

## **Intermediate Module 324**

### **Paint Application – Spraying**

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This module provides information on the various methods used to apply liquid coatings by spraying techniques. These techniques involve using specialised air or hydraulically pressurised equipment to atomise the paint.

Some simple air-assisted methods are commonly 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. Many of the methods can also be used on automated plants.

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 involvement and interest in surface coatings. Preferably, they will be employed in a coatings-related industry, in the manufacture or application of such products. 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 would be a useful module to compliment this one.

### **2. Introduction to Module 324**

Module 324 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.

This module provides information on the various methods employed to apply liquid coatings under the general term – spraying. Some simple air-assisted 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
- assignment – 2 hours

The theory block is split into four sections which are not of equal length. Each section includes figures that you should refer to as you go through the material.

A number of self-Assessed Questions (SAQ's) 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 is also an assignment (ASG) set in 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.

Finally, for candidates who wish to receive a full certificate for passing the module must undergo a written test of 30 minutes duration, taken under examination conditions. 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 for a test once instead of three times.

#### **4. Assignment**

ASG 1- Factors affecting the choice of application methods (maximum 35% of marks) This will be found in Appendix 2

#### **5. Assessment**

For students completing all assessments, the maximum possible marks for this module are 100 made up of the four elements.

CMA	20%
TMA	45%
ASG	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. Air-assisted Spraying**

After studying each section, you should be able to:

- 1.1 Describe construction, operation and maintenance of pressure fed air-assisted spraying equipment.
- 1.2 Explain the differences between conventional and HVLP spraying.
- 1.3 State faults that commonly occur with air-assisted spraying, their causes, and how they may be corrected.
- 1.4 Describe examples of suitable methods for spraying two-pack finishes, and state any problems involved.

##### **Section 2. Airless, Air-assisted airless, Hot spray and Aerosol Spraying**

- 2.1 State methods and advantages of hot air-assisted spraying.
- 2.2 Describe construction, operation and potential hazards of airless spraying.
- 2.3 State advantages of the air-assisted modification to airless spraying.
- 2.4 State advantages and disadvantages of aerosol spraying.

### **Section 3. Electrostatic Spraying**

- 3.1 Describe the principle of electrostatic spraying of liquids and the variety of equipment used in this process.
- 3.2 Explain why E/S is easily automated.

### **Section 4. Manual / Automatic Spraying, Conveyors, Compressors and choices of suitable equipment**

- 3.1 Compare the advantages of manual and automatic spraying.
- 3.2 Describe various types of conveyors in spraying situations.
- 3.3 Describe various air compressors and their safe operation.
- 3.4 Suggest factors affecting choices of spraying methods (ASG)