Level 3 NVQ in Digital Print Production (5158-30)

Standards and assessment requirements

Digital Artwork for Print
Pre-Press
500/1469/9

About City and Guilds

City and Guilds is the UK's leading provider of vocational qualifications, offering over 500 awards across a wide range of industries, and progressing from entry level to the highest levels of professional achievement. With over 8500 centres in 100 countries, City and Guilds is recognised by employers worldwide for providing qualifications that offer proof of the skills they need to get the job done.

City and Guilds Group

The City and Guilds Group includes City and Guilds, ILM (the Institute of Leadership and Management) which provides management qualifications, learning materials and membership services, NPTC which offers land-based qualifications and membership services, and HAB (the Hospitality Awarding Body). City and Guilds also manages the Engineering Council Examinations on behalf of the Engineering Council.

Equal opportunities

City and Guilds fully supports the principle of equal opportunities and we are committed to satisfying this principle in all our activities and published material. A copy of our equal opportunities policy statement *Access to assessment and qualifications* is available on the City and Guilds website.

Publications

City and Guilds publications are available on the City and Guilds website or from our Publications Sales department at the address below or by telephoning +44 (0)20 7294 2850 or faxing +44 (0)20 7294 3387.

Every effort has been made to ensure that the information contained in this publication is true and correct at the time of going to press. However, City and Guilds' products and services are subject to continuous development and improvement and the right is reserved to change products and services from time to time. City and Guilds cannot accept liability for loss or damage arising from the use of information in this publication.

City and Guilds
1 Giltspur Street
London EC1A 9DD
T +44 (0)20 7294 2800   **www.cityandguilds.com**
F +44 (0)20 7294 2400   **enquiry@cityandguilds.com**

Level 3 NVQ in Digital Print Production (5158-30)

Standards and assessment requirements

This page is intentionally blank

Contents

This page is intentionally blank

1   Introduction

About this document

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

Level 3 NVQ in Digital Print Production (5158-30)

QCA accreditation number: 500/1469/9

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

- City and Guilds Level 2 Certificate in Printing and Graphic Communications 5261-02
- City and 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 and Guilds *N/SVQ Guides*:

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

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

Other essential City and Guilds documents

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

- ***Providing City and 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 and Guilds assessment and policy issues.

- ***Centre toolkit***
  contains additional information on *Providing City and 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 and Guilds resources, please refer to the City and 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 and 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 and Guilds Qualifications* for further information.

Existing City and Guilds centres

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

Centres already offering City and 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 and 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 and 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 and 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 and 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 and 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 and 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 and Guilds with personal data for staff and candidates. Guidance on data protection and the obligations of City and Guilds and centres are explained in *Providing City and 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 and 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 and 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 and Guilds also endorses the electronic recording systems *Quick Step* and *Paper Free*.

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

8 The qualification structure
Level 3 NVQ in Digital Print Production (5158-30)

The certificates referred to in this complex (5158-30) are as follows:

- Level 3 NVQ in Digital Print Production – Digital Artwork for Print
- Level 3 NVQ in Digital Print Production – Pre-Press

8 The qualification structure

8.1 Digital Artwork for Print

Candidates must achieve **all seven** mandatory common units, plus **one** optional technical unit.

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

Optional technical units

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

8 The qualification structure

8.2 Pre-Press

Candidates must achieve **all seven** mandatory common units, plus **one** optional technical unit.

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

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

9 Relationships to other qualifications

9.1 Relationship to previous versions of the qualifications

City and Guilds has identified the connections to the NVQ previously offered by City and 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 3 NVQ in Digital Artwork for Print (5158-30) and the forerunner Level 3 NVQ in Desktop Publishing (5157-04)

Level 3 NVQ in Digital Artwork for Print (5158-30)	Level 3 NVQ in Desktop Publishing (5157-04)
Unit Number/Title	Related units
203 Plan work to meet production requirements	101 Plan your work to meet production order requirements
206 Produce imposed separations for printing	110 Prepare and output data to produce image carriers 102 Plan image laydown for printing
207 Operate digital printing machines	226 Prepare equipment and systems for non-impact printing 227 Operate non-impact printing machines
261 Send and receive digital files	901 Control the use of electronic communication (ITNTO unit 327)
301 Ensure your own actions reduce risks to health and safety in the workplace	001 Reduce risks to health and safety in your workplace
302 Improve Individual and Organisational Performance	002 Develop yourself in your job
303 Plan and capture digital images	112 Plan image production
304 Maintain digital systems in working order	N/A
305 Design and produce creative digital colour artwork for print	706 Create and apply typographical specifications to meet customer requirements 904 Design and produce documents using graphics (ITNTO unit 312) 906 Design and produce documents using word processing software (ITNTO unit 305)
306 Plan and produce edited images	116 produce digital images for printing
307 Manage colour reproduction in digital pre-press	707 Calibrate and control colour in desk top publishing
308 Produce approved proofs from digital artwork	115 Produce proofs to meet requirements 117 Produce and assess digital proofs

Relationship between this Level 3 NVQ in Pre-press (5158-30) and the forerunner Level 3 NVQ in Pre-press (5157-02)

Level 3 NVQ in Pre-press (5158-30) Unit Number/Title	Level 3 NVQ in Pre-press (5157-02) Related units
203 Plan work to meet production requirements	101 Plan your work to meet production order requirements
228 Prepare stencils for printing	219 Prepare stencils for printing
261 Send and receive digital files	901 Control the use of electronic communication (ITNTO unit 327)
301 Ensure your own actions reduce risks to health and safety in the workplace	001 Reduce risks to health and safety in your workplace
302 Improve Individual and Organisational Performance	002 Develop yourself in your job
303 Plan and capture digital images	112 Plan image production
304 Maintain digital systems in working order	N/A
305 Design and produce creative digital colour artwork for print	906 Design and produce documents using word processing software (ITNTO unit 305) 904 Design and produce documents using graphics (ITNTO unit 312) 706 Create and apply typographical specifications to meet customer requirements
306 Plan and produce edited images	116 produce digital images for printing
307 Manage colour reproduction in digital pre-press	707 Calibrate and control colour in desk top publishing
308 Produce approved proofs from digital artwork	115 Produce proofs to meet requirements 117 Produce and assess digital proofs
309 Produce computer generated image carriers	119 Produce computer generated image carriers
310 Make photopolymer plates for flexographic printing	105 Make photopolymer plates for flexographic printing
311 Make plates for lithographic printing	229 Make plates for lithographic printing
312 Make gravure cylinders	106 Make gravure cylinders

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 and 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'.

Please note: Key Skills Level 2 is illustrated as **2**
                 Key Skills Level 3 is illustrated as **3**

Unit number	Communication	Application of Number	Information Technology
203	2	2	2
206	2	2	2
207	2		2
228	2	2	
261	2	2	2
301	3	2	2
302	3	2	
303	3	2	2
304	3	2	2
305	3	2	3
306	3	2	3
307	3	2	3
308	3	2	3
309		2	3
310	2		

311			
312			

Unit number	Problem Solving	Improving own learning and performance	Working With Others
203	2	2	2
206	2	2	2
207	2	2	2
228	2	2	2
261	2	2	2
301	3	3	2
302	3	3	3
303	3	3	3
304	3	3	3
305	3	3	3
306	3	3	3
307	3	3	3
308	3	3	3
309	3	3	3
310	3	3	3
311	2	3	2
312	2	3	2

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 and Guilds website.

11 The units

Unit 203   Plan work to meet production requirements

Introduction

Introduction

Planning work to make sure it is completed correctly and on time is vitally important in a production environment.

Pre-press, digital printing and creative artwork departments invariably deal with jobs (orders) that are made up of several operations.

This unit is about making sure that for each job there is a plan setting out what work is required, the sequence of the work and the time it is expected to take.

This unit consists of **two** elements:

1   Element 203.1   Interpret production requirements

2   Element 203.2   Plan production tasks to meet customer requirements

This is what the unit covers

When a job comes into a digital artwork, pre-press or digital printing area, it is essential to find out:

- what work is required to complete the job
- the sequence that the work needs to be carried out in
- the resources that will be needed for the work
- the time available to complete the work so as to meet the customer's and the company's production deadline.

Where a line manager or production department has provided a plan or a schedule for the job, it is important to check the plan against the actual job – sometimes extra work may be found to be needed that was not known about, in which case the plan will need to be revised. Where no plan or schedule has been provided by someone else, the first step on receipt of the job should be to find out what needs to be done and to prepare an accurate plan for the work.

To complete this unit, evidence must show that the work needed on various jobs has been correctly identified and a plan produced (or an existing plan checked and confirmed) showing the tasks required for that job, the order in which the tasks should be carried out, the availability of resources such as materials, labour and outwork and the approximate time needed to complete each operation or task in the job.

For people whose usual role involves having individual tasks delegated to them by others, evidence should show that they confirm how their tasks fit within the overall job, the time-scales and resources required to complete their task, and that they work co-operatively with colleagues to ensure the job is completed on time. Where, for any reason, they are unable to complete their task as expected, or where tasks that are being proposed were not part of the original job plan, they will take prompt action to bring this to the attention of the appropriate person.

For people whose usual role involves organising all parts of the job, evidence should show that they plan the work for themselves and, where necessary, colleagues and outworkers.

The essence of this unit is that job planning and task review should be routine practice in day-to-day work at all levels. It is not sufficient to produce simulated or project evidence.

There is also a significant amount of knowledge and understanding required of digital artwork, pre-press and printing processes, without which it may not be possible to plan the sequence of tasks or estimate the time each will involve.

Element 203.1 Interpret production requirements

Performance criteria

You must be able to:

1   check that you have all the details for the job

2   identify the finished product required by the customer

3   identify what your department or area of work is required to produce

4   list the tasks for the job that are needed to be completed within your area of work, and the order in which the tasks should be carried out

5   where necessary, check with the appropriate person that you have correctly interpreted or understood the tasks required

6   where necessary, check with the appropriate person whether the content of the job may lawfully be reproduced

7   bring to the attention of the appropriate person any tasks required for the job that were not originally planned or expected.

Element 203.2 Plan production tasks to meet customer requirements

Performance criteria

You must be able to:

1   confirm that you have the resources needed to complete the tasks identified including equipment, materials and labour

2   realistically estimate the time needed to complete each task

3   identify any possible problems with resources, including insufficient time, and take instructions from the appropriate person about what to do

4   organise your work so that you:

    a   complete it within the time expected

    b   avoid unnecessary repetition and re-working

    c   meet your company's quality standards

    d   whenever possible, work productively and co-operatively as part of a team

    e   where necessary, obtain approval for the way you have planned to organise the work.

Unit 203 Plan work to meet production requirements

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.

