

# Level 2 Award in Printing and Graphic Communications (5405-20/21/22/23/24)

October 2017  
Version 1.2



## Qualification at a glance

<b>Subject area</b>	<b>Printing and Graphic Communications</b>
<b>City &amp; Guilds number</b>	5405
<b>Age group approved</b>	All
<b>Entry requirements</b>	No entry requirements
<b>Assessment</b>	Assessed via online multiple choice test.
<b>Automatic approval</b>	Available
<b>Support materials</b>	Centre handbook
<b>Registration and certification</b>	Consult the Walled Garden/Online Catalogue for last dates

<b>Title and level</b>	<b>GLH</b>	<b>TQT</b>	<b>City &amp; Guilds number</b>	<b>Accreditation number</b>
Level 2 Award in Printing and Graphic Communications – Pre-Press	93	120	5405-20	600/1930/X
Level 2 Award in Printing and Graphic Communications - Desktop Publishing	93	120	5405-21	600/1930/X
Level 2 Award in Printing and Graphic Communications - Machine Printing	93	120	5405-22	600/1930/X
Level 2 Award in Printing and Graphic Communications - Mechanised Print Finishing and Binding	93	120	5405-23	600/1930/X
Level 2 Award in Printing and Graphic Communications - Carton Manufacture	93	120	5405-24	600/1930/X

<b>Version and date</b>	<b>Change detail</b>	<b>Section</b>
1.2 October 2017	Added TQT details	<b>Qualification at a glance &amp; Structure</b>

	Deleted QCF	<b>Throughout</b>
1.1 July 2011	Test specifications added	<b>Assessment</b>
1.1 October 2011	Range in Unit 201, Learning Outcome 1 under Regulations	<b>Unit 201</b>



# Contents

<b>1</b>	<b>Introduction</b>	<b>5</b>
	Structure	5
<b>2</b>	<b>Centre requirements</b>	<b>8</b>
	Approval	8
	Resource requirements	8
	Candidate entry requirements	8
<b>3</b>	<b>Delivering the qualification</b>	<b>9</b>
	Initial assessment and induction	9
<b>4</b>	<b>Assessment</b>	<b>10</b>
	Assessment of the qualification	10
	Test Specifications	10
<b>5</b>	<b>Units</b>	<b>15</b>
<b>Unit 201</b>	<b>Working in the printing and graphic communications industry</b>	<b>16</b>
<b>Unit 202</b>	<b>Productivity and quality assurance in desktop publishing (DTP) and pre-press</b>	<b>32</b>
<b>Unit 203</b>	<b>Productivity, quality assurance and maintenance in machine printing and print finishing</b>	<b>36</b>
<b>Unit 204</b>	<b>Digital pre-press processes</b>	<b>43</b>
<b>Unit 205</b>	<b>Desktop publishing (DTP)</b>	<b>48</b>
<b>Unit 206</b>	<b>Production printing processes</b>	<b>55</b>
<b>Unit 207</b>	<b>Mechanised print finishing and binding</b>	<b>66</b>
<b>Unit 208</b>	<b>Carton manufacturing processes</b>	<b>75</b>
<b>Appendix 1</b>	<b>Relationships to other qualifications</b>	<b>79</b>
<b>Appendix 2</b>	<b>Sources of general information</b>	<b>80</b>



# 1 Introduction

This document tells you what you need to do to deliver the qualifications:

Area	Description
Who are the qualifications for?	For candidates who work or want to work in the printing and graphic communications sector.
What do the qualifications cover?	They allow candidates to learn, develop and practise the skills required for employment and/or career progression in the printing and graphic communications sector. Candidates can also choose a specialist pathway to meet their career or employer's requirements.
Are the qualifications part of a framework or initiative?	They serve as technical certificates in the Printing Apprenticeship framework.
What opportunities for progression are there?	They allow candidates to progress into employment or to the following City & Guilds qualifications: <ul style="list-style-type: none"> <li>Level 3 Certificate in Printing and Graphic Communications (5405)</li> </ul>

## Structure

To achieve the **Level 2 Award in Printing and Graphic Communications**, learners must achieve **12** credits from the mandatory units. Please see below for the different mandatory units for each pathway.

### Level 2 Award in Printing and Graphic Communications – Pre-Press

Unit accreditation number	City & Guilds unit	Unit title	Credit value
<b>Mandatory</b>			
H/503/1759	201	Working in the printing and graphic communications industry	4
L/503/1772	202	Productivity and quality assurance in desktop publishing and pre-press	4
R/503/1787	204	Digital pre-press processes	4

## Level 2 Award in Printing and Graphic Communications – Desktop Publishing

Unit accreditation number	City & Guilds unit	Unit title	Credit value
<b>Mandatory</b>			
H/503/1759	201	Working in the printing and graphic communications industry	4
L/503/1772	202	Productivity and quality assurance in desktop publishing and pre-press	4
K/503/1794	205	Desktop publishing	4

## Level 2 Award in Printing and Graphic Communications - Machine Printing

Unit accreditation number	City & Guilds unit	Unit title	Credit value
<b>Mandatory</b>			
H/503/1759	201	Working in the printing and graphic communications industry	4
K/503/1777	203	Productivity, quality assurance and maintenance in machine printing and print finishing	4
D/503/1761	206	The production printing processes	4

## Level 2 Award in Printing and Graphic Communications – Mechanised Print Finishing and Binding

Unit accreditation number	City & Guilds unit	Unit title	Credit value
<b>Mandatory</b>			
H/503/1759	201	Working in the printing and graphic communications industry	4
K/503/1777	203	Productivity, quality assurance and maintenance in machine printing and print finishing	4
H/503/1762	207	Mechanised print finishing and binding	4

## Level 2 Award in Printing and Graphic Communications - Carton Manufacture

Unit accreditation number	City & Guilds unit	Unit title	Credit value
<b>Mandatory</b>			
H/503/1759	201	Working in the printing and graphic communications industry	4
K/503/1777	203	Productivity, quality assurance and maintenance in machine printing and print finishing	4
J/503/1771	208	Carton manufacturing processes	4

## Total Qualification Time

Total Qualification Time (TQT) is the total amount of time, in hours, expected to be spent by a Learner to achieve a qualification. It includes both guided learning hours (which are listed separately) and hours spent in preparation, study and assessment.

Title and level	GLH	TQT
Level 2 Award in Printing and Graphic Communications – Pre-Press	93	120
Level 2 Award in Printing and Graphic Communications - Desktop Publishing	93	120
Level 2 Award in Printing and Graphic Communications - Machine Printing	93	120
Level 2 Award in Printing and Graphic Communications - Mechanised Print Finishing and Binding	93	120
Level 2 Award in Printing and Graphic Communications - Carton Manufacture	93	120



## 2 Centre requirements

### Approval

If your centre is approved to offer the qualification Level 2 Certificate in Printing and Graphic Communications (5261-02) you will receive automatic approval for the new Level 2 Award in Printing and Graphic Communications (5405-20/21/22/23/24).

To offer this qualification, new centres will need to gain both centre and qualification approval. Please refer to the *Centre Manual - Supporting Customer Excellence* for further information.

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualification before designing a course programme.

### Resource requirements

#### Centre staffing

Staff delivering these qualifications must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be technically knowledgeable in the area[s] for which they are delivering training and/or have experience of providing training. This knowledge must be to the same level as the training being delivered
- have credible experience of providing training.

Centre staff may undertake more than one role, e.g. tutor and assessor or internal verifier, but cannot internally verify their own assessments.

#### Continuing professional development (CPD)

Centres must support their staff to ensure that they have current knowledge of the occupational area, that delivery, mentoring, training, assessment and verification is in line with best practice, and that it takes account of any national or legislative developments.

#### Candidate entry requirements

City & Guilds does not set entry requirements for this qualification[s]. However, centres must ensure that candidates have the potential and opportunity to gain the qualification successfully.

#### Age restrictions

There is no age restriction for this qualification unless this is a legal requirement of the process or the environment.





### 3 Delivering the qualification

#### **Initial assessment and induction**

An initial assessment of each candidate should be made before the start of their programme to identify:

- if the candidate has any specific training needs
- support and guidance they may need when working towards their qualification
- any units they have already completed, or credit they have accumulated which is relevant to the qualification
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the candidate fully understands the requirements of the qualification, their responsibilities as a candidate, and the responsibilities of the centre. This information can be recorded on a learning contract.



## 4 Assessment

### Assessment of the qualification

City & Guilds has written online multiple choice tests to use with these qualifications. Candidates must successfully complete one online test for each mandatory unit.

Multiple choice tests which assess knowledge and understanding will be set for each unit. These will be marked Pass or Fail. For candidates with particular requirements centres should refer to City & Guilds policy document *Access to assessment* on the City & Guilds website.

### Test Specifications

**Test 1:** Unit 201

**Duration:** 1 hour 40 mins

Unit	Outcome	Number of questions	%
201	1 Understand the responsibility of an employee for health and safety under the Health and Safety at Work Act 1974	12	18
	2 Know the health and safety risks associated with equipment and processes in the workplace	7	10
	3 Know the safety clothing, footwear and equipment suitable for use in the printing industry	4	6
	4 Understand how to create and maintain effective working relationships	3	4.5
	5 Understand the principles of personal development planning and training	4	6
	6 Understand the principles and techniques of communicating with others	4	6
	7 Know the printing processes and their common applications	5	8
	8 Know the stages in the printing process from pre-press to finished printing product	10	16
	9 Know the types of representative organisations and other associations	3	4.5
	10 Know the key job functions and their main purposes within the printing industry	2	3
	11 Understand legal issues concerning employment and working in the printing industry	12	18
	<b>Total</b>	<b>66</b>	<b>100</b>

**Test 2:** Unit 202**Duration:** 45 minutes

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
202	1 Understand the main activities and processes within the DTP and pre-press areas	4	13
	2 Understand issues which affect profitable production and productivity	6	20
	3 Know the main features of quality assurance and quality control systems	6	20
	4 Know the procedures for checking job specifications and identifying the DTP and/or pre-press work required	5	17
	5 Know the main types of proofs used and their role in the printing process	6	20
	6 Understand the main reasons and methods for archiving DTP and pre-press work securely	3	10
<b>Total</b>		<b>30</b>	<b>100</b>

**Test 3:** Unit 203**Duration:** 1 hour 30 mins

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
203	1 Understand the issues which affect profitable production and productivity and why these are important	6	11
	2 Understand the main features of quality assurance and quality control systems	12	20
	3 Understand the systems and documentation used to organise and control production	11	18
	4 Know the procedures for cleaning machinery and related equipment	8	13
	5 Understand lubrication schedules and the types of lubricants used with machinery and related equipment	8	13
	6 Know the roles and responsibilities for maintaining machinery and related equipment	7	12
	7 Understand component replacement procedures for machinery and related equipment	8	13
<b>Total</b>		<b>60</b>	<b>100</b>

**Test 4:** Unit 204**Duration:** 1 hour 15 mins

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
204	1 Know the hardware and software systems typically used in pre-press	6	12
	2 Understand the basic principles of converting originals into digital files	13	26
	3 Know the basic principles of layout and imposition, including the use and placement of the basic marks	13	26
	4 Know the principles involved in the production of image carriers	7	14
	5 Know the principles involved in the production of digital proofs	6	12
	6 Know the basic principles of pre-flighting and ripping files in digital pre-press	5	10
<b>Total</b>		<b>50</b>	<b>100</b>

**Test 5:** Unit 205**Duration:** 1 hour 50 mins

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
205	1 Know the main issues affecting the design of DTP documents	4	7
	2 Understand the operation of hardware and software systems typically used in DTP	5	9
	3 Understand the creation of digital fonts and how they are applied in DTP	10	18.5
	4 Know the main issues connected with the creation, editing and use of digital images	10	18.5
	5 Know the main issues connected with colour in DTP documents	8	14
	6 Understand the principles of setting up and laying out documents in DTP	9	16.5
	7 Understand the main issues connected to proofing and pre-flighting DTP documents	9	16.5
<b>Total</b>		<b>55</b>	<b>100</b>

**Test 6:** Unit 206**Duration:** 1 hour 15 mins

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
206	1 Understand the printing processes used in machine printing and their main characteristics	4	7
	2 Understand the ink/coating and drying systems commonly used in machine printing	9	17
	3 Understand the properties and characteristics of the materials commonly used in machine printing	15	27
	4 Know make-ready and operating procedures for machine printing production	6	11
	5 Understand the purpose and procedures for quality control in machine printing	9	17
	6 Know the common print faults, causes and remedies associated with machine printing processes	3	5
	7 Know the in-line and off-line converting operations commonly undertaken in machine printing departments	9	16
<b>Total</b>		<b>55</b>	<b>100</b>

**Test 7:** Unit 207**Duration:** 1 hour 30 mins

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
207	1 Know the terminology commonly used for imposition and folding schemes in mechanised print finishing and binding	13	22
	2 Know the types and characteristics of paper and board	7	12
	3 Understand the uses of materials found in mechanised print finishing and binding	5	8
	4 Know the main operations involved in mechanised print and finishing to cut, fold and secure printed material	9	15
	5 Know the main operations involved in newspaper and magazine finished processes	6	10
	6 Know the make-ready and operating procedures for a range of print finishing equipment	8	13
	7 Understand the purpose and procedures for quality control in mechanised print finishing and binding	9	15
	8 Know the procedures required to protect material from damage during finishing and binding operations	3	5
<b>Total</b>		<b>60</b>	<b>100</b>

**Test 8:** Unit 208**Duration:** 1 hour

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
208	1 Know the materials and equipment required in carton manufacturing process	13	33
	2 Understand the principles, methods and techniques of carton design and manufacturing processes	8	20
	3 Know the make-ready and operational procedures for cutting and creasing, multi-folding, gluing and enhancing machinery	6	14
	4 Understand the manufacturing procedures of die making and cutting and creasing forms	7	18
	5 Understand the purposes and procedures of quality control in carton manufacturing processes	6	15
	<b>Total</b>	<b>40</b>	<b>100</b>



## 5 Units

### Availability of units

The following units are also on The Register of Regulated Qualifications:  
<http://register.ofqual.gov.uk/Unit>

### Structure of units

These units each have the following:

- City & Guilds unit number
- title
- unit accreditation number (UAN)
- level
- credit value
- guided learning hours (GLH)
- relationship to NOS (National Occupational Standards)
- assessment requirements
- unit aim
- learning outcomes which are comprised of a number of assessment criteria
- range

### Summary of units

Unit	Title	UAN	Credits
201	Working in the printing and graphic communications industry	H/503/1759	4
202	Productivity and quality assurance in desktop publishing and pre-press	L/503/1772	4
203	Productivity, quality assurance and maintenance in machine printing and print finishing	K/503/1777	4
204	Digital pre-press processes	R/503/1787	4
205	Desktop publishing	K/503/1787	4
206	The production printing processes	D/503/1761	4
207	Mechanised print finishing and binding	H/503/1762	4
208	Carton manufacturing processes	J/503/1771	4

## Unit 201

## Working in the printing and graphic communications industry

<b>UAN:</b>	<b>H/503/1759</b>
<b>Level:</b>	Level 2
<b>Credit value:</b>	4
<b>GLH:</b>	33
<b>Relationship to NOS:</b>	This unit is linked to 001 and 002 of the Level 2/3 NVQ in Printing.
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by Proskills. It will be assessed via an online multiple choice test.
<b>Aim:</b>	This unit is concerned with developing an understanding of working in the printing and graphic communications industry, including health and safety, personal development, working relationships, an industry overview and the rights and responsibilities of employers and employees.

