

INTERMEDIATE MODULE 322

Evaluation of Coating Powders

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Summary

This module describes the methods commonly used to evaluate thermosetting coating powders at all stages of development and processing.

As the coatings industry has developed, it has been necessary to invent standard test procedures, in order to define and control the production, application and performance characteristics of our products.

As a relatively recent addition to the coatings range, powders are still in a very innovative phase of their development. Accordingly, there are still many new questions that need to be answered. A cured film of powder coating is often indistinguishable from its liquid equivalent. However, in the powder form, the materials have certain features that demand closer and more specific scrutiny.

It is expected that it will take approximately 8 to 10 hours to complete this module, including the practical work involved.

Structure of the Module

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Learning Objectives

For each topic in the module, there is a learning objective. These objectives are listed immediately before the study material.

Marking Scheme

The marks are allocated to the different features of the module, as follows:

PAX 1	35%
CMA	20%
End Test	<u>45%</u>
TOTAL	<u>100%</u>

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.

Self Assessment Questions (SAQs)

The answers to SAQs can be found in Appendix 1. If you have any difficulties, go over the text again to make sure that you understand the answer. Ask your Tutor or Counsellor to explain anything you do not understand.

Practical Attendance Exercises (PAXs)

In Section 3, you will be asked to carry out a piece of experimental work. The PAX can be found in Appendix 2. If you have any difficulties in setting up the experiments or in finding suitable equipment, ask your Tutor or Counsellor for advice. Please note that these PAXs are optional, but final marks will be affected accordingly.

Computer Marked Assessments

When you have finished the module, a note in the text will guide you to the Computer Marked Assessment (CMA) on the website. Send the completed CMA to your tutor for marking. Receipt of the CMA at BCF will also tell them that you have completed the module and that, if necessary, they must arrange an End Test.

The Module Calendar

We expect that the amount of learning material in this module can be completed within a month of starting.

Note: *This subject of powder coatings is dealt with, in detail, in:*

- Technology of Powder Coatings by S.T. Harris ISBN 9019 9 4936 Published (1976) by Portcullis Press.
- Electrostatic Powder Coatings by J.F. Hughes, University of Southampton
- The Science of Powder Coatings, Volume 1. Chemistry, Formulation and Application (1990), Volume 2. Applications (including Manufacture) (1993) by D.A. Bates Published by SITA Technology
- Code of Safe Practice: Application of Powder Coatings by Electrostatic Spraying Published by The British Coatings Federation
- Explosibility Assessments of industrial powders and dusts – by P. Field, Building Research Establishment Report, HMSO, 1983.

OBJECTIVES

At the end of this module, you should be able to do the following:

Section 1. Why Standards?

- 1.1. Describe the ways in which standard tests are developed and their importance in all aspects of powder coatings
- 1.2. Discuss the important factors in controlling testing and measurements
- 1.3. Outline the types and nature of tests used to evaluate powder coatings

Section 2. Quality & Performance Testing

- 2.1. Discuss the role of the Development laboratory in testing and proving new formulations
- 2.2. Describe how problems associated with the characteristics of raw material can influence the performance of coating powder
- 2.3. Describe the various stage checks in the production of powders and the adjustments needed to correct the problems that can arise
- 2.4. Describe the problems that might arise during the application of the coating and how they may be remedied

Section 3. Particle Technology

- 3.1. Describe the important properties of powder in particulate form
- 3.2. Discuss how the particles characteristics affect the application and performance of the finished powder
- 3.3. Describe the safety hazards associated with using powder coatings and how these can be controlled