

Study Guide

Module 407 – Level 4

Alkyds and Polyesters

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Summary

This Intermediate Level Module commences with the important topic of functionality and its significance to polymerisation.

A polyester is described as the reaction product of polyfunctional acids and alcohols and examples given showing the difference between saturated and unsaturated resins.

Alkyds are then discussed, and their properties shown to relate to their oil content and the type of oil or fatty acid used. Their modification with vinyl monomers to give additional hardness and with polyamides to give thixotropy are described.

Finally, some important methods of introducing water solubility to resins and oils are described.

Structure of the Module

The module consists of 3 sections, 1 set of Self Assessed Questions (SAQ), 1 Computer Marked Assessment Questions (CMA), 2 Tutor marked Assignments (ASG), and an end test (TMA).

The module is designed to take about 13 hours of study. This excludes the time taken to write up your report for the ASG's

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. Please note that there are 2 ASG's in this module.

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

CMA	20%
ASG	35%
TMA	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

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](#)

Persons taking these modules should be employed or have recently been employed in the coatings or a related industry.

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



Successful completion of six modules, including at least four at level 4 entitles a student to a full, Level 4 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.

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 and chemistry.

Module Objectives

When you have finalised this module, you should be able to do the following:

Section 1. Convertible Media

- 1.1 Functionality and Polymerisation

Section 2. Polyester Resins

- 2.1 Describe a polyester as the product of a reaction between polyfunctional acids and alcohols, stating two examples of (a) saturated, and (b) unsaturated polyester resins

Section 3. Alkyd Resins

- 3.1 Explain that alkyd resins may be prepared from both fatty acids and vegetable oils
- 3.2 Explain the influence on properties of alkyd resins, of 'oil content' and the type of oil or fatty acid used

Section 4. Vinyl Modified and Thixotropic Alkyds

- 4.1 Compare the general properties of vinyl modified alkyd resins with the unmodified resin
- 4.2 Describe the general characteristics of thixotropic alkyds
- 4.3 Describe the typical uses of alkyd resins

Section 5. Water Soluble Resins

- 5.1 Describe how resins and oils can be made water-soluble