<b>Learning outcome</b>	<b>The learner will:</b>
1.	Understand the responsibility of an employee for health and safety under the Health and Safety at Work Act 1974
<b>Assessment criteria</b>	
The learner can:	
1.1	explain why the Health and Safety at Work Act 1974 was introduced
1.2	describe the employees primary <b>legal duties</b> under the Health and Safety at Work Act 1974
1.3	describe the employer's primary <b>legal duties</b> under the Health and Safety at Work Act 1974
1.4	explain how the <b>regulations</b> (with revisions) may apply to employees working in the printing industry
1.5	explain <b>methods</b> used by the Health and Safety Executive or local Environmental Health Authority to implement the Health and Safety at Work Act 1974 and other relevant regulations
1.6	explain what should be covered by a <b>health and safety policy</b> in a company that employs more than five people
1.7	explain the <b>duty of care</b> for any visitors to the work area
1.8	describe the <b>procedures</b> for dealing with an accident to a colleague
1.9	identify the <b>information</b> which should be entered into the Accident Book



- 1.10 list the **principal duties** of the company appointed first aider
- 1.11 explain the requirement for reporting **incidents/accidents** to the Health and Safety Executive or Environmental Health Authority
- 1.12 explain the procedures for **reporting and recording** accidents under the RIDDOR regulations
- 1.13 describe the general **fire precautions** appropriate to an organisation
- 1.14 describe the **procedure** employees should follow on hearing the fire alarm
- 1.15 describe the **role** of a fire marshal/warden
- 1.16 outline the **employer's responsibility** to control hazardous substances under the COSHH regulations
- 1.17 identify the **chemicals** used in the printing industry that are covered by the Hazardous Waste (England and Wales) Regulation 2005 and require disposal to a licensed carrier.

### Range

#### Legal duties (employee's – AC1.2)

- a. taking reasonable care for their own health and safety and that of others who may be affected by what they do or do not do
- b. co-operating with their employer on health and safety
- c. correctly using work items provided by their employer, including Personal Protective Equipment (PPE), in accordance with training or instructions
- d. not interfering with or misusing anything provided for health and safety

#### Legal duties (employer's AC1.3)

- a. making the workplace safe and without risks to health
- b. ensuring that plant and machinery are safe and that safe systems of work are set and followed
- c. ensuring articles and substances are moved, stored and used safely
- d. providing adequate welfare facilities
- e. giving employees the information, instruction, training and supervision necessary for their health and safety

#### Regulations

- a. Control of Substances Hazardous to Health Regulations (COSHH) 2002
- b. Health and Safety (Display Screen Equipment) Regulations 1992
- c. Electricity at Work Regulations 1989
- d. Fire Precautions (Workplace) 1999
- e. Health and Safety (First-Aid) Regulations 1981
- f. Workplace (Health, Safety and Welfare) Regulations 1992
- g. Management of Health and Safety at Work Regulations 1999
- h. Manual Handling Operations Regulations 1992
- i. The Control of Noise at Work Regulation 2005
- j. Personal Protective Equipment Regulations 1994
- k. Provision and Use of Work Equipment Regulations 1998
- l. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 1995

- m. Health and Safety (Safety Signs and Signals) Regulations 1996
- n. Special Waste Regulations 1996

### **Methods**

- a. inspections
- b. improvement notices
- c. prohibition notices
- d. prosecutions
- e. investigation of accidents or complaints

### **Health and safety policy**

- a. the general aims of the company in relation to the employee's health and safety
- b. the organisation's health and safety
- c. the systems and procedures in place for ensuring the health and safety of employees
- d. to be brought to the attention of all employees
- e. revised if the organisation changes or new hazards arise
- f. supported by sufficient resources

### **Duty of care**

- a. identifying actual or potential hazards
- b. providing any required PPE, e.g. ear defenders
- c. understanding the law with regard to managing contractors when they are on site

### **Procedures**

- a. ensuring the safety of the immediate work area
- b. seeking help from the competent person/first aider
- c. providing help (as directed by the competent person/first aider) to assist with the injured person
- d. ensuring the accident is reported and recorded

### **Information**

- a. first aid equipment and facilities
- b. deterioration in an existing condition
- c. promoting the recovery of the patient
- d. calling the emergency services when required

### **Principal duties**

- a. keeping details of the accident
- b. notifying the enforcing authority immediately
- c. reporting of certain diseases suffered by workers, who do specified types of work, as soon as possible on receiving a written diagnosis from a medical practitioner
- d. investigating of the cause and the reviewing of procedures as appropriate
- e. notifying dangerous occurrences to the enforcing authority

### **Incidents/accidents**

- a. a fatality

- b. an employee receiving a major injury requiring hospitalisation
- c. a visitor injured on the premises and requiring hospital treatment
- d. an employee injured on the premises and unable to perform their normal job for three days
- e. an accident/incident arising from an electric shock or poisoning
- f. an accident/incident arising from an explosion or fire which stops work for 24 hours

#### **Reporting and recording**

- a. name, home address and occupation of the injured person
- b. signature, date, home address and occupation of the person completing the record
- c. time, date and place of the accident
- d. details about the accident - how it happened and the cause (if known)

#### **Fire precautions**

- a. knowing what to do in case of a fire
- b. knowing how to raise the alarm and use fire extinguishers where appropriate
- c. knowing what to do if there is a need to call the fire brigade
- d. all fire exits are clearly marked and unobstructed
- e. fire escape doors are easily opened whenever anyone is on the premises, they must never be wedged open

#### **Procedure (AC1.14)**

- a. leaving the building as quickly as possible by the nearest fire exit
- b. going to the appointed fire assembly point
- c. ensuring presence is recorded by the Fire Marshal/Warden
- d. not re-entering the building until told to do so by the Fire Brigade or Fire Marshal/Warden

#### **Role**

- a. identifying potential hazards
- b. maintaining emergency exits and fire fighting equipment
- c. raising the alarm in the event of a fire
- d. liaising with the Fire Brigade
- e. identifying and recording the presence of employees and visitors at the Fire Assembly Point
- f. giving instructions for the re-occupation of the building when safe to do so

#### **Employer's responsibility**

- a. assessing the risks to health arising from the use of hazardous substances at work
- b. reviewing assessment if changes occur
- c. preventing or controlling the risk
- d. ensuring that control measures are used and maintained
- e. monitoring exposure and carrying out health surveillance when necessary
- f. informing, instructing and training employees about the risks and the precautions needed

g. keeping records where required

### Chemicals

- a. aerosol cans
- b. blanket wash
- c. plate cleaners
- d. etch solution
- e. gravure etching solutions
- f. Isopropyl Alcohol (IPA)
- g. plate developer
- h. solvent based inks
- i. wash-up solvents

Learning outcome	The learner will:
2.	Know the health and safety risks associated with equipment and processes in the workplace
<b>Assessment criteria</b>	
The learner can:	
2.1	identify the <b>principal hazards</b> of working in the printing industry
2.2	describe the <b>risks and hazards</b> that commonly occur in printing companies
2.3	describe how <b>machine guarding</b> , safe systems of work and machine maintenance contribute to machine safety
2.4	describe how to stop and isolate machinery in the event of an emergency
2.5	list the safety checks that should be carried out on <b>equipment</b> daily, weekly, monthly or before use
2.6	identify <b>equipment</b> used in the printing industry which people under the age of 18 are prohibited from using
2.7	describe the correct <b>procedures</b> used in manual handling
2.8	identify what is involved in <b>risk assessment</b>
2.9	explain the importance of complying with safety instructions from suppliers, manufacturers and companies concerning the use of materials and operation of equipment.

Range
<b>Principal hazards</b>
a. noisy machinery
b. the use of chemicals
c. manual handling
d. moving parts of machinery
<b>Risks and hazards</b>
a. trips caused by badly placed items such as pallets
b. slips caused by spilt chemicals
c. trapping caused by clothing or rags being caught in machinery
d. crushing caused by heavy objects falling on hands or feet
e. electric shock caused by poorly maintained wiring
f. cuts caused by careless use of sharp blades

- g. accidents/damage caused by poorly maintained/checked machinery and equipment

### **Machine guarding**

- a. identifying basic machinery hazards
- b. interlocking guards
- c. machine controls
- d. integrity of guard interlocks

### **Equipment (AC2.5)**

- a. machines
- b. machine guards
- c. guillotines
- d. hand tools
- e. services to machines, e.g. electricity, compressed air, gas, supplies
- f. reporting wear and tear

### **Equipment (AC2.6)**

- a. platens
- b. wire stitchers
- c. guillotines
- d. forklift trucks, which require a licence for use

### **Procedures**

- a. planning the lift
- b. standing close to load and bending knees
- c. taking a firm grip of the object and holding it close to the body
- d. standing up, keeping back straight and elbows tucked in
- e. moving forward smoothly, using small steps and not jerking or twisting
- f. when destination is reached, bending knees and positioning object
- g. altering hand hold and pushing into final position

### **Risk assessment**

- a. identifying hazards
- b. deciding who might be harmed and how
- c. assessing how great the risk is:
  - i. how often do people approach the hazard
  - ii. how long are they exposed to the hazard
  - iii. how serious could the consequences be
- d. deciding whether existing controls are adequate or more are required
- e. recording the significant findings
- f. putting in place the additional precautions needed
- g. reviewing the assessment

<b>Learning outcome</b>	<b>The learner will:</b>
3.	Know the safety clothing, footwear and equipment suitable for use in the printing industry
<b>Assessment criteria</b>	
The learner can:	
3.1	describe <b>employer's responsibilities</b> under the Personal Protective Equipment (PPE) at Work Regulations Act 1992
3.2	list the <b>PPE</b> commonly used in the printing industry
3.3	describe <b>safe working conditions</b> for the operation of computer equipment
3.4	identify the types and uses of <b>fire extinguishers</b>
3.5	identify and describe the signage used for information, warning, prohibition and mandatory instruction within the printing industry.

<b>Range</b>
<p><b>Employer's responsibilities</b></p> <ol style="list-style-type: none"> <li>assess risks to health and safety, which have not been avoided before providing PPE</li> <li>provide suitable PPE free of charge to protect employees against risks, which have not been controlled by other means</li> <li>take all reasonable steps to ensure PPE is properly used</li> <li>maintain PPE provided, in clean and efficient working order with appropriate storage accommodation for when it is not in use</li> <li>give information, instruction and training for the use of PPE</li> <li>ensure that employees must use PPE provided and report any loss or obvious defect to the employer.</li> </ol> <p><b>PPE</b></p> <ol style="list-style-type: none"> <li>safety hand and footwear</li> <li>eye, face and ear protection</li> <li>barrier cream and cleansing soaps.</li> </ol> <p><b>Safe working conditions</b></p> <ol style="list-style-type: none"> <li>adequate space to work</li> <li>suitable environment – lighting, noise free, good ventilation</li> <li>adjustable chair – back and height</li> <li>adjustable computer screen height and visibility</li> <li>adequate working area including space in front of keyboard to allow wrists to be supported.</li> </ol> <p><b>Fire extinguishers</b></p> <ol style="list-style-type: none"> <li>water</li> <li>carbon dioxide (CO<sub>2</sub>)</li> <li>foam</li> <li>dry powder.</li> </ol>

<b>Learning outcome</b>	<b>The learner will:</b>
4.	Understand how to create and maintain effective working relationships
<b>Assessment criteria</b>	
The learner can:	
4.1	describe the <b>advantages</b> of team working
4.2	describe the <b>results</b> of poor team working
4.3	explain the importance of teams working together towards the same goal, supporting and assisting colleagues to overcome production problems or difficulties
4.4	describe <b>ways of resolving conflict</b> with a colleague
4.5	describe <b>methods</b> of maintaining communication and productivity within the workplace
4.6	explain how <b>equal opportunities legislation</b> influences the workplace.

<b>Range</b>
<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>a. a productive, stimulating atmosphere</li> <li>b. individuals feeling they belong and having commitment</li> <li>c. problems being overcome/resolved and targets being achieved</li> <li>d. continuous improvement in performance</li> </ul> <p><b>Results</b></p> <ul style="list-style-type: none"> <li>a. little or no communication</li> <li>b. failure to accept responsibility</li> <li>c. poor quality work – mistakes, inaccuracies and sub-standard work are the norm</li> <li>d. low productivity and low rates of achievement by individuals</li> <li>e. poor understanding of the requirements of the job</li> <li>f. no improvement in working practices</li> <li>g. uncooperative atmosphere, with conflict, lethargy and a general disinterest</li> </ul> <p><b>Ways of resolving conflict</b></p> <ul style="list-style-type: none"> <li>a. not walking away as the conflict will still be there</li> <li>b. staying calm and not shouting or getting angry</li> <li>c. checking the facts of the matter in dispute</li> <li>d. not telling lies and apologising if in error</li> <li>e. being assertive</li> <li>f. asking another member of the team to mediate</li> <li>g. treating colleagues with respect</li> </ul> <p><b>Methods</b></p> <ul style="list-style-type: none"> <li>a. reporting difficulties in completing the work</li> <li>b. identifying problems in delivering the completed work in the allocated time</li> <li>c. identifying problems during the production process that will impact upon subsequent operations reporting problems in the immediate</li> </ul>

<p>work area – e.g. a health and safety hazard</p> <p>d. ensuring all necessary information is passed on to colleagues and line managers at the end of the shift</p> <p><b>Equal opportunities legislation</b></p> <p>a. do not discriminate against another person for reasons of race, gender, religion, disability, age or sexual orientation</p> <p>b. do not harass or bully a colleague for any reason</p> <p>c. do not ignore or belittle another person</p> <p>d. do not display inappropriate material in the workplace which people may find offensive</p>
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<b>Learning outcome</b>	<b>The learner will:</b>
5. Understand the principles of personal development planning and training	
<b>Assessment criteria</b>	
The learner can:	
5.1 describe <b>techniques</b> individuals use to identify their existing skills	
5.2 explain how setting goals and implementing a personal action plan may contribute to development	
5.3 describe how identifying personal strengths and weaknesses contributes to the process of personal development planning	
5.4 explain the <b>common content</b> of an individual learning plan and the importance of it	
5.5 explain the importance of continuing to learn new skills and acquire further knowledge throughout working life	
5.6 identify where skills and knowledge required for personal development can be <b>obtained</b> .	

