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Facilitator Guide



Sector
Furniture & Fittings

Sub-Sector
Furniture Design & Production

Occupation
Furniture Production (Machine Shop)

Reference ID: **FFS/Q1002**, Version **1.0**
NSQF Level **4.5**

Panelworks Machine Operator

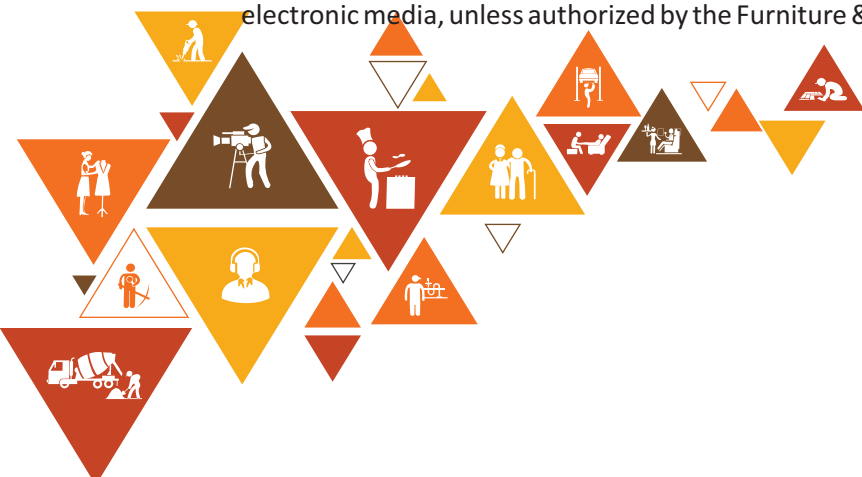
(Pasting and Pressing Machines/Cutting and Sizing Machines/Edge Band Machines/Drilling Machines/Routing Machines/Veneer Cutting and Splicing Machines/CNC Machines)

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Shri Narendra Modi
Prime Minister of India

“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”



Acknowledgements

We are thankful to all organizations and individuals who have helped us in the preparation of this Facilitator Guide. We also wish to extend our gratitude to all those who reviewed the content and provided valuable inputs for improving the quality, coherence and content presentation of chapters. This Facilitator Guide will lead to the successful rollout of the skill development initiatives, helping greatly our stakeholders particularly trainees, trainers and assessors etc. We are thankful to our Subject Matter Expert for the content and for helping us in the preparation of this Facilitator Guide.

It is expected that this publication would meet the complete requirements of QP/NOS based training delivery. We welcome suggestions from users, industry experts and other stakeholders for any improvement in future.

About this Guide

The objective of the guide is to provide an approach map for interacting with the trainees undergoing training in this job role. The course aims to provide both theoretical and practical knowledge to the trainees and also to guide them about Panelworks Machine Operator. The guide is neither a substitute nor a complete road map, but an aid to help to pass on the knowledge on all the aspects to the trainees in a systematic manner. It is expected that the trainer is fully conversant with all the contents of the guide. The guide is just to indicate how to proceed in covering a topic and includes some additional information that may be necessary for the trainer to develop better comprehension of the following aspects:

- **Knowledge and Understanding:** Satisfactory operational learning and comprehension to play out the required chore.
- **Performance Criteria:** Pick up the required aptitudes through hands-on preparation and play out the required operations inside the predetermined measures.
- **Professional Skills:** Capacity to settle on operational choices relating to the zone of work.

The job will also include judging comprehension and also help them learn more through hands-on training. But it has to be ensured that these are following the knowledge imparted and time spent on each unit. It is expected that irrespective of the region, knowledge of all aspects will be imparted to trainees.

Symbols Used



Ask



Activity



Do



Demonstrate



Explain



Elaborate



Example



Exercise



Facilitation Notes



Field Visit



Learning Outcomes



Notes



Objectives



Practical



Resources



Role Play



Summarize



Say



Team Activity

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Bridge Module

Key Learning Outcomes

At the end of this module, you will be able to:

1. Explain the functioning of the furniture industry.
2. Describe the segments of the furniture industry.
3. Explain the scope and significance of the furniture industry.

UNIT 1.1: Introduction to the Interiors, Furniture, and Allied Industry

Unit Objectives

At the end of this unit, you will be able to:

1. Describe the scope and significance of the furniture industry.
2. Discuss the various segments of the furniture industry and how they function.
3. Explain various types and categories of furniture.
4. Describe the types of allied or enabling industries involved in furniture manufacturing.
5. Describe the relationship between interiors and the furniture industry.
6. Classify different types of Interior projects.
7. Describe the occupational map of the furniture industry.
8. Explain the significance of the Interiors, Furniture, and Allied industries.

Resources to be Used

Theory:

- Participant Handbook, Trainer Guide
- Whiteboard & Markers
- PowerPoint Slides/Projector
- Industry overview videos or virtual plant tour clips
- Handouts/Charts of occupational map and project types.

Practical:

- Samples or images of different furniture types (e.g., modular, bespoke, traditional)
- Posters or infographics of allied industries (wood, laminates, fittings, upholstery)
- Case study briefs of interior projects (residential, commercial, hospitality, etc.)

Say

- Good morning and welcome to the training program on “Panelworks Machine Operator.”
- Start with an ice-breaking session. Introduce yourself and ask participants to introduce themselves.
- Before we start working on machines and panels, it’s important to understand the big picture.
- In today’s session, we’ll explore the Interiors, Furniture, and Allied Industry—what it includes, why it matters, and how all the pieces connect together. This foundation will help you see where your role as a Panelworks Machine Operator fits in the larger industry puzzle."

Ice Breaker Activity: ‘Furniture & Me’



Purpose: This activity aims to familiarise the participants in the group with one another.

Tentative Duration: 15 minutes

Procedure:

- Ask participants to introduce themselves with an adjective that begins with the initial letter of their name (e.g., “Panelworks Machine Operator Nakul”).
- Request that they share their interest in the Furniture & Fittings sector.

