

22.2.0 CONSTRUCTION MATERIALS II

22.2.1 Introduction

This module unit deals with the properties of materials used in construction work. The purpose of the module unit is to equip the trainee with knowledge, skills and attitudes necessary to identify sources, manufacturing and production processes and the use of construction materials.

22.2.2 General Objectives

By the end of the module unit, the trainee should be able to:

- Describe properties of various construction
- Describe manufacturing process of construction materials
- Explain the use of various materials in construction

22.2.3 Module Unit Summary and Time Allocation

Construction Materials

Code	Sub-Module Unit	Content	Time (Hours)		
			Theory	Practice	Total
22.2.01	Plastics and Rubbers	<ul style="list-style-type: none">• Methods of Manufacture• Properties of plastics and rubbers• Uses of plastics and Rubbers• Safety Precautions• Tests on plastics and rubber	6	12	18
22.2.02	Paints and Varnishes	<ul style="list-style-type: none">• Manufacture• Properties• surface preparation• Mixing paints• Application• Safety• Defects	6	12	18
22.2.03	Glass	<ul style="list-style-type: none">• Manufacturing Process• Types• Properties and Use• Glass as a Construction Material• Fixing materials• Fixing Glass	4	12	16

Code	Sub-Module Unit	Content	Time (Hours)		
			Theory	Practice	Total
22.2.04	Bituminous Products	<ul style="list-style-type: none"> • Manufacturing Process • Types • Properties • Uses 	4	10	14
22.2.05	Glues and Adhesives	<ul style="list-style-type: none"> • Types of Glues and Adhesives • Application 	2	4	6
22.2.06	Sealants	<ul style="list-style-type: none"> • Types of sealants • Methods of application 	2	4	6
22.2.07	Fibrous Materials	<ul style="list-style-type: none"> • Types of fibrous materials • Properties of fibrous materials • Application 	4	6	10
Total			28	60	88

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22.2.01	PLASTICS AND RUBBER	Practice
22.2.01C	Competence The trainee should have the ability to select and use plastics and rubber as construction materials	22.2.01 P0 <i>Specific Objectives</i> By the end of the sub-module unit, the trainee should be able to a) select plastic and rubber materials for construction work b) Tests plastics and rubbers
	Theory	
22.2.01T0	<i>Specific Objectives</i> By the end of the sub-module unit, the trainee should be able to: a) describe the methods of manufacturing plastics b) explain properties of plastics and rubber c) explain and uses of plastics and rubber d) explain the safety precautions for plastics and rubber e) perform tests on plastics and rubber	<i>Content</i> 22.2.01P1 Selection of plastic and rubber materials for construction works 22.2.01P2 Tests i) fire resistance
	<i>Content</i>	<i>Suggested Teaching/Learning Activities</i> - Discussion - Question and answers - Observations - Testing - Internet - Site visits
22.2.01T1	Methods of manufacturing of plastics	<i>Suggested Teaching/Learning Resources</i> - Text books - Specimens - Internet
22.2.01T2	Properties of plastics and rubber	
22.2.01T3	Uses of plastics and rubber	<i>Suggested Assessment Methods</i> - Assignments - Written tests
22.2.01T3	Safety precautions	
22.2.01T4	Tests i) fire resistance	

22.2.02 PAINTS AND VARNISHES

22.2.02C Competence

The trainee should have the ability to:

- i) Prepare surface before painting and varnishing
- ii) Mix paints
- iii) Select and apply paints and varnishes to different surfaces

Theory

22.2.02T0 *Specific Objectives*

By the end of the sub-module unit, the trainee should be able to:

- a) describe the manufacture of paints and varnishes
- b) explain properties of paints and varnishes
- c) outline the procedure of surface preparation before painting and varnishing
- d) describe the procedure of mixing paints
- e) describe the procedure of applying paints and varnishes
- f) outline safety precautions to be observed while

working with paints and varnishes

- g) explain procedures of remedying defects on paints and varnishes

Content

- 22.2.02T1 Manufacture of paints and varnishes
- 22.2.02T2 Properties of paints and varnishes
- 22.2.02T3 Surface preparation
- 22.2.02T4 Mixing of paints
- 22.2.02T5 Procedures of applying paints and varnishes
- 22.2.02T6 Safety precautions while working with paints and varnishes
- 22.2.02T7 Remedy of defects on paints and varnishes

Practice

- 22.2.02P0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- a) select paints and varnishes for various jobs
 - b) prepare surfaces before painting and varnishing a surface
 - c) mix paints to various colors and consistency
 - d) apply paints and varnishes to surfaces

- Content*
- 22.2.02P1 Selection of paints and varnishes
- 22.2.02P2 Surface preparation
- 22.2.02P3 Mixing of paints
i) colours
ii) consistency
- 22.2.02P4 Apply paints and varnishes to surfaces
i) coats
ii) tools/equipment

