

Syllabus for Packing and Marking Operator

Course Name	Packing and Marking Operator
Sector	Logistics
Course Code	LGS/2023/PAMO/250
Level	3
Occupation	Packing & Marking Operator
Job Description	Packing and Marking Operator first identify & select the packing materials suitable for packing of products. The finished pack then marked with correct identification code or tag.
Course Duration	Total Duration 390 hrs. (Theory- 90 hrs., Practical- 180 hrs., OJT-60 and ES-60)
Trainees' Entry Qualification	Grade 10 OR Grade 8 with two year of (NTC/ NAC) after 8 th OR Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 8th grade pass with 2 yrs relevant experience OR Previous relevant Qualification of NSQF Level 2 with one yr experience OR Previous relevant Qualification of NSQF Level 2.5 with 6 months experience
Trainers Qualification	BE/B.Tech in Packaging Technology with 1 yr experience in any Iron & Steel industry. Diploma in Packaging Technology with 2 Yrs experience in any Iron & Steel industry.

Structure of Course:

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs) [Multiple of 30]
1.	Packaging Materials	Identify various packaging materials based on their properties & applicability	20	40	60
2.	Ancillary Materials required for Packaging	Identify various ancillary materials with their properties & their application process in Packaging.	30	60	90
3.	Coding & Marking system used in Iron & Steel industry	Apply different identification coding & marking required for different finished products.	20	40	60
4.	Safety Standards	Follow different safety rules & measures of packaging industry.	20	40	60
5.	OJT	Work in real job situation with	--	60	60

		special emphasis on basic safety and hazards in this domain (OJT).			
6.	Employability Skill	As per guided curriculum	60	--	60
TOTAL:			150	240	390

SYLLABUS:**Module - 1: Packaging Materials**

Outcome: Identify various packaging materials based on their properties & applicability

Theory Content:

1.1 Introduction: Primary Packaging Materials, Secondary Packaging Materials, Tertiary Packaging Materials.

1.2 Wood: Properties of wood as Packaging Material, forms of wood, decay and preservation of woods.

1.3 Paper: Type of paper, Treated Paper, Advantages & Limitation of paper-based package materials. Properties of paper, Specialty papers for packaging.

1.4 Paper Board: Definition, classification, manufacture of paper board.

1.5 Corrugated paper Board: Introduction, Types of corrugated Board, Properties of corrugated board, Types of corrugated boxes, application.

1.6 Folding Cartons: Introduction, Properties, Folding Carton design.

Practical Content:

- Testing of Paper: Thickness, Puncture resistance, Bursting strength, Folding Endurance.
- To study and test grammage cutter
- To study and test tensile strength of different packaging materials
- To study and test tear strength of different packaging materials
- To study and test coefficient friction of different packaging materials
- To study and test compression strength & deformation of different boxes
- To study and test bursting strength of different packaging materials
- To study and test stiffness of different packaging materials and their comparative study

Tools & Equipment needed:

- Thickness gauge
- Grammage Cutter
- Puncture resistance tester
- Bursting strength tester
- Folding Endurance Tester
- Vibration Tester
- Drop Tester
- Inclined Impact Tester
- Tensile strength tester
- Tear strength tester
- Coefficient of friction tester

- Hydro static pressure tester
- Stack load tester

Module- 2: Ancillary Materials required for Packaging

Outcome: Identify various ancillary materials with their properties & their application process in Packaging.

Theory Content:

2.1 Introduction: Different forms of Ancillary Materials.

2.2 Adhesives: Different types of adhesives, vegetable, animal, inorganic & synthetic adhesive, gelatine, hot-melt adhesive, Dextrin adhesive. Adhesive tapes, gum tapes, pressure-sensitive tapes & their application.

2.3 Cushioning: Types of cushioning material & properties wood shaving, saw dust, coir, rigid plastics & foams, honeycomb, corrugated fiber board (CFB), Cellophane.

