2 NVQ in Machine Printing	5158-21 and -81	500/1483/3
Level 2 NVQ in Mechanised Print Finishing and Binding	5158-22 and -82	500/1479/1
Level 2 NVQ in Envelope Manufacture	5158-23 and -83	500/1476/6
Level 3 NVQ in Digital Print Production	5158-30 and -90	500/1469/9
Level 3 NVQ in Machine Printing	5158-31 and -91	500/1491/2
Level 3 NVQ in Mechanised Print Finishing and Binding	5158-32 and -92	500/1475/4
Level 3 NVQ in Envelope Manufacture	5158-33 and -93	500/1487/0
Level 3 NVQ in Hand Binding	5158-34 and -94	500/1477/8
Level 3 NVQ in Carton Manufacture	5158-35 and -95	500/1478/X
Level 3 NVQ in Print Administration	5158-36 and -96	500/1472/9

Level 2 NVQ in Digital Print Production

Mandatory common units

201	Comply with Health and Safety Requirements in the Workplace
202	Improve your performance at work
203	Plan your work to meet production requirements
204	Capture images from specified sources

Mandatory Technical Units

Group A – Digital Artwork for Print

205 Create digital colour artwork for print

Group B – Pre-Press

206 Produce imposed separations for printing

Group C – Digital Printing

207 Operate digital printing machines

Level 2 NVQ in Machine Printing

Mandatory common units

201 Comply with Health and Safety Requirements in the Workplace

202 Improve your performance at work

208 Contribute to maintaining equipment in working order

Mandatory technical units (Groups A-G) – complete two units from same pathway

Group A - Lithography	Group B - Web Offset	Group C - Flexography	Group D - Screen	Group E - Gravure	Group F - Pad printing	Group G - Dye Stamping
209 Prepare machines for sheet fed lithographic printing	217 Prepare machines for web offset printing	221 Prepare machines for flexographic printing	226 Prepare equipment and machines for screen printing	229 Prepare machines for gravure printing	232 Prepare machines for pad printing	262 Prepare dye stamping machines for printing
210 Operate sheet fed lithographic printing machines	218 Operate web offset printing machines	222 Operate flexographic printing machines	227 Operate screen printing machines	230 Operate gravure printing machines	233 Operate pad printing machines	263 Operate dye stamping machines

Optional technical units – complete one unit from chosen pathway

211 Operate in-line converting equipment	211 Operate in-line converting equipment	211 Operate in-line converting equipment	211 Operate in-line converting equipment	211 Operate in-line converting equipment	212 Operate ink drying equipment	211 Operate in-line converting equipment
212 Operate ink drying equipment	212 Operate ink drying equipment	212 Operate ink drying equipment	212 Operate ink drying equipment	212 Operate ink drying equipment	213 Prepare inks	213 Prepare inks

Continued on next page

213 Prepare inks	214 Set up and operate auxiliary equipment	213 Prepare inks	213 Prepare inks	220 Operate reel handling equipment	234 Maintain the condition of consumables for printing	214 Set up and operate auxiliary equipment
214 Set up and operate auxiliary equipment	219 Operate in-line printing units	214 Set up and operate auxiliary equipment	228 Prepare stencils for printing	231 Mix, dry and cure inks		216 Prepare and produce wet proofs
215 Maintain the condition of plates for printing	220 Operate reel handling equipment	215 Maintain the condition of plates for printing				
216 Prepare and produce wet proofs		220 Operate reel handling equipment				
		223 Operate and monitor bar code printing				
		224 Control colour throughout the run				
		225 Maintain anilox roll conditions				

Level 2 NVQ in Mechanised Print Finishing and Binding

Mandatory common units

201 Comply with Health and Safety Requirements in the Workplace

202 Improve your performance at work

208 Contribute to maintaining equipment in working order

Optional technical units (Groups A-B) – complete two optional from chosen pathway