<b>Range</b>
<b>Techniques</b>
a. self-assessment of skills and knowledge, often with reference to national standards or qualifications
b. setting goals to improve skills and knowledge
c. implementing a personal action plan to achieve goals
<b>Common content</b>
a. target dates for completion of parts of the learning programme
b. the method of delivery of the programme
c. a system to review progress against target dates
<b>Obtained</b>
a. teachers
b. trainers
c. mentors
d. assessors
e. colleges
f. self study



<b>Learning outcome</b>	<b>The learner will:</b>
6.	Understand the principles and techniques of communicating with others
<b>Assessment criteria</b>	
The learner can:	
6.1	describe ways of communicating with others at work
6.2	describe how to communicate with colleagues and visitors, making appropriate use of technical language
6.3	explain the difference between open and closed questions
6.4	describe the <b>characteristics</b> of formal language
6.5	describe the <b>characteristics</b> of informal language
6.6	identify the <b>techniques</b> , both verbal and written, for giving constructive feedback to colleagues.

<b>Range</b>
<p><b>Characteristics – formal language (AC6.4)</b></p> <ul style="list-style-type: none"> <li>a. organised or prepared</li> <li>b. avoidance of slang and colloquialisms</li> <li>c. use of complete sentences</li> <li>d. used in larger groups or official circles, e.g. meetings/groups</li> </ul> <p><b>Characteristics – informal language (AC6.5)</b></p> <ul style="list-style-type: none"> <li>a. improvised and spontaneous</li> <li>b. the use of slang and colloquialisms</li> <li>c. often ignoring conventional sentences</li> <li>d. use in one-to-one or small groups</li> </ul> <p><b>Techniques</b></p> <ul style="list-style-type: none"> <li>a. verbal (one-to-one discussions, group presentations)</li> <li>b. written (memos, notes, reports)</li> </ul>

<b>Learning outcome</b>	<b>The learner will:</b>
7.	Know the printing processes and their common applications
<b>Assessment criteria</b>	
The learner can:	
7.1	identify the <b>main printing processes</b>
7.2	describe the basic principles of each printing process
7.3	describe the image carriers used to reproduce the image
7.4	identify the <b>products</b> that are associated with the printing processes
7.5	describe the characteristics of the printed image within the printing process
7.6	describe how the choice of substrate to be printed effects which printing process is suitable for output.

<b>Range</b>
<p><b>Main printing processes</b></p> <ul style="list-style-type: none"> <li>a. lithography</li> <li>b. flexography</li> <li>c. letterpress</li> <li>d. gravure</li> <li>e. screen</li> <li>f. pad</li> <li>g. digital print</li> </ul> <p><b>Products</b></p> <ul style="list-style-type: none"> <li>a. lithography - primarily for printing onto paper and board to produce magazines, brochures, leaflets, packaging, stationery and many other products requiring high quality multi-colour images</li> <li>b. flexography - primarily for printing onto flexible roll materials e.g. for food packaging or other types of wrappings, but can also be used for producing books, newspapers, labels, wall coverings etc</li> <li>c. letterpress is used for roll tickets, vouchers, labels and pads where the image is carried on a metal or wooden block or metal type, and is nowadays often adapted for cutting and creasing, foiling and numbering work</li> <li>d. gravure - primarily to produce magazines, packaging and security work</li> <li>e. screen printing - primarily for printing on non-standard shapes and substrates, e.g. clothing, large format rigid display material</li> <li>f. pad uses a metal or plastic photo engraved plate (called a cliché) to transfer the image to an intermediate silicone rubber and onto the substrate, with the ink supplied to the plate after each impression and is used primarily to print on irregular shaped substrate surfaces, e.g. basketballs, masking tape</li> <li>g. digital printing uses electronic data from a computer system and outputs it direct to a reproduction system which can range from simple desktop printers to large directly imaged printing presses</li> </ul>

<b>Learning outcome</b>	<b>The learner will:</b>
8.	Know the stages in the printing process from pre-press to finished printed product
<b>Assessment criteria</b>	
The learner can:	
8.1	identify the <b>key stages</b> in the production process within print
8.2	describe the responsibilities of each production area toward the finished product
8.3	explain the key operations undertaken within each production area
8.4	describe the importance of carrying out checks throughout production
8.5	list the types of checks which take place in each production area
8.6	explain how pre-press creates designs which are made up of text and images
8.7	explain the different broad families of type (serif and sans serif) and the different styles (roman, italic and bold)

- 8.8 explain the term image
- 8.9 describe how digital images are **created**
- 8.10 explain how digital type and digital images may be **obtained**
- 8.11 list the main operations in finishing and converting
- 8.12 define the terms cutting and trimming
- 8.13 define the term folding
- 8.14 describe common methods of binding used in the printing industry
- 8.15 describe **additional operations** that may be carried out by some print finishing departments
- 8.16 describe the process of carton manufacture.

### Range

#### Key stages

- a. design – usually text, images and illustrations
- b. image carrier – layout, imposition
- c. printing – method – sheet work, half-sheet work, work and turn, work and tumble
- d. finishing – cutting, folding, securing

#### Created

- a. scanning an existing hard copy photograph or illustration
- b. drawing or painting an image directly in a software application
- c. using a digital camera to take pictures

#### Obtained

- a. removable digital storage media, e.g. CD, external hard-drive
- b. another computer via a network, e.g. Internet/e-mail/ISDN

#### Additional operations

- a. collating
- b. laminating or encapsulation
- c. decoration, e.g. gold blocking
- d. hole punching or drilling
- e. slitting
- f. cutting and creasing
- g. numbering

Learning outcome	The learner will:
9.	Know the types of representative organisations and other associations
Assessment criteria	
The learner can:	
9.1	identify the <b>main bodies</b> in the printing industry that represent employers
9.2	describe the <b>general role</b> of employer's organisations
9.3	identify the <b>role</b> of the trade unions
9.4	identify <b>professional bodies</b> that are open for individuals to join
9.5	describe the <b>role</b> relating to the printing and graphic communication industry of national and international organisations.

<p><b>Range</b></p> <p><b>Main bodies</b></p> <ul style="list-style-type: none"> <li>a. British Printing Industries Federation (BPIF)</li> <li>b. British Association of Printers and Copyshops (BAPC)</li> <li>c. Corrugated Packaging Association (CPA)</li> <li>d. European Flexographic Trade Association (EFTA)</li> <li>e. Metal Packaging Manufacture's Association (MPMA)</li> <li>f. Screen Printing Association (SPA)</li> <li>g. Scottish Printing Employer's Federation (SPEF)</li> <li>h. Local Chambers of Commerce</li> </ul> <p><b>General role</b></p> <ul style="list-style-type: none"> <li>a. providing a forum for members to discuss common problems</li> <li>b. representing the views of employers to government and other statutory bodies</li> <li>c. negotiating with trade unions and employee representatives on wages and conditions</li> <li>d. assisting companies to improve their effectiveness and performance</li> </ul> <p><b>Role (AC9.3)</b></p> <ul style="list-style-type: none"> <li>a. negotiate with employers at local and national levels about wages and conditions</li> <li>b. represent the view of members to government and other statutory bodies</li> <li>c. provide benefits to members during times of distress and unemployment</li> </ul> <p><b>Professional bodies</b></p> <ul style="list-style-type: none"> <li>a. Institute of Printing (IoP)</li> <li>b. Institute of Directors</li> <li>c. Institute of Management</li> </ul> <p><b>Role (AC9.5)</b></p> <ul style="list-style-type: none"> <li>a. maintain qualifications and standards and/or promote training e.g. Sector Skills Council</li> <li>b. research and publish technical and economic information, e.g. PIRA, GATF</li> <li>c. agree international protocols for use by manufacturers of equipment and software developers. e.g. ISO, CIP</li> </ul>
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<b>Learning outcome</b>	<b>The learner will:</b>
10. Know the key job functions and their main purposes within the printing industry	
<b>Assessment criteria</b>	
The learner can:	
10.1	identify the <b>departments</b> that may exist within a printing company
10.2	describe the <b>activities</b> of the departments within a printing company

- 10.3 identify the roles of the **management team** in a large printing company
- 10.4 identify the **principal job roles** in production departments.

<b>Range</b>	
<b>Departments</b>	
<ul style="list-style-type: none"> <li>a. sales and marketing</li> <li>b. production (pre-press, printing, finishing and despatch)</li> <li>c. administration and accounting</li> </ul>	
<b>Activities</b>	
sales and marketing role is to:	
<ul style="list-style-type: none"> <li>a. market the business to potential customers</li> <li>b. obtain profitable orders for the company</li> </ul>	
production activities:	
<ul style="list-style-type: none"> <li>a. works order processing and/or control</li> <li>b. production planning and control</li> </ul>	
administration and accounting usually deal with:	
<ul style="list-style-type: none"> <li>a. estimating</li> <li>b. costing, pricing and customer invoicing</li> <li>c. payment of salaries and suppliers' invoices</li> <li>d. monthly and end of year accounts</li> </ul>	
<b>Management team</b>	
<ul style="list-style-type: none"> <li>a. a managing director or chief executive</li> <li>b. a finance manager or accountant</li> <li>c. a sales and/or marketing manager</li> <li>d. a production manager</li> </ul>	
<b>Principal job roles</b>	
<ul style="list-style-type: none"> <li>a. pre-press – desktop publisher, planner, platemaker, scanner</li> <li>b. printing – printer, assistant</li> <li>c. finishing – folder, guillotine operator, finisher, binder, cutting and creasing operator</li> <li>d. despatch – warehouseman, forklift truck driver, van driver</li> </ul>	

<b>Learning outcome</b>	<b>The learner will:</b>
11. Understand legal issues concerning employment and working in the printing industry	
<b>Assessment criteria</b>	
The learner can:	
11.1 explain that employers and employees have statutory rights and responsibilities under UK and European employment law	
11.2 define the term 'contract of employment'	
11.3 identify the purpose of employment contract terms	
11.4 identify the most <b>relevant issues</b> for the printing industry covered by employment law	

- 11.5 explain the **reasons** why an employer may dismiss an employee
- 11.6 identify **employees' responsibilities** under their contract of employment
- 11.7 explain that employment contracts are recognised in law as being based on the principle of mutual trust and confidence and that a major breach of this principle by either party is likely to result in the contract being broken
- 11.8 explain on what grounds employers are not entitled to **discriminate** against employees
- 11.9 identify the **sources** of external help in resolving a serious employment problem
- 11.10 outline the **purpose** of the Data Protection Act 1998
- 11.11 describe how **the law** protects individuals and groups in relation to printing and publication
- 11.12 explain the possible **consequences** of breaching the laws which govern printing and publishing
- 11.13 explain why some work must carry the details of the printing company who produced it
- 11.14 describe the **types of company** in relation to their ownership
- 11.15 identify the **information** about the company that company stationery, including letterheads and invoices, must carry.

### Range

#### Relevant issues

- a. the minimum wage that must be paid (with exceptions for some young people in training)
- b. the maximum time that an individual may be required to work each week
- c. the minimum paid holiday that must be given each year
- d. the minimum sick pay (SSP) that must be paid to someone who is off work and genuinely sick
- e. the entitlement of parents to time off for maternity and paternity leave
- f. minimum periods of notice to be given to employees (other than in cases of immediate dismissal for gross misconduct)

#### Reasons

- a. behaviour has been sufficiently bad to justify dismissal
- b. capability or qualifications do not allow the job to be performed competently
- c. role is redundant, because the job no longer needs to be done
- d. who, for a legal requirement, can no longer be employed, e.g. a driver who loses their licence
- e. dismissal was for a justifiable and substantial reason

#### Employees' responsibilities

- a. giving and working the required amount of notice
- b. using any grievance procedure in the event of an unresolved grievance or dispute with their employer
- c. not breaching their duty of confidentiality to their employer

**Discriminate**

- a. race
- b. gender
- c. religion
- d. disability
- e. trade union membership or activity
- f. sexual orientation
- g. maternity

**Sources**

- a. any trade union of which they are a member
- b. a Citizens Advice Bureau
- c. a solicitor

**Purpose**

- a. inaccurate
- b. incomplete
- c. irrelevant

**Law**

- a. untrue statements about a person or organisation which diminish their reputation (libel)
- b. statements which incite racial hatred or are highly offensive
- c. obscenity
- d. unauthorised reproduction of copyright material, (usually something created and owned by another person)
- e. reproducing licenses, passports, currency, postage stamps etc

**Consequences**

- a. either criminal or civil proceedings, or both
- b. criminal courts sentencing the offender to imprisonment, a fine or other punishment
- c. civil courts awarding monetary compensation to be paid by the defendant if he/she loses the case

**Types of company**

- a. sole traders/proprietors
- b. partnerships
- c. limited (liability) companies – private or public

**Information**

- a. trading name and address
- b. names of the proprietor, partners
- c. full company name and registered number, registered office and place of registration (if a company)

## Unit 202

## Productivity and quality assurance in desktop publishing (DTP) and pre-press

<b>UAN:</b>	<b>L/503/1772</b>
<b>Level:</b>	Level 2
<b>Credit value:</b>	4
<b>GLH:</b>	33
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by Proskills. It will be assessed via online multiple choice test.
<b>Aim:</b>	This unit is concerned with the theoretical understanding of DTP and pre-press processes, it looks at well defined tasks and the responsibilities within productivity, quality assurance and archiving of work, developing the knowledge required to deal with straight forward issues and problems which may arise.

<b>Learning outcome</b>	<b>The learner will:</b>
1. Understand the main activities and processes within the DTP and pre-press areas	
<b>Assessment criteria</b>	
The learner can:	
1.1 describe the <b>main activities</b> which are part of the DTP and pre-press process	
1.2 define the terms 'analogue' and 'digital'	
1.3 describe the roles and responsibilities of a pre-press/DTP operative	
1.4 describe the <b>types of image carriers</b> produced in pre-press for the different production printing processes.	

