

Higher National Unit Specification

General information for centres

Unit title: Printing Industry: Materials Technology

Unit code: F0PJ 34

Unit purpose: This Unit is designed to enable candidates to evaluate the characteristics and quality requirements of materials used in the printing industry. It is intended for candidates who are in employment or studying a relevant course in printing.

On completion of the Unit the candidate should be able to:

- 1 Describe the characteristics and suitability for use of materials used in the printing industry.
- 2 Evaluate the characteristics of materials.
- 3 Investigate the effect of the workshop environment on the performance of printing materials.

Credit points and level: 1 HN Credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Recommended prior knowledge and skills: Entry is at the discretion of the Centre. However, candidates should have some knowledge of printing processes and the links between production and the materials used. This may be demonstrated by possession of the HN Units *Printing: Production Processes* at SCQF level 7 and *Print Finishing Processes* at SCQF level 7, equivalent qualifications or relevant work experience.

Core Skills: There may be opportunities to gather evidence towards the Core Skill of Communication at SCQF level 5 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

Context for delivery: If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Assessment: Evidence for Outcome 1 will be generated under open book controlled conditions. Assessment may take the form of short answer questions. Outcomes 2 and 3 will be assessed by investigative tasks.

Higher National Unit specification: statement of standards

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The sections of the Unit stating the Outcomes, knowledge and/or skills, and evidence requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the knowledge and/or skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Describe the characteristics and suitability for use of materials used in the printing industry

Knowledge and/or skills

- ◆ Characteristics of materials: substrates, inks, adhesives, and damping solutions
- ◆ Suitability for use of materials
- ◆ Health and safety requirements

Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can correctly describe the characteristics and suitability for use of materials used in the printing industry. The materials will include commonly used substrates, inks, adhesives and damping solutions and technical notes be made about the health and safety requirements of each.

A minimum of two types of material from each category, ie substrates, inks, adhesives and damping solutions, should be described.

Evidence should be generated by assessment undertaken in open book controlled conditions. Candidates should have access to manufacturers' datasheets and other relevant documentation.

Assessment guidelines

The assessment used may be in the form of short answer questions or responses to short case studies.

Outcome 2

Evaluate the characteristics of materials

Knowledge and/or skills

- ◆ Printing materials: substrates, inks, adhesives, and damping solutions
- ◆ Technical properties
- ◆ Testing techniques
- ◆ Performance

Higher National Unit specification: statement of standards (cont)

Unit title: Printing Industry: Materials Technology

Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and skills by showing that they can evaluate the characteristics of **four** printing materials.

Evidence should be generated by investigating the properties and performance of a sample of **four** printing materials. Satisfactory evidence should be submitted for each material. The evidence should incorporate:

- ◆ two visual and two technical properties
- ◆ identification of testing techniques employed
- ◆ data and suitability of the tested material for a specified purpose

Candidates will have access to health and safety data and operating information relative to any apparatus being used in testing.

Assessment guidelines

A test pro forma may be completed for each investigation incorporating apparatus, testing techniques, samples, data and evaluation. Alternatively a report may be produced for each investigation.

Outcome 3

Investigate the effect of the workshop environment on the performance of printing materials

Knowledge and/or skills

- ◆ Relative humidity
- ◆ Temperature
- ◆ Dimensional stability
- ◆ Ink drying
- ◆ Static electricity

Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and skills by investigating the effect of the workshop environment on the performance of **two different kinds of** printing materials. Each investigation should take account of:

- ◆ relative humidity and its effect on dimensional stability
- ◆ ink drying
- ◆ static electricity
- ◆ temperature

Assessment should take place under open-book supervised conditions. Candidates should have access to documentation provided with the testing apparatus and materials used together with their own notes.

Higher National Unit specification: statement of standards (cont)

Unit title: Printing Industry: Materials Technology

Assessment guidelines

The assessment may be in the form of illustrated laboratory reports which may also include:

- ◆ Material: type and purpose
- ◆ Apparatus
- ◆ Procedures used
- ◆ Results
- ◆ Possible sources of error
- ◆ Evaluation
- ◆ Recommendations for environmental conditions

Administrative Information

Unit code: F0PJ 34
Unit title: Printing Industry: Materials Technology
Superclass category: KH
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Version	Description of change	Date

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Higher National Unit specification: support notes

Unit title: Printing Industry: Materials Technology

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

This Unit was developed as part of the HNC/HND Printing where it is an optional Unit. It is intended to give candidates the necessary knowledge and skills to understand the requirements of printing materials and the problems which may arise due to the use of unsuitable materials or working environments. It prepares candidates for this role by providing them with the underpinning knowledge needed to carry out investigation of problems via materials testing techniques. It is primarily intended for candidates undertaking a qualification in printing and publishing. It would also be relevant to those with appropriate work experience such as printing, printing materials supply or printing management. Candidates will be expected to exercise a degree of autonomy in carrying out the tasks required for the Unit.