Expected Outcome: The outcome of this activity is that the Participants build camaraderie, creating a collaborative learning environment.

Ask



Ask the participants the following questions:

- Have you ever noticed how the furniture in a home, office, or hotel is different? Why do you think that is?
- Can you name a few materials or industries that might be involved in making a piece of furniture?
- What do you think is the difference between modular furniture and traditional furniture?

Write their responses on the whiteboard/flipchart and encourage a discussion to build on their existing knowledge.

Elaborate



In this session, we will cover the following points:

- **Scope of the Industry:** How large and impactful the furniture and interiors sector is—domestically and globally.
- **Segments of the Industry:** From large-scale manufacturing to bespoke furniture-making, and how they serve different market needs.
- **Types of Furniture:** Residential, office, institutional, and specialized furniture.
- **Allied Industries:** How materials like laminates, hardware, adhesives, and finishing products play a role.
- **Furniture & Interiors Connection:** Why good furniture design supports good interior design—and vice versa.
- **Types of Interior Projects:** Residential flats, retail stores, hotels, offices—each with their own furniture needs.
- **Occupational Map:** The wide range of jobs in this field—from designers to operators like you.
- **Industry Significance:** How this sector is evolving with trends like modular furniture, sustainability, and automation.

Activity



Name: Mapping the Furniture World

Objective:

- To help trainees visualize how various segments and allied industries contribute to a furniture project.

Materials Needed:

- A3 sheets
- Colored markers or sketch pens
- Chart paper with example project (e.g., hotel lobby or modular kitchen)
- Sticky notes

Procedure:

- Divide trainees into small groups.
- Assign each group a different type of furniture project (e.g., residential kitchen, office space, boutique store).
- Ask them to draw a basic layout and list all the types of furniture and materials needed.
- Then, ask them to connect those to relevant allied industries (e.g., plywood from timber, hinges from hardware, edge bands, upholstery, polish).
- Each group will present their work and explain how various segments are involved.

Outcome:

- Trainees will be able to identify and map how different types of furniture projects bring together multiple players in the value chain.

Do



- Support each group as they brainstorm and map their project.
- Ask guiding questions like: “What material would be used here?”, “Who supplies this part?”, “What kind of worker would do this job?”
- Encourage creativity but also accuracy—this activity is both fun and informative.
- Help trainees visualize connections with real-world examples from your experience or the industry.

Say



- Great work, everyone! You've just seen how complex and fascinating the world of furniture really is. Whether it's a simple chair or an entire office setup, many people and industries are involved.
- As we move forward in this course, remember—your role as a Panelworks Machine Operator is an important link in this chain. Understanding where you fit helps you work smarter and take more pride in your craft.

Notes for Facilitation



- Use real-life visuals wherever possible—it helps learners connect theory to practice.
- Keep the tone conversational and engaging, especially in the early stages of the course.
- If available, show a short video or virtual tour of a furniture manufacturing unit.
- Encourage participants to ask questions and share what they already know—this helps build confidence.
- Use a wall or board to create a visual industry map as you go—add new segments or roles to it during the session.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. What is the significance of the furniture industry in the economy?

The furniture industry contributes significantly to economic development through job creation, manufacturing, exports, and demand for allied materials and services.

2. Name three major segments of the furniture industry and briefly describe their functions.

- Residential: Produces furniture for homes such as beds, sofas, wardrobes.
- Commercial: Focuses on office furniture like desks, cubicles, chairs.
- Institutional: Serves schools, hospitals, and public buildings with functional and durable furniture.

3. How do allied industries support furniture manufacturing?

Allied industries supply essential raw materials and components such as wood, plywood, laminates, metal parts, adhesives, textiles, and finishes, enabling the production of complete furniture products.

4. What is the relationship between interior design and the furniture industry?

Interior design and furniture are closely linked; good furniture enhances the aesthetics and functionality of interiors, while interior design guides furniture selection and layout to meet spatial and stylistic needs.

5. Why is it important to classify different types of interior projects?

Classifying interior projects helps in planning, budgeting, material selection, and execution by understanding the specific needs of spaces such as residential, commercial, or hospitality environments.

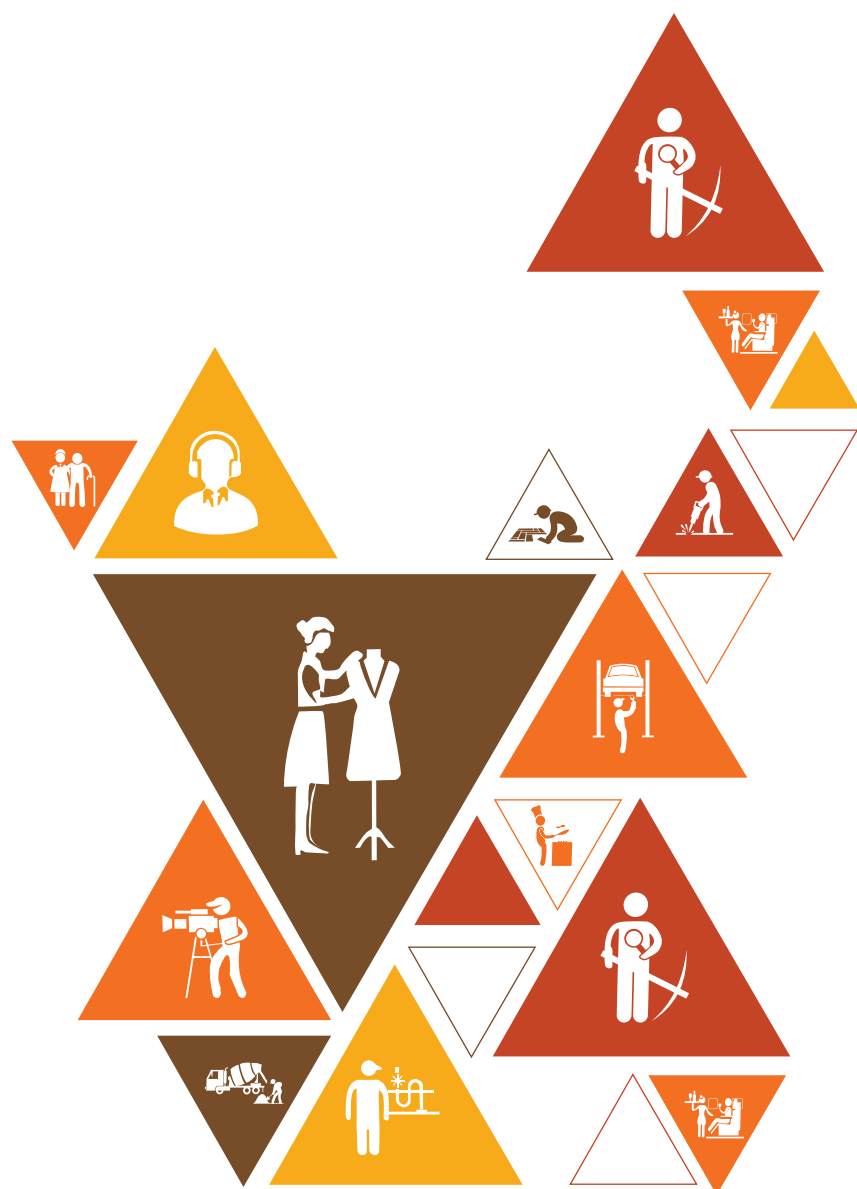
Fill in the Blanks:

1. The furniture industry is divided into various segments, such as residential, commercial, and institutional.
2. Allied industries, such as wood suppliers and textile manufacturers, play a key role in furniture production.
3. The relationship between furniture and interior design ensures aesthetic and functional spaces.
4. The occupational map of the furniture industry provides a structured classification of job roles and skills.
5. The Interiors, Furniture, and Allied industries contribute significantly to growth and employment.

True/False Questions:

1. **False** – The furniture industry includes products made from various materials like metal, plastic, and engineered wood.
2. **True** – Allied industries such as metalworking, textile, and upholstery are essential for creating complete furniture.
3. **False** – Interior projects can be classified into multiple categories such as residential, commercial, hospitality, and institutional.
4. **True** – The occupational map helps in identifying career paths and required competencies in the industry.
5. **False** – The significance of these industries extends beyond home decor to include commercial and institutional spaces.

[illegible]



Bridge Module

Key Learning Outcomes

At the end of this module, you will be able to:

1. Explain the methods and mechanisms for effective communication.
2. Demonstrate the usage of effective communication and interpersonal skills.
3. List the latest skills and technologies prevalent in the furniture industry.
4. Demonstrate the usage of different tools and technologies.
5. Describe organizational hygiene and sanitation guidelines.

UNIT 2.1: Organizational Framework and Workplace Guidelines

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the importance of team objectives and goals.
2. List the basic parts of a computer and explain their functions.
3. Explain the working of various social media platforms: WhatsApp, Facebook, Twitter, etc.
4. State the significance of payment methods and gateways for financial transactions.
5. List the steps involved in a financial transaction using a suitable medium.
6. Differentiate and learn the escalation in the hierarchy.
7. Explain the functions of MS Office.
8. Explain the importance of effective communication and team coordination.
9. Explain the difference between briefing and debriefing.
10. State the importance of coordinating and resolving conflicts with the team members to achieve a smooth workflow.
11. Discuss organizational hygiene and sanitation guidelines and ways of reporting breaches/gaps, if any.
12. Describe how to address and resolve conflicts among employees.

Resources to be Used

Theory:

- Charts or visuals of an organizational hierarchy
- Presentation on team objectives and coordination
- Notes or handouts on MS Office and communication protocols
- Posters on hygiene and sanitation standards
- Print material on digital transactions and payment gateways
- Communication flow diagrams (briefing vs. debriefing).

Practical:

- Computer with MS Office suite installed
- Mobile phones/tablets with WhatsApp, Facebook, Twitter for demonstration
- Demo setup for UPI/online payments (mock environment)
- Workplace hygiene checklist
- Scenario cards for role plays (conflict resolution, escalation, team briefing)
- Printed diagrams for computer parts identification

Say



- “Workplaces are more than just physical spaces — they are systems of people, tools, and communication. To work efficiently, we need to understand how teams function, how we use technology, and how to follow guidelines to stay organized and safe.”

Ask



Let me start by asking you a few questions:

- “Can you think of a time when your team worked well — or didn’t? What made the difference?”
- “Which digital apps do you use the most in your daily life?”
- “Why do you think communication and hygiene are important in a professional setting?”
- “What would you do if you had a disagreement with a teammate?”

Please feel free to share your experiences with the group. I’ll be noting down your ideas on the whiteboard.

Elaborate



During this session, we will focus on:

- Explain what team objectives are and how roles are assigned.
- Use a diagram to show the escalation hierarchy in organizations.
- Describe the parts of a computer — monitor, CPU, keyboard, mouse, etc.
- Talk about digital communication tools: WhatsApp, Facebook, Twitter.
- Explain how digital payments work — UPI, card, net banking, etc.
- Introduce MS Word, Excel, PowerPoint — what they’re used for.
- Differentiate briefing and debriefing with examples.
- Explain basic workplace hygiene and how to report issues.
- Discuss methods of conflict resolution and maintaining smooth team coordination.