<b>Range</b>
<b>Main activities</b>
a. Data capture – all forms of electronic files plus hard copy (typed or hand written)
b. Scanning of images to disk or film
c. Colour correction and/or retouching
d. Page assembly
e. Imposition planning
f. Plate making/mastering/image setting
g. Proofing
h. Data archiving



**Types of image carriers**

- a. Plates for lithographic printing
- b. Cylinders for gravure printing
- c. Stencils for screen printing
- d. Plates for flexographic printing
- e. File masters for digital printing

<b>Learning outcome</b>	<b>The learner will:</b>
2.	Understand issues which affect profitable production and productivity
<b>Assessment criteria</b>	
The learner can:	
2.1	describe the importance of ensuring all jobs are producing profitably and meet customer requirements
2.2	describe the importance of working 'within tolerance' regarding timescales and standards
2.3	describe the importance of monitoring production to ensure the job is right first time
2.4	describe the <b>issues</b> which affect profitability and production.
2.5	describe the affect of inaccurate job instructions and serviceability of equipment on production output and profitability
2.6	describe the <b>key features</b> of production equipment being 'fit for production'
2.7	describe the importance of gaining authorisation prior to a job continuing to the next stage.

<b>Range</b>
<b>Issues</b>
<ol style="list-style-type: none"><li>a. Equipment is in serviceable condition, correctly calibrated and available for production</li><li>b. Accurate work instructions have been prepared and passed to those who will produce the job</li><li>c. Earlier operations or processes have been completed to the correct specification and standard</li></ol>
<b>Key features</b>
<ol style="list-style-type: none"><li>a. Clean – scanning surfaces, monitors, imaging heads, drums and any transport systems in the equipment must be free from dust or foreign particles</li><li>b. Lubricated – to ensure there is no unnecessary wear of moving parts</li><li>c. Maintained – in accordance with the manufacturer's instructions and specifications, so as to ensure safety of operation and satisfactory performance in operation</li></ol>

<b>Learning outcome</b>	<b>The learner will:</b>
3.	Know the main features of quality assurance and quality control systems
<b>Assessment criteria</b>	
The learner can:	
3.1 define a quality product	
3.2 describe what is meant by quality control and quality assurance	
3.3 identify the <b>types of quality control aids</b> commonly used in print production	
3.4 describe what <b>techniques</b> are included as part of a <b>quality assurance system</b> in print	
3.5 define the terms inspection, testing and sampling	
3.6 describe what is included as part of a quality assurance system in print	
3.7 define what is meant by ISO standards.	

<b>Range</b>
<b>Types of quality control aids</b>
a. Densitometers – transmission and reflection, dot meter, colour reference books/swatches (e.g. pantone), calibrated ruler, colour management software
<b>Techniques</b>
a. Inspection
b. testing
c. sampling
d. the use of input and output controls
<b>Quality assurance system</b>
a. Control of suppliers, receiving goods in, detailed operating procedures
b. A system for tracing production and controlling documentation
c. Arrangements for dealing with non-conforming products
d. Arrangements for internally auditing the quality system and procedures
e. Calibration and machine maintenance

<b>Learning outcome</b>	<b>The learner will:</b>
4.	Know the procedures for checking job specifications and identifying the DTP and/or pre-press work required
<b>Assessment criteria</b>	
The learner can:	
4.1 describe the term job specification	
4.2 describe the importance of clarifying uncertainties in job specifications	
4.3 describe why it is important for pre-press staff to have knowledge of the printing and post press requirements of a job	
4.4 describe how to <b>protect</b> a customer's artwork from loss or damage	
4.5 describe <b>the steps</b> to be taken when problems are identified with material supplied.	

<b>Range</b>
<p><b>Protect</b></p> <ol style="list-style-type: none"> <li>Labelling any originals and/or placing them in a labelled artwork bag</li> <li>Copying any original digital files to another storage media prior to opening</li> </ol> <p><b>The steps</b></p> <ol style="list-style-type: none"> <li>Referring the matter to a work colleague who has responsibility for such matters</li> <li>Contacting the customer to explain the problems and obtaining instructions on how to proceed, if agreed by your line manager</li> </ol>

<b>Learning outcome</b>	<b>The learner will:</b>
5.	Know the main types of proofs used and their role in the printing process
<b>Assessment criteria</b>	
The learner can:	
5.1 describe the purpose of a proof	
5.2 describe the <b>checks</b> that should be carried out on a proof	
5.3 describe what is meant by a low and high resolution proof	
5.4 identify the range of proofs available	
5.5 describe the importance of making the customer aware of proof limitations	
5.6 describe the importance of obtaining a signed proof.	

<b>Range</b>
<p><b>Checks</b></p> <ol style="list-style-type: none"> <li>Text layout</li> <li>spelling and grammar</li> <li>image resolution and quality</li> <li>page imposition</li> <li>correct font usage</li> <li>colour accuracy</li> <li>colour trapping</li> <li>overprinting and knockouts</li> </ol>

<b>Learning outcome</b>	<b>The learner will:</b>
6.	Understand the main reasons and methods for archiving DTP and pre-press work securely
<b>Assessment criteria</b>	
The learner can:	
6.1 describe the methods of storing and archiving customer's jobs	
6.2 describe why it is important for all items relating to a customer's job to be labelled during storage	
6.3 describe the importance of storing films, proofs and plates safely	
6.4 describe the importance of backing up digital files.	

## Unit 203

## Productivity, quality assurance and maintenance in machine printing and print finishing

<b>UAN:</b>	<b>K/503/1777</b>
<b>Level:</b>	Level 2
<b>Credit value:</b>	4
<b>GLH:</b>	32
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by Proskills. It will be assessed via online multiple choice test.
<b>Aim:</b>	This unit is concerned with theoretical understanding and defined tasks, of the issues which affect productivity and quality, including quality systems, production control and organisation, as well as ensuring that machinery and equipment is properly maintained to ensure it is available and fit for use when required.

<b>Learning outcome</b>	<b>The learner will:</b>
1.	Understand the issues which affect profitable production and productivity, and why these are important
<b>Assessment criteria</b>	
The learner can:	
1.1	describe the importance of producing all work profitably
1.2	describe how the profit on a job can be affected by time, standards, resources and waste
1.3	describe the effects of not completing work on time
1.4	identify the <b>key issues</b> which surround profitability
1.5	describe the importance of having production equipment in <b>serviceable condition</b>
1.6	outline the <b>process</b> to ensure materials for production are available and meet the job specification requirements
1.7	describe the importance of having a system of authorising the release of a job
1.8	identify the methods which ensure all those involved in production have the correct details to produce the job.

<p><b>Range</b></p> <p><b>Key issues</b></p> <ol style="list-style-type: none"> <li>Plant and equipment being in serviceable condition and available for production</li> <li>Correct materials for the job being available in the required quantity</li> <li>Accurate work instructions having been prepared and passed to those who will produce the job</li> <li>Previous operations or processes having been completed to the correct specification and standard</li> <li>Workers being properly trained and possessing the skills and knowledge necessary to do the work successfully</li> </ol> <p><b>Serviceable condition</b></p> <ol style="list-style-type: none"> <li>Clean – inks, coatings, substrate particles and solvents must not be contaminating rollers, Cylinders and surfaces which will come into contact with the product</li> <li>Lubricated – to ensure that moving parts of the equipment do not suffer unnecessary wear or damage</li> <li>Maintained – in accordance with the manufacturer’s instructions and specifications, so as to ensure safety of operation and satisfactory performance in operation</li> </ol> <p><b>Process</b></p> <p>An order from a supplier must have been raised or :</p> <ol style="list-style-type: none"> <li>the materials identified as being in stock, and</li> <li>at the time of delivery or stock allocation, the materials specification and quantity must have been carefully checked to confirm that they are correct</li> </ol>
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<b>Learning outcome</b>	<b>The learner will:</b>
2.	Understand the main features of quality assurance and quality control systems
<b>Assessment criteria</b>	
The learner can:	
2.1	define the term quality product
2.2	identify the factors that can affect quality of production output
2.3	define the terms quality control and quality assurance
2.4	describe the <b>methods of inspection</b> used to monitor finished output
2.5	define the term sampling
2.6	explain how a sampling plan can help improve the quality of production output
2.7	describe the purpose of a pass sheet
2.8	identify the <b>tools</b> used to help maintain a quality product
2.9	describe the <b>procedures</b> found within a quality assurance plan
2.10	explain how regular maintenance can help maintain consistency in production output
2.11	identify the external standards available to support quality assurance systems and policies within an organisation.

<b>Range</b>
<p><b>Methods of inspection</b></p> <ul style="list-style-type: none"> <li>a. Inspection</li> <li>b. Testing</li> <li>c. Sampling</li> <li>d. The use of input and output controls</li> </ul> <p><b>Tools</b></p> <ul style="list-style-type: none"> <li>a. Densitometer – transmission and reflection, dot meter, colour reference book/swatches (e.g. pantone), calibrated ruler, colour management software</li> </ul> <p><b>Procedures</b></p> <ul style="list-style-type: none"> <li>a. Receiving goods in</li> <li>b. Detailed operating procedures</li> <li>c. A system for tracing production and controlling documentation</li> <li>d. Arrangements for dealing with non-conforming products</li> <li>e. Arrangements for internally auditing the quality system and procedures</li> <li>f. Calibration and machine maintenance</li> </ul>

<b>Learning outcome</b>	<b>The learner will:</b>
3.	Understand the systems and documentation used to organise and control production
<b>Assessment criteria</b>	
The learner can:	
3.1	identify the <b>main categories</b> which production jobs for print fall into
3.2	explain the <b>process</b> a job will go through on receipt of the order, to ensure it is processed for production
3.3	describe the purpose of a visual loading board
3.4	describe the importance of monitoring the production process
3.5	identify the effects on the company and customer when a job falls behind in production
3.6	identify the <b>common causes</b> for delay in production
3.7	describe the purpose of a proof
3.8	describe the purpose of job bag/works docket
3.9	describe the importance of maintaining performance records of production output
3.10	describe the importance of correctly interpreting job instructions prior to production
3.11	describe the production reporting systems employed.

<b>Range</b>
<p><b>Main categories</b></p> <ul style="list-style-type: none"> <li>a. New jobs, reprints of previously printed jobs</li> <li>b. Amendments and changes to previously printed jobs</li> </ul> <p><b>Process</b></p> <ul style="list-style-type: none"> <li>a. The specification of the job is clearly understood, including size, quantity, number of colours, finishing method</li> <li>b. The time needed to produce the job is calculated and a delivery deadline agreed with the customer</li> <li>c. A written works order (also known as a works instruction ticket or job bag) will be produced containing all the information and instructions needed for those who are going to produce the job</li> <li>d. The materials needed for the job are identified and, where necessary, an order placed with a supplier</li> <li>e. A production plan is produced, listing all the processes and the sequence in which they will be undertaken</li> <li>f. A production schedule is produced, so that the workflow through the production departments is efficient and will guarantee that the delivery deadline is met</li> </ul> <p><b>Common causes</b></p> <ul style="list-style-type: none"> <li>a. Machines or equipment not being available for production because of breakdowns</li> <li>b. Machines or equipment not performing to the required standards because of a lack of maintenance, lubrication or cleaning</li> <li>c. Materials not being available in the required quantities at the time these are required</li> <li>d. Unplanned absence of staff</li> <li>e. Work being produced which does not meet the required standard</li> </ul>

<b>Learning outcome</b>	<b>The learner will:</b>
4.	Know the procedures for cleaning machinery and related equipment
<b>Assessment criteria</b>	
The learner can:	
4.1	describe the <b>purpose</b> of cleaning production equipment
4.2	describe the extent of operator responsibility with regard to cleaning
4.3	identify the manufacturer's requirements for cleaning equipment
4.4	describe the importance of referencing the production plan prior to cleaning of a machine
4.5	identify the correct cleaning materials required to carry out the job
4.6	describe the <b>health and safety requirements</b> which surround the safe cleaning of equipment
4.7	identify the operation checks necessary for safe start up of machinery after cleaning
4.8	identify the legislative requirements regarding the disposal of waste
4.9	describe the <b>procedures</b> for disposing of chemicals, solvents and special waste.

<b>Range</b>
<p><b>Purpose</b></p> <ol style="list-style-type: none"> <li>Ensure the efficient and effective working of the machinery</li> <li>Prevent damage or discolouration of the output</li> </ol> <p><b>Health and safety requirements</b></p> <ol style="list-style-type: none"> <li>Reference to the relevant Safety Data sheets to identify the potential hazards of any solvents</li> <li>The correct use of any personal protective equipment ensuring that the machinery is rendered safe</li> </ol> <p><b>Procedures</b></p> <ol style="list-style-type: none"> <li>Identifying the specified disposal method</li> <li>Clearly labelling the chemical or solvent</li> <li>Storing chemicals or solvents in correct conditions whilst awaiting disposal</li> <li>Obtaining consignment note from disposal contractor</li> </ol>

<b>Learning outcome</b>	<b>The learner will:</b>
5.	Understand lubrication schedules and the types of lubricants used with machinery and related equipment
<b>Assessment criteria</b>	
The learner can:	
5.1	describe the purpose of a lubrication schedule
5.2	identify the information which can be drawn from a lubrication schedule
5.3	describe the <b>purpose</b> of lubrication
5.4	identify the <b>main kinds</b> of lubricant
5.5	describe what an oil and a grease are used for
5.6	describe how lubricants differ in viscosity
5.7	explain how the viscosity of oil is measured
5.8	identify the <b>methods</b> of lubrication.

<b>Range</b>
<p><b>Purpose</b></p> <ol style="list-style-type: none"> <li>Reduce friction</li> <li>prevent wear</li> <li>prevent overheating of moving parts</li> </ol> <p><b>Main kinds</b></p> <ol style="list-style-type: none"> <li>Oil, grease</li> </ol> <p><b>Methods</b></p> <ol style="list-style-type: none"> <li>By hand, automatic</li> </ol>



<b>Learning outcome</b>	<b>The learner will:</b>
6.	Know the roles and responsibilities for maintaining machinery and related equipment
<b>Assessment criteria</b>	
The learner can:	
6.1	describe the <b>purpose</b> of maintaining machinery employed in the printing industry
6.2	describe the importance of following manufacturer's instructions when lubricating a piece of equipment
6.3	identify the machine operator's responsibilities with regards to maintaining and contributing to maintenance
6.4	describe the <b>reporting procedures</b> for maintenance in the workplace
6.5	explain the importance of maintaining machine maintenance records
6.6	identify what information should be recorded
6.7	describe the importance of considering the time involved to carry out maintenance.