2.4 Seals: Normal seals, Pressure seals, Vacuum seals etc.

2.5 Reinforcements: Straps – steel, Plastic, Rayon etc.

Practical Content:

- To study and operate Heat sealing machine
- To study and operate Cutting machine
- To study and operate Stitching machine
- To study and operate Gluing machine
- To study and operate Wrapping machine in industry

Tools & Equipment needed:

- Heat sealer
- Stitching machine
- Cutting machine
- Gluing machine
- Wrapping Machine

Module- 3: Coding & Marking system used in Iron & Steel industry

Outcome: Apply different identification coding & marking required for different finished products.

Theory Content:

3.1 Introduction: Coding & marking- batch code, batch number, QR code, MRP, manufacturing date, expiry date, types of coding

3.2 Labeling: Labels & labelling including instant labels.

3.3 Coding & Marking Standards: Coding and marking as per Iron & steel industry standards.

3.4 Coding system: Generation of Bar code, Security numbering process, Tag identification through radio frequency identification & detection, Bar code reader technology.

3.5 Inks, colorants: Dyes & pigments used for Coding & Marking of packaged product

Practical Content:

- Study and operation of Bar code Generating Machine
- Study and Operation of Numbering Machine
- Study and operation of Inkjet coding machine

Tools & Equipment needed:

- Inkjet coding machine
- Barcode generating machine

Module- 4: Safety Standards

Outcome: Follow different safety rules & measures of packaging industry.

Theory Content:

4.1 Hazards: Introduction, Identification of potential hazards, Different types of hazards during handling, storage, transportation, Fire hazards, etc.

4.2 Safety: follow safe working practices while dealing with hazards, handling of heavy items, working in and around trenches, elevated places and confined areas, etc.

4.3: Safety precautions & equipment: protective clothing/equipment for specific tasks and work, various types of fire extinguisher, various types of safety signs and their meaning, appropriate first aid treatment, industry specific relevant standards, procedures and policies

Practical Content:

- Read safety instructions/guidelines
- Study & operation of fire extinguisher
- Routine checking of the machines
- Fire drill
- Emergency procedures such as raising alarm, safe evacuation
- First aid treatment relevant to different condition e.g. bleeding, minor burns, eye injuries etc.

Tools & Equipment needed:

- Fire extinguisher
- First aid Box

Module- 5: OJT

Outcome: Work in real job situation with special emphasis on basic safety and hazards in this domain

Practical Content:

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for **60 Hours**.)

Module- 6: Employability Skills (60 Hrs)

Key Learning Outcomes**Introduction to Employability Skills**

Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

Constitutional values - Citizenship

Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century

Duration: 2.5 Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

Basic English Skills

Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

Career Development & Goal Setting

Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

Communication Skills

Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

Diversity & Inclusion

Duration: 2.5 Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

Financial and Legal Literacy

Duration: 5 Hours

17. Outline the importance of selecting the right financial institution, product, and service

18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

Essential Digital Skills

Duration: 10 Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

Entrepreneurship

Duration: 7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

Customer Service

Duration: 5 Hours

30. Describe the significance of analyzing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

Getting Ready for apprenticeship & Jobs

Duration: 8 Hours

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities

Learning Outcome – Assessment Criteria

Module No.	Outcome	Assessment Criteria
1	Identify various packaging materials based on their properties & applicability	<p>After completion of this module students will be able to:</p> <p>1.1 Identify different packaging materials.</p> <p>1.2 State the properties of different packaging materials.</p> <p>1.3 Select appropriate packaging materials based on their properties.</p> <p>1.4 Design various types of folding cartons & corrugated box</p> <p>1.5 Test different properties of packaging material</p>
2	Identify various ancillary materials with their properties & their application process in Packaging.	<p>After completion of this module students will be able to:</p> <p>2.1 Identify different forms of Ancillary Materials.</p> <p>2.2 State the properties and application of different types of adhesives.</p> <p>2.3 Explain types of cushioning material & their properties.</p> <p>2.4 Demonstrate Normal seals, Pressure seals, Vacuum seals etc.</p> <p>2.5 Apply different types of reinforcements in packaging</p> <p>2.6 Operate various packaging machines like Heat sealing, cutting, stitching, gluing wrapping.</p>
3	Apply different identification coding & marking required for different finished products.	<p>After completion of this module students will be able to:</p> <p>3.1 Identify different types of coding & marking system.</p> <p>3.2 Explain various types of Labels & labelling including instant labels.</p> <p>3.3 Explain Coding & Marking Standards followed in Iron & steel industry.</p> <p>3.4 Identify types of Inks, used for Coding & Marking of packaged product</p>
4	Follow different safety rules & measures of packaging industry.	<p>After completion of this module students will be able to:</p> <p>4.1 Identify Different types of hazards during handling, storage, transportation, fire hazards, etc.</p> <p>4.2 Learn safety standards and policies followed in industry</p> <p>4.3: Use various safety equipments.</p>
5	OJT	Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual

Module No.	Outcome	Assessment Criteria
		workplace under any supervisor / contractor for 60 Hours.)
6	Employability Skill	As per guided curriculum

List of Tools, Equipment & materials needed for 30 Trainees (Practical)

Sl No	Items Name	Specification	Qty
1	Thickness gauge	Measuring range: 0-50 mm Resolution: 0.01 mm Measuring unit: mm or inch Display: LCD	1no.
2	Grammage Cutter	Cutting area: 100cm ² Cutting thickness: 5 mm Cutting diameter: 112.8 mm Dimension: 150 x 115 Weight: 1.2 Kg	1no.
3	Puncture resistance tester	Energy Range of Weights: 6, 12, 24, 48 J, Accuracy: $\pm 2\%$ within the entire range, The release angle of Pendulum: 90°, Display: LED (Digital), Power: 220V, 50Hz, Single Phase	1no.
4	Bursting strength tester	Capacity: 40 kg/cm ² , Display: LED (Digital), Accuracy: $\pm 1\%$ within 10% to 90% of the entire range as per IS: 1828 with the master gauge, Least Count/Resolution: 0.1Kg/cm ² , Power: 220V, Single phase, 50 Hz, Test fluid: Glycerin is about 98% purified (lab grade), Rate of fluid displacement: 95 cc/minute, Motor: 1/4 HP Single Phase, 1440 rpm, Test Range: 1Kg / cm to 38 Kg / cm ²	1no.
5	Folding Endurance Tester	Specimen: 15×150mm, Load Method: 500g×3,255g×3(optional)(Hang type weight) (Can select weight as per requirements), Load precision: $\pm 0.5\%$, Folding angle: 135 $\pm 0.5^\circ$, 90 $\pm 0.5^\circ$, Width of folding head: 19 \pm 1mm, Arc radius of folding surface: 0.25 ± 0.02 mm, 0.38 ± 0.02 mm, 3.5 ± 0.02 mm	1no.
6	Vibration Tester	Load Capacity: 50 Kgs (5 – 50 Kg loading), Standard Platform Size: 600 x 600 mm, Step-Less Frequency Variation: 1 – 5 Hz with VFD Drive, Step-Less Speed Variation: 60 – 300 RPM with VFD Drive, Motor: 2 H.P. 1 Ph 230 V.AC 50hz (VFD Compatible), Box Retainer System: 6-8" height Adjustable Sliding Supports	1no.
7	Drop Tester	Height of the laboratory equipment is 1.8	1no.

