

## **Intermediate Module 312**

### **Raw Materials Testing of Solvents and Resins**

Author: R J Stanfield

*Updated by Dr T Sayer, P Collins*

#### **Summary**

Module 312 deals with the testing of solvents and resins and is one of a series on the raw materials used in coatings. Earlier studies on raw materials include the foundation module 202, which discusses general properties of resins & solvents, and intermediate level 403 that deals with the properties of solvents in some detail.

312 starts by defining solvents and their role in coatings and then explains different ways in which they may be classified. It then goes on to describe the characteristic properties of solvents and explains how their properties may be determined. An Assignment exercise is included, which requires the student to identify and report on the factors affecting solvent selection.

The second half of Module 312 reviews the classification of resin types used in coatings and their characteristic properties. It then proceeds to explain the general tests that are carried out to measure these properties. An outline of the polymerisation processes involved in the manufacture of resins is given, and some of the tests carried out during manufacture explained. Finally, brief reference is made to properties of specific chemical types of resin and the effect of these properties on manufacture and coating performance.

Students requiring a more detailed study of specific types of synthetic resin should consider modules 407, 408 & 409.

### **Structure of the module.**

The module consists of a theory block, 1 Computer Marked Assessment and 1 Assignment. The theory block is split into four sections which are not of equal length but should take, on average, about 2.5 hours to go through.

The module is designed to take about 10 hours of study in the theory block. This excludes the time taken to research and write up your report for the Assignment exercise.

The rules and topic for the Assignment are given in Appendix 2. You should discuss these with your tutor.

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

### **Marks for this module**

CMA answers	20%
ASG	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. 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.

## **Module Objectives**

### **Section 1. Definition of solvents and their role in coatings. Differences between solvents and diluents. Methods of classifying solvents and their characteristic properties**

- 1.1. To define solvents and understand their role in surface coatings.
- 1.2. To classify solvents
- 1.3 Describe the characteristic properties of solvents
- 1.4 Describe further characteristic properties of solvents.

### **Section 2. Methods of test for solvents and methods of determining the composition of a solvent mixture**

- 2.1 Determine the distillation range of a solvent.
- 2.2 Determine the flashpoint of a solvent.
- 2.3 Determine the approximate evaporation rates of solvents.  
Check on the colour, clarity and odour of a solvent.
- 2.4 Explain the use of solvent blends and determine the composition of a solvent mixture. (using RI & RD)

### **Section 3. Classification & characteristic properties of resins**

- 3.1 Describe the role of resins in surface coatings
- 3.2 Classify resins into different types using different parameters.
- 3.3 Describe the characteristic properties of resins.

### **Section 4. Methods used for testing resins, polymerisation, tests during manufacture, properties of specific chemical types of resin**

- 4.1. Understand methods of test for resin properties - general
- 4.2 Understand the polymerisation process.
- 4.3 Describe the testing of resins during manufacture.
- 4.4. Review methods of test for specific chemical types of resin.