<b>Range</b>
<b>Purpose</b>
a. Ensure the effective and efficient operation of the piece of machinery
b. Reduce wear and tear on the moving parts
c. Prolong the working life of the equipment
<b>Reporting procedures</b>
a. Analysis of the problem
b. An estimate of the probable amount of downtime
c. A report to the appropriate authority

<b>Learning outcome</b>	<b>The learner will:</b>
7.	Understand component replacement procedures for machinery and related equipment
<b>Assessment criteria</b>	
The learner can:	
7.1	describe the importance of working safely at all times
7.2	describe the importance of following organisation and manufacturer instructions
7.3	identify who has the authority to replace defective components
7.4	describe the operators' <b>responsibilities</b> with regard to component replacement
7.5	identify the limitations of operators' responsibilities with regards to Health and Safety regulations
7.6	describe the importance of changing defective components
7.7	identify the correct tools required to change components
7.8	describe the mechanical faults commonly encountered within the printing and print finishing environment
7.9	describe the <b>tools</b> used to remove and replace defective components.

**Range****Responsibilities**

- a. Cost of the component
- b. Safety aspects of replacing the component
- c. Cost and length of time required to replace the component
- d. Tasks involved in replacing component

**Tools**

- a. Screwdriver (Phillip/slot)
- b. Allen key or socket wrench
- c. Open ended spanner
- d. Ring spanner
- e. Box spanner
- f. Socket wrench
- g. Torque wrench/spanner
- h. Tommy bar

<b>UAN:</b>	<b>R/503/1787</b>
<b>Level:</b>	Level 2
<b>Credit value:</b>	4
<b>GLH:</b>	30
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by Proskills. It will be assessed via online multiple choice test.
<b>Aim:</b>	This unit is concerned with theoretical understanding of the principles of digital pre-press processes. It covers the defined tasks of conversion of originals to digital files, imposition and layout for print, creation of image carriers, digital proofing, pre-flighting and ripping of files, developing the knowledge required to deal with straight forward issues and problems which may arise.

<b>Learning outcome</b>	<b>The learner will:</b>
1.	Know the hardware and software systems typically used in pre-press
<b>Assessment criteria</b>	
The learner can:	
1.1	define the term pre-press
1.2	identify the <b>hardware</b> used in digital pre-press production
1.3	identify the <b>software applications</b> used in pre-press
1.4	describe the importance of calibrating hardware such as computer monitors and computers to plate devices
1.5	define RGB and CMYK colour modes
1.6	identify the different formats colour images may exist in.

<b>Range</b>
<b>Hardware</b>
a. Computer platform – e.g. PC, MAC
b. Display (screen or monitor)
c. Graphic pen tablets
d. Low resolution printers (e.g. desktop inkjet or laser, black and white or colour)
e. High resolution printers (e.g. proofing printers)
f. Image setters/film recorders/CTP systems
g. Scanners: flatbed / drum
h. Removable storage media
i. Raster Image Processor (RIP)

<p><b>Software applications</b></p> <p>a. Word processing, Photo-editing, Drawing, Page make up</p> <p>b. Scanning, colour management, electronic imposition</p> <p>c. Portable Document Format (PDF) creation</p> <p>d. RIP, Pre-flighting, Files transfer, e.g. e-mail, the Internet, ISDN</p>
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<b>Learning outcome</b>	<b>The learner will:</b>
2.	Understand the basic principles of converting originals into digital files
<b>Assessment criteria</b>	
The learner can:	
2.1	describe the <b>terminology</b> used in digital reproduction
2.2	describe the term image resolution
2.3	explain how image resolution effects the printed output
2.4	define the term bitmap
2.5	identify the different types of scanner and their basic operation
2.6	describe the basic principles for the reproduction of an original image into a digital format
2.7	interpret how a CMYK colour can be given a value against a colour chip or chart
2.8	define what is meant by highlight, shadow and mid tone
2.9	distinguish between brightness and contrast
2.10	define the terms GCR and UCR
2.11	define 'dot gain'
2.12	describe the term 'colour gamut'
2.13	identify the <b>factors</b> to be considered when correcting an image.

<b>Range</b>
<b>Terminology</b> Screening, screen angle, screen ruling, image resolution, bitmap, vector
<b>Factors</b> Contrast, sharpness, colour cast, dust and scratches

<b>Learning outcome</b>	<b>The learner will:</b>
3.	Know the basic principles of layout and imposition, including the use and placement of the basic marks
<b>Assessment criteria</b>	
The learner can:	
3.1	define the term imposition
3.2	describe the factors to be considered when preparing an imposition scheme
3.3	identify the common paper sizes identified under ISO
3.4	describe how the 'A' series paper sizes can be subdivided
3.5	identify the most common <b>methods of working</b> when producing a printed sheet
3.6	describe what is meant by work and turn and work and tumble
3.7	describe what is meant by sheet work and half sheet work

- 3.8 identify the **items** which need to be taken into account when preparing template/layout
- 3.9 describe why these items are important to the production of the printed copy
- 3.10 describe the importance of identifying the 'lay edge' when creating a layout for print
- 3.11 identify the **areas** which need to be calculated when preparing an imposition
- 3.12 describe the **factors** to be considered when planning multiple images/step and repeat.

### Range

#### Methods of working

- a. Sheet work
- b. half sheet work
- c. work and turn
- d. work and tumble

#### Items

- a. The image dimensions
- b. Allowances (clamp, grip and trim) for use during printing and finishing operations

#### Areas

- a. Plate clamp and sheet grip allowances, centre line
- b. Page dimensions

#### Factors

- a. That all repeat images are identical
- b. That all repeat images are positioned accurately

Learning outcome	The learner will:
4.	Know the principles involved in the production of image carriers
<b>Assessment criteria</b>	
The learner can:	
4.1	describe the advantages and disadvantages of using digital image carrier reproduction for print
4.2	describe the <b>factors</b> to consider when selecting an appropriate image carrier for print
4.3	describe why image resolution is an important factor when outputting an image carrier
4.4	describe how the use of lines, dots or type can achieve the desired appearance in print
4.5	describe the image carriers used across the print production processes
4.6	describe the importance of checking the image carrier after preparation
4.7	identify the <b>methods</b> used to verify that the finished image carrier is fit for purpose.

<b>Range</b>
<p><b>Factors</b></p> <ul style="list-style-type: none"> <li>a. Shelf life of the image carrier</li> <li>b. Production time to produce the image carrier</li> <li>c. Image resolution requirements</li> </ul> <p><b>Methods</b></p> <ul style="list-style-type: none"> <li>a. Visual inspection, e.g. dot glass, control strip</li> <li>b. Measurement, e.g. dot meter</li> </ul>

<b>Learning outcome</b>	<b>The learner will:</b>
5.	Know the principles involved in the production of digital proofs
<b>Assessment criteria</b>	
The learner can:	
5.1	describe the purpose of a proof
5.2	identify the <b>types of proof</b> used in print
5.3	describe the <b>benefits and limitations</b> of the range of proofs
5.4	identify what checks are taken prior to proof output
5.5	identify the <b>printer aids</b> which are available to calibrating proofing devices
5.6	describe why the customer should be aware of the proofing limitations
5.7	explain why output of a file to different devices may result in a difference in print appearance.

<b>Range</b>
<p><b>Types of proof</b></p> <ul style="list-style-type: none"> <li>a. Low resolution proof – Laser output, inkjet</li> <li>b. High resolution proof – Chromalin</li> </ul> <p><b>Benefits and limitations</b></p> <ul style="list-style-type: none"> <li>a. Shelf life of the image carrier</li> <li>b. Production time to produce the image carrier</li> <li>c. Image resolution requirements</li> <li>d. Colour match to press</li> </ul> <p><b>Printer aids</b></p> <ul style="list-style-type: none"> <li>a. Colour measurement devices</li> <li>b. Colour reference guides</li> <li>c. Grey balance test prints</li> </ul>

<b>Learning outcome</b>	<b>The learner will:</b>
6.	Know the basic principles of pre-flighting and ripping files in digital pre-press
<b>Assessment criteria</b>	
The learner can:	
6.1	describe the <b>elements</b> to be checked in a digital pre-press document
6.2	define the term 'pre-flight checks'
6.3	identify the <b>pre-flight checks</b> a job should go through prior to production output
6.4	define the term 'postscript'
6.5	define the term 'PDF'
6.6	define the term 'RIP'
6.7	describe the <b>elements</b> which should be checked prior to ripping a file.

<b>Range</b>
<p><b>Elements</b></p> <ul style="list-style-type: none"> <li>a. Final size reproduction</li> <li>b. Font usage / list</li> <li>c. Image usage / list</li> <li>d. Location of images</li> <li>e. Number and names of colour separations</li> </ul> <p><b>Pre-flight check</b></p> <ul style="list-style-type: none"> <li>a. Checking that all fonts are present and available</li> <li>b. Checking that all images are present and the correct colour mode and resolution</li> <li>c. Checking that the document setup/page size is correct</li> <li>d. Checking the appearance against the signed off proof</li> </ul> <p><b>Elements</b></p> <ul style="list-style-type: none"> <li>a. Page orientation</li> <li>b. Presence and position of printer's marks</li> <li>c. Colour separation into correct number of colours</li> <li>d. Right/wrong-reading</li> <li>e. Positive/negative</li> <li>f. Correct fonts</li> <li>g. Resolution of images</li> </ul>

<b>UAN:</b>	<b>K/503/1794</b>
<b>Level:</b>	Level 2
<b>Credit value:</b>	4
<b>GLH:</b>	32
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by Proskills. It will be assessed via online multiple choice testing.
<b>Aim:</b>	This unit is concerned with developing an understanding of the requirements regarding design and production of Desktop Publishing documents. It includes taking responsibility and well defined steps toward preparing and agreeing a design task. Consideration is given to the use of type, photographs and other images, digital image manipulation, document layout and use of colour, proofing and pre-flighting jobs prior to print.

<b>Learning outcome</b>	<b>The learner will:</b>
1.	Know the main issues affecting the design of DTP documents
<b>Assessment criteria</b>	
The learner can:	
1.1	describe the <b>factors</b> to consider before commencing work on a DTP task
1.2	describe <b>each stage</b> involved in producing a job using a DTP system
1.3	define the term <b>corporate identity</b>
1.4	define the term house style
1.5	identify the <b>checks</b> that should be carried out when producing DTP documents.

<b>Range</b>
<b>Factors</b>
a. The purpose of the document – e.g. to inform, invite, entertain
b. The target audience – who will receive and read the document
c. The information needed to be contained in the document
d. The illustrations or images to be used in the document (if any)
<b>Each stage</b>
a. Finding out what is required by the customer and obtaining clear instructions



- b. Identifying a suitable style for the document e.g. by looking at similar types of work, considering any templates available, finding out about any corporate identities or house styles
- c. Checking how much text or copy has to be fitted in the document
- d. Identifying how the text or copy is structured and the relative prominence that should be given to each word, sentence, paragraph etc
- e. Preparing visual draft layouts for discussion with the customer
- f. Producing the document in the agreed style and submitting proofs for approval

**Corporate identity**

- a. One or more logos/images and directions for their use/position/size
- b. A particular typeface and directions for use/style
- c. One or more colours with directions for their use either as mono, spot colour or process colour

**Checks**

- a. All the text and pictures are available
- b. Hard copy proofs of all work are available
- c. All the layout design instructions are available

<b>Learning outcome</b>	<b>The learner will:</b>
2.	Understand the operation of hardware and software systems typically used in DTP
<b>Assessment criteria</b>	
The learner can:	
2.1	describe the function of the hardware used within DTP
2.2	identify the <b>range of software</b> and the application they are used for
2.3	list the possible outcomes when hardware and software are incompatible
2.4	identify where to seek advice and guidance when setting up a DTP system
2.5	describe the <b>methods</b> of transferring digital documents between computers.

<b>Range</b>
<b>Range of software</b>
a. Word processing
b. Photo-editing (for bitmap images)
c. Drawing/illustration (for vector images)
d. Page make up (DTP)
e. Scanning
f. PDF (Portable Document Format) creation
g. E-mail
h. Compression, e.g. ZIP
<b>Methods</b>
a. A local area network (LAN)

- b. Wi-fi
- c. Removable media, e.g. CD, memory sticks, DVD and external hard drives,
- d. E-mail / the Internet

<b>Learning outcome</b>	<b>The learner will:</b>
3.	Understand the creation of digital fonts and how they are applied in DTP
<b>Assessment criteria</b>	
The learner can:	
3.1	define the terminology used in the creation and design of fonts
3.2	describe the <b>constituent parts</b> of a typographic letter which contributes to the creation of a font
3.3	define the <b>terminology</b> given to the alignment of text
3.4	describe what <b>typographical attributes</b> should be considered when preparing and selecting text for a document
3.5	describe the variable <b>characteristics</b> which can be applied to type
3.6	describe the <b>copyright law</b> with regard to the use of fonts
3.7	describe how type designs can be broken down into a range of families covering serif and sans serif types
3.8	describe the digital formats used for fonts
3.9	define what is meant by a true type font
3.10	describe the <b>file formats</b> used for saving text
3.11	describe how a computer keyboard allows for all the characters and symbols to be produced.

<b>Range</b>
<b>Constituent parts</b>
a. An 'x' height - the size of the lowercase letters, excluding ascenders and descenders
b. Base line - the line on which all the characters sit
c. The ascender - the part of the character above the 'x' height
d. The descender - the part of the character below the 'x' height
<b>Terminology</b>
a. Aligned left – producing a straight line down the left hand side of the page
b. Aligned right - producing a straight line down the right hand side of the page
c. Centred – where each line has a space of equal distance on both sides
d. Fully justified - producing a straight line down the left and right hand sides of the page
<b>Typographical attributes</b>
a. Font or type style
b. Font size
c. Interline spacing/leading
d. Font colour
e. Bold or italic styles

- f. Upper or lower case
- g. Inter word spacing
- h. Spacing for paragraph indents
- i. Spacing for above or below headings

**Characteristics**

- a. Style
- b. weight
- c. width
- d. size

**Copyright law**

- a. they may not be installed on a computer unless a license has been purchased, by the user, allowing the font to be so installed
- b. they may not be copied or adapted without the permission of the owner
- c. they may not be sent to another individual or company for further use (e.g. Printing) unless it is embedded within a document in such a way that any use as a free-standing font will be impossible

**File formats**

- a. .txt
- b. .rtf
- c. .doc

Learning outcome	The learner will:
4. Know the main issues connected with the creation, editing and use of digital images	
<b>Assessment criteria</b>	
The learner can:	
4.1	describe the <b>images</b> used within the design of a job
4.2	describe the different <b>methods</b> of obtaining and creating digital images available
4.3	identify the <b>techniques</b> used to improve the appearance and impact of images and graphics
4.4	describe the <b>key advantages</b> of being able to manipulate an image
4.5	describe the <b>file formats</b> used for saving graphics
4.6	describe the advantages of compressing bitmap images
4.7	define the <b>terminology</b> used in the creation of digital images
4.8	describe why consideration should be given to 'resolution' when working with images
4.9	outline the effects of using the 'wrong resolution'
4.10	describe the effects of brightness control and contrast control.