Sl No	Items Name	Specification	Qty
		meter (Adjustable), Higher height models are also available, Load can be exerted up to 50Kg., Maximum and Minimum height of drop is 1800 mm and 750 mm respectively, Sample Mounting table –465 * 445 mm, Adjustable angle holder is provided with the device.	
8	Inclined Impact Tester	Load capacity: up to 1000 kg, Impact stroke: 0~3600 mm, Test angle: 10°, Test speed: 3.6 m/sec, Rolling carriage size: 1200 X 1200mm, Impact surface (bumper) size: 2500X 2500mm	1no.
9	Tensile strength tester	Capacity: 50N, 500N,1KN,10KN,20KN, Force measure range: 0.2% ~100%FS, Load accuracy: ±0.5%, Decomposition degree of load: 1/200,000, Power: 1 phase 220V, 50/60hz	1no.
10	Tear strength tester	Capacities of 1600 grams, 3200 grams, and 6400 grams, The clamp surface of each clamp is of Length 35.5 mm x M 15.5 mm, The distance between both the clamps is 2.5 +/-0.25mm, The size of the slit is 20mm, The machine is equipped with a measurement scale reading in the range of 0 to 100%, The machine is available with the calibrated weights 1600grams, 3200 grams, and 6400 grams, Accuracy: ± 2% within the entire range, Least count of scale: 1%	1no.
11	Coefficient of friction tester	Complete with data acquisition software, 200g sled weight (1kg sled weight available), Wide speed range 10~305 mm/min, Stroke: 9" (230mm), Work table accommodates samples 4.7" wide x 10" long,	1no.
12	Hydro static pressure tester	Unit of pressure kg/cm ² , BAR Pressure range 0.00 to 60.00kg/cm ² Pressure resolution 0.01kg/cm ² Time range 999.9 Hours Time resolution 0.1 Hour / 6 Minute Hydraulic circuit Made from corrosion-less S.S. 304 tubing and fittings Compressed air requirement Min.3.0 kg/cm ² from compressor unit Pressure developing system Through hydro-pneumatic type reciprocating pump No. of pumps Single Pressure control system Hydro-pneumatic pressure regulating device Paint Powder coated Power supply 230V AC, Single phase,	1no.

Sl No	Items Name	Specification	Qty
		50Hz	
13	Stack load tester	Least Count: 0.05kg (50gm), Traverse Speed: 10 to 50mm/min (Adjustable) Power: 220V 50Hz Platform Size: 300x300 mm Max Force: 500 kgf	1no.
14	Heat sealer	Material: Stainless Steel, Aluminium Capacity: 12 mm width Voltage: 230V Power: 300 watts Size: 8"	1no.
15	Stitching machine	Product Type Box Stitching Machine, General Use Industrial Type Corrugated Box Making Machine, Automatic, Drive Type Electric, Voltage 220-380 Volt	1no.
16	Cutting machine	Max.Sheet size: 1280 ×920 mm Min.Sheet size: 550 ×420 mm Max.Die-size: 1270 X 900cm Max.Die-cutting pressure: 250 N/CM Cardboard: 8 mm Power: 13.5KW	1no.
17	Gluing machine	Max. size of cardboard: 1000 mm x 2000 mm Automatic system Speed of folder gluer: 150 sheets/min Min. Size of cardboard: 260 mm x 600 mm	1no.
18	Wrapping Machine	Material: Stainless steel Machine Layout: Horizontal Power Requirement: 3.5 - 5 Kw (Approx) Voltage: 240 - 440 V (Approx)	1no.
19	Inkjet coding machine	Nozzle Type: Thermal Foamable Head, Printing Accuracy: 150 DPI / 300 DPI / 600 DPI, Print Height: Minimum Print – 1mm, Maximum Print – 12.7mm, Printing From: Keep a distance of 1-2mm, Ink Cartridge Company: HP, Ink Colour: Black, USB Compatible: Yes, Power Parameters: 240 V, Print Options: Manual and Online (Automatic with sensor)	1no.
20	Barcode generating machine	Type: Printer Weight: 100-150 Grams (g) Power Source: Electric Voltage: 100-240 Volt (v) Colour: Black	1no.
21	Fire extinguisher	As per industry standard	1no.
22	First aid Box	As per industry standard	1no.

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr. marks
Identify various packaging materials based on their properties & applicability	LGS/2401/OC1	30	150
Identify various ancillary materials with their properties & their application process in Packaging.	LGS/2401/OC2	50	200
Apply different identification coding & marking required for different finished products.	LGS/2401/OC3	30	150
Follow different safety rules & measures of packaging industry.	LGS/2401/OC4	40	150
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	LGS/2401/OC5	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0