K1 The Law as it affects printing

1 Copyright and Ownership of images

2 Obscenity

3 Incitement

4 Forgery

5 Data Protection

K2 Ethical and Employment Issues relevant to printing

1 Confidentiality

K4 The safe handling of customer material

K5 Security and Storage

1 Computer system security and virus protection

2 Print with time-sensitive or restricted release dates

3 High value products or print with a high risk of theft

K6 Communication

1 With colleagues

2 With customers

K7 Workplace policy and practice

1 Workplace 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 choice of processes for any particular product

3   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

2   The relationship between resource usage and profitability

3   How to maximise productivity

4   The relationship between productivity and competitiveness

K14   **Digital Imaging**

1   The range of methods, equipment, material and software appropriate to the imaging requirements

2   The relative merits of the methods, equipment, material and software

Unit 206   Produce imposed separations for printing

Introduction

Introduction

Most print work requires multiple pages or images to be imposed on a sheet. This may range from '2-up' for a simple leaflet, '64-up' for a large magazine and even more for a book. Where more than one colour printing is involved, the imposition must be repeated exactly for each colour separation. The final stage before printing is the creation of an image carrier

This unit covers the work involved in identifying the number of colours in a job, the separation of colours where that is necessary, the imposition of pages or images and the output of an image carrier.

This unit consists of **three** elements:

1   Element 206.1   Identify colour separations for printing

2   Element 206.2   Create impositions for printing

3   Element 206.3   Output image carriers for printing

This is what the unit covers

Developments in pre-press technology now means that a single technician will typically receive and check a digital artwork file, impose the work electronically, and send it to an output device to create an image carrier. This unit requires the pre-press technician to demonstrate the ability to perform each of those tasks.

You must be able to examine digital artwork and identify how many colours are in the job. Outputting multi-colour artwork separations is not essential for this unit, but you should be able to identify additional colours in a digital artwork file if they are present and understand how to output at least two-colour separations from a digital file if called upon to do so.

Inconsistencies in the colour setup of documents presented for print are not uncommon and if the number of colours used in the document or the colour spaces of images are found to be incorrect for the printing method, the file will probably need to be referred back to its originator for correction.

Once the number of colours have been confirmed and the digital artwork is correct, if there is more than one colour, you must be able to assess whether any colour(s) should overprint or knockout another. Where this is the case, you must confirm that the artwork is correctly set to overprint or knockout as appropriate. If it is not, you must take prompt action to refer the problem to your manager or customer.

If you are working with an electronic imposition programme, you must be able to create impositions as well as retrieve stored imposition templates. Most graphics and DTP software allow impositions to be created at the 'print dialogue' stage and another method of creating impositions is to 'patch' pages into a larger page setup in the software. Any of these methods is acceptable for this unit, so long as the imposition is workable and contains the trims, bleeds, gutters and marks needed for print.

You must be able to determine what effect different finishing methods may have on the imposition, such as folding and binding sections, cutting and creasing folding board products, and how the best use of the substrate and machines can be achieved through imposition.

Once your imposition has been approved, you must be able to create image carriers for each colour, correctly imposed.

The range of work described so far could be extremely complex depending on the environment in which the work is carried out. However, for this unit you only need to show in performance evidence that over a period of time you can assess the colour set up of digital artwork files correctly, create impositions and output image carriers for at least single colour work.

Element 206.1 Identify colour separations for printing
Performance criteria

You must be able to:

1   check that you have all the details you need for the job

2   identify the number of colours that will be used to print the job

3   identify the number of colours used in the digital artwork file and whether they are defined as 'spot' or process colours

4   identify the colour space(s) used in the digital artwork

5   where there is a conflict between the artwork colours and the intended printing colours / method, bring this to the attention of your manager or the customer without delay

6   if artwork needs to be changed so that colours will separate correctly for the printing process to be used, follow the directions of your manager to carry out the work yourself or pass it to the person who will carry out the work

7   check whether any knockouts and overprints have been correctly set and, if not, follow the directions of your manager or the customer

8   create and / or identify the file that will be used to output or print the job to the image carrier.

Element 206.2 Create impositions for printing

Performance criteria

You must be able to:

1   identify the printing machines and any finishing machines that will be used in the production of the job

2   identify the imposition requirements for the job to be produced in the most efficient way, taking into account:

     a   press size

     b   substrate size

     c   the method of finishing

3   identify a suitable imposition scheme approved by your company or create a new one

4   retrieve the imposition template if one exists, or set up the imposition to the approved specification

5   incorporate relevant marks in the imposition to aid printing and finishing processes, such as trim and bleed marks, register marks, folding marks, grip and side-lay and any mechanical or digital quality control aids required by your company

6   if appropriate, save the imposition template so that it can be easily identified and used again if required.

Element 206.3 Output image carriers for printing
Performance criteria

You must be able to:

1   send or print the approved output file to the destination device to create imposed separations

2   check that all the elements of the job appear on the correct separations

3   check that fonts and images are correct

4   check that imposition marks required for the job appear on the correct separations

5   if appropriate, obtain approval for outputting the job to an image carrier

6   check that the image carrier is fit for purpose

7   obtain approval from your manager for this stage of the production work.

[This sequence presumes that the files will be sent to a 'RIP' and there will be an opportunity to preview the files before final output to the image carrier. Where the files are sent directly for output to an image carrier, the sequence set out above may be interpreted in a different order]

Unit 206   Produce imposed separations for printing
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.

K1   The Law as it affects printing

1   Copyright and Ownership of Images

2   Forgery

K3   Health and Safety

1   Your duties and responsibilities for health and safety as defined by any specific legislation covering your job role

2   Workplace health and safety procedures

3   Manufacturers' and suppliers' health and safety instructions / advice

K4   The safe handling of customer material

K5   Security and Storage

1   Computer system security and virus protection

2   Secure means of archiving digital and conventional artwork

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 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

2   The relationship between resource usage and profitability

K10   The operation of equipment

1   The operation of software, hardware and pre-press equipment.

K12   Printing

1   The principles of layout and imposition, including the use and placement of marks and control guides

K14   Digital Imaging

1   Colour theory, e.g. additive and subtractive systems such as RGB and CMYK

K15   How to deal with digital files

1   File management

Unit 207   Operate digital printing machines

Introduction

Digital printing machines are now found everywhere – in homes, in offices and in commercial printing businesses. They range from small ink-jet printers that can be held in the hand to large-format poster printers and high-speed document machines that can print in black and white and, increasingly, colour.

This unit is for people who operate digital printing machines in a production environment – where there is a customer, either internal or external, for whom work is produced and a person whose job it is to produce print on the digital machine(s).

This unit consists of **three** elements:

1   Element 207.1   Prepare digital printing machines for production

2   Element 207.2   Run digital printing machines

3   Element 207.3   Assist in fault finding and correction

This is what the unit covers

Digital printing machines are usually either:

- standalone with their own internal hardware or computer interface
- connected to a local computer
- network devices that are available to many computers on a network

Whichever type of machine is being operated, digital files need to be sent or downloaded to the printer, possibly with fonts embedded in them or with fonts accessible to the digital printer, colour images may need to be 'ripped' or processed, and the correct paper or substrate taken by the machine from a drawer, reel or single-fed sheet.

This unit requires the operator to be able to prepare the digital machine for printing, send the digital files to the machine, ensure the correct substrate is present, check the output is satisfactory and, if it is, run the machine and maintain quality of output.

If problems should occur, simple faults such as substrate, inks or toners requiring replenishment should be dealt with by the operator. Machine faults, particularly those affecting the quality of output, may need additional support from colleagues or the manufacturer's maintenance team. The operator must quickly identify faults that cause the output to fall below an acceptable quality, and arrange for attention from the appropriate person.

Scope

Given the vast range of digital printing machines, the evidence required for any particular machine is that the operator is capable of running the machine competently under supervision in a commercial or production environment, fulfilling all the performance criteria statements that follow.

Element 207.1 Prepare digital printing machines for production

Performance criteria

You must be able to:

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   accurately any identify post-printing requirements

5   check that the machine and your work area are safe and ready for production

6   download or print the digital job file(s) to the digital printing machine using the correct settings so that:

   a   the print output meets the job specification

   b   the image is complete, colour accurate, free from contamination or other faults, and in register

   c   the correct fonts have been used

   d   the correct substrates have been used

   e   any duplexing or finishing options are correct imposition, scaling and orientation are correct

   f   the output satisfies the required quality standard

7   make adjustments to the machine settings or print download settings as necessary to achieve the required job specification and quality standards

8   report promptly to your manager, if the specification or quality standards cannot be met

9   promptly report any machine faults which it is not your job to correct.

Element 207.2 Run digital printing machines
Performance criteria

You must be able to:

1   run the digital printing machine:

     a   at the required speed

     b   safely and efficiently

2   keep up the supply of materials and consumables throughout the run

3   regularly check that quality standards and job specifications are met

4   accurately record production and quality assurance details

5   follow the correct procedure for the removal of waste

6   stack work safely, using the approved method.

Element 207.3 Assist in fault finding and correction
Performance criteria

You must be able to:

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

2   accurately identify and correct machine 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.

Unit 207   Operate digital printing machines
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.

K1   The Law as it affects printing

1   Copyright and Ownership of Images

2   Forgery

3   Data Protection

K2   Ethical Issues relevant to printing

1   Confidentiality

K3   Health and Safety

1   Your duties and responsibilities for health and safety as defined by any specific legislation covering your job role

2   Manufacturer's health and safety requirements relevant to your job

3   How to stop a machine in the event of an emergency

K4   The safe handling of customer material

K5   Security and Storage

1   Computer system security and virus protection

2   Secure means of archiving digital and conventional artwork

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

K8   The identification and assessment of printing options

1   The stages in the printing process from pre-press to printed product

K9   Time and Resources
1   How to maximise productivity

K10   The operation of equipment

1   The operation of digital printing machinery

K13   Printing

1   The principles of digital printing

K15   How to deal with digital files

1   Dealing with embedded information

2   File management

K16   The causes and treatment of common faults

1   Raw material faults

2   Processing faults

3   Machine faults

K17   Administrative procedures

1   Recording and reporting

2   Product labelling

K21   Environmental

1   Any specific environmental legislation that covers processes in your company

2   Control of pollution

K22   Quality Assurance and Control

1   Techniques for controlling quality

2   Equipment for controlling quality in digital printing

K23   Problem Solving

1   Sources of information

2   Techniques for assessing machine faults

K24   Materials

1   The types and characteristics of paper, board and other commonly used substrates

2   The types and characteristics of inks, toners and coatings

3   Maintaining the quality of materials during storage and handling

K25   Cleaning, Lubrication and Maintenance

1   The principal activities involved with machine cleaning, lubrication and maintenance

2   Roles and responsibilities for cleaning, lubrication and maintenance

3   Machine faults and how they can be rectified

4   The maintenance plans for machines which you operate

5   Which components wear or become degraded over time

6   The choice and use of suitable cleaning agents and lubricants

7   What parts of the machine you are allowed to clean, lubricate and maintain

K26   Proofing

1   The principal types of proof and their role in

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.

Unit 261   Send and receive digital files

Introduction

Introduction

This unit covers the sending and receiving of digital files over a telecommunications network, including as email attachments, by ISDN or through a virtual private network or similar permanent connection.