Activity-1



Practical Activity 1: Understanding Briefing and Debriefing

- Objective: To help trainees experience and articulate the difference between briefing (before the task) and debriefing (after the task).
- Materials Needed:
 - ✓ Printed instruction sheets for a simple task (e.g., assembling a paper model or solving a puzzle)
 - ✓ Pen and notepad for observations
 - ✓ Timer
- Steps:
 - ✓ Divide trainees into teams of 3–4 members.
 - ✓ Assign a simple task, such as building a paper object, sorting colored tokens in a specific pattern, or solving a short riddle-based challenge.
 - ✓ Step 1: Conduct a briefing.
 - One trainee will act as the “Team Leader” and will brief the rest of the team about the task (based on instructions you provide).
 - The briefing must include task goals, time allowed, and who does what.
 - ✓ Step 2: Teams perform the task.
 - Allow 5–7 minutes for task completion.
 - ✓ Step 3: Conduct a debriefing.
 - The same “Team Leader” now leads a short discussion reflecting on:
 - What went well?
 - What challenges did the team face?
 - What could be improved?
- Facilitator Prompts (During Debrief):
 - ✓ “Did the initial briefing help you complete the task effectively?”
 - ✓ “How was the debrief useful in reflecting on performance?”
- Outcome: Trainees will understand that briefing is for planning and preparation, while debriefing is for reflection and learning.

Activity-2



Practical Activity 2: Conflict Resolution Role Play

- Objective: To enable trainees to identify causes of conflict and apply suitable strategies to resolve them constructively.
- Materials Needed:
 - ✓ Printed role-play scenarios involving workplace conflicts
 - ✓ Conflict resolution checklist or tips (prepared in advance)
 - ✓ Observer checklist (optional)
- Steps:
 - ✓ Divide trainees into groups of 3–4.
 - Two will act out a conflict, one will be a mediator or supervisor, and the rest can observe.
 - ✓ Distribute role-play scenarios. Examples include:
 - Team member A is not meeting deadlines, causing frustration.
 - Two employees disagree on how to divide a shared task.
 - One employee feels left out of communication in a group project.
 - ✓ Allow 3–5 minutes for preparation.
 - ✓ Conduct the role-play while the facilitator or observer notes behaviors such as listening, empathy, solution suggestion, tone of voice, etc.
 - ✓ Post-role play discussion:
 - What was the main issue?
 - How did the parties try to resolve it?
 - What worked and what didn't?
 - Was the conflict resolved?
- Facilitator Prompts:
 - ✓ “Did both parties feel heard?”
 - ✓ “Was there a focus on finding a solution?”
 - ✓ “What could have been done differently?”
- Outcome: Trainees will be able to demonstrate constructive dialogue, active listening, and collaborative problem-solving in handling conflicts.

Say

- “Understanding the organizational setup, using digital tools efficiently, and communicating well with your team helps you grow professionally and contribute meaningfully to your workplace. These are essential skills for today’s industry.”

Notes for Facilitation

- Ensure access to digital tools for all participants during practice.
- Be sensitive when discussing conflict or hygiene; use neutral examples.
- Encourage peer learning during group discussions and activities.
- Use visuals wherever possible to explain abstract ideas (like hierarchy).
- If internet access is not available, simulate digital platforms with printed mock-ups.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. Why are team objectives and goals important in an organization?

Team objectives and goals align all members toward a common purpose, improve coordination, increase productivity, and help track performance and outcomes effectively.

2. Name the basic parts of a computer and briefly explain their functions.

- CPU (Central Processing Unit): Processes all data and instructions.
- Monitor: Displays output from the computer visually.
- Keyboard: Allows user input via keys.
- Mouse: Enables navigation and interaction with the interface.
- Hard Drive/Storage: Stores data and software permanently.
- RAM: Temporarily stores data for active tasks and programs.

3. How do payment methods and gateways contribute to financial transactions?

Payment methods and gateways ensure secure, fast, and authenticated processing of digital financial transactions between customers and service providers.

4. What is the purpose of escalation in an organizational hierarchy?

Escalation allows unresolved issues to be passed up the chain of command for effective resolution by higher authorities.

5. How does effective communication help in team coordination?

Effective communication ensures that team members share ideas, receive clear instructions, understand roles, and collaborate efficiently to avoid misunderstandings.

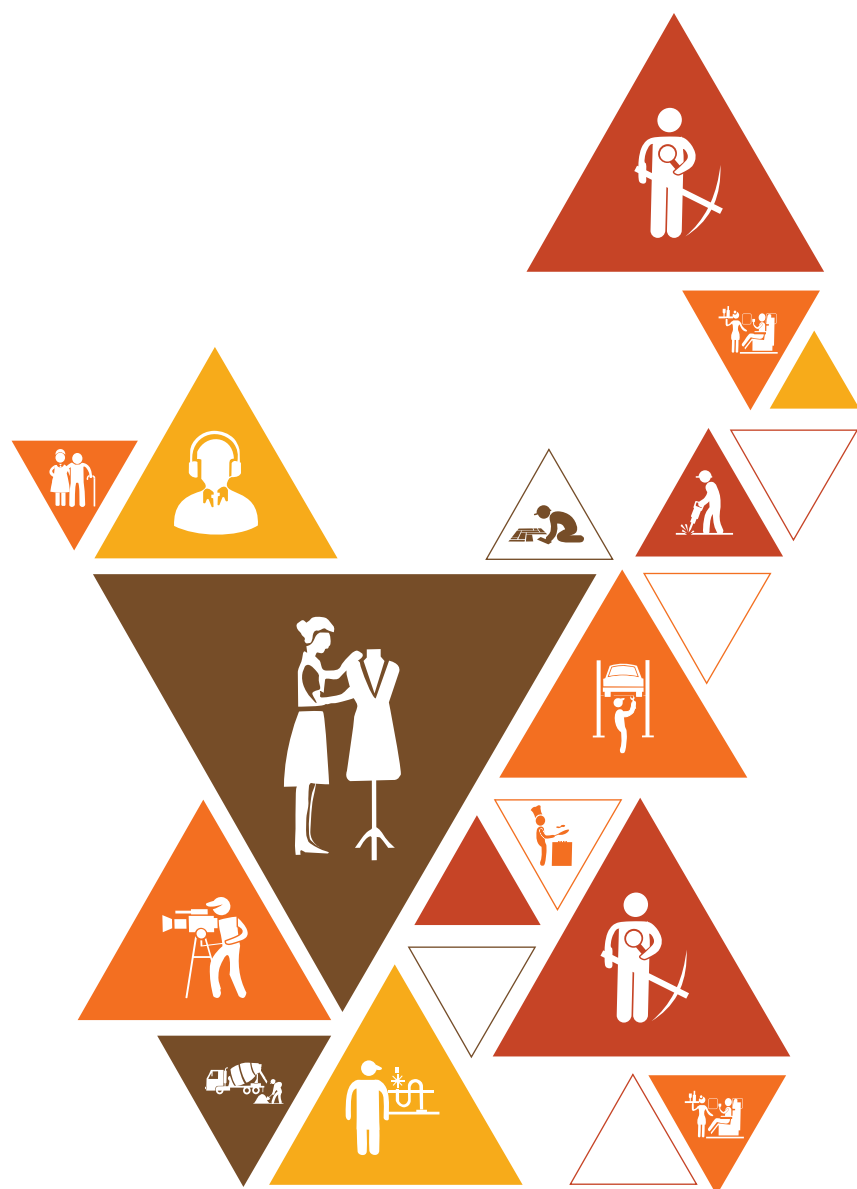
Fill in the Blanks:

1. The CPU is the brain of the computer and processes all instructions.
2. WhatsApp, Facebook, and Twitter are examples of social media platforms.
3. A financial transaction typically involves the steps of authentication, authorization, and confirmation.
4. MS Office includes applications such as Word for word processing and Excel for data analysis.
5. Conflict resolution among employees ensures a harmonious and productive work environment.

True/False Questions:

1. **False:** Team coordination is not necessary for achieving organizational goals.
2. **True:** Escalation in hierarchy helps resolve issues that lower levels cannot handle.
3. **False:** Briefing and debriefing are the same processes in a team discussion.
4. **True:** Reporting sanitation guideline breaches is essential for workplace hygiene.
5. **False:** Effective communication is only important in customer interactions, not within teams.

[illegible]

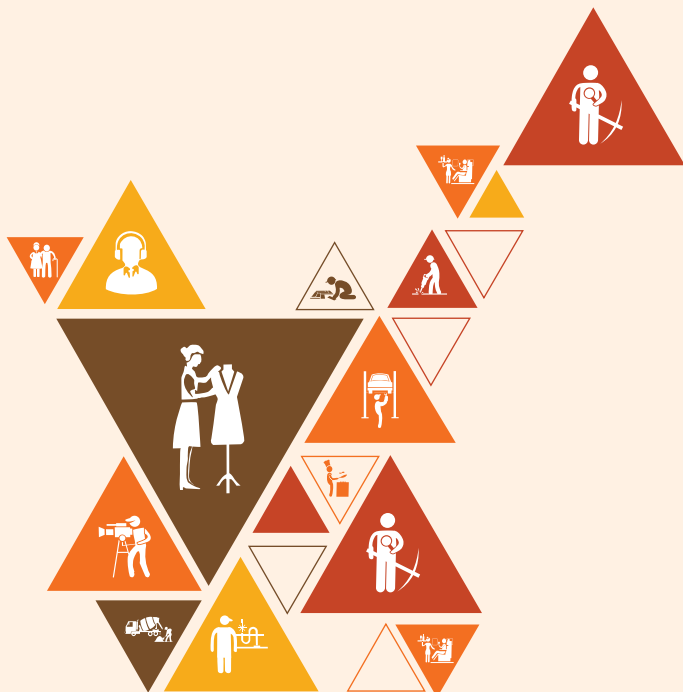




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3. Introduction to the Role of a Panelworks Machine Operator

Unit 3.1 - Role of an Panelworks Machine Operator



Bridge Module

Key Learning Outcomes

At the end of this module, you will be able to:

1. Explain the role and responsibilities of a Panelworks Machine Operator.
2. Discuss the scope of work for a Panelworks Machine Operator.

UNIT 3.1: Role of an Panelworks Machine Operator

Unit Objectives

At the end of this unit, you will be able to:

1. Elaborate on the various organizational structure, processes, code of conduct, reporting matrix, and escalation hierarchy.
2. Explain the role, responsibilities, and limitations of a Panelworks Machine Operator.
3. Describe the attributes and basic skill sets required for a Panelworks Machine Operator.
4. Explain the process of communication with team members and supervisors as per the protocol of the organization.
5. List all the documents required to carry out the job, such as a job sheet and checklist for oneself.
6. List the various operations/activities that take place at the worksite and Panelworks Machine Operator's role in the same.
7. Discuss the regulatory authorities, laws, and regulations related to an individual while working in the Furniture and Fittings Industry.
8. Discuss the career path for the Panelworks Machine Operator job role.
9. Explain the nature of work, timeliness, and requirement.

Resources to be Used

Theory:

- Whiteboard and markers
- Presentation slides on organizational structure, job roles, and hierarchy
- Handout on attributes, regulations, and responsibilities of Panelworks Machine Operators
- Samples of job sheets, checklists, and reporting formats.

Practical:

- Roleplay scripts for team communication
- Sample panelwork station setup
- Demonstration of job sheet filling
- Chart/visual of escalation matrix
- Case studies on jobsite operations.

Say



- “In any workplace, clarity of roles, communication, and adherence to structure are key to smooth functioning. The Panelworks Machine Operator plays a critical role in ensuring that high-quality panels are prepared as per job requirements. Today, we will explore this role in depth, including the expectations, workflow, communication, and compliance aspects.”

Ask



- “Have you ever seen large wooden or laminated panels being cut or shaped in a factory? What do you think is the operator’s role in that process?”
- “Why do you think documenting your work is important, especially when working on machines?”

Please feel free to share your experiences with the group. I’ll be noting down your ideas on the whiteboard.