<b>Range</b>
<b>Images</b>
a. Illustrations, photographs, charts and diagrams
b. Decorative borders or ornaments

### Methods

- a. Copyrighting free clip-art images
- b. Licensing use of copyright images, e.g. from photo image libraries
- c. Scanning of copyright free art work publications
- d. Creating bit-mapped images
- e. Creating vectored draw-type line images
- f. Using digital cameras, (still or video)

### Techniques

- a. Cropping the graphic to show a part or small section
- b. Rotating the graphic to any angle
- c. Changing the colours of the graphic
- d. Wrapping text around the graphic

### Key advantages

- a. Enhancing images to make them clearer or more easily reproduced
- b. Modifying images to create visual effects

### File formats

- a. TIFF (Tag Image Format File)
- b. JPEG (Joint Photographic Expert Group)
- c. EPS (Encapsulation PostScript)
- d. BMP (Bitmap)
- e. GIF (Graphics Interchange Format)

### Terminology

- a. Screening, screen ruling, image resolution, bitmap, vector

Learning outcome	The learner will:
5.	Know the main issues connected with colour in DTP documents
Assessment criteria	
The learner can:	
5.1	identify the <b>colour models</b> in use when using DTP systems
5.2	describe the effects of producing documents which contain the wrong 'colour model' for the intended output
5.3	describe the importance of converting all colours in a document into the correct colour mode prior to output
5.4	describe why colour seen on a screen appears different to the printed output
5.5	describe the <b>steps</b> which can be taken to 'reduce the risk' of unexpected colour differences between screen and printed output
5.6	define the <b>terminology</b> used in DTP relating to colour control
5.7	describe what is meant by colour separation
5.8	describe how the viewing conditions have an effect on colour matching and selection.

<b>Range</b>
<p><b>Colour models</b></p> <ul style="list-style-type: none"> <li>a. CMYK - Cyan, Magenta, Yellow and Black (Key)</li> <li>b. RGB - Red, Green and Blue</li> <li>c. A spot colour matching standard system – e.g. Pantone, Focal Tone</li> </ul> <p><b>Steps</b></p> <ul style="list-style-type: none"> <li>a. Ensuring all printers and monitors are colour calibrated</li> <li>b. Ensuring that colour management software and colour profiles are correctly installed and configured within the system</li> </ul> <p><b>Terminology</b></p> <ul style="list-style-type: none"> <li>a. Trapping, knockout, overprint</li> </ul>

<b>Learning outcome</b>	<b>The learner will:</b>
6.	Understand the principles of setting up and laying out documents in DTP
<b>Assessment criteria</b>	
The learner can:	
6.1	identify the basic <b>information</b> required to set up a DTP document
6.2	explain the reasons for setting up page templates
6.3	describe the importance of ensuring the page numbering on a layout matches the imposition
6.4	describe the influencing <b>factors</b> of page layout
6.5	describe the purpose of using frames and boxes when producing a document for print
6.6	describe how a document must be set up to allow for 'bleed' on the printed job
6.7	define the terminology used in DTP relating to page layout and design
6.8	describe the <b>purpose</b> of embedding graphic images
6.9	identify the sources of help available when producing documents using DTP.

<b>Range</b>
<p><b>Information</b></p> <ul style="list-style-type: none"> <li>a. Portrait or landscape orientation</li> <li>b. Page size</li> <li>c. Single or double sided pages</li> <li>d. Output destination</li> <li>e. Number of colours permissible</li> <li>f. Document purpose</li> </ul> <p><b>Factors</b></p> <ul style="list-style-type: none"> <li>a. The page width of the document</li> <li>b. The type size</li> <li>c. Any house style for the publication</li> <li>d. The use of the document</li> </ul>

<p><b>Purpose</b></p> <ul style="list-style-type: none"> <li>a. Linking images leaves the high resolution image file outside the publication and uses a low resolution header in the image file for display purposes in the document</li> <li>b. Linking images results in a small DTP native file, because the image files are not included in it</li> <li>c. Linked images have to be supplied separately as well as the DTP document if it is sent for printing elsewhere</li> </ul>
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<b>Learning outcome</b>	<b>The learner will:</b>
7.	Understand the main issues connected to proofing and pre-flighting DTP documents

<b>Assessment criteria</b>
<p>The learner can:</p> <ul style="list-style-type: none"> <li>7.1 describe the <b>purpose</b> of a proof</li> <li>7.2 explain the <b>sequence of proofing</b> within an organisation</li> <li>7.3 describe the items which need to be checked on a proof</li> <li>7.4 .explain why it is important the customer understands the limitations of the proof</li> <li>7.5 describe what is meant by a 'pre-flight check'</li> <li>7.6 identify the main proofing methods in use</li> <li>7.7 describe the difference between the proofing systems, outlining the benefits and issues</li> <li>7.8 describe the importance of supplying a hard copy proof as well as in digital format</li> <li>7.9 describe the importance of obtaining a customer signature and date prior to output of the job.</li> </ul>

<b>Range</b>
<p><b>Purpose</b></p> <ul style="list-style-type: none"> <li>a. Presentation visual - material prepared as a sample of the proposed final appearance of a printed work</li> <li>b. Page proof - a proof of a completed page of document that has been assembled and composed in a DTP system</li> <li>c. Press proof - the last proof to be read before giving authorisation for printing</li> </ul> <p><b>Sequence of proofing</b></p> <ul style="list-style-type: none"> <li>a. Images and captions being correctly positioned and matched</li> <li>b. Correct spelling of words and names</li> <li>c. Accuracy of any numbers such as telephone or fax numbers</li> <li>d. Text flow</li> <li>e. Colours appearing as expected</li> </ul>

<b>UAN:</b>	<b>D/503/1761</b>
<b>Level:</b>	Level 2
<b>Credit value:</b>	4
<b>GLH:</b>	33
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by Proskills. It will be assessed via online multiple choice test.
<b>Aim:</b>	This unit is concerned with theoretical understanding of the main printing processes. It defines tasks within the make ready procedure, knowledge of their process capabilities, materials used and the common faults.

<b>Learning outcome</b>	<b>The learner will:</b>
1.	Understand the printing processes used in machine printing and their main characteristics
<b>Assessment criteria</b>	
The learner can:	
1.1	describe the basic principles of each of the <b>main printing processes</b>
1.2	identify the surface <b>characteristics</b> of the image carriers in use
1.3	define the terms 'sheet fed' and 'web fed'
1.4	define what is meant by 'item fed'
1.5	describe the <b>types</b> of printing presses giving consideration to the press capabilities, construction and design.

<b>Range</b>
<p><b>Main printing processes</b></p> <ul style="list-style-type: none"> <li>a. Lithography</li> <li>b. Flexography</li> <li>c. Photogravure</li> <li>d. screen process</li> <li>e. letterpress</li> <li>f. Digital pad</li> </ul> <p><b>Characteristics</b></p> <ul style="list-style-type: none"> <li>a. Lithography - planographic</li> <li>b. Flexography - relief</li> <li>c. Photogravure – intaglio</li> <li>d. Screen process – stencil</li> </ul>

<ul style="list-style-type: none"> <li>e. Letterpress – relief</li> <li>f. Digital - non contact</li> <li>g. Pad – pad</li> </ul> <p><b>Types</b></p> <ul style="list-style-type: none"> <li>a. single or multi-unit presses</li> <li>b. common impression, satellite and tandem presses</li> <li>c. common blanket presses</li> <li>d. perfecting presses</li> </ul>
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<b>Learning outcome</b>	<b>The learner will:</b>
2.	Understand the ink/coating and drying systems commonly used in machine printing
<b>Assessment criteria</b>	
The learner can:	
2.1	describe the different <b>types of ink</b> in use and the inking systems used to apply the ink to the image carrier
2.2	identify the <b>health and safety considerations</b> associated with drying equipment
2.3	describe the <b>function</b> of the main component parts of an inking system employed with each printing process
2.4	identify the <b>methods</b> of applying coatings and materials which assist in the drying process
2.5	describe the basic <b>component parts</b> of an ink
2.6	describe the main <b>methods</b> by which inks and coatings dry
2.7	define the term ‘viscosity’
2.8	describe how viscosity can influence the printability of an ink
2.9	describe how viscosity is measured using a range of <b>instruments</b> .

<b>Range</b>
<p><b>Types of ink</b></p> <ul style="list-style-type: none"> <li>a. multi-roller - litho and letterpress</li> <li>b. drum storage - litho and letterpress</li> <li>c. doctor blade – gravure and flexography</li> <li>d. ink curtain/spray – flexography and gravure</li> <li>e. applicator roller - gravure</li> <li>f. anilox roller - flexography</li> <li>g. squeegee and flow-coat - screen</li> <li>h. electrostatic charge - digital</li> <li>i. others - pad, ink jet</li> </ul> <p><b>Health and safety considerations</b></p> <ul style="list-style-type: none"> <li>a. safety data sheets</li> <li>b. emissions to the atmosphere - CO2, ozone etc</li> <li>c. guarding of dangers</li> <li>d. heat – burns, fires</li> <li>e. material safe storage and handling</li> <li>f. solvent – flash point, toxicity, dermatitis, narcotic effects</li> <li>g. ultra violet (UV) – ozone, eye damage</li> </ul>



**Function**

- a. lithography and letterpress:
  - i ink duct and roller
  - ii duct keys
  - iii distributing roller
  - iv vibrator/transfer roll
  - v oscillating roller
  - vi plate roller
  - vii storage rollers
- b. gravure and flexography:
  - i ink tank
  - ii applicator roller
  - iii doctor blade
  - iv anilox roller
  - v ink curtain
- c. screen:
  - i frame
  - ii flow coater
  - iii squeegee
  - iv coolers
  - v inkjet/drop
  - vi thermal
  - vii dye sublimation
  - viii other processes:
    - ix toner tray
    - x coroner charger
    - xi laser

**Methods**

- a. roller coater
- b. knife coater
- c. relief image (printing)
- d. planographic image
- e. stencil
- f. dusting

**Component parts**

- a. pigment to provide the colour
- b. vehicle or carrier
- c. additives for special properties
- d. driers to assist drying

**Methods**

- a. conventional – oxidation polymerisation, quick-set
- b. absorption - cold set inks
- c. evaporation – heat assisted
- d. heat set - gas jet/combustion
- e. ultra violet - polymerisation
- f. electron beam - polymerisation
- g. infra red - energy set

<p><b>Instruments</b></p> <ul style="list-style-type: none"> <li>a. efflux cups</li> <li>b. ford</li> <li>c. shell</li> <li>d. zahn</li> <li>e. viscometers</li> </ul>
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Learning outcome	The learner will:
3.	Understand the properties and characteristics of the materials commonly used in machine printing
<b>Assessment criteria</b>	
The learner can:	
3.1	identify the <b>printing substrates</b> in use
3.2	describe the <b>ISO paper sizes</b> and what they are used for
3.3	define the term 'imposition'
3.4	identify the standard impositions in common use
3.5	identify the key <b>component parts</b> to a layout/imposition
3.6	identify the common ' <b>methods of working</b> '
3.7	explain the relationship between the method of working and the imposition scheme
3.8	describe the terms used to explain the weight, size and finish on a substrate
3.9	define the term 'grain direction' and why it should be considered prior to printing
3.10	define the term 'relative humidity' and how it is measured
3.11	describe the <b>effects</b> of humidity on the substrate
3.12	describe the optimum conditions and the tools used to monitor the press room conditions
3.13	identify the characteristics of <b>plastics</b> commonly used
3.14	describe the term 'polymer'
3.15	identify the <b>metals</b> used regularly
3.16	describe how <b>light</b> is used to change the state of various coatings.

<b>Range</b>
<b>Printing substrates</b>
<ul style="list-style-type: none"> <li>a. paper</li> <li>b. board</li> <li>c. plastics</li> <li>d. polymers</li> <li>e. fabric</li> <li>f. metal</li> <li>g. glass</li> <li>h. ceramic</li> <li>i. wood</li> </ul>
<b>ISO paper sizes</b>
<ul style="list-style-type: none"> <li>a. A series – printing requirements</li> <li>b. B series – a series that falls between the A sizes (B3 falls between A3 and A2) originally developed for posters and map printing</li> </ul>

- c. C series – envelopes (A4 documents require a C4 envelope if you do not wish to fold the A4 sheets)

**Component parts**

- a. page position
- b. head margins
- c. gutter margins
- d. spine margins
- e. trim allowances
- f. grip or sheet transfer allowances

**Methods of working**

- a. sheet work
- b. half sheet work
- c. work and turn
- d. work and tumble

**Effects**

- a. temperature
- b. moisture content
- c. dimensional stability of paper
- d. strength of paper

**Plastics**

- a. natural and man made/synthetic polymers and rubbers
- b. thermo setting plastics and resins
- c. thermoplastic plastics and resins
- d. vulcanised rubbers and polymers used for rollers and offset blankets
- e. photopolymers used as light sensitive coatings

**Metals**

- a. aluminium for litho plates
- b. copper for gravure cylinders, ink rollers
- c. stainless steel for cylinders and rollers
- d. chrome for damping rollers, image carrier material

**Light**

- a. light hardening
- b. light softening
- c. polymerisation

<b>Learning outcome</b>	<b>The learner will:</b>
4.	Know make-ready and operating procedures for machine printing production
<b>Assessment criteria</b>	
The learner can:	
4.1	describe the basic <b>component parts</b> of a printing press
4.2	describe the purpose of a job bag/works docket

- 4.3 identify the **information** to be found on a job bag/works docket
- 4.4 identify the types of resources required to set up and operate a printing press
- 4.5 describe the **procedures** to follow to set up and operate a printing press
- 4.6 identify the types of information which should be recorded and monitored for quality purposes.