It applies to you if you work in a studio, imaging bureau, pre-press department or digital printing environment and send and receive images digitally.

This unit consists of the following **two** elements:

1   Element 261.1   Send digital files by electronic means

2   Element 261.2   Receive digital files by electronic means

This is what the unit covers

If you work in a studio, bureau, pre-press or printing environment you will often receive files digitally, work on them and send them or proofs derived from them back to customers digitally. The files themselves are often very large.

You are likely to be using broadband (ADSL or SDSL) or ISDN. With broadband, the files are carried over the internet; with ISDN there may be an internet connection or there may be a direct connection from one computer to another over a telecommunications network, not using the internet.

'Dial-up' connections to the internet using a modem are still common, although slow compared to other methods. Direct modem to modem connections are now less common.

Files may be in a variety of file formats, e.g. JPG, TIF, GIF and PDF. Whichever format is used, it should be appropriate for the method of transmission – there is no point in trying to send an enormous file that cannot be properly received or which is likely to take so long there is a risk of the connection being lost during transmission. Where appropriate therefore, files should be compressed or created so as to produce the minimum acceptable file size.

Transmitted files should be accompanied by any relevant information that will inform the recipient of the reason for the file(s) being sent and any reference or identifying information.

Transmission and reception problems may include the following:

* Local hardware and software problems, affecting your own and / or your customer's computer and communications systems
* Physical problems with wider communications networks, e.g. telephone lines or cable links
* Service problems originating at Internet service providers and other communications suppliers
* Problems arising from the nature of the communication itself, e.g. large file sizes
* Problems arising from computer viruses.

This unit has been imported from Skillset, the Sector Skills Council for the Audio Visual Industries, and adjusted for the Print industry.

Element 261.1 Send digital files by electronic means
Performance criteria

This is what you have to do:

1   confirm that the file(s) to be sent are in the format required by the customer and are of a suitable size for transmission

2   make sure the transmission method is suitable for the files to be transmitted. Where there is a choice of transmission method, choose the most suitable taking account of the customer's preferences, speed of transmission, security and cost

3   make sure that the information accompanying the digital file(s) is:

   a   detailed enough for the customer

   b   clear and accurate

4   send the files to the correct people

5   where necessary, seek confirmation that the files have been received correctly:

   a   identify immediately any problems with the transmission of your files

   b   do what you can, within the limits of your job, to resolve the problems

   c   where you can't resolve them, refer them to the correct people

   d   tell the correct people about the problems and about the actions you took to deal with them

6   complete, clearly and accurately, all necessary records on the transmission.

Element 261.2 Receive digital files by electronic means
Performance criteria

This is what you have to do:

1 confirm that the digital communications systems are operating properly and are ready to receive incoming files

2 check, at the correct intervals, for incoming files

3 if required, connect to remote sites and initiate download of stored digital files

4 save received files correctly

5 confirm that you have received the correct files

6 where necessary, provide confirmation that the files have been received correctly

7 before opening received files, check that virus software is up-to-date and functioning correctly on the host computer

8 identify immediately any problems with file reception:

    a do what you can, within the limits of your job, to resolve the problems

    b where you can't resolve them, refer them to the correct people

    c tell the correct people about the problems and about the actions you took to deal with them

9 complete, clearly and accurately, all necessary records on the files received.

Unit 261   Send and receive digital files

Knowledge and understanding

This is the knowledge and understanding you need to complete this unit successfully.

K1   The Law as it affects printing

1   Copyright and Ownership of Images

2   Data Protection

K2   Ethical Issues relevant to printing

1   Confidentiality

K3   Health and Safety

1   Hazards and risks in your own job, their assessment and the action to take to deal with them -including relevant regulations on the safe handling of equipment and materials, and the safe use of computer equipment

2   Manufacturer's health and safety requirements relevant to your job

K5   Security and Storage

1   Computer system security and virus protection

K6   Communication

1   With colleagues

2   With customers

K7   Workplace policy and practice

1   Workplace objectives, priorities, standards and procedures

K10   The operation of equipment

1   The set-up of digital communications equipment and software

2   The operation of digital communications equipment and software

K15   How to deal with digital files

1   File conversion techniques

2   File compression and decompression techniques

3   The transmission of digital files

4   File management

K17   Administrative procedures

1   Recording and reporting

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

Introduction

Workplaces and work activities contain hazards that may create risks to the health and safety of workers and visitors. One of the key ways of minimising risk is to identify hazards, evaluate the risks from them, and implement a programme of action to reduce any risks to an acceptable level. This process is known as risk assessment.

This unit requires the candidate to identify the hazards in the workplace and reduce risks from those hazards by ensuring that actual working practice follows the advice and guidance contained in written documents such as the employer's workplace policies and procedures, the industry's codes of practice, suppliers' data sheets on use of substances harmful to health, etc.

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　　　Element 301.1　Identify hazards and evaluate risks

2　　　Element 301.2　Reduce risks to health and safety in the workplace

This is what the unit covers

Fundamental to this unit is an understanding of the terms hazard and risk. This unit does not require the candidate to undertake a full risk assessment; it is about having an appreciation of significant risks in the workplace and knowing how to identify them and deal with them.

The Health and Safety Executive define a hazard as 'something with the potential to cause harm' and a risk is 'the likelihood of a hazard's potential being realised'. Each organisation should have its own risk control strategy and the candidate is required to work within this.

Almost anything may be a hazard, but it may or may not become a risk. For example: a trailing electrical cable from a piece of equipment is a hazard. If it is trailing across a passageway there is a high risk of someone tripping over it, but if it lies along a wall out of the way, the risk is much less.

Toxic or flammable chemicals stored in a building are a hazard, and by their nature may present a high risk. However, if they are kept in a properly designed secure store, and handled by properly trained and equipped people, the risk is much less than if they are left about in a busy workshop for anyone to use -or misuse.

The risks covered by this unit are those which could result from:

- the use or maintenance of machinery or equipment
- the use of materials or substances
- working practices which do not conform to laid down policies or codes of practice
- unsafe behaviour
- accidental breakages and spillages
- environmental factors.

Element 301.1 Identify hazards and evaluate risks in your workplace

Performance criteria

This is what you need to do:

1 correctly name and locate the person(s) responsible for health and safety in your workplace

2 identify which workplace policies and procedures are relevant to your working practices

3 identify those working practices in any part of your job role which could harm yourself or other persons

4 identify those aspects of the workplace which could harm yourself or other persons

5 evaluate which of the potentially harmful working practices and the potentially harmful aspects of the workplace are those with the highest risk to you or to others

6 report any hazards which present a high risk to the persons responsible for health and safety in the workplace

7 deal with hazards with a low risk in accordance with workplace policies and legal requirements.

Element 301.2 Reduce risks to health and safety in the workplace

Performance criteria

This is what you need 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

3 rectify those health and safety risks within your capability and the scope of your job responsibilities

4 pass on any suggestions for reducing risks to health and safety within your job role to the responsible persons

5 make sure your personal conduct in the workplace does not endanger the health and safety of yourself or other persons

6 follow suppliers' or manufacturers' instructions for the safe use of equipment, materials or products

7 report any differences between workplace policies and procedures and suppliers / manufacturers instructions

8 make sure your personal presentation at work:

a   meets any legal duties

b   ensures the health and safety of yourself and others

c   is in accordance with workplace policies and procedures.

Unit 301   Ensure your own actions reduce risks to health and safety 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   Hazards and risks in the workplace, their assessment and the action to take to deal with them

6   Hazards and risks in your own job, their assessment and the action to take to deal with them

7   Manufacturers' and suppliers' health and safety instructions / advice

8   Personal Presentation

9   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 302   Improve individual and organisational performance

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 adopting a culture that encourages their people to take responsibility for improving their own and their organisation's performance. This often involves individuals acquiring new skills or expertise, taking on additional responsibilities and making improvements to working practices.

This unit is about regularly reviewing, planning, implementing and evaluating the success of objectives designed to improve your own performance as well as the performance of your organisation or team.

This unit consists of **three** elements:

1   Element 302.1   Evaluate and develop your own skills and expertise

2   Element 302.2   Improve customer service delivery

3   Element 302.3   Improve quality, productivity and team working within your organisation

This is what the unit covers

The first stage of the planning cycle involves review. You will need to involve colleagues at work and ideally customers. You should discuss which kinds of performance improvements are likely to benefit you and your organisation. Detailed notes should be kept to help in the preparation of an action plan.

Once you have collected sufficient constructive advice and ideas, you will need to discuss them with your manager and agree on the priorities. It is important to ensure that the 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 measured. It is also important to set out realistic timescale.

For the purpose of this unit, the action plan should include, as a minimum, proposals for:
- improvement to your own skills and knowledge
- improvement to customer service delivery
- improvements to quality, productivity and team working within your organisation.

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

If the plan soon becomes out of date because, for example,

- all the targets or objectives are achieved very quickly
- it proves impossible to make progress towards any of the targets
- there is a change of strategy within your organisation
- operational changes affect your or your team's plans

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 objectives or targets in action plans have been met.

However, the evidence must show that action planning and review covering all the areas specified in this standard is a continuing activity over a reasonable timescale. It is unlikely that such evidence could be produced in less than six months.

The evidence must 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 also insufficient.

Element 302.1 Evaluate and develop your own skills and expertise

Performance criteria

This is what you need to do:

1. objectively assess your existing skills and expertise against current industry standards

2. identify ways in which you can improve your performance at work by improving your skills and expertise

3. seek constructive feedback from others on how your performance at work could be improved

4. identify with your manager areas for development to maintain and improve your own skills and expertise

5. set yourself improvement objectives which are specific and achievable

6. agree an action plan with your manager that includes realistic timescales and measurable targets

7. evaluate your progress and update your action plan regularly with your manager.

Element 302.2 Improve customer service delivery
Performance criteria

This is what you need to do:

1. check that the service you and your team give meets your customers' needs and expectations

2 where you or your team could have given better service to your customers identify how the service could have been improved

3 include in your personal action plan at least one target that should result in an improvement to the service you or your team give to customers

4. share relevant information with others in your team to improve your organisation's customer service delivery

5. provide evidence that the service you and / or your team give to customers has improved over time.

*customers in this context may be 'internal' or 'external' to the workplace

Element 302.3 Improve quality, productivity and team working within your organisation

Performance criteria

This is what you need to do:

1 periodically identify possible improvements to the quality of your organisation's products or services by improvements to:

    a   your organisation's systems or procedures

    b   your own skills or expertise

    c   your organisation's resources

    d   team working within your organisation

2 periodically identify possible improvements to your organisation's productivity by improvements to:

    a   your organisation's systems or procedures

    b   your own skills or expertise

    c   your organisation's resources

    d   team working within your organisation

3 discuss with your manager the improvements to quality, productivity and team working that you have identified

4 include in your personal development plan at least one target that might contribute to improvements in your organisation's quality of product / service, productivity and team working

5 provide evidence that the quality of product or service, productivity and team working within your organisation has been maintained or improved over time.