Elaborate



- Share the organizational structure in a typical furniture manufacturing unit, including escalation levels.
- Explain the roles and responsibilities of a Panelworks Machine Operator.
- Discuss required attributes like precision, attention to detail, and safety awareness.
- Go over typical workplace communication protocols with team leads and supervisors.
- Present documents such as job sheets and checklists and their purpose.
- Describe the nature of work expected: punctuality, following instructions, meeting output targets.
- Discuss key regulations applicable in the furniture industry (e.g., worker safety, material handling).
- Show a sample career path — from Machine Operator to Supervisor to Plant In-Charge.

Activity-1



Implementing a Safety Management Plan (SMP) in Mines

- Objective: Demonstrate the organizational procedure for implementing a Safety Management Plan (SMP) in mines.

- **Materials Needed:**
 - ✓ SMP Template
 - ✓ Flip charts/Whiteboard
 - ✓ Markers
 - ✓ Mining Safety Regulations (DGMS Guidelines, CEA Regulation 2010)
- **Procedure:**
 - ✓ **Explain:** Begin by explaining the importance of a Safety Management Plan (SMP) and the key components (risk assessments, safety audits, emergency plans, etc.).
 - ✓ **Activity:**
 - Divide the group into teams and assign them different sections of an SMP, such as emergency protocols, risk assessments, or communication procedures.
 - Ask each team to review relevant regulations (such as DGMS guidelines) and design the section of the plan for their assigned area.
 - ✓ **Demonstration:**
 - Each group will present their section of the SMP to the class.
 - Afterward, combine all sections to build a complete Safety Management Plan for a mock mining operation.
 - ✓ **Discussion:** Facilitate a discussion on the challenges of implementing SMP and how the plan can help in reducing mining accidents.
- **Outcome:** Trainees will understand the structure and procedure for implementing a Safety Management Plan in mining operations.

Activity-2



Role Play - Conducting Daily Pre-Shift Meetings

- **Objective:** Role-play a situation on how to conduct daily pre-shift meetings to inform employees about safety and production issues.
- **Materials Needed:**
 - ✓ Pre-shift meeting checklist (safety, production targets, etc.)
 - ✓ Example of previous shift reports
 - ✓ Safety guidelines

- Procedure:
 - ✓ Explain: Begin by explaining the importance of daily pre-shift meetings for communicating safety updates, production targets, and addressing any issues from the previous shift.
 - ✓ Role Play:
 - Divide participants into pairs or small groups. Assign one person to be the foreman and the others as mine workers.
 - The foreman will conduct a pre-shift meeting, discussing safety topics such as potential hazards, shift goals, and safety procedures.
 - The foreman should ask employees to share any concerns or suggestions related to safety and production.
 - ✓ Debrief: After the role play, discuss the effectiveness of the meeting. What could be improved in terms of communication and engagement?
- Outcome: Trainees will be able to conduct an effective pre-shift meeting that covers safety, production targets, and worker concerns.

Do



- Roleplay: Practice workplace communication with a team leader regarding machine breakdown and escalation.
- Group Exercise: Map out the job activities of a Panelworks Machine Operator from start to end of a shift.
- Fill a checklist and job sheet based on a task scenario (e.g., cutting panels for a furniture batch).

Say



- “To become a reliable Panelworks Machine Operator, one must understand not only the technical part but also how to operate within a system — communicating clearly, reporting properly, and maintaining professionalism. These are the foundations for growing into supervisory or leadership roles.”

Notes for Facilitation

- Encourage trainees to ask questions and share their prior experiences (if any) with machine operations.
- Use simple, visual aids to explain hierarchy and job flows.
- Emphasize workplace discipline and accuracy, especially in documentation.
- Allow time for peer feedback during roleplay and group activities.
- Use local language or examples for better comprehension, wherever needed.

Exercise

Key Solutions to PHB Exercise:

Short Answer Questions:

1. What are the key components of an organizational structure?

The key components include hierarchy levels, reporting matrix, roles and responsibilities, workflows, and escalation procedures.

2. What is the primary role of a Panelworks Machine Operator?

The primary role is to operate, maintain, and monitor panel cutting or shaping machines to produce parts used in furniture manufacturing as per job specifications.

3. Name three essential skills required for a Panelworks Machine Operator.

Technical knowledge of machines, attention to detail, and ability to follow safety protocols.

4. How should a Panelworks Machine Operator communicate with team members and supervisors?

By using clear, respectful, and timely communication following organizational protocols, including verbal updates, written reports, or through assigned communication channels.

5. What are some regulatory authorities governing the Furniture and Fittings Industry?

Some regulatory bodies include the Bureau of Indian Standards (BIS), Occupational Safety and Health Administration (OSHA), and Labour Laws under Ministry of Labour and Employment.

