

Study Guide

Advanced Module 503

Formulation – Determining Factors

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Summary

This paper is one of a series of Advanced modules, which consider various aspects of product formulation.

When formulating a surface coating, the Coatings Chemists will need to take account of a number of outside constraints, any of which may affect the final formulation. For example, performance specifications, application techniques and the nature of the substrate must all be taken into consideration when deciding on the optimum surface coating. Health & safety or environmental issues increasingly limit that choice.

This Module investigates the various factors affecting the selection of a coating.

Note: It is assumed that the student already has a thorough grounding in the basics of coating technology and an understanding of the chemistry involved.



Structure of the Module

The module training material consists of 3 sections, 1 self-assessent questions (SAQ), 1 Computer Marked Assessment Questions (CMA), 1 Assignment (ASG) and an End Test (TMA).

This module is designed to take approx. 10 – 12 hours of study. This exludes the time taken to write up the report for the ASG.

Self-Assessment Questions (SAQ)

Are designed to enable you to check your own progress. Questions are asked as you progress through the module. You should write down your answers and then check them against the answers given in the Appendices. No marks are awarded for SAQs.

Computer Marked Assessment Questions (CMA)

Are a multi-choice question set that tests your understanding of the module. Please carry out this test before you submit any other work for marking by your tutor. These are completed online, you will need to log onto your study portal and then follow the CMA link/ instructions.

Assignment (ASG)

The ASG are an exercise in which the student research into and reports on certain objectives. You can discuss your proposed assignment with your tutor and mentor before commencing work. You will need to write a report on the assignment, which is then sent to your tutor for marking. Please see further instructions included in the Appendix on ASG Guidance Notes.

Tutor Marked Assessment (TMA)

Is a mandatory end test question paper taken under 'closed books', fully invigilated exam conditions. These are normally held on-site with an invigilator in attendance, which is normally your workplace mentor. The student or mentor will contact Lorraine Beard, and she will arrange for the TMA and instructions to be sent, by email to the chosen invigilator, and then this is then given to the student on the day and time that has been chosen.



Marks for the module

СМА	20%
ASG	35%
ТМА	45%
	100%

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. In addition, an overall mark of 50% - 64% must be achieved for a PASS to be awarded, an overall mark of 65% - 84% must be achieved for a Merit and over 85% for a Distinction.

Module Pre-requisites

The main prerequisite for persons taking Modules at Advanced level, is an interest in surface coatings. Preferably, they will be employed in the coatings or a related industry. They may also be employed by a user of paints, inks or powder coatings.

These modules include references to scientific concepts relating to coatings technology. For example, those identified with an asterisk contain many references to chemical formulae and reactions. Therefore, it is a requirement that you have a scientific education, with Chemistry and Physics to at least UK Advanced Level or higher, of which you can provide evidence.

Overview of qualification levels

Successful completion of six modules, including at least four at level 5, entitles a student to a full, Level 5 International Certificate in Coatings Technology (ICCT), awarded by The Coatings Training Institute. However, individual certificates are also presented if the student chooses to take less than six modules.



Note: The subject of Coating Formulation is dealt with in detail in:

- Introduction to Paint Chemistry by G P A Turner ISBN 0-412 16190-8
 Chapman & Hall, 11 New Fetter Lane, London EC4P 4EE
- Concise Paint Technology by J Boxall & J A von Fraunhoffer ISBN 0-236 40086-X Paul Elek (Scientific Books) Ltd
 54/58 Caledonian Road, London N1 9RN
- Introduction to Paint Technology Oil & Colour Chemists' Association (OCCA), Priory House, 967 Harrow Road, Wembley, Middlesex HA0 2SF
- Basic Science for Students of Paint Technology OCCA

The books shown below are rather expensive but are useful for reference purposes.

- Outline of Paint Technology (2 vols) by W M Morgans Chas Griffin, Crendon Street, High Wycombe, Bucks.
- Surface Coatings
 - Volume 1-- Raw materials and their usage
 - Volume 2 -- Paints and their application
 Obtainable from Oil & Colour Chemists' Association
 Priory House, 967 Harrow Road, Wembley, Middlesex HA0 2SF
- Protective Coatings -- Fundamentals of Chemistry and Composition by Clive H. Hart Published by SURFEX, Priory House, 967 Harrow Road, Middlesex HA0 2SF Reference Material

Copies of testing standards may be obtained directly from:

British Standards Institution 389 Chiswick High Road London W4 4AL

Tel: 0181 996 7000



MODULE OBJECTIVES

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

Section 1 – The nuts and bolts of Formulation

- 1.1. Identify the important characteristics that a formulator should have.
- 1.2. Discuss the factors that need to be taken into account when compiling a specification and the constraints that might inhibit its complete realisation.
- 1.3. Describe techniques that are used to formulate coatings

Section 2 - Media selection

- 2.1. Review and compare the relative merits and applications of the principal classes of media system in current use.
- 2.2. Describe specific coatings media in common use and their particular advantages.

Section 3 – Aspects of Development

- 3.1. Explain how Raw materials and Testing factors influence the formulation of a coating
- 3.2. Explain how Production and cost considerations influence the formulation of a coating
- 3.3. Explain how Application issues influence the formulation of a coating
- 3.4. Explain how the End-use of a coated article influences the formulation of a coating
- 3.5. Explain how Safety, health and environmental considerations influence the formulation of a coating.