Group A – General Print

235 Run and monitor guillotines

236 Run and monitor adhesive binding machinery

237 Run and monitor case making machinery

238 Run and monitor casing-in machinery

239 Run and monitor folding machinery

240 Set and operate booklet-making machinery

241 Set and operate mail processing machinery

242 Set and operate multi-knife trimming machinery

243 Set and operate multiple hopper feeders

Group B – Newspapers and Periodicals

249 Operate automated inserting equipment for newspapers and periodicals production

250 Operate automated stitch and trim equipment for newspapers and periodicals production

251 Set up machines for automated newspapers and periodicals print finishing

252 Move materials for newspaper and periodical production

253 Repair and maintain feeder machinery

254 Control publishing equipment for newspaper and periodicals production

255 Control auto-palletising equipment for newspaper and periodicals production

Continued on next page

244 Set and operate auto-fed sewing machinery

245 Control auto punching and cutting machinery

246 Control foil blocking machinery

247 Control twin loop wire binding machinery

248 Control parallel folding

Level 2 NVQ in Envelope Manufacture

Mandatory common units

201 Comply with Health and Safety Requirements in the Workplace

202 Improve your performance at work

208 Contribute to maintaining equipment in working order

256 Monitor and run envelope manufacturing machines

Optional Technical units – complete one optional

257 Prepare and set printing units

258 Prepare and set window cutting and patching units for envelope manufacture

259 Prepare and set scoring, folding and gumming units for envelope manufacturing

260 Prepare and set profile cutting units for envelope manufacture

Level 3 NVQ in Digital Print Production

Mandatory Common Units

203 Plan work to meet production requirements

261 Send and receive digital files

301 Ensure your own actions reduce risks to health and safety in the workplace

302 Improve Individual and Organisational Performance

303 Plan and capture digital images

304 Maintain digital systems in working order

305 Design and produce creative digital colour artwork for print

Mandatory Technical Units (Groups A-B) – complete one units from chosen pathway

Group A - Digital Artwork for Print

206 Produce imposed separations for printing

207 Operate digital printing machines

306 Plan and produce edited images

307 Manage colour reproduction in digital pre-press

308 Produce approved proofs from digital artwork

Group B - Pre-press

228 Prepare stencils for printing

306 Plan and produce edited images

307 Manage colour reproduction in digital pre-press

308 Produce approved proofs from digital artwork

309 Produce computer generated image carriers

310 Make photopolymer plates for flexographic printing

311 Make plates for lithographic printing

312 Make gravure cylinders

Level 3 NVQ in Machine Printing

Mandatory common units

301	Ensure your own actions reduce risks to health and safety in the workplace
302	Improve Individual and Organisational Performance
348	Maintain equipment in working order

Mandatory technical units

Group A – Lithography	Group B – Web Offset	Group C – Flexography	Group D - Screen	Group E - Gravure	Group F - Pad Printing
315 Control sheet-fed multi unit lithographic printing machines	319 Control web offset printing machines	323 Control flexographic printing machines	325 Control screen printing machines	326 Control gravure printing machines	327 Control pad printing machines

Optional Technical Units (Groups A-F) – complete two units from chosen pathway

Group A – Lithography	Group B – Web Offset	Group C – Flexography	Group D - Screen	Group E - Gravure	Group F - Pad Printing
215 Maintain the condition of plates for printing	316 Control in-line converting machinery	215 Maintain the condition of plates for printing	213 Prepare inks	316 Control in-line converting machinery	213 Prepare inks
311 Make plates for lithographic printing	317 Control ink drying machinery	316 Control in-line converting machinery	228 Prepare stencils for printing	317 Control ink drying machinery	234 Maintain the condition of consumables for printing

Continued on next page

316 Control in-line converting machinery	318 Control auxiliary equipment	317 Control ink drying machinery	316 Control in-line converting machinery	318 Control auxiliary equipment	317 Control ink drying machinery
317 Control ink drying machinery	320 Control in-line printing units	318 Control auxiliary equipment	317 Control ink drying machinery	321 Control reel handling equipment	
318 Control auxiliary equipment	321 Control reel handling equipment	321 Control reel handling equipment		322 Control in-line folding units	
	322 Control in-line folding units	324 Test flexographic printing machines			