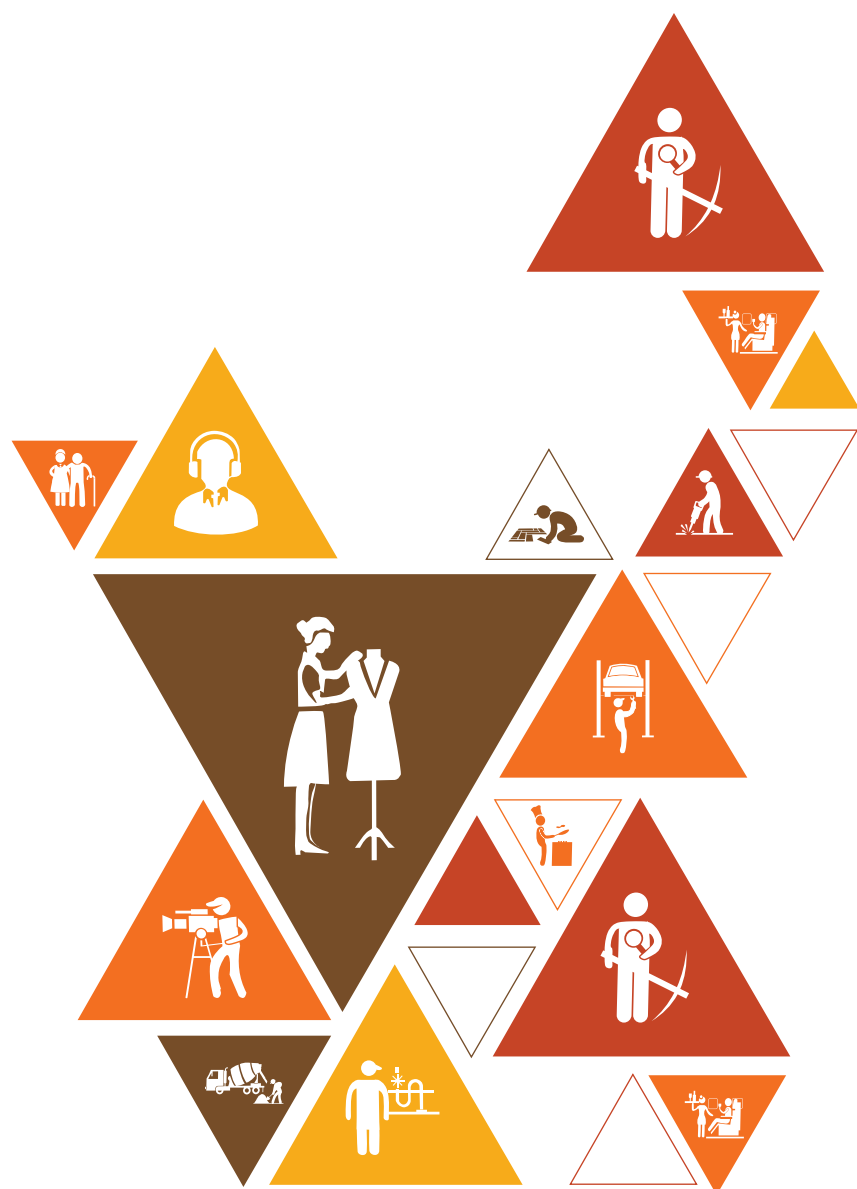
Fill in the Blanks:

1. The organizational structure defines the hierarchy, reporting structure, and workflow in an organization.
2. A Panelworks Machine Operator is responsible for operating and maintaining panel processing machines.
3. Proper communication ensures that workplace activities are coordinated and productive.
4. A job sheet and checklist are essential documents for tracking work progress.
5. The career path of a Panelworks Machine Operator can lead to supervisory or managerial roles.

True/False Questions:

1. **True** : The code of conduct in an organization outlines acceptable and ethical behavior.
2. **False** : A Panelworks Machine Operator must strictly follow safety regulations at the worksite.
3. **True** : A reporting matrix helps employees understand whom they report to within an organization.
4. **False** : There are laws and regulations that apply to workers in the Furniture and Fittings Industry.
5. **True** : Timeliness and efficiency are key requirements for a Panelworks Machine Operator.

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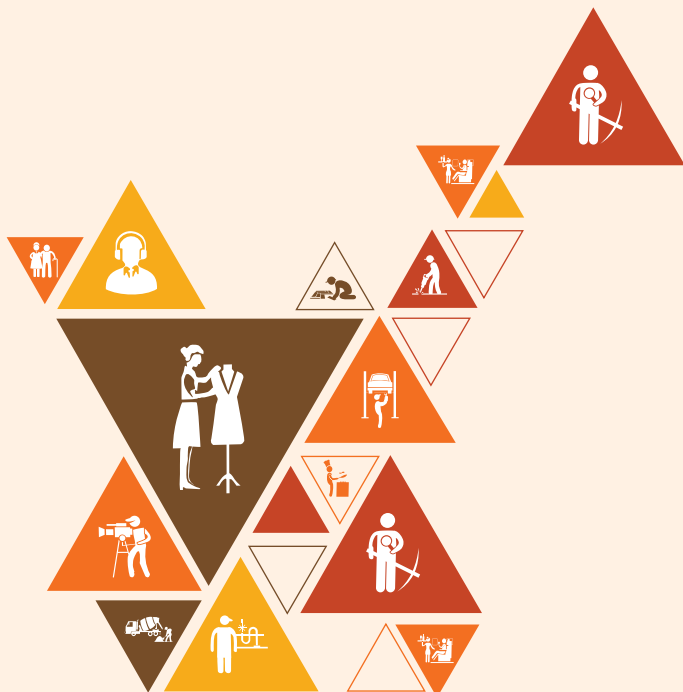




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4. Task Planning and Delegation

Unit 4.1 – Work Planning and Task Allocation



FFS/N1010

Key Learning Outcomes

At the end of this module, you will be able to:

1. Discuss the process and techniques involved in identifying and analysing work orders and product details.
2. Assist in planning and scheduling machine operations to maximize machine capacity utilization and achieve maximum productivity.
3. Allocate tasks to team members based on their skills and capabilities to optimize productivity and performance.
4. Communicate effectively with assistants, ensuring mutual understanding of assigned tasks and fostering a collaborative work environment.

UNIT 4.1: Work Planning and Task Allocation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss how to analyze work orders and project details to identify job work requirements accurately.
2. Explain the principles of effective planning and scheduling to maximize machine capacity utilization.
3. Discuss the importance of assessing team members' skills and capabilities when allocating tasks.
4. Explain the importance of effective communication in clarifying tasks and promoting a collaborative work environment.
5. Discuss the significance of timely job card filling and submission in maintaining accurate project tracking and reporting.
6. Demonstrate the ability to analyze work orders and project details, identifying job work requirements accurately and effectively.
7. Collaborate with the supervisor in planning and scheduling machine operations, optimizing machine capacity utilization, and achieving maximum productivity.
8. Effectively allocate tasks to team members based on their skills and capabilities to optimize productivity and performance.
9. Display skills to communicate clearly and effectively with assistants, ensuring understanding of assigned tasks and fostering a collaborative work environment.
10. Oversee the timely and accurate filling and submission of job cards, adhering to documentation standards and utilizing project tracking systems effectively.