Outcome 1

Suitable topics may include:

- ◆ Paper: types, grammage, furnish, calliper, grain direction, opacity, tear resistance, absorption, colour, surface finish, coating, paper faults causing print problems eg picking, hickies, show through, surface pH, dimensional stability, conditioning.
- ◆ Board: types, and applications.
- ◆ Other substrates: film, foil.
- ◆ Inks: types, constituents, applications, drying methods, viscosity, pigment vehicle ratio, ink to paper relationship, ink film thickness
- ◆ Adhesives: types, applications, suitability for use.
- ◆ Damping solutions: constituents, pH and conductivity
- ◆ Health and safety: storage, handling, precautions, sources of information, regulations, environmental requirements, disposal of waste.

Outcome 2

Methods may involve testing equipment, printing equipment and print finishing equipment.

Suitable topics for investigation may include:

- ◆ Paper: dimensional stability, grain direction, opacity, bulk, tear resistance, printing problems.
- ◆ Ink: viscosity, tack, colour strength, transparency, opacity, density, hue, trapping, drying time, fading.
- ◆ Adhesives: open time, drying time, pull resistance, flexibility, discoloration factors.

Higher National Unit specification: support notes (cont)

Unit title: Printing Industry: Materials Technology

Outcome 3

Methods may involve testing equipment, printing equipment and print finishing equipment.

Suitable topics for investigation may include:

- ◆ Relative humidity: paper dimensional stability, ink drying and static electricity.
- ◆ Temperature: ink drying, adhesives curing and materials handling.

Guidance on the delivery and assessment of this Unit

This Unit covers a large field of knowledge and should be tailored to the needs of the candidates and to take account of modern materials and processes.

Some investigations may be suitable for group working and where this is the case the contribution of each member of the group should be clearly identified for assessment purposes.

There is no prescription regarding particular software and hardware facilities. However, tasks should replicate working practices for printing in terms of instrumentation, software and hardware used in the printing industry. The relevant facilities should be available to the candidate throughout the duration of the Unit

Outcome 1 may be assessed by means of a short answer test which samples each category of materials.

Candidates should be provided with a topic for investigation for each of the investigations used to assess Outcomes 2 and 3. A standard pro forma may be used to complete each of the reports. The report should include title, aim(s), equipment, procedures, results, possible sources of error, presentation of data, evaluation of suitability for use and conclusions.

Opportunities for developing Core Skills

Communication skills at SCQF level 5 will be developed throughout this Unit. The candidates are required to look at, summarise and act on the content of manufacturer's guidelines for materials used and health and safety requirements which need to be followed. They are asked to describe, evaluate and investigate during the course of this Unit and this will extend their oral or written communication skills.

Open learning

This Unit is suitable for delivery by distance learning providing that the candidate has access to suitable computer hardware and software eg Adobe Acrobat Reader and Microsoft PowerPoint. The teaching notes and pro formas can be provided as PDF or word processed files. Access to printing equipment and/or testing facilities is essential to undertake Outcomes 2 and 3. The investigations would have to be selected so as to be suitable for undertaking using equipment available to the candidate.

Higher National Unit specification: support notes (cont)

Unit title: Printing Industry: Materials Technology

If this Unit is delivered by open or distance learning methods, additional planning and resources may be required for candidate support, assessment and quality assurance. A combination of new and traditional authentication tools may have to be devised for assessment and reassessment purposes eg via virtual learning environment authentication tools, video conferencing and community based learning centres.

For further information refer to the SQA guide, Assessment and Quality Assurance of Open and Distance Learning (www.sqa.org.uk).

Candidates with disabilities and/or additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative Outcomes for Units. For information on these, please refer to the SQA document *Guidance on Alternative Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs*, which is available on SQA's website: www.sqa.org.uk.

General information for candidates

Unit title: Printing Industry: Materials Technology

This Unit is designed to enable you to understand the requirements of printing materials and to recognise the problems that may arise through the use of unsuitable materials or work environments.

In Outcome 1 you will learn about the characteristics and suitability for use of materials used in the printing industry. You will gain an awareness of the health and safety requirements when using a variety of printing materials.

In Outcome 2 you will evaluate the suitability of materials for specific uses.

In Outcome 3 you will use materials testing techniques and evaluate the information derived from testing. The information derived from testing will be presented in a manner so as to inform others.

In working through this Unit you will also develop your communication skills.