

Intermediate Module 327

Equipment for the Application of Powder Coatings

Author: R J Stanfield

Updated by Dr T Sayer, M Griffiths

Summary

Module 327 contains a comprehensive study of the equipment used to apply powder coatings by electrostatic spraying, fluidised bed and a number of other less widely used application techniques.

Although this module repeats some of the material in the foundation module 208 "Powder Coating Application & Cure", the main focus of this intermediate-level module is on the equipment and methods used in the production line. Also, 327 covers a wider range of application techniques.

After reviewing the components and set up of powder coating application lines, the module proceeds with the equipment and methods employed for each application technique.

The final section explains production control procedures, including 'on-line' quality control. This section also discusses problems that may occur on a production line, the causes of these problems and possible solutions.

Structure of the module

The module consists of a theory block, 1 Computer Marked Assessment and 1 Practical Attendance Exercise. The theory block is split into five sections which are not of equal length but should take, on average, about 2 hours to go through.

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

- theory block
- an assignment

This time excludes the time taken to write up your report for the assignment.

The assignment is explained in Appendix 2. You should discuss this with your counsellor and tutor.

For full certification, the CMA and the Assignment must be completed satisfactorily.

Marks for this module

CMA answers	20%
Assignment	35%
End Test (TMA)*	45%

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

*You may, if you wish, await the completion of three modules before sitting the TMA papers. By 'Stacking' tests in this way, you will only need to attend the test centre once instead of three times.

Module Pre-requisites

Persons taking modules at Intermediate Level should be employed or have recently been employed in the coatings or a related industry. They should have studied some science, including physics and chemistry.

Most intermediate students will have studied some modules at foundation level 2. However, students who have not studied modules at foundation level but have a scientific background and experience of the coatings industry in general and powder coatings, in particular, should be able to benefit from this module.

Module Objectives

Section 1. Examples of coating lines; conveyors; Review of application, powder recovery, ovens & stoving

- 1.1** Give examples of a Powder Coating Line.
- 1.2** Describe the transport of articles on the coating line
- 1.3** Describe the application section of a powder coating line.
- 1.4** Illustrate and explain the design of stoving ovens and understand subsequent handling procedures.

Section 2. Spray guns and associated equipment – Design & Safety

- 2.1** Explain the design of corona charging spray guns for the application of powder coatings.
- 2.2** Explain the design of Tribo-charging and electrostatics for the application of powder coatings.
- 2.3** Describe methods of feeding powder to guns.
- 2.4** Describe spray techniques and ancillary equipment

Section 3. Spray booths and recovery systems

- 3.1** Explain the principles of powder spray booth design
- 3.2** Describe and illustrate the types of powder spray booth
- 3.3** Review booth developments to improve powder utilisation
- 3.4** Understand the importance of cleaning booths and the methods used

Section 4. Fluidised bed method of application. Other Methods of Application

- 4.1** Describe the application of powder coatings by conventional and electrostatic fluidised bed
- 4.2** Review other methods of powder coating application
[Cloud chamber; Powder disc; Coil coating]
- 4.3** Review other methods of powder coating application (continued)
[flame spraying, pipe coating, rotational moulding, vacuum coating, encapsulation, wire and strip coating and cloth coating]

Section 5. Production Control; Quality control 'On-line'; Problems, causes and solutions

- 5.1** Explain Production Control Procedures – Planning, Batch
- 5.2** Explain Production Control Procedures
Checking: Pretreatment, General Cleanliness, Guns & Hoppers, Air Supply. Describe the importance of Earthing & Jigs in Production Control
- 5.3** Describe 'On-line' Quality Control Procedures
- 5.4** Recognise problems – their causes and solutions