Resources to be Used

Theory:

- Sample work orders and project briefs
- Job card templates
- Presentation on planning, scheduling, and communication principles
- Whiteboard and markers

Practical:

- Simulated work order and team allocation exercise
- Job card filling exercise
- Group planning activity using case scenarios

Say



- "In any workplace, especially in a manufacturing or processing unit, efficient planning and proper task allocation are the foundation for productivity. Today, we'll understand how to analyze work orders, plan schedules, allocate work, and communicate effectively within a team environment."

Ask



- "Have you ever worked in a team where tasks were not properly assigned? What problems did you face?"
- "Why do you think it's important to match a person's skills to a task?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



- Discuss the typical contents of a work order or project brief.
- Explain steps in analyzing a work order to identify job requirements.
- Introduce principles of planning (time, sequence, resources, priorities).
- Describe how to assess a team's skills and allocate tasks accordingly.
- Discuss how communication impacts task clarity and collaboration.
- Explain job card formats, usage, and submission protocols.

Activity-1



Analyze the Work Order

- **Objective:** To enable trainees to analyze work orders and project details, and identify job work requirements accurately and effectively.
- **Materials Needed:**
 - ✓ Sample printed work orders or project briefs
 - ✓ Pens and notepads
 - ✓ Planning sheets or templates

- **Procedure:**

- ✓ Distribute sample work orders to trainees (in pairs or small groups).
- ✓ Ask them to review the document and extract key information:
 - Tasks to be completed
 - Materials and equipment required
 - Estimated timelines
 - Manpower needed
- ✓ Each group prepares a brief job requirement summary.
- ✓ Groups present their summaries to the class.

- **Outcome:**

- ✓ Trainees will understand how to interpret work orders and translate them into actionable job requirements for planning and execution.

Activity-2



Planning Machine Scheduling with Supervisor

- **Objective:** To help trainees collaborate with a supervisor in planning and scheduling machine operations to optimize capacity utilization and productivity.
- **Materials Needed:**
 - ✓ Sample machine availability charts
 - ✓ Operation/task duration sheets
 - ✓ Planning templates
- **Procedure:**
 - ✓ Trainees form pairs (one acts as the operator, one as the supervisor).
 - ✓ Provide them with a list of machine-based tasks and available machines/timings.
 - ✓ Ask them to work together to:
 - Schedule the tasks
 - Avoid scheduling conflicts
 - Maximize use of machine time
 - ✓ Have them present their final plan to the group.

- **Outcome:**

- ✓ Trainees gain practical experience in collaborative scheduling and understand how planning decisions impact machine productivity.

Activity-3



Task Allocation Based on Skills

- **Objective:**

- ✓ To enable trainees to allocate tasks effectively based on individual skill sets, optimizing team productivity and performance.

- **Materials Needed:**

- ✓ Printed skill cards (with fictional team members' strengths)
- ✓ Task cards for a simulated project
- ✓ Flip charts or worksheets

- **Procedure:**

- ✓ Divide trainees into small groups.
- ✓ Distribute a set of “employee skill cards” and a list of tasks for a panelwork job.
- ✓ Ask groups to match tasks with team members based on suitability.
- ✓ Each group presents their allocation and gives reasoning.

- **Outcome:**

- ✓ Trainees learn how to assess skills and assign work logically, supporting productivity and team efficiency.

Activity-4



Role-Play – Task Communication

- **Objective:**

- ✓ To help trainees practice clear and effective communication when assigning tasks, promoting a collaborative team environment.

- **Materials Needed:**
 - ✓ Task briefing sheets for team leads
 - ✓ Observation checklist for trainers
 - ✓ Notepads for assistants
- **Procedure:**
 - ✓ Form groups of 3–4. Assign one trainee as the team lead; others are assistants.
 - ✓ Provide the lead with a task brief to convey to the group.
 - ✓ The lead explains the task clearly; assistants repeat their understanding.
 - ✓ Trainer observes and gives feedback on clarity, tone, and interaction.
- **Outcome:**
 - ✓ Trainees will improve their ability to deliver instructions clearly, check for understanding, and foster teamwork.

Activity-5



Job Card Filling Drill

- **Objective:**
 - ✓ To train trainees in accurate and timely completion of job cards, following documentation standards for project tracking.
- **Materials Needed:**
 - ✓ Sample shift data sheets (task logs, time taken, materials used)
 - ✓ Job card templates (printed or digital)
 - ✓ Pens or devices
- **Procedure:**
 - ✓ Share a sample shift log with details like start/end times, outputs, and remarks.
 - ✓ Trainees use this to fill a job card, ensuring completeness and accuracy.
 - ✓ Trainer reviews job cards and simulates submission (e.g., placing in a file box or scanning digitally).
 - ✓ Feedback is shared on accuracy, errors, or omissions.
- **Outcome:**
 - ✓ Trainees become confident in maintaining accurate documentation and understand the importance of timely job card submission in project tracking.

Do

- Analyze a sample work order and identify tasks.
- Create a schedule for machine operation based on priorities.
- Allocate tasks to team members by mapping their skills.
- Fill and Submit a sample job card with simulated task details.

Say

- "Planning isn't just about machines—it's about people too. When we plan well and communicate clearly, work gets done efficiently, with fewer errors and more satisfaction for everyone involved. Let's keep these principles in mind as we take up real projects in the future."

Notes for Facilitation

- Emphasize real-world relevance—link each concept to shop floor challenges.
- Encourage peer discussion during group work and role-play activities.
- Guide trainees while interpreting work orders and allocating tasks to avoid confusion.
- Provide feedback on their communication during task explanations.
- Ensure job card templates are familiar and understood before the activity.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. Why is it important to analyze work orders before starting a project?

Analyzing work orders ensures a clear understanding of the job requirements, timelines, resources needed, and potential challenges, leading to better planning and execution.

2. How does