Unit 302 Improve individual and organisational performance

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 choice of processes for any particular product

3 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

2 The relationship between resource usage and profitability

3 How to maximise productivity

4 The relationship between productivity and competitiveness

K20 Management

1 Target-setting

2 Problem solving

3 Ways of presenting and describing workplace activities

4 Business Improvement Techniques

K22   Quality Assurance and Control

1   The main features of quality assurance and quality control systems

2   Techniques for controlling quality, including inspection, testing, sampling, use of input and output controls

3   Equipment for controlling quality in printing

K27   Personal Development

1   The principles of personal development planning and training

2   Developing people at work

Unit 303   Plan and capture digital images

Introduction

This unit is about converting analogue material into digital form. It covers all aspects of scanning, including detailed intervention where automatic settings do not give the required result.

The unit applies if you produce digital artwork for print or work in a pre-press or digital printing environment.

Subject to the demands of any brief, you are responsible for deciding on the approach you want to take, both creative and technical. You need to have enough flexibility to change your approach when you think it is necessary.

This unit consists of **three** elements:

1   Element 303.1   Decide on the scanning approach

2   Element 303.2   Prepare equipment and material for scanning

3   Element 303.3   Produce scanned images

This is what the unit covers

Scanners

Advances in scanning technology mean that much of the work previously done on drum scanners is now done on flat-bed scanners; advances in digital copying and printing mean that many devices now have built in scanning and the ability to correct a wide range of colour and tonal issues in originals prior to printing. You must be able to recognise when your workplace scanners can — and cannot — produce the output your customers want. Where you cannot produce the sort of work your customers want, you must be able to make arrangements to sub-contract the work.

Scope

1   The material to be scanned

     You must be able to scan the following material:

     a   reflective material, e.g. photographic prints and printed material from books, magazines and newspapers

     b   transparencies and photographic negatives

     c   black-and-white and colour material, including line, halftone and continuous tone

     d   material with a wide range of tonal contrast.

     A key requirement is the ability to handle safely the material to be scanned, particularly if this is the property of other people.

2   Scanning

     Whichever device is used, it must be capable of allowing the operator to make adjustments covering the range of adjustments to the scanned image set out in element 3 of this unit. These may be made by software settings on a computer controlling the scanner or through settings on the copier / printer itself. However, 'all-in-one' devices at the lower end of the

market (e.g. fax-copy-scan-print inkjet devices) are unlikely to have sufficient range of operator-selectable settings for this unit.

You must be able to scan single and multiple originals using a drum, flat-bed or scanner forming part of a digital copier / printer.

You must be able to handle complex settings for difficult originals, e.g. originals with limited tonal range and with colour faults. You must be able to output to file or to printer.

3   Discussions with customers

Although you will not have to discuss all of your scanning with customers, you must be able to do so when the need arises, e.g. when you have questions about the scanning, when you have to deal with "difficult" material or when there are problems with the scanning. You must be able to tell customers about the capacities and limitations of scanning and suggest other approaches, e.g. photographic approaches, where necessary. If you are scanning your own material, you yourself are the customer.

4   Assessment of scanned output

You must be able to make an accurate assessment of the scanned output. You must be able to detect any defects; you must also be able to recognise those due to faulty scanning and those due to other factors, e.g. difficult originals.

5   Legal issues

Legal issues are, by their nature, difficult to predict and are unlikely to occur in many cases. However, you must be aware of the legal knowledge specified for this unit so that you can spot any potential problems and take the action required in your workplace.

Element 303.1 Decide on the scanning approach

Performance criteria

This is what you need to do:

1

       a   make an accurate assessment of the suitability of the material for scanning

       b   tell customers, clearly and accurately, about the advantages and disadvantages of scanning the material

       c   tell customers, clearly and accurately, when approaches other than scanning may be more suitable

2   make an accurate assessment of the scanner operations necessary to produce the required output

3

       a   recognise when the scanners in your workplace will produce the sort of output your customers want

       b   make arrangement to sub-contract any scanning work you cannot carry out in the workplace

4   select the most suitable scanning equipment for the material to be scanned and the output required.

Element 303.2 Prepare equipment and material for scanning
Performance criteria

This is what you have to do:

1   carry out any low-resolution scanning necessary to establish the correct software values

2   apply the correct software values for:

   a   the material to be scanned

   b   the output required

3   make sure that the scanner to be used, and the material to be scanned, are clean

4   handle safely the material to be scanned

5   load correctly the material to be scanned.

Element 303.3 Produce scanned images
Performance criteria

This is that you have to do:

1   produce scanned images which are correct in terms of the following:

    a   physical size

    b   file size

    c   content

    d   orientation

    e   colour

    f   sharpness

    g   brightness (exposure)

    h   contrast

    I   colour space — RGB, CMYK and greyscale

    j   output resolution

2   produce scanned images to the correct image profiles

3   produce scanned images which are free of the following unwanted effects:

    a   physical defects — fingerprints, dust damage and scratches

    b   Newton's rings

    c   moiré patterning from screened originals

    d   pixelisation

    e   posterisation

    f   halo effects

4   assess the scanned images accurately against customer requirements and workplace standards

5

    a   detect any problems with the scanned images

    b   identify correctly the causes of the problems — those due to faulty scanning and those due to other factors

    c   discuss any scanning problems with the correct colleagues and, where necessary, with customers

    d   agree the action to be taken to resolve the problems

6

    a   recognise any potential legal issues arising from the nature of the scanned images

    b   follow workplace procedures in dealing with potential problems

7   carry out any discussions with customers positively and constructively

8   maintain the confidentiality of customer material

9   save the scanned image data files in the correct format.

Unit 303　　　Plan and capture digital images
Knowledge and understanding

This is the knowledge and understanding you need to complete this unit successfully

K1　　The Law as it affects printing

1　Defamation

2　Copyright and Ownership of Images

3　Obscenity

4　Incitement

5　Forgery

6　Data Protection

K2　　Ethical Issues relevant to printing

1　Confidentiality

2　Personal issues important to others, e.g. ethnic origin, gender, religion, sexuality

K3　　Health and Safety

1　Hazards and risks in your own job, their assessment and the action to take to deal with them - including relevant regulations on the safe handling of equipment and materials, and the safe use of computer equipment

2　Manufacturer's health and safety requirements relevant to your job

K4　　The safe handling of customer material

K5　　Security and Storage

1　Secure means of archiving digital and conventional artwork

K6　　Communication

1　With customers

K7　　Workplace policy and practice

1　Workplace objectives, priorities, standards and procedures

K8　　The identification and assessment of printing options

1　The reasons for selecting one process over another

2　The choice of processes for any particular product

3　The role of images in graphic communication

4　Changing image styles, fashions and demands in printed products

5　The stages in the printing process from pre-press to printed product

K9   Time and Resources

1   The relationship between resource usage and profitability

2   How to maximise productivity

K10   The operation of equipment

1   The set-up of scanning equipment

2   The operation of scanning equipment

K14   Digital imaging

1   Colour theory, e.g.: additive and subtractive systems such as RGB and CMYK; colour gamut's

2   The relationship between image size, file size and resolution

3   File formats for digital images - the differences between them and the reasons for using them

4   The range of methods, equipment, material and software appropriate to the imaging requirements

5   Methods of controlling contrast, density and colour characteristics during scanning

6   The relative merits of the methods, equipment, material and software

7   The assessment of material for scanning - potential problems and solutions

8   Colour management: how to set up, maintain and use image profiles

K15   How to deal with digital files

1   Dealing with embedded information

2   File management

K16   The causes and treatment of common faults

1   In scanning

K22   Quality Assurance and Control

1   The main features of quality assurance and quality control systems

2   Techniques for controlling quality, including inspection, testing, sampling, use of input and output controls

3   Light standards for viewing and assessing colour print

K25   Cleaning, Lubrication and Maintenance

1   The choice and use of suitable cleaning agents and lubricants

2   What parts of the machine you are allowed to clean, lubricate and maintain

Unit 304   Maintain digital systems in working order

Introduction

This unit covers the routine start-up and shut-down of digital systems and routine care and maintenance. It requires the operator to understand the hardware and software in the system, how hardware devices are connected and communicate with each, and to be able to troubleshoot problems that occur with the system. Important factors here are computer system security, and the security and storage of individual files. The unit also covers what you have to do to work efficiently and effectively.

The unit consists of **three** elements:

1   Element 304.1   Start up and close down digital systems

2   Element 304.2   Contribute to the effective operation of digital systems

3   Element 304.3   Contribute to efficient and effective production

This is what the unit covers

In order for production to be carried out profitably, the equipment used must be in serviceable condition, correctly calibrated and available for production.

Digital systems have particular requirements, namely the protection of application and operating systems software from corruption, either due to faulty components or malicious code.

Output devices usually require active maintenance plans and the frequent replenishment of consumables.

This unit requires the operator of digital systems to:

• maintain the equipment in serviceable condition

• understand and operate the digital systems and equipment correctly

• take appropriate measures to protect software systems from corruption

• make sure critically important systems software and data files are backed up in order to quickly restore them in the event of system failure or corruption

• solve problems related to software and hardware.

Scope

You must be able to recognise common problems in the operation of digital systems. The problems may have a variety of causes, for example:

- faulty hardware, i.e. computers, output devices, input devices storage devices, and communication equipment
- faulty application software
- faulty system software
- faulty file and system security.

You must be able to deal with the following solutions:

- uninstalling software
- installing and reinstalling software
- making good any loose electrical connections.

However, you do not have to solve all of the problems that may arise. Where you cannot solve them, you must report them to the correct person. This may be an experienced colleague or a systems specialist.

Element 304.1 Start up and close down imaging systems
Performance criteria

This is what you need to do:

1   start up the digital system hardware correctly

2   set up the digital system hardware correctly for the work to be carried out

3   open the correct software application program(s)

4   follow workplace security procedures for the following:

     a   file security

     b   system security

     c   virus protection

5   save data files correctly at appropriate intervals

6   archive completed data files correctly in the file storage system

7   exit the application and system software correctly after use

8   close down the hardware correctly after use.

Element 304.2 Contribute to the effective operation of digital systems

Performance criteria

This is what you have to do:

1 recognise any problems in the operation of the digital system:

    a do what you can to solve the problems

    b tell the correct people immediately if you cannot solve the problems

    c follow their instructions on how to respond to the problems

2 carry out the following maintenance activities correctly, and at the required times:

    a cleaning

    b replacement of consumables

    c replacement of faulty user-serviceable components

3 carry out the following system "housekeeping" activities correctly, and at the required times:

    a software and system checks

    b hardware checks

    c organisation of digital filing systems

    d back-up of stored files

    e deletion of unwanted files

    f hard-drive maintenance.