### **Range**

#### **Component parts**

- a. machine substrate store, feeder pile or reel stand
- b. substrate in feed system and control
- c. substrate registration
- d. process and impression units
- e. substrate transport/transfer
- f. drying unit
- g. delivery/output
- h. ancillary operations
- i. image quality and control systems

#### **Information**

- a. customer name and job number/identification code
- b. substrate type, size and location
- c. length of run
- d. number and specification of colours, inks and quantities
- e. method of working
- f. proofs and other samples
- g. time allocation/delivery date
- h. authority to proceed

#### **Procedures**

- a. identifying and clarifying the job instructions
- b. obtaining the materials (e.g. ink, substrate, image carrier) for production
- c. setting substrate transport
- d. setting the output/delivery devices
- e. preparing and fitting the image carrier(s)
- f. preparing the inking system
- g. running the press to obtain print and identify correct position and fit
- h. obtaining colour and image quality
- i. obtaining pass sheet and gaining authority to begin production run
- j. running off required number of copies at production speed (taking samples, diagnosing and rectifying print faults)
- k. completing appropriate quality control and production documentation/information
- l. cleaning down press and preparing for next job
- m. carrying out maintenance as scheduled or necessary

<b>Learning outcome</b>	<b>The learner will:</b>
5.	Understand the purpose and procedures for quality control in machine printing
<b>Assessment criteria</b>	
The learner can:	
5.1	identify the factors that can affect the quality of production output
5.2	describe the purpose of quality control in machine printing
5.3	identify the <b>key items</b> on the product output to be monitored
5.4	describe the <b>methods</b> of testing/inspection used to monitor printed output
5.5	identify the <b>special patches</b> which appear on the image carrier to assist the printer in monitoring the standards
5.6	define the term 'sampling'
5.7	describe how a sampling plan can help improve the quality of production output
5.8	describe the purpose of a 'pass sheet'
5.9	explain how regular maintenance in the printing workshop can help maintain consistency in production output.

<b>Range</b>
<p><b>Key items</b></p> <ul style="list-style-type: none"> <li>a. suitability and quality of the image carrier</li> <li>b. position and fit on the substrate</li> <li>c. substrate registration (sheet to sheet/unit to unit)</li> <li>d. correct colour hue and saturation</li> <li>e. image resolution and sharpness</li> <li>f. surface characteristics matt/gloss</li> <li>g. tone reproduction</li> <li>h. presence of regular and irregular marks and blemishes</li> <li>i. consistency of production</li> <li>j. correct size and format, section, cut off, fold etc</li> </ul> <p><b>Methods</b></p> <ul style="list-style-type: none"> <li>a. broad head micrometers</li> <li>b. colorimeters</li> <li>c. colour viewing booths</li> <li>d. densitometers</li> <li>e. drying time tester</li> <li>f. dyne tester</li> <li>g. grain direction test</li> <li>h. magnetic ink oscilloscope</li> <li>i. rub testers</li> <li>j. shore meter</li> <li>k. special lighting conditions</li> <li>l. spectro-photometers</li> <li>m. tack meter</li> <li>n. tensile strength tester</li> <li>o. tension meter</li> </ul>

<p>p. viscometers</p> <p>q. visual display monitors</p> <p><b>Special patches</b></p> <p>a. solid patches for colour and trapping</p> <p>b. print register marks for register and fit</p> <p>c. cut/tick marks for cutting and folding guides</p> <p>d. front and side lay marks for substrate register, grip and lay edge</p> <p>e. step wedges for correct plate /master exposure and engraving</p> <p>f. slur guide for substrate or image movement</p> <p>g. star target for correct image contact at exposure, slurs and dot gain</p> <p>h. dot gain scales for dot gain</p> <p>i. micro lines for correct exposure/engraving, image resolution and print reproduction</p> <p>j. halftone scales for correct exposure/engraving dot gain, image reproduction, grey balance</p>
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<b>Learning outcome</b>	<b>The learner will:</b>
6.	Know the common print faults, causes and remedies associated with machine printing processes
<b>Assessment criteria</b>	
The learner can:	
6.1	describe the common <b>printing faults</b> and how they can be identified
6.2	describe how <b>printing faults</b> can be corrected
6.3	explain the affects on the company and customer when faults are not recognised during the production.

<b>Range</b>
<p><b>Printing faults</b></p> <p>a. set off/blocking</p> <p>b. dot gain and loss</p> <p>c. slur/image distortion</p> <p>d. strike through</p> <p>e. show through</p> <p>f. picking</p> <p>g. fluffing</p> <p>h. creasing</p> <p>i. spots and blemishes</p> <p>j. ghosting, ink coverage</p> <p>k. ghosting</p> <p>l. tracking</p> <p>m. mottle</p>

<b>Learning outcome</b>	<b>The learner will:</b>
7.	Know the in-line and off-line converting operations commonly undertaken in machine printing departments
<b>Assessment criteria</b>	
The learner can:	
7.1	define the terms in-line and off-line with regard to converting operations
7.2	identify <b>'in-line' ancillary operations</b>
7.3	identify <b>'off-line' ancillary operations</b>
7.4	describe the <b>advantages</b> of 'in-line' and 'off-line' processes
7.5	describe the <b>disadvantages</b> of the in-line and off-line processes
7.6	describe the purpose of an in-line drying facility employed on multi-colour printing presses
7.7	describe the converting and binding operations undertaken across printing processes
7.8	define the <b>terminology</b> used in converting operations
7.9	identify the ancillary operations employed on web fed, sheet fed and continuous stationery presses
7.10	describe the converting and/or binding operations undertaken over a range of <b>printed products</b> .

<b>Range</b>
<p><b>'In-line' ancillary operations</b></p> <ul style="list-style-type: none"> <li>a. trimming</li> <li>b. folding</li> <li>c. slitting</li> <li>d. laminating</li> <li>e. die cutting</li> <li>f. embossing – foil blocking</li> <li>g. perforating</li> <li>h. punching</li> <li>i. numbering</li> <li>j. varnishing</li> <li>k. creasing</li> </ul> <p><b>'Off-line' ancillary operations</b></p> <ul style="list-style-type: none"> <li>a. encapsulation</li> <li>b. round cornering</li> <li>c. eyeletting</li> <li>d. cording</li> <li>e. envelope stuffing</li> <li>f. carton and box folding</li> <li>g. gluing</li> <li>h. scoring</li> <li>i. palletising</li> <li>j. carton and box folding and gluing</li> </ul>

**Advantages**

- a. cost savings
- b. reduced handling of the product
- c. completion of the product in one pass of press
- d. maximisation in the use of resources, staff and equipment
- e. product orientated

**Disadvantages**

- a. less flexibility
- b. production being disrupted if breakdowns occur
- c. printers requiring wider range of skills
- d. the high capital cost of larger equipment
- e. a reduction in press running speeds
- f. longer set up times

**Terminology**

- a. slitting
- b. folding
- c. sheeting
- d. coating
- e. creasing
- f. perforating
- g. die cutting/cutting and creasing
- h. punching
- i. stapling/stitching
- j. re-reeling
- k. numbering
- l. crimping
- m. stacking
- n. palletising
- o. varnishing
- p. laminating
- q. scoring

**Printed products**

- a. magazines – slitting, folding, securing and trimming
- b. mail order catalogues – slitting, folding, securing and trimming
- c. luggage tags – punching
- d. labels – punching
- e. direct mail – folding, securing and trimming
- f. stationery – embossing and foil blocking
- g. tickets – numbering
- h. cereal packets – die cutting, creasing, folding and gluing
- i. sales literature – laminating
- j. liquid containers – laminating
- k. tobacco packaging – die cutting, creasing, folding and gluing
- l. invitations – embossing
- m. travel brochures – slitting, folding, securing and trimming
- n. invoices, bills and statements – numbering and trimming
- o. cheque books – numbering, securing, trimming



- p. diaries – embossing, foil blocking, securing and trimming
- q. lottery ticket and scratch cards – numbering and trimming

## Unit 207

## Mechanised print finishing and binding

<b>UAN:</b>	<b>H/503/1762</b>
<b>Level:</b>	Level 2
<b>Credit value:</b>	4
<b>GLH:</b>	28
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by Proskills. It will be assessed via online multiple choice test.
<b>Aim:</b>	This unit is concerned with developing theoretical understanding of the processes involved in all aspects of mechanised print finishing and binding. It covers defined tasks including material identification, machine operations and control of output and develops the knowledge required to deal with straight forward issues and problems which may arise.

<b>Learning outcome</b>	<b>The learner will:</b>
1.	Know the terminology commonly used for imposition and folding schemes in mechanised print finishing and binding
<b>Assessment criteria</b>	
The learner can:	
1.1	identify the ISO paper sizes in regular use within the printing industry
1.2	describe what the A, B and C series paper size are used for
1.3	describe how the A series paper sizes can be <b>sub-divided</b> into standard divisions
1.4	define in millimetres the size of A0 sheet
1.5	describe how paper is measured in terms of size and weight and bulk
1.6	define the term 'Imposition'
1.7	identify the number of pages found in common imposition schemes
1.8	describe the factors to be considered when preparing an imposition scheme
1.9	describe the most common ' <b>methods of working</b> ', when producing a printed sheet
1.10	identify the <b>items</b> which need to be taken into account when preparing a 'template/layout
1.11	describe why the items are important to the production of the printed copy

- 1.12 describe why it is important to identify a 'grip' and 'lay' edge on the printed sheet
- 1.13 describe what is meant by the term 'grain direction'.

<p><b>Range</b></p> <p><b>Sub-divided</b></p> <p>a. A0 is divided by 2 to achieve A1</p> <p>b. A1 is divided by 2 to achieve A2</p> <p>c. A2 is divided by 2 to achieve A3</p> <p>d. A3 is divided by 2 to achieve A4</p> <p><b>Methods of working</b></p> <p>a. sheet work</p> <p>b. half sheet work</p> <p>c. work and turn</p> <p>d. work and tumble</p> <p><b>Items</b></p> <p>a. page position</p> <p>b. head margins</p> <p>c. gutter margins</p> <p>d. spine margins</p> <p>e. trim allowances</p> <p>f. grip or sheet transfer allowances</p>
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<b>Learning outcome</b>	<b>The learner will:</b>
2.	Know the types and characteristics of paper and board
<b>Assessment criteria</b>	
The learner can:	
2.1	identify the <b>characteristics</b> of paper
2.2	describe how the characteristics of paper can be measured
2.3	describe how the characteristics of paper can have an effect on the printing and post press operations
2.4	identify what <b>special features</b> can be added to paper during production
2.5	describe the main <b>types of paper</b> in use and their features
2.6	describe the main <b>types of board</b> in use and their features
2.7	identify the factors to be considered when storing paper and board.

<p><b>Range</b></p> <p><b>Characteristics</b></p> <p>a. brightness/whiteness</p> <p>b. opacity</p> <p>c. tensile strength</p> <p>d. wet strength</p> <p>e. dimensional stability</p> <p>f. sizing</p>
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<ul style="list-style-type: none"> <li>g. picking resistance</li> <li>h. weight</li> <li>i. calliper/thickness</li> <li>j. microns</li> <li>k. gloss</li> <li>l. surface characteristics</li> </ul> <p><b>Special features</b></p> <ul style="list-style-type: none"> <li>a. watermarks - use of a dandy roller</li> <li>b. textures - use of embossed rollers on paper making machine</li> </ul> <p><b>Types of paper</b></p> <ul style="list-style-type: none"> <li>a. bulky mechanical</li> <li>b. part mechanical</li> <li>c. recycled</li> <li>d. wood-free</li> <li>e. newsprint</li> <li>f. machine-finished (MF)</li> <li>g. matt-coated</li> <li>h. gloss-coated</li> <li>i. machine-glazed (MG)</li> <li>j. chromo paper</li> <li>k. cast-coated</li> <li>l. specialist papers: <ul style="list-style-type: none"> <li>i kraft (bleached or unbleached)</li> <li>ii hand-made paper</li> <li>iii carbonless paper</li> <li>iv heat sealable paper</li> <li>v pressure sealable paper</li> <li>vi self-adhesive paper</li> <li>vii gummed paper</li> </ul> </li> </ul> <p><b>Types of board</b></p> <ul style="list-style-type: none"> <li>a. unlined chipboard</li> <li>b. lined chipboard</li> <li>c. straw board</li> <li>d. pulp board</li> <li>e. coated board</li> <li>f. art board</li> </ul>
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<b>Learning outcome</b>	<b>The learner will:</b>
3.	Understand the uses of materials found in mechanised print finishing and binding
<b>Assessment criteria</b>	
The learner can:	
3.1	identify the <b>substrate</b> used in mechanised print finishing and binding
3.2	identify the <b>types of adhesives</b> in use within the bindery department

- 3.3 describe the **methods** that can be used to enhance the appearance of printed products
- 3.4 identify **methods** binding and securing use in print finishing
- 3.5 describe the methods that can be used to protect the printed product from regular use.

**Range**

**Substrate**

- a. paper
- b. board
- c. plastic
- d. clear film
- e. linen
- f. mull
- g. bookcloth (covering material)

**Types of adhesive**

- a. PVA emulsions
- b. PUR adhesives
- c. hot melt
- d. animal glue
- e. scotch/pearl glue
- f. starch paste
- g. fan-apart adhesive
- h. double-sided tapes

**Methods (AC3.3)**

- a. laminates
- b. varnishes
- c. foils

**Methods (AC3.4)**

- a. wire
- b. sewing thread
- c. plastic comb
- d. wire O/spiral wire
- e. interscrews (brass/plastic)
- f. slide bars

<b>Learning outcome</b>	<b>The learner will:</b>
4.	Know the main operations involved in mechanised print and finishing to cut, fold and secure printed material
<b>Assessment criteria</b>	
The learner can:	
4.1	identify the <b>main operations</b> which take place in mechanised print finishing and binding
4.2	describe the folding schemes commonly employed in bindery
4.3	describe how printed sections can be 'gathered' or 'Inset'

- 4.4 identify the **cutting, slitting and trimming** operations which take place in print finishing
- 4.5 describe the methods used in print finishing to 'secure' pre-printed products
- 4.6 describe what is meant by the term 'decorating' in print finishing
- 4.7 identify the **ancillary operations** which take place in the finishing of a product
- 4.8 define the term 'Bookbinding'
- 4.9 describe the **methods** of bookbinding in regular use.