Suggested Teaching/Learning Activities

- Discussion
- Question and answers
- Observations
- Tests

Suggested Teaching/Learning Resources

- Text books
- Specimens
- Internet
- Site visits

Suggested Assessment Methods

- Assignments
- Written tests

22.2.03 GLASS

22.2.03C Competence
The trainee should have the ability to select and fix glass

Theory

- 22.2.03T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- a) describe the manufacturing processes of glass
 - b) outline types of glass
 - c) explain properties and uses of various types of glass.
 - d) outline advantages of glass as a construction materials
 - e) state materials used for fixing glass
 - f) outline the procedure of fixing glass

Content

- 22.2.03T1 Manufacturing processes of glass
- 22.2.03T2 Types of glass
- 22.2.03T3 Properties and uses of glass
- 22.2.03T4 Advantages of glass as a construction material
- 22.2.03T5 Fixing materials:
i) rubber
ii) putty
iii) beads
- 22.2.03T6 Procedure of fixing glass

Practice

- 22.2.03P0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- elect materials for glazing
 - fix glass panes

Content

- 22.2.03P1 Selection of glazing materials
22.2.03P2 Fixing glass panes

Suggested Teaching/Learning Activities

- Discussion
- Questions and answers
- Observation
- Site visits

Suggested Teaching/Learning Resources

- Text books
- Specimens
- Internet
- Site visits

Suggested Assessment Methods

- Assignments
- Written tests

22.2.04 BITUMINOUS PRODUCTS

- 22.2.04C Competence**
The trainee should have the ability to apply bituminous products in building construction

Theory

- 22.2.04T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- describe the process of manufacturing bituminous products
 - identify types of bituminous materials
 - explain properties of various bituminous products
 - outline the use of bituminous products in construction

Content

- 22.2.04T1 Manufacturing process
22.2.04T2 Types of bituminous materials
22.2.04T3 Properties of bituminous products
22.2.04T4 Uses of bituminous products

Practice

22.2.04P0 *Specific Objective*
By the end of the sub-module unit, the trainee should be able to select appropriate bituminous materials for building construction

Content

22.2.04 P1 Selection of bituminous materials

Suggested Teaching/Learning Activities

- Discussion
- Question and answers
- Observations
- Testing
- Site visits

Suggested Teaching/Learning Resources

- Text books
- Specimens
- Internet
- Site visits

Suggested Assessment Methods

- Assignments
- Written tests

22.2.05 GLUES AND ADHESIVES

22.2.05C Competence

The trainee should have the ability to apply glues and adhesives appropriately

Theory

22.2.05T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:

- describe types of glues and adhesives
- apply glues and adhesives on different surfaces

Content

22.2.05T1 Types of glues and adhesives

- natural
 - animal glues (casein, blood albumen)
 - vegetable glues
 - bituminous adhesives
 - rubber adhesives
- synthetic adhesive
 - thermoplastic
 - thermo setting plastics
 - rubber adhesives

- 22.2.05T2 Application on different surfaces
- i) wooden
 - ii) plastics and rubber
 - iii) glass
 - iv) metal
 - v) concrete

Suggested Assessment Methods

- Assignments
- Written tests
- Practical assessment

Practice

- 22.2.05P0 *Specific Objective*
By the end of the sub-module unit, the trainee should be able to apply glues and on adhesives on different surfaces

Content

- 22.2.05P1 Application on different surfaces
- i) wooden
 - ii) plastics and rubber
 - iii) glass
 - iv) metal
 - v) concrete

Suggested Teaching/Learning Activities

- Discussion
- Question and answers
- Observations

Suggested Teaching/Learning Resources

- Text books
- Specimens
- Internet

22.2.06 SEALANTS

22.2.06C Competence

The trainee should have the ability to apply sealants in building construction

Theory

22.2.06T0 *Specific Objectives*

By the end of the sub-module unit, the trainee should be able to:

- a) identify various define types of sealants
- b) explain methods of application of sealants

Content

22.2.06T1 Types of sealants

- i) plastic
- ii) elastic

22.2.06T2 Methods of application

- i) gun
- ii) knife
- iii) hot application

Practice

- 22.2.06P0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- select appropriate sealants
 - apply sealants

Content

- 22.2.06P1 Selection of sealants
22.2.06P2 Application of sealants

Suggested Teaching/Learning Activities

- Discussion
- Question and answers
- Observations

Suggested Teaching/Learning Resources

- Text books
- Specimens
- Internet

Suggested Assessment Methods

- Assignments
- Written tests
- Practical assessment

22.2.07 FIBROUS MATERIALS

22.2.07C Competence

The trainee should have the ability to select and appropriate fibrous

materials in building construction

Theory

- 22.2.07T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- identify various define types of fibrous materials
 - explain properties of fibrous materials
 - explain application of fibrous materials in building construction

Content

- 22.2.07T1 Types of fibrous materials
- natural
 - synthetic
- 22.2.07T2 Properties of fibrous materials
- mechanical
 - thermal
 - chemical
- 22.2.07T3 Application of fibrous materials
- sound insulation
 - thermal insulation
 - decorations

Practice

- 22.2.07P0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- select fibrous materials

b) apply fibrous materials

Content

- 22.2.07P1 Selection of fibrous materials
- 22.2.07P2 Application of fibrous materials

Suggested Teaching/Learning Activities

- Discussion
- Question and answers
- Observations

Suggested Teaching/Learning Resources

- Text books
- Specimens
- Internet

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