

Intermediate Ink Module 326

Ink Application Technology

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Summary

This module describes the common printing processes commercially used in the United Kingdom. It explains the general principles used to print both liquid and paste ink and discusses the key points of each printing process and the types of press configuration, which are available. It also explains the importance of plate technology and how different product applications need to be printed. The module concentrates on the specific processes of flexography, gravure, offset, lithography, screen and letterpress printing.

Some consideration is given to historical methods, to better illustrate how some of the processes have evolved, and to give a clearer view of the physical processes involved.

The module does not cover the inkjet or toner based technologies, or techniques such as intaglio relief printing, recess printing or collotype, which are rarely used, except for special purposes.

Module Pre-requisites

It is recommended that students tackling this module to have already studied selected modules at foundation level, in particular, modules 204 and 209.

Science subjects at GCSE, advanced level or the equivalents thereof would also be advantageous.

Any relevant experience would also be of advantage. Ideally, a student should be currently employed within the coatings industry or by a supplier to this industry.

Structure of the module

The module consists of a theory block of 6 sections of text, 1 Computer Marked Assessment (CMA), 1 Practical Attendance Exercise (PAX) and a series of Self Assessed Questions (SAQ). The total study time will be approximately 10hrs, with additional time being required for the CMA and the PAX. Experience indicates that on average, the total time to complete this module will be in the order of 4 – 6 weeks.

You may, if you wish, await the completion of three modules before sitting the Tutor Marked Assessment (TMA) papers. By 'stacking' tests in this way you will only need to arrange one examination period, once instead of three times.

Please contact the course administrator for examination papers and information to be sent to your Mentor.

You will be allocated a Tutor from the Coatings Training Institute. If you have any technical questions arising from the text, please contact your Tutor.

For full certification, the CMA, PAX and TMA must all have been completed satisfactorily.

Marks for the module

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| CMA | 20% |
| PAX | 35% |
| TMA | 45% |

SAQ – Self Assessment Questions

These do not carry any marks for completion and do not have to be submitted to your Tutor. Nevertheless, they are important to the student, as they show you that the Section has been clearly understood.

The answers to SAQs may be found in Appendix 1.

PAX – Practical Attendance Exercise

There is one PAX in Module 326.

Your tutor will discuss the options available and select material that is relevant to the coating equipment available at your test centre.

A reminder of how to fill in a PAX is given in the General Introduction document, which you will have received on enrolment.

CMA – Computer Marked Assessment

The CMA may be found on the website. Full details of how to complete this important part of the Module may be found in the general introduction to this module.

Module Objectives

When you have finished this module, you should be able to do the following:

1. Section 1. General Overview of Printing Techniques

- 1.1. Give a brief account of the history of the industry and list the more common, current methods of printing.

2. Section 2. The Letterpress Printing Process

- 2.1. Describe the key points of the letterpress printing process
- 2.2. Explain the differences between the three main types of letterpress printing presses
- 2.3. Explain what a letterpress forme is, and what function it has
- 2.4. Explain the different types of the printing plate and how they are produced.
- 2.5. Define the term to make ready
- 2.6. Describe what products are best manufactured using letterpress

3. Section 3. The Offset Lithographic Process

- 3.1. Explain the principles of the lithographic printing process and what is meant by offset.
- 3.2. Describe the different types of lithographic printing unit
- 3.3. Explain how the damping system on a lithographic press functions. Describe the components used to prepare the fountain solution and explain the function of each
- 3.4. Describe the function and make-up of offset printing blankets.
- 3.5. Explain how press automation features assist the lithographic printer
- 3.6. Explain the types and manufacture of lithographic printing plates.
- 3.7. Define the term dot gain
- 3.8. Explain how colour levels are controlled on the printing press

4. Section 4. The Flexographic Printing Process

- 4.1. Describe the key characteristics of the flexographic process
- 4.2. Describe the basic parts of a flexographic printing process
- 4.3. Describe the different types of printing plate available, what advantages and disadvantages each has and the importance of the viscosity of inks.
- 4.4. Explain the difference between the three basic types of Flexographic press configuration
- 4.5. Describe what applications are best printed using flexography

5. Section 5. The Screen Printing Process

- 5.1. Describe the screen printing process
- 5.2. Explain how screen printing units are configured
- 5.3. Describe how screen stencils are manufactured
- 5.4. Explain the difference between direct and indirect stencils
- 5.5. Describe the principal applications for screen printing

6. Section 6. The Gravure Printing Process

- 6.1. Explain how the gravure printing process works
- 6.2. Describe how a gravure printing press is configured
- 6.3. Explain how a gravure cylinder is prepared
- 6.4. Explain what control systems are required on a gravure press
- 6.5. Describe the major gravure printing applications.