### **Range**

#### **Main operations**

- a. folding
- b. trimming, dividing, cutting and creasing
- c. insetting or gathering into a prescribed order
- d. securing with thread, wire stitches or adhesive
- e. protective covering
- f. decorating
- g. fabrication
- h. ancillary operations

#### **Cutting, slitting and trimming operations**

- a. guillotining with a single knife to cut stock for production
- b. guillotining with a single knife to split printed sheets
- c. guillotining with a single knife to trim printed sheets
- d. trimming of secured sections with three or five knife trimmers
- e. using a slitting and winding machine to divide reels into two or more mini-reels
- f. cutting and creasing rules to allow carton shapes to be created and the box to be folded
- g. slitting wheels on machines such as folders

#### **Ancillary operations**

- a. drilling
- b. hole punching
- c. round cornering
- d. indexing
- e. riveting
- f. perforating
- g. thread stitching
- h. eyeleting
- i. numbering

#### **Methods**

- a. folding printed sheets to create a series of 8, 16 or 32 page sections
- b. securing sections together by thread and adhesive to make book block
- c. securing sections by perfect binding

- d. making, covering and decorating case (cover)
- e. casing-in, bringing together book block and case, and securing by adhesive and endpapers

<b>Learning outcome</b>	<b>The learner will:</b>
5.	Know the main operations involved in newspaper and magazine finishing processes
<b>Assessment criteria</b>	
The learner can:	
5.1	describe the <b>main activities</b> involved in newspaper and magazine finishing
5.2	identify 'inline' and 'offline' activities
5.3	define the terms 'inserting' and 'onserting'
5.4	describe what is meant by 'stitching and trimming'
5.5	define the term 'palletising'
5.6	describe what is meant by 'bundling'
5.7	describe the <b>methods</b> used to move and transport goods in the production environment.

<b>Range</b>
<b>Main activities</b>
a. inserting
b. onserting
c. stitching and trimming of the product to achieve the job specification
d. finishing, counting, bundling, labelling, wrapping and strapping publications
e. palletising
f. transporting stock, reels, discs and logs within the factory and between factories to meet production requirements
<b>Methods</b>
a. pump trucks
b. fork-lift trucks
c. disc trucks

<b>Learning outcome</b>	<b>The learner will:</b>
6.	Know the make-ready and operating procedures for a range of print finishing equipment
<b>Assessment criteria</b>	
The learner can:	
6.1	identify the range of <b>equipment</b> used in print finishing
6.2	describe which of the equipment is employed 'on-line' or 'inline'
6.3	describe the 'make ready' procedure of equipment used in the print finishing process
6.4	describe the operating procedures for a range of <b>post press equipment</b>
6.5	identify paper transport systems in regular use

6.6	describe the importance of setting up a machine safely and accurately to achieve the finished product
6.7	identify the 'procedures' to be followed when completing the post press operation
6.8	describe the considerations and procedures to be followed when disposing of finished waste.

<b>Range</b>	
<b>Equipment</b>	
a.	guillotine
b.	folding machine
c.	spiral wire binder
d.	coating machine
e.	slitting and winding machine
f.	laminating machine
g.	non-automated (hand operate) machines
h.	hopper fed inserting/gathering machines
i.	sewing machine
j.	enveloping machine
<b>Post press equipment</b>	
a.	guillotines
b.	folding machines
c.	spiral wire binding equipment
d.	coating machinery
e.	slitting and winding machinery
f.	sheet fed laminating machinery
g.	non-automatic machines
h.	hopper-fed inserting machinery
i.	hopper-fed gathering machinery
j.	auto-fed sewing machinery
k.	newspaper specific equipment

<b>Learning outcome</b>	<b>The learner will:</b>
7.	Understand the purpose and procedures for quality control in mechanised print finishing and binding
<b>Assessment criteria</b>	
The learner can:	
7.1	identify the factors that can effect the quality of production output
7.2	describe the purpose of quality control in print finishing
7.3	identify the key <b>items</b> on the product output to be monitored
7.4	describe the methods of monitoring finished output as part of a quality control system
7.5	define the term 'sampling'
7.6	explain how a <b>sampling plan</b> can help improve the quality of production output
7.7	describe the purpose of a 'pass sheet'
7.8	identify the <b>finishing faults</b> on guillotines, folding machines, slitting/winding machinery and non-automated machinery



7.9 describe how regular maintenance in the printing workshop can help maintain consistency in production output.

**Range**

**Items**

- a. inspection
- b. testing
- c. sampling
- d. the use of input/output controls

**Sampling plan**

- a. standard deviation
- b. distribution curves
- c. previous records for the job

**Finishing faults**

- a. guillotines:
  - i overcut
  - ii undercut
  - iii wavy edge cut
  - iv bow or hollow cut
- b. folding machines:
  - i sheets fail to feed and separate
  - ii feeding doubles
  - iii sheets fail to transfer and run evenly on in-feed conveyor table or roller cross carrier
  - iv sheets fail to enter fold plate
  - v sheets fail to leave plate
  - vi sheets fold out of square at plate blank
  - vii sheets fail to be driven between knife fold rollers
  - viii perforating line splits
  - ix sheets/sections creasing
  - x sheets/sections marking
  - xi sections insert into each other on delivery table/box
  - xii sections conveyed to delivery are uneven
- c. slitting and winding machinery:
  - i glue reel joins
  - ii damaged reels
  - iii reel bouncing
  - iv creases
  - v poor edge cutting
  - vi web breaks
  - vii weak splice
  - viii missing print
  - ix tension fault
- d. non-automatic machines:
  - i wire stitching machines
  - ii drilling machines
  - iii punching machines

- iv riveting machines
- v perforating machines
- vi thread stitching machines
- vii eyeletting machines (straight line or rotary)
- viii rotary perforating machine
- e. hopper-fed inserting machinery:
  - i missing section
  - ii pagination incorrect
  - iii misaligned sections
  - iv double feed
- f. hopper-fed gathering machinery:
  - v missing section
  - vi pagination incorrect
  - vii misaligned sections
  - viii double feed
- g. auto-fed sewing machinery:
  - i missing stitches
  - ii thread breaking
  - iii loose stitching
  - iv section dropping at head
  - v sections not square at head
  - vi insets sewn out of position
- h. newspaper specific equipment, faults on:
  - i inserting equipment
  - ii stitch and trim equipment
  - iii moving materials equipment
  - iv feeder machinery
  - v publishing equipment
  - vi auto-palletising equipment

Learning outcome	The learner will:
8.	Know the procedures required to protect material from damage during finishing and binding operations
<b>Assessment criteria</b>	
The learner can:	
8.1	describe the procedures for protecting material from damage when operating a range of <b>print finishing equipment</b>
8.2	describe how an incorrect machine setting can cause damage to the material/substrate
8.3	identify the types of damage which can be caused by not following organisational and manufacturers' procedures.

<b>Range</b>
<b>Print finishing equipment</b> <ul style="list-style-type: none"> <li>a. Guillotine</li> <li>b. Auto punching and cutting equipment</li> <li>c. Folding equipment</li> <li>d. Insetting equipment</li> <li>e. Inline/offline binding equipment</li> </ul>

## Unit 208

## Carton manufacturing processes

<b>UAN:</b>	<b>J/503/1771</b>
<b>Level:</b>	Level 2
<b>Credit value:</b>	4
<b>GLH:</b>	30
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by Proskills. It will be assessed via online multiple choice test.
<b>Aim:</b>	This unit is concerned with developing theoretical understanding of the processes involved in all aspects of carton manufacture including design, materials technology, die forme manufacture. It covers well defined tasks within the make-ready and operation of carton production equipment and develops the knowledge required to deal with straight forward issues and problems which may arise.

<b>Learning outcome</b>	<b>The learner will:</b>
1. Know the materials and equipment required in carton manufacturing processes	
<b>Assessment criteria</b>	
The learner can:	
1.1 identify the <b>substrates</b> regularly used in carton manufacture	
1.2 describe the <b>adhesives</b> used in carton manufacture	
1.3 describe the factors which influence the choice of adhesive	
1.4 describe the different <b>capabilities</b> of the rules used in die forme manufacture	
1.5 identify the component parts of a 'die forme'	
1.6 identify the different types of ' <b>ejection materials</b> '	
1.7 identify the different types of 'matrix materials' used for creasing	
1.8 identify the <b>materials</b> used for enhancing carton appearance	
1.9 identify the <b>equipment</b> used to produce sample carton copies	
1.10 identify the types of <b>equipment</b> used for 'matrix cutting'	
1.11 describe the 'operational function' of the types of <b>machines</b> used in cutting, creasing and enhancing	
1.12 identify the types of <b>equipment</b> used in folding and gluing application.	

## **Range**

### **Substrates**

- a. carton boards
- b. corrugated boards

### **Adhesives**

- a. emulsions
- b. hot melts
- c. adhesive tapes
- d. latexes

### **Capabilities**

- a. cutting
- b. creasing
- c. scoring
- d. perforating
- e. special

### **Ejection materials**

- a. open cell
- b. closed cell
- c. high performance shaped
- d. cork

### **Materials**

- a. foils
- b. laminates/films
- c. blocking/embossing dies

### **Equipment (AC1.9)**

- a. technical drawing equipment
- b. creasing tool and creasing rule
- c. computer and peripheral equipment
- d. CAD (computer-aided design) software

### **Equipment (AC1.10)**

- a. mitre cutters (bench and hand)
- b. chamfer knife/cutting knives
- c. counter cutting systems

### **Machines**

- a. hand fed vertical platens
- b. automatic machine fed light platens
- c. automatic machine fed horizontal platens
- d. automatic machine fed cylinder press
- e. automatic machine fed rotary press
- f. machine stripping units
- g. hand stripping equipment

h. machine separating units

**Equipment (AC1.12)**

- a. straight lines
- b. glued lock bottom
- c. 4/6 corners
- d. adhesive applicators

<b>Learning outcome</b>	<b>The learner will:</b>
2.	Understand the principles, methods and techniques of carton design and manufacturing processes
<b>Assessment criteria</b>	
The learner can:	
2.1	identify the information required from a customer to create and design a sample carton for production
2.2	describe the basic styles, types and parts of carton designs
2.3	describe the sequence of operations for making sample carton designs
2.4	describe the checks that a sample design should be put through
2.5	describe the types of problems associated with carton design and manufacture
2.6	explain how computer aided design (CAD) machines help with design and manufacture
2.7	identify the hazards associated with carton design and manufacture
2.8	describe the production requirements needed for the carton layouts.

<b>Learning outcome</b>	<b>The learner will:</b>
3.	Know the make-ready and operational procedures for cutting and creasing, multi-folding, gluing and enhancing machinery
<b>Assessment criteria</b>	
The learner can:	
3.1	identify the information required to set up and operate the machinery and equipment employed in carton manufacture
3.2	describe the operator responsibilities when operating the machinery and equipment employed in carton manufacture
3.3	describe the 'make-ready' process of setting up equipment used in carton manufacture and production
3.4	describe the function of a 'matrix'
3.5	describe the methods used to 'enhance output' of carton manufacture
3.6	identify the problems associated with carton manufacture.

<b>Learning outcome</b>	<b>The learner will:</b>
4.	Understand the manufacturing procedures of die making and cutting and creasing forms
<b>Assessment criteria</b>	
The learner can:	

4.1	describe the purpose of a 'die forme'
4.2	identify the different types of formes in use
4.3	assess the advantages and disadvantages of a die forme
4.4	define the terminology associated with die forme manufacture
4.5	describe the sequence of die forme manufacture
4.6	describe the relevance of the 'point system' used in die forme manufacture.

<b>Learning outcome</b>	<b>The learner will:</b>
5.	Understand the purpose and procedures of quality control in carton manufacturing processes
<b>Assessment criteria</b>	
The learner can:	
5.1	define the term 'quality control'
5.2	describe the importance of carrying out quality control checks during manufacture
5.3	identify the methods of 'quality control' which can be used
5.4	describe the quality checks which should be carried out during production output at each stage of production
5.5	describe the importance of maintaining performance records.



## Appendix 1 Relationships to other qualifications

### Links to other qualifications

Centres are responsible for checking the different requirements of all qualifications they are delivering and ensuring that candidates meet requirements of all units/qualifications.

This qualification has connections to the Level 2 Certificate in Printing and Graphic Communications (5261-02).

### Literacy, language, numeracy and ICT skills development

This qualification can develop skills that can be used in the following qualifications:

- Functional Skills (England) – see [www.cityandguilds.com/functionalskills](http://www.cityandguilds.com/functionalskills)
- Essential Skills (Northern Ireland) – see [www.cityandguilds.com/essentialskillsni](http://www.cityandguilds.com/essentialskillsni)
- Essential Skills Wales – see [www.cityandguilds.com/esw](http://www.cityandguilds.com/esw)



## Appendix 2 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

The **Centre Manual - Supporting Customer Excellence** 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, as well as updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

**Our Quality Assurance Requirements** encompasses all of the relevant requirements of key regulatory documents such as:

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

**Access to Assessment & Qualifications** provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.



The **centre homepage** section of the City & Guilds website also contains useful information such on such things as:

- **Walled Garden:** how to register and certificate candidates on line
- **Events:** dates and information on the latest Centre events
- **Online assessment:** how to register for e-assessments.

## Useful contacts

<b>UK learners</b> <b>General qualification information</b>	<b>T: +44 (0)844 543 0033</b> <b>E: learnersupport@cityandguilds.com</b>
<b>International learners</b> General qualification information	T: +44 (0)844 543 0033 F: +44 (0)20 7294 2413 E: <b>intcg@cityandguilds.com</b>
<b>Centres</b> Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: <b>centresupport@cityandguilds.com</b>
<b>Single subject qualifications</b> Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 F: +44 (0)20 7294 2404 (BB forms) E: <b>singlesubjects@cityandguilds.com</b>
<b>International awards</b> Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: <b>intops@cityandguilds.com</b>
<b>Walled Garden</b> Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: <b>walledgarden@cityandguilds.com</b>
<b>Employer</b> Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	T: +44 (0)121 503 8993 E: <b>business@cityandguilds.com</b>
<b>Publications</b> Logbooks, Centre documents, Forms, Free literature	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413

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### **City & Guilds Group**

The City & Guilds Group operates from three major hubs: London (servicing Europe, the Caribbean and Americas), Johannesburg (servicing Africa), and Singapore (servicing Asia, Australia and New Zealand). The Group also includes the Institute of Leadership & Management (management and leadership qualifications), City & Guilds Land Based Services (land-based qualifications), the Centre for Skills Development (CSD works to improve the policy and practice of vocational education and training worldwide) and Learning Assistant (an online e-portfolio).

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