Element 304.3 Contribute to efficient and effective production

Performance criteria

This is what you have to do:

1   organise your work schedule to take account of the following:

      a   customer requirements

      b   workplace priorities

      c   the efficient use of equipment and material

2   where it proves impossible to complete your work within the agreed time:

      a   tell the correct people

      b   agree how to progress the work

3   tell the correct people about any problems and questions raised by your work

4   produce the required volume and quality of work

5   produce your work within workplace wastage limits

6   complete all work records clearly and accurately.

Unit 304   Maintain digital systems in working order
Knowledge and understanding

This is the knowledge and understanding you need to complete this unit successfully

K3   Health and Safety

1   Your duties and responsibilities for health and safety as defined by any specific legislation covering your job role

2   Hazards and risks in your own job, their assessment and the action to take to deal with them

3   Manufacturers' and suppliers' health and safety instructions / advice

K4   The safe handling of customer material

K5   Security and Storage

1   Computer system security and virus protection

2   Secure means of archiving digital and conventional artwork

K6   Communication

1   With colleagues

2   With suppliers

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

K9   Time and Resources

1   The relationship between resource usage and profitability

2   How to maximise productivity

3   The relationship between productivity and competitiveness

K10   The operation of equipment

1   The assembly and set-up of digital systems

2   The operation of digital systems

K14   Digital imaging

1   File formats for digital images -the differences between them and the reasons for using them

K15   How to deal with digital files

1   File management

K17   Administrative Procedures

1   Scheduling

K21   Environmental

1   The legal requirements for the classification, storage, carriage and disposal of waste

2   Environmental management

3   Control of Pollution, including disposal of computer equipment and consumables

K23   Problem solving

1   Types of problems that may need to be solved

2   Sources of information

3   Techniques for solving complex problems

4   Techniques for assessing machine faults

K25   Cleaning, Lubrication and Maintenance

1   The principal activities involved with machine cleaning, lubrication and maintenance

2   Roles and responsibilities for cleaning, lubrication and maintenance

3   Machine faults and how they can be rectified

4   The maintenance plans for machines which you operate

5   Which components wear or become degraded over time

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

7   The choice and use of suitable cleaning agents and lubricants

8   What parts of the machine you are allowed to clean, lubricate and maintain

9   Preventive v. Predictive Maintenance

Unit 305   Design and produce creative digital colour artwork for print

Introduction

This unit covers the design and production of digital artwork for print using software such as desk top publishing, word processing, electronic page composition or graphic illustration.

The unit is intended for designers working in a production environment whose role involves working with and advising customers on appropriate specifications for artwork for print and producing finished digital artwork to agreed or amended specifications.

This unit consists of **three** elements:

1   Element 305.1   Agree a design specification for digital colour artwork for print

2   Element 305.2   Produce creative digital colour artwork suitable for proofing

3   Element 305.3   Amend digital colour artwork as required to meet customer and product specification

This is what the unit covers

Creative colour artwork for print is required for a vast range of products that may be printed using various printing methods. For example, printed textiles, ceramics, packaging, books, magazines, display and point-of-sale material, may involve lithography, flexography, gravure or screen process, depending on the substrate and other factors. Each product and printing method requires artwork to be designed and produced, mostly in digital format that will meet the product specification and the customer's requirements.

It is critically important at the outset of a printing project that the product design requirements, as they relate to print, are correctly specified. For example the size of the print area, the number of colours to be used and any post-print processes that may impact on the design must be determined. There will be many different factors to be considered, depending on the type of product.

The designer must be able to assess technical printing issues and product requirements when the artwork design is being specified, and to offer correct advice to the customer to prevent subsequent problems during printing and post-printing operations. In addition, the designer must be capable of understanding and interpreting the customer's creative requirements, so that the artwork fulfils its practical, aesthetic and design objectives.

Once a design specification has been agreed, artwork must be produced, often incorporating several different kinds of source material. Photography, copy-writing and image scanning may need to be commissioned, for example. Depending on the size of the project, work colleagues and outworkers may need to be co-ordinated so that all the elements required for the creation of the digital artwork are available in time to meet the production schedule.

After the first proof has been submitted to the customer, there are likely to be changes required. These may range from simple typographical corrections to major re-working of the artwork. The designer must be able to deal with the customer professionally and helpfully whilst making sure that the project remains on time, within budget, and meets the product technical specification and print requirements. Where any of these are at risk of being missed, the designer must give appropriate and timely advice.

On completion of the artwork and approval by the customer, the designer must make sure that all the digital files are properly archived and the files required for print are forwarded in the required format to the printer.

Scope

The essence of this unit is that the designer takes full responsibility for managing the creative and production process from concept to completion.

The work must involve an appreciation of budgets, co-ordination of different source material, understanding of technical specifications of products, processes and substrates and applying that knowledge correctly in the creation and production of artwork.

Evidence will need to be provided to show that the designer has worked with several different customers, either directly or as part of a team, and taken responsibility for advising, specifying and producing colour digital artwork for print. Evidence will also need to show that the designer has produced artwork that is fit for purpose and which has successfully been used in the production of commercial products.

Successful designers of artwork for print usually work on many varied projects, and the range of evidence required to claim competence for this unit should reflect this. It is not required for the designer to produce artwork for more than one printing process, but it is expected that the work will cover more than one kind of product.

A portfolio of quality, well-designed and produced, commercially successful work is expected for this unit.

Element 305.1 Agree a design specification for digital colour artwork for print

Performance criteria

This is what you have to do:

1   establish from the customer* and any other appropriate person(s) the proposed specification for the artwork, including any technical requirements relating to the application or use of the printed product

2   identify the printing method likely to be used for printing the artwork, together with any enhancements required to the printed product during or after printing

3   establish the creative or stylistic needs for the artwork in order to satisfy its intended audience, use and/or application

4   propose to the customer a design specification that meets all the requirements identified above for the artwork, including those relating to print production and printed product use

5   amend your proposals in response to any comments from the customer and re-submit proposed design specifications until the customer is satisfied

6   agree timescales with the customer for the production of the artwork that both meets the needs of the customer and the capability of yourself and your team

7   keep an adequate record of the agreed design and product specifications, the scope of the work agreed, and any other relevant contractual issues.

Element 305.2 Produce creative digital colour artwork suitable for proofing

Performance criteria

This is what you have to do:

1   identify the range and sequence of tasks that will be required to produce the artwork

2   identify and/or locate digital files that will be used in production of the artwork, including any text, database, spreadsheet or image files

3   identify other source material that will required, such as photography, scanning or copy-writing

4   delegate and co-ordinate tasks as required to colleagues or external sources in order to meet the agreed timescale for production

5   confirm that digital files for use in the artwork are in a suitable format and convert or use appropriate import filters to bring the files into the artwork layout software, retaining original formatting where required

6   produce creative colour artwork that meets the agreed design specification as far as possible

7   make sure that any typographical elements are formatted to a high standard of accuracy

8   make sure that any charts or tables are correctly formatted

9   make sure that any line-art or bitmap images are of sufficient quality for the document use, have the correct resolution and colour space

10   make sure that all the colours used in the document are consistent with the intended printing method

11   save the digital files securely using an adequate archiving/indexing system

12   submit a colour proof to the customer.

Element 305.3 Amend digital colour artwork as required to meet customer and product specification

Performance criteria

You must be able to:

1. assess the extent of any corrections, amendments and stylistic changes required to the proof by the customer

2. correctly interpret typographic corrections indicated by readers and copy preparation marks

3. seek clarification or advice from the customer where requirements are unclear or unable to be effected

4. where additional costs are likely to be caused by re-working that were not part of the original contractual agreement with the customer, that issue is brought to the attention of the customer or the appropriate colleague within your organisation, and agreement sought for the additional work to be done (if that is the policy of your organisation)

5. make corrections and amendments as required by the customer and submit subsequent proofs after each round of amendments until the artwork is approved

6. archive digital files securely

7. submit the finished digital artwork for printing in the format required by the printer

8. liaise with the printer or pre-press specialist to resolve any difficulties with the digital artwork

9. where-ever possible review the finished artwork after printing and/or completion of the product and evaluate how the design and digital colour artwork has worked in practice.

*Note - references to customer in this unit may also be taken to mean 'an appropriate person' such as internal senior colleague or a third party such as a print buyer / consultant. However, the essence of this unit is one of taking responsibility for the design and production process, so simply implementing instructions from a line manager will be insufficient to demonstrate competence to the standard.

Unit 305   Design and produce creative digital colour artwork for print

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.

K1   The Law as it affects printing

1   Defamation

2   Copyright and Ownership of Images

3   Obscenity

4   Incitement

5   Forgery

6   Data Protection

K2   Ethical Issues relevant to printing

1   Confidentiality

2   Personal issues important to others, e.g. ethnic origin, gender, religion, sexuality

K3   Health and Safety

1   Hazards and risks in your own job, their assessment and the action to take to deal with them -including relevant regulations on the safe handling of equipment and materials, and the safe use of computer equipment

K4   The safe handling of customer material

K5   Security and Storage

1   Computer system security and virus protection

2   Print with time-sensitive or restricted release dates

3   High value products or print with a high risk of theft

4   Secure means of archiving digital and conventional artwork

K6   Communication

1   With colleagues

2   With customers

3   With suppliers

4   With visitors

K7   Workplace policy and practice

1   Workplace objectives, priorities, standards and procedures

2   The range of work carried out in the workplace

3   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 choice of processes for any particular product

3   The role of images in graphic communication

4   Changing image styles, fashions and demands in printed products

5   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

2   The relationship between resource usage and profitability

K10   The operation of equipment

1   The operation of software and hardware used in a creative artwork environment

K12   Typography and Design

1   Typefaces and fonts

2   Document checking and proofing

3   Document layout

4   The principles of design

K14   Digital Imaging

1   Sources of original material, e.g. photographers and graphic artists

2   How to find and use archive and on-line sources of digital images

3   Colour theory

4   The importance of visual compatibility in digital images

5   The relationship between image size, file size and resolution

6   File formats for digital images

7   The assessment of material for scanning – potential problems and solutions

K15   How to deal with digital files

1   Dealing with embedded information

2   File management

3   File conversion techniques

4   The transmission of digital files

K17   Administrative procedures

1   Planning

2   Scheduling

3   Recording and reporting

4   Product labelling

K22   Quality Assurance and Control

1   The main features of quality assurance and quality control systems

2   Light standards for viewing and assessing colour print

K24   Materials

1   The types and characteristics of paper, board and other commonly used substrates

2   The types and characteristics of inks, coatings and coatings

K26   Proofing

1   The principal types of proof and their role in the printing process

Unit 306   Plan and produce edited images
Introduction

This unit is about editing digital images. It covers the development of the editing approach and the production of edited image data files.

Subject to the demands of any brief, you are responsible for deciding on the approach you want to take, both creative and technical. You need to have enough flexibility to change your approach when you think it is necessary.