Level 3 NVQ in Mechanised Print Finishing and Binding

Mandatory common units

301 Ensure your own actions reduce risks to health and safety in the workplace

302 Improve Individual and Organisational Performance

Optional technical units (Groups A-B) – complete one optional from chosen pathway

Group A – General Print

Optional technical units – complete two units

328³ Control adhesive binding machinery

329 Control case making machinery

330 Control casing-in machinery

331 Control programmatic guillotines

332² Control folding machinery

333¹ Control in-line booklet making machinery

Optional Technical units complete one unit

Group B – Newspapers and Periodicals

Mandatory technical units – complete one unit

348 Maintain equipment in working order

Optional Technical units complete two units

253 Repair and maintain feeder machinery

344 Control automated inserting processes for newspapers and periodicals print

345 Control automated stitch and trim processes for newspaper and periodicals print

346 Control the set up of machines for newspaper and periodicals print finishing

347 Control materials handling for newspaper and periodicals print finishing

Continued on next page

246	Control foil blocking machinery
334	Control non-automatic finishing machines
335	Control multiple hopper feeders
336	Control auto-fed sewing machinery
337	Control multi-knife trimming machinery
338 ¹	Set and operate booklet-making machinery
339 ²	Control parallel folding
340 ³	Run and monitor adhesive binding machinery
341	Control inline inseting-stitching-trimming machines
342	Control inline gathering-adhesive-binding-trimming machinery
343	Control inline block-feeding-forwarding-case binding machinery

Notes

¹Unit 338 may not be used in conjunction with Unit 333

²Unit 339 may not be used in conjunction with Unit 332

³Unit 340 may not be used in conjunction with Unit 328

Level 3 NVQ in Envelope Manufacture

Mandatory common Units

301 Ensure your own actions reduce risks to health and safety in the workplace

302 Improve Individual and Organisational Performance

314 Identify and organise the requirements for production

348 Maintain equipment in working order

349 Control envelope manufacturing machinery

Optional technical units – complete one optional

350 Support the efficient use of resources (MCI)

351 Manage yourself (MCI)

352 Contribute to the development of teams and individuals (MCI)

353 Lead the work of teams and individuals to achieve their objectives (MCI)

354 Train new operators

Level 3 NVQ in Hand Binding

Mandatory common units

301 Ensure your own actions reduce risks to health and safety in the workplace

302 Improve Individual and Organisational Performance

355 Prepare for hand binding operations

356 Bind books by hand

357 Cut page edges and binding materials by guillotine

Optional technical units – complete one optional

351 Manage yourself (MCI)

352 Contribute to the development of teams and individuals (MCI)

353 Lead the work of teams and individuals to achieve their objectives (MCI)

354 Train new operators

358 Decorate cases

Level 3 NVQ in Carton Manufacture

Mandatory common units

301 Ensure your own actions reduce risks to health and safety in the workplace

302 Improve Individual and Organisational Performance

348 Maintain equipment in working order

Optional technical units – complete one optional

359 Control cutting and creasing machinery

360 Control multi-folding and gluing machinery

361 Produce dies and tooling

Optional technical units – complete one optional

314 Identify and organise the requirements for production

350 Support the efficient use of resources (MCI)

351 Manage yourself (MCI)

352 Contribute to the development of teams and individuals (MCI)

353 Lead the work of teams and individuals to achieve their objectives (MCI)

354 Train new operators

Additional technical unit

362 Control carton enhancing machinery

Level 3 NVQ in Print Administration

Mandatory common units

301 Ensure your own actions reduce risks to health and safety in the workplace

302 Improve Individual and Organisational Performance

261 Send and receive digital files

Optional technical units – complete three optional

363 Produce estimates from customer requirements

364 Prepare job cost information and produce invoices

365 Agree job specification and prepare production schedules

366 Control Production

367 Purchase materials and services for production

368 Service customer accounts

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