

Intermediate Module 325

Paint Application - Non-Spraying

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This module provides information on the various methods employed to apply liquid coatings, except spraying which is covered in 324.

The main topic areas are dipping, including Electrophoresis, Roller coating, Coil coating, Curtain coating, Brushing, Hand rolling and Padding.

Some simple application methods are usually used in laboratory situations to try out new materials or on quality control of batches under manufacture. Similar equipment is used in small scale or specialist finishing operations, which are then sometimes used on automated situations. For those employed on customer service or sales of paint products, the module will give a fuller understanding of the equipment used by potential customers. For customers, many of whom will have automated plants in order to cope with continuous line-production, there is added information about conveyerisation, potential problems, and an opportunity to evaluate or compare alternative methods.

Introduction

1. Module Prerequisites

The main prerequisite for persons taking Modules at Intermediate level is an interest in surface coatings. Preferably, they will be employed in the coatings or a related industry. For this module they may be employed by a user of paints, possibly involved in application by dipping, roller coating, curtain coating or another non-spraying method. In addition they should preferably have a basic education in chemistry and physics. It would be useful if only for reference, that foundation module 209 has already been studied. Module 206 on Substrates and their preparation would be a useful module to compliment this one.

2. Introduction to Module 325

Module 325 is one of a series of modules at Intermediate level. Following successful completion of this module, you may proceed to study further modules selected on the basis of your needs. There is also a series of Modules at Advanced level, which you may wish to study at a later stage.

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Some simple application methods are usually used in laboratory situations to try out new materials or on quality control of batches under manufacture. Similar equipment is used in small scale or specialist finishing operations, which are then sometimes used on automated situations. For those employed on customer service or sales of paint products, the module will give a fuller understanding of the equipment used by potential customers. For customers, many of whom will have automated plants in order to cope with continuous line-production, there is added information about conveyerisation, potential problems, and an opportunity to evaluate or compare alternative methods.

3. Structure of the Module

The module is designed to take approximately 10 hours of study made up of:

- theory block – 8 hours
- assignments – 2 hours

The theory block is split into four sections which are not of equal length, sections 1 2 and 3 could take about 2 hours 30 minutes each, with section 4 taking only about 1 hour. Each section includes figures that you should refer to as you go through the material.

A number of self-Assessed Questions (SAQs) are included for you to answer as you work through the text. The answers to these are given at the end of the module in Appendix 1.

There are also assignments (ASG) during section 4, details of which can be found in Appendix 2.

The computer-marked assessment (CMA) consisting of 10 multi-choice questions is included in the course, the answers to which should be entered on the website.

4. Assignment

ASG 1 Choice of application equipment from brushing, hand-rolling or padding. (15%).

ASG 2 Choice of application equipment for flat-stock. (20%)

These will be found in Appendix 2.

5. Assessment

All persons taking the course must attempt the CMA

TMA, A written test of 30 minutes duration, is taken under examination conditions.

This test is optional for candidates wishing to simply study the material, but it is mandatory for those wishing to receive a certificate. Students may, if they wish, await their completion of three modules before sitting the TMA papers. By 'Stacking' tests in this way, they will only need to attend their test centre once instead of three times.

ASGs' are essential for the certificate.

For students completing the assessments, the maximum possible marks for this module are 100 made up as follows:

CMA	20
TMA	45
ASG's	35

An overall mark of 50% or more is necessary for successful completion of the module, with students achieving at least 40% of the marks available in each element.

6. Objectives

Section 1. Dipping

At the end of this section, you should be able to:

- 1.1 Differentiate between hand and automatic dipping
- 1.2 Discuss hazards, stability and problems encountered with solvent-based systems.
- 1.3. State principles of electrodeposition, and compare.
 - 1.3.1 Compare advantages and disadvantages of electrodeposition with conventional dipping.
 - 1.3.2 Explain reasons for rinsing work after the electrodeposition process.
- 1.4 Describe suitable equipment used to convey objects into dipping tanks.
- 1.5 Describe the operation of a fluidised bed coater.

Section 2. Roller Coating

- 2.1 Explain the terms, direct roller coating, spot coatings, and wet on wet or overprint varnishing.
- 2.2 Describe the formation of a can from coated tinplate.
- 2.3 Describe the causes and remedies for ribbing.
- 2.4 Explain the process and reasons for reverse roller coating.
- 2.5 Discuss tube and line coating equipment and processes.

Section 3. Coil and Curtain Coating

- 3.1 Explain the essential reasons for a coil coating plant.
- 3.2 List the types of finishes used on coil-coated stock.
- 3.3 Compare the merits of pre-coating stock with traditional post-finishing.
- 3.4 Describe the essential features of a curtain coater.
- 3.5 Barrelling & Flood Coating

Section 4. Other methods of applying paints

- 4.1. Discuss the other methods of applying paints; principally for decorating.