The unit consists of **two** elements:

1   Element 306.1   Decide on the imaging approach

2   Element 306.2   Produce edited images

This is what the unit covers

1   Editing

        You must be able to carry out a wide range of imaging activities, eg:

        a   creating new images from existing elements

        b   altering material

        c   adding material

        d   deleting material

        e   combining elements to form new images

        f   optimising material for output

        g   planning the editing approach is a crucial part of the editing process

2   The images to be edited

        You must be able to edit the following:

        a   bitmap and vector images

        b   colour and black-and-white material, including line, halftone and continuous tone

        c   text and graphics

        d   you must be able to deal with image elements which are not immediately compatible with one another.

4   Automated procedures

        You must be able to create and use automated editing processes. You must also be able to apply automated procedures to batches of images.

5   Output

        You must be able to produce output for screen display and for hard-copy presentation.

6   Assessment of images

You must be able to assess images in objective as well as subjective terms. This includes measuring the values of individual pixels and adjusting them to meet specified output requirements in terms of colour, contrast and brightness.

7   Proofs

You must be able to produce and assess proofs for content, though not for precise output values. You may have to deal with "soft" proofs, eg PDF proofs, which can be distributed digitally, annotated, and returned digitally.

8   Discussions with customers

Although you will not have to discuss all of your editing with customers, you must be able to do so when the need arises, eg when you have questions about the editing, when you have to deal with "difficult" material or when there are problems with the editing. You must be able to tell customers about the capacities and limitations of editing.

If you are editing your own material, you yourself are the customer.

9   Legal issues

Legal issues are, by their nature, difficult to predict and are unlikely to occur in many cases. However, you must be aware of the legal knowledge specified for this unit so that you can spot any potential problems and take the action required in your workplace.

This unit has been imported from Skillset, the Sector Skills Council for the Audio Visual Industries, and adjusted for the Print industry.

Element 306.1 Decide on the imaging approach
Performance criteria

This is what you have to do:

1   arrange for the supply of any original material you cannot produce yourself

2   select the hardware and software most suitable for the editing you intend to carry out

3   retrieve, from image databases, any material relevant to the images required

4

       a   check the compatibility of the elements to be combined in the editing process

       b   decide how to treat any elements that are not compatible

5

       a   recognise any potential legal issues arising from the nature of the scanned images

       b   follow workplace procedures in dealing with potential problems

6

       a   produce, for discussion with customers, any preliminary drafts required

       b   reach agreement with customers on the editing approach to be adopted.

Element 306.2 Produce edited images
Performance criteria

This is what you have to do:

1   import the required image elements correctly into the editing software

2   produce edited images that:

        a   communicate the required information clearly and accurately

        b   present the required treatment of the subject

        c   arouse the required viewer response

3   produce edited images which are correct in terms of the following:

        a   physical size

        b   file size

        c   content

        d   colour

        e   sharpness

        f   brightness (exposure)

        g   contrast

        h   colour space — RGB, CMYK and greyscale

        I   output resolution

4   produce edited images to the correct image profiles

5   produce scanned images which are free of the following unwanted effects:

        a   physical defects — fingerprints, dust damage and scratches

        b   Newton's rings

        c   Moiré patterning from screened originals

        d   Pixelisation

        e   Posterisation

        f   Halo effects

6

        a   produce image proofs

        b   check the content and quality of the edited images against customer requirements and workplace standards

        c   detect any problems with the edited images

        d   discuss any editing problems with the correct colleagues and, where necessary, with customers

        e   agree the action to take to resolve the problems

7   carry out any discussions with customers positively and constructively

8   maintain the confidentiality of customer material

9   attribute copyright and credits clearly and accurately

10   save the edited image data files in the correct format.

Unit 306   Plan and produce edited images

Knowledge and understanding

This is the knowledge and understanding you need to complete this unit successfully.

K1   The Law as it affects printing

1   Copyright and Ownership of Images

2   Obscenity

3   Forgery

K2   Ethical Issues relevant to printing

1   Confidentiality

K3   Health and Safety

1   Hazards and risks in your own job, their assessment and the action to take to deal with them

2   Manufacturers' and suppliers' health and safety requirements relevant to your job

K4   The safe handling of customer material

K5   Security and Storage

1   Computer system security and virus protection

2   Print with time-sensitive or restricted release dates

3   High value products or print with a high risk of theft

4   Secure means of archiving digital and conventional artwork

K6   Communication

1   With customers

K7   Workplace policy and practice

1   Workplace objectives, priorities, standards and procedures

K8   The identification and assessment of printing options

1   The role of images in graphic communication

2   Changing image styles, fashions and demands in printed products

K10   The operation of equipment

1   The set-up of image editing equipment and software

2   The operation of image editing equipment and software

K12   Typography and Design

1   The principles of typography

2   The principles of design

K14   Digital Imaging

1   Sources of original material, eg photographers and graphics artists

2   How to find and use archive and on-line sources of digital images

3   Colour theory, eg: additive and subtractive systems such as RGB and CMYK; colour gamuts

4   The importance of visual compatibility in digital images

5   The relationship between image size, file size and resolution File formats for digital images - the differences between them and the reasons for using them

6   Colour management: how to set up, maintain and use image profiles

K15   How to deal with digital files

1   File conversion techniques

2   File compression and decompression systems

3   File management

Unit 307   Manage colour reproduction in digital pre-press

Introduction

As digital workflows have developed, the complexities of colour reproduction have increased significantly for the pre-press technician. An image that looks fine on a display monitor may look nothing like it when printed on a printing machine.

There are many reasons why colour shifts occur. Understanding digital colour workflows and managing them to achieve the correct output is now at the heart of the pre-press technician's job.

This unit is about having control over the digital pre-press workflow to ensure that colours are properly represented to the customer from the outset and that the colours when printed are predictable and meet the customer's expectations or are at least within acceptable commercial parameters. What is acceptable will depend on the nature of the work.

This unit consists of **three** elements:

1   Element 307.1   Maintain digital pre-press equipment in calibration

2   Element 307.2   Configure pre-press software within the workflow

3   Element 307.3   Use colour profiles correctly

This is what the unit covers

The first step in solving the problem is to find out where in the work flow the colours changed and why. Was the colour on the monitor misleading? Or has something happened during digital prepress to actually change the colours defined in the image? Has the image carrier produced 'dots' of the correct size for print? Or has dot gain on the press changed the colour?

Colour Management Systems are now common in proprietary software such as Adobe Photoshop, Quark Express, CorelDraw and many other graphics software. Unfortunately, not all work in the same way, and colour mode conversion engines made by different companies can deliver significantly different results. Moreover, once a file has been sent from a graphics application to a RIP or direct to a printer / proofer, the data in that file can be handled very differently by the output devices depending on how they interpret the file and how they deal with any embedded profiles.

Reliable colour output requires the following three things to be done:

- All devices are correctly calibrated and where calibration has generated profiles for devices, the profiles must be used and checked periodically to ensure their accuracy.

- Software applications must be set up to handle files predictably – there may be many 'check boxes' in many windows all of which need to be correctly configured. This is particularly important where embedded profiles in images are concerned – the difference between 'using' and 'ignoring' an embedded colour profile can be dramatic.

- Using colour profiles is only any use if they are the correct profiles – checking that source profiles are present and correct in imported images, particularly those from digital cameras, is essential.

This unit covers these three issues. Irrespective of whether a pre-press department is using a complete workflow or several stand alone software applications that receive and send files to one

another, the essential requirements are to calibrate hardware, configure the system(s) and use profiles correctly.

Understandably, some pre-press departments will not want their system configurations changing by someone demonstrating they can meet this standard. Therefore the performance evidence in such cases must show that:

- the operation of all the colour management features of the system software is fully understood and can be explained in detail, in particular the way in which each part of the software handles profiles and any colour mode conversion settings that change the digital information in images
- the system hardware is regularly calibrated and calibration results kept and that the candidate is able to perform calibration
- the use of colour profiles is understood and profiles are used correctly
- a standard reference target (either hard copy for scanning or a suitable digital reference file) has been used by the candidate to verify the accuracy of the colour management system
- quality control tools such as a densitometer, spectrophotometer, dot meter, and colour control / calibration strips are used by the candidate to measure and verify the accuracy of the colour management procedures.

Element 307.1 Maintain digital pre-press equipment in calibration

Performance criteria

This is what you have to do:

1. calibrate at least one display monitor in the workflow to produce accurate colour reproduction

2. calibrate all output devices, particularly image setter / CTP setter and proofer(s)

3. calibrate any scanners in the workflow

4. store any device profiles created during calibration of monitors, scanners and printers in the correct location.

5. regularly check that all calibrated devices are still within calibration

6. when necessary, adjust profiles or equipment parameters to bring devices back into calibration

7. keep records of calibration checks as required.

Element 307.2 Configure pre-press software within the workflow

Performance criteria

This is what you have to do:

1   find out which software applications in the workflow have colour management features

2   find out what each colour management feature in each software application is set to do

3   make sure that any software colour management features that may alter the colour values in digital images, either through the use of colour profiles, dot gain compensation/simulation, colour mode conversion or total ink content calculations, are correctly configured

4   establish what the typical dot gain is on printing machines and configure the application software or workflow appropriately to make allowance for dot gain

5   save software settings once configuration is complete

6   make sure that colleagues who use the workflow are aware of how it is configured and where in the workflow colour mode changes and colour profiles are used

7   use appropriate reference material to check that the hardware and software colour management configuration produces reliable colour reproduction on press and/or from any 'high resolution' proofing device(s).

Element 307.3 Use colour profiles correctly
Performance criteria

This is what you have to do:

1   identify source profiles and destination profiles stored within the workflow

2   select the correct destination profiles for outputting to specific devices

3   make sure that source profiles embedded in image files are the correct source profiles

4   where an embedded source profile is not correct or is missing, advise the appropriate person of the consequences

5   assign a new profile where it is the best option

6   assign the correct profile to a file after conversion to a new colour mode

7   make sure that all application software in the workflow are set to use source and destination profiles correctly.

Unit 307　　　Manage colour reproduction in digital pre-press

Knowledge and understanding

This is the knowledge and understanding you need to complete this unit successfully.

K3　　Health and Safety

1　　Hazards and risks in your own job, their assessment and the action to take to deal with them

2　　Manufacturer's health and safety requirements relevant to your job

K5　　Security and Storage

1　　Computer system security and virus protection

K6　　Communication

1　　With colleagues

2　　With customers

3　　With suppliers

K7　　Workplace policy and practice

1　　Workplace objectives, priorities, standards and procedures

2　　The range of work carried out in the workplace

K10　　The operation of equipment

1　　The set-up of digital imaging equipment and software

2　　The operation of digital imaging equipment and software

K14　　Digital imaging

1　　Colour theory, e.g.: additive and subtractive systems such as RGB and CMYK; colour gamuts

2　　Colour management: how to set up, maintain and use image profiles

3　　The range of methods, equipment, material and software appropriate to the imaging requirements

4　　The assembly and set-up of image editing and output systems

5　　The operation of image editing and output systems

K15　　How to deal with digital files

1　　Dealing with embedded information

2　　File management

3　　File types and which files formats can carry embedded profiles

K17　　Administrative procedures

1   The nature and use of record-keeping systems

K22   Quality Assurance and Control

1   The main features of quality assurance and quality control systems

2   Techniques for controlling quality, including inspection, testing, sampling, use of input and output controls

3   Equipment for controlling quality in pre-press

K23   Problem Solving

1   Techniques for solving complex problems

K25   Cleaning, Lubrication and Maintenance

1   The maintenance plans for machines which you operate

K26   Proofing

1   The principal types of proof and their role in the printing process

Unit 308   Produce approved proofs from digital artwork

Introduction

This unit is about producing, assessing and correcting hard-copy proofs produced from digital artwork that meet the criteria for a 'contract-quality' proof.

A contract-quality proof is a proof that is of a high enough standard, particularly as regards colour reproduction, that it is capable of forming the basis of the contract between printer and customer for the subsequent printing process.

Even the most elementary device can now be used for outputting colour prints; however this unit requires that high quality proofs are produced that are evaluated for colour accuracy by means of measurement with suitable quality control equipment.

This unit consists of **three** elements:

1   Element 308.1   Produce digital proofs for print

2   Element 308.2   Assess proofs against specifications

3   Element 308.3   Modify digital artwork to meet specifications

This is what the unit covers

Accurate, high quality proofs are required in the printing industry in order that the customer and the printer have a common understanding of the standard to which the job has to be printed. Although there are increasing advances in technology aimed at enabling screen proofs (or soft proofs) to be approved, the hard copy 'signed off' proof is still the most common form of proof when colour accuracy is required.

Scope

Although there are many kinds of proofs produced at various stages of production for different purposes, it must be clearly understood that this unit is about the production of high quality contract-quality proofs that can be, and routinely are, certified by measurement as meeting a defined quality standard.

In the absence of evidence that such equipment is actually used in the workplace by the candidate, it will not be possible for a claim to competence for this unit to succeed.

Element 308.1 Produce digital proofs for print
Performance criteria

This is what you have to do:

1   confirm what kind of proof is required

2   correctly locate and retrieve the files required for the proof

3   make sure the files are in the correct format for proofing

4   convert any files that are not in the correct format for proofing

5   include on the proof a suitable colour control strip for checking colour accuracy

6   make sure the proofing device is calibrated, in serviceable condition and has the correct paper and sufficient consumables loaded

7   promptly report any faults with the proofing device that it is not your job to correct

8   make sure any colour profiles are correctly selected for the proof, including:

   a   . any profiles required related to the proofing paper

   b   . any profiles relating to the printing machine or standard 'dot gain' curves

9   output the proof at the required size and resolution

10   keep accurate records of the work you have completed, and any problems which have occurred.

Element 308.2 Assess proofs against specifications
Performance criteria

This is what you have to do:

1   carefully inspect the proof and identify any defects, including:

   a   physical defects in the making of the proof

   b   colour irregularities

   c   font or typographical problems

   d   image resolution

   e   trapping and knockout of colours

   f   size and orientation of pages or images

2   confirm by measuring the colour control strip that the proof is colour accurate and meets the standard used by your company and any relevant national or international standard

3   repeat the proofing operation if required until the proof is of a standard that it can be submitted to the customer for consideration

4   label the proof with an identification reference and record the details for quality assurance and administrative purposes as required by your company.

Element 308.3 Modify digital artwork to meet specifications

Performance criteria

This is what you have to do:

1 accurately identify amendments required to proofs

2 amend or arrange for others to amend the artwork to meet the customer's requirements

3 make sure the amendments are completed by the deadline set

4 re-proof the job, as required, until a final proof is approved by the customer or as set out in your company's procedures

5 reference and archive the approved digital file and any intermediate files, in accordance with your company's procedures

6 identify the approved proof clearly and make sure that any other unapproved proofs are archived or dealt with in accordance with your company's procedures.

Unit 308   Produce approved proofs from digital artwork

Knowledge and understanding

This is the knowledge and understanding you need to complete this unit successfully.

K1   **The Law as it affects printing**

1   Copyright and Ownership of Images

2   Obscenity

3   Forgery

K2   **Ethical Issues relevant to printing**

1   Confidentiality

K3   **Health and Safety**

1   Hazards and risks in your own job, their assessment and the action to take to deal with them

2   Manufacturers' and suppliers' health and safety requirements relevant to your job

K4   **The safe handling of customer material**

K5   **Security and Storage**

1   Computer system security and virus protection

2   Secure means of archiving digital and conventional artwork

K6   **Communication**

1   With customers

K7   **Workplace policy and practice**

1   Workplace objectives, priorities, standards and procedures

K10   **The operation of equipment**

1   The set-up of proofing equipment and software

2   The operation of proofing equipment and software

K14   **Digital Imaging**

1   Colour theory, e.g.: additive and subtractive systems such as RGB and CMYK; colour gamut's

2   The relationship between image size, file size and resolution

3   File formats for digital images -the differences between them and the reasons for using them

4   Colour management: how to set up, maintain and use image profiles

K15   How to deal with digital files

1   File conversion techniques

2   File compression and decompression systems

3   File management

K16   The causes and treatment of common faults

1   In proofing

K17   Administrative Procedures

1   Recording and reporting

2   Product labelling

K19   Business and Contracts

1   The law of contract

K22   Quality Assurance and Control

1   The main features of quality assurance and quality control systems

2   Techniques for controlling quality

3   Equipment for controlling quality in printing

4   Light standards for viewing and assessing colour print

K24   Materials

1   The types and characteristics of paper, board and other commonly used substrates

2   The types and characteristics of inks, toners and coatings

3   Maintaining the quality of materials during storage and handling

K26   Proofing

1   The principal types of proof and their role in the printing process

Unit 309 Produce computer generated image carriers

Introduction

This unit is about producing image carriers for printing from digital artwork. The image carrier may be for any kind of printing process, including lithography, screen, gravure and flexography.

This unit consists of **three** elements:

1 Element 309.1 Impose images electronically

2 Element 309.2 Prepare images for processing

3 Element 309.3 Process data through computer-to-image carrier systems

This is what the unit covers

Most artwork for printing is created electronically and at some point an image carrier has to be produced. Usually the artwork also has to be imposed in order to make best use of the printing machines and substrate.

Different printing processes require different image carriers and this unit is intended to apply to most image carriers. However, the unit is not intended for extremely simple image carriers, for example small, single colour film output for cutter guides or die making where there is no element of imposition, nor is it intended for digital printing machines such as copier / printers. However printing presses fitted with digital imaging heads are suitable.

Digital artwork, once approved for print, has to be output in imposed format to an image carrier. Any colour separations and bitmap images in the artwork need to be processed correctly to achieve the required reproduction quality when printed. This involves selecting the correct output parameters, including screen ruling and dot type, resolution and screen angle. The image also needs to be correctly positioned on the image carrier.

Scope

Competence in this unit will include the ability to demonstrate performance skills and understanding of the following for at least one type of image carrier and printing process:

- operation of all software in the workflow, such as imposition, RIPs, proofing, font management, etc
- calibration and loading of image carrier material for the output device
- use of removable media, such as CDs, DVDs, floppy disks, USB devices, etc
- selection and setting of resolution, screen angles, screen type, orientation, rotation, image / media position, colour separations, negative / positive, right / wrong reading, marks positioning, quality control strips positioning
- processing of the image carrier
- inspection and measurement of the image on the image carrier.

In relation to the measurement, it is a requirement of this unit that there must be an objective way of checking that the image on the image carrier is correct. This would be expected to be through the use of a dot meter or densitometer, although the type of image carrier will dictate the means of checking. Visual inspection alone is insufficient.

Element 309.1 Impose images electronically
Performance criteria

This is what you have to do:

1   check that you have all the details you need for the job

2   select an appropriate imposition scheme by taking into account:

    a   the quantity required

    b   the working size of the job

    c   printing machine sizes and the number available

    d   the type of printing machine to be used

    e   colour fall (where appropriate)

    f   the method of finishing

3   retrieve or create an imposition template that meets the requirements of the imposition scheme

4   operate equipment safely and productively

5   accurately identify and correct data, system and software problems which will affect the production of impositions

6   promptly report data, software and system problems which are not your job to deal with

7   create an accurate job reference and store your digital job files securely.

Element 309.2 Prepare images for processing
Performance criteria

This is what you have to do:

1   check that the job files are compatible with the imaging software to be used

2   set the correct output parameters to meet the job specification, including where relevant:

    a   resolution

    b   screen ruling and dot type

    c   screen angle

    d   orientation

    e   position on the image carrier

    f   register or other marks

    g   right / wrong reading

    h   emulsion up / down

    i   separations settings

3   make sure the correct image carrier (material) is loaded into the output device

4   check carefully that the output device is calibrated and for operation

5   complete your work by the deadline set.

Element 309.3 Process data through computer-to-image carrier systems

Performance criteria

This is what you have to do:

1   send the data to the output device

2   after imaging, process the image carrier as required

3   check the image carrier and accurately identify and correct errors and faults

4   promptly report errors and faults which are not your job to deal with

5   carefully check that output meets the job requirements for quality and specification

6   store finished output securely

7   keep accurate records for quality assurance and administrative purposes as required by your company

8   archive digital files as required by your company.

Unit 309　　　　Produce computer generated image carriers
Knowledge and understanding

This is the knowledge and understanding you need to complete this unit successfully.

K1　　The Law as it affects printing

1　　Copyright and Ownership of Images

2　　Obscenity

3　　Forgery

K2　　Ethical Issues relevant to printing

1　　Confidentiality

K3　　Health and Safety

1　　Hazards and risks in your own job, their assessment and the action to take to deal with them

2　　Manufacturers' and suppliers' health and safety requirements relevant to your job

K4　　The safe handling of customer material

K5　　Security and Storage

1　　Computer system security and virus protection

2　　Secure means of archiving digital and conventional artwork

K6　　Communication

1　　With colleagues

2　　With customers

K7　　Workplace policy and practice

1　　Workplace objectives, priorities, standards and procedures

K8　　The identification and assessment of printing options

1　　The reasons for selecting one process over another

K10　　The operation of equipment

1　　The set-up of digital imaging equipment and software

2　　The operation of digital imaging equipment and software

K13　　Printing

1　　The characteristics of sensitive material

K14   Digital Imaging

1   Colour theory, e.g.: additive and subtractive systems such as RGB and CMYK; colour gamut's

2   The relationship between image size, file size and resolution

3   File formats for digital images -the differences between them and the reasons for using them

4   Colour management: how to set up, maintain and use image profiles

K15   How to deal with digital files

1   File conversion techniques

2   File compression and decompression systems

3   File management

K16   The causes and treatment of common faults

1   In digital imaging

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

K22   Quality Assurance and Control

1   The main features of quality assurance and quality control systems

2   Techniques for controlling quality

3   Equipment for controlling quality in printing

K23   Problem Solving

1   Types of problems that may need to be solved

2   Sources of information

3   Techniques for assessing machine faults

K24   Materials

1   The types and characteristics of paper, board and other commonly used substrates

2   The types and characteristics of inks, toners and coatings

K25   Cleaning, Lubrication and Maintenance

1   The principal activities involved with machine cleaning, lubrication and maintenance

2   Roles and responsibilities for cleaning, lubrication and maintenance

3   Machine faults and how they can be rectified

4   The maintenance plans for machines which you operate

5   Which components wear or become degraded over time

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

7   The choice and use of suitable cleaning agents and lubricants

8   What parts of the machine you are allowed to clean, lubricate and maintain

9   Preventive v. Predictive Maintenance

Unit 310 Make photopolymer plates for flexographic printing

Introduction

This unit consists of **two** elements:

1   Element 310.1   Prepare photopolymer plates

2   Element 310.2   Process photopolymer plates

This involves:

- identifying the work you have to do

- exposing plates

- processing plates

- checking the image created

- cleaning and recharging the processor.

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:

- photocopy of the job instructions

- sample of a plate you have made

- a sample of the printed job.

Element 310.1 Prepare photopolymer plates
Performance criteria

You must show that you:

1   check thoroughly that you have all the details you need for the job

2   check that you have all the materials of the right type needed for the job

3   check carefully that:

    a   negatives match with artwork

    b   elements match imposition

    c   non-image density matches the manufacturer's recommendations and your company's quality standard

4   prepare the exposure unit correctly for the job

5   handle and load plates safely

6   position plates so that all image elements fall on the finished plate

7   select exposure values which produce the required plate characteristics after processing

8   expose the assembly correctly

9   pass the plate for processing.

Element 310.1 Prepare photopolymer plates
Knowledge and understanding

You must understand:

K1   what details you need for the job

K2   your company's quality standards

K3   the types of plates in use in your company, and the types of job for which they are used

K4   why it is important to check negatives, elements and non-image density

K5   the range, use and limitations of processing materials and equipment

K6   the risks which arise when you handle plates and materials and operate exposure units and how to avoid them.

Element 310.1 Prepare photopolymer plates
Performance evidence

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

R1   you can prepare plates incorporating:

     a   coarse line and solid

     b   fine line

     c   line and halftone

     d   close register text and spot colour

R2   you can identify what is required from:

     a   your job instructions

     b   the layout

Element 310.2 Process photopolymer plates
Performance criteria

You must show that you:

1 load the processor correctly

2 handle and load materials safely and efficiently

3 set and operate processor safely and efficiently

4 keep up the supply of solvents throughout the run

5 trim the finished plate accurately to the required size

6 check that the finished plate meets your company's standard for:

   a   thickness

   b   relief height

   c   spots and blemishes

7 accurately identify and correct faults which it is your job to rectify

8 promptly report faults and problems which it is not your job to rectify

9 keep waste to a minimum and dispose of it by applying the correct procedures

10 report promptly when the plate is ready for production.

Element 310.2 Process photopolymer plates
Knowledge and understanding

You must understand:

K1   the platemaking methods and equipment in use in your company

K2   what safe light conditions are

K3   the risks associated with operating the equipment

K4   how to set up and operate the equipment

K5   your company's waste disposal procedures

K6   to whom you must report faults

K7   how to recognise when you should correct faults yourself and when you should ask for help.

Element 310.2 Process photopolymer plates

Performance evidence

You must show that you can process photopolymer plates consistently over a period of time. Your evidence must show that:

R1   you can process plates incorporating:

     a   coarse line and solid

     b   fine line

     c   line and halftone

     d   close register text and spot colour.

Unit 311   Make plates for lithographic printing

Introduction

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

1   Element 311.1   Prepare the plate

2   Element 311.2   Transfer the image to the plate

This involves:

- identifying what work you have to do

- preparing equipment and materials for the job

- operating equipment to transfer the image to the plate

- dealing with problems which can arise when making lithographic plates

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 layout

- a sample of the printed job.

Element 311.1 Prepare the plate
Performance criteria

You must show that you:

1   check that you have all the details you need for the job

2   accurately select

      a   the equipment to be used

      b   the type of plate required

3   check carefully that the plate is clean and suitable for the job

4   check and adjust equipment so that it is ready to operate

5   select and prepare the correct masks

6   keep waste materials to a minimum.

Element 311.1 Prepare the plate
Knowledge and understanding

You must understand:

K1   the types of plates in use in your company, and the types of job for which they are used

K2   how to check that plates are fit for use

K3   the range, use and limitations of processing materials and equipment

K4   your company's procedures for minimising waste

K5   why it is important to meet production deadlines.

Element 311.1 Prepare the plate

Performance evidence

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

R1   you can prepare plates for at least **one** of the following:

      a   single colour work

      b   coarse register spot colour work

      c   four colour process work

R2   ... and for the following types of image:

      a   line

      b   line and half tone

R3   you can identify what is required from:

      a   your job instructions

      b   the layout.

Element 311.2 Transfer the image to the plate
Performance criteria

You must show that you:

1   check that the plate is free from faults and blemishes

2   check carefully that the equipment is ready for image transfer

3   set and operate the equipment so that:

    a   the complete image is transferred to the plate

    b   the image is sharp and clean, at the required resolution

    c   the finished plate is free from faults and suitable for production

4   accurately identify and correct faults which it is your job to rectify

5   promptly report faults and problems which it is not your job to rectify

6   keep waste to a minimum and dispose of it by applying the correct procedures

7   report promptly when the plate is ready for production.

Element 311.2 Transfer the image to the plate
Knowledge and understanding

You must understand:

K1   the platemaking methods and equipment in use in your company

K2   what safe light conditions are

K3   the risks associated with operating the equipment

K4   how to set up and operate the equipment

K5   your company's waste disposal procedures

K6   your company's reporting procedures.

Element 311.2 Transfer the image to the plate
Performance evidence

You must show that you can transfer the image to the plate consistently over a period of time. Your evidence must show that:

R1   you can transfer the following image types:

        a   line

        b   line and half tone

        c   mono and multicolour.

Unit 312　　　Make gravure cylinders
Introduction

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

1　　　Element 312.1　Prepare the cylinder

2　　　Element 312.2　Transfer the image to the cylinder

This involves:

- identifying what work you have to do

- preparing equipment and materials for the job

- operating equipment to transfer the image to the cylinder

- dealing with problems which can arise when making gravure cylinders.

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:

- photocopy of the job instructions

- sample of a plate you have made

- a sample of the printed job.

Element 312.1 Prepare the cylinder
Performance criteria

You must show that you:

1   check that you have all the details you need for the job

2   check that you have sufficient materials for the job

3   check carefully that the cylinder is clean and suitable for the job

4   check and adjust equipment so that it is ready to operate efficiently and safely

5   select and prepare the correct masks

6   keep waste materials to a minimum.

Element 312.1 Prepare the cylinder
Knowledge and understanding

You must understand:

K1   what details you need for the job

K2   the types of cylinders in use in your company, and the types of job for which they are used

K3   why it is important to check that the cylinder is clean and suitable for the job

K4   the range, use and limitations of processing materials and equipment

K5   your company's procedures for minimising waste

K6   the types of mask in use in your company.

Element 312.1 Prepare the cylinder
Performance evidence

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

R1   you can prepare cylinders for at least **one** of the following:

      a   single colour work

      b   coarse register spot colour work

      c   four colour process work

R2   … and for the following types of image:

      a   line

      b   line and half tone

R3   you can identify what is required from:

      a   your job instructions

      b   the layout.

Element 312.2 Transfer the image to the cylinder
Performance evidence

You must show that you:

1   check carefully that the equipment is ready for image transfer

2   set and operate the equipment so that:

    a   the complete image is transferred to the cylinder

    b   the image is sharp and clean, at the required resolution

    c   the finished cylinder is free from faults and suitable for production

3   accurately identify and correct faults which it is your job to remedy

4   promptly report faults and problems which it is not your job to correct

5   keep waste to a minimum and dispose of it by applying the correct procedures

6   report promptly when the plate is ready for production.

Element 312.2 Transfer the image to the cylinder
Knowledge and understanding

You must understand:

K1   the cylinder making methods and equipment in use in your company

K2   the safe light conditions for inspecting cylinders

K3   the risks associated with operating the equipment

K4   how to set up and operate the equipment

K5   your company's waste disposal procedures

K6   common faults which can occur when making gravure cylinders, 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 when there are faults, and when the plate is ready for production.

Element 312.2 Transfer the image to the cylinder
Performance evidence

You must show that you can transfer the image to the cylinder consistently over a period of time. Your evidence must show that:

R1   you can transfer the following image types:

      a   line

      b   line and half tone

      c   mono and multicolour.

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	Group B – Pre-Press	Group C – Digital Printing
205 Create digital colour artwork for print	206 Produce imposed separations for 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

Group A - Lithography	Group B - Web Offset	Group C - Flexography	Group D - Screen	Group E - Gravure	Group F - Pad printing	Group G - Dye Stamping
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	**Group B – Newspapers and Periodicals**
235 Run and monitor guillotines	249 Operate automated inserting equipment for newspapers and periodicals production
236 Run and monitor adhesive binding machinery	250 Operate automated stitch and trim equipment for newspapers and periodicals production
237 Run and monitor case making machinery	251 Set up machines for automated newspapers and periodicals print finishing
238 Run and monitor casing-in machinery	252 Move materials for newspaper and periodical production
239 Run and monitor folding machinery	253 Repair and maintain feeder machinery
240 Set and operate booklet-making machinery	254 Control publishing equipment for newspaper and periodicals production
241 Set and operate mail processing machinery	255 Control auto-palletising equipment for newspaper and periodicals production
242 Set and operate multi-knife trimming machinery	
243 Set and operate multiple hopper feeders	Continued on next page

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		**Group B - Pre-press**	
206	Produce imposed separations for printing	228	Prepare stencils for printing
207	Operate digital printing machines	306	Plan and produce edited images
306	Plan and produce edited images	307	Manage colour reproduction in digital pre-press
307	Manage colour reproduction in digital pre-press	308	Produce approved proofs from digital artwork
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

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	**Group B – Newspapers and Periodicals**
Optional technical units – complete two units	**Mandatory technical units – complete one unit**
328 [3] Control adhesive binding machinery	348 Maintain equipment in working order
329 Control case making machinery	Optional Technical units complete two units
330 Control casing-in machinery	253 Repair and maintain feeder machinery
331 Control programmatic guillotines	344 Control automated inserting processes for newspapers and periodicals print
332 [2] Control folding machinery	345 Control automated stitch and trim processes for newspaper and periodicals print
333 [1] Control in-line booklet making machinery	346 Control the set up of machines for newspaper and periodicals print finishing
Optional Technical units complete one unit	347 Control materials handling for newspaper and periodicals print finishing

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 insetting-stitching-trimming machines
342	Control inline gathering-adhesive-binding-trimming machinery
343	Control inline block-feeding-forwarding-case binding machinery

Notes
[1] Unit 338 may not be used in conjunction with Unit 333
[2] Unit 339 may not be used in conjunction with Unit 332
[3] Unit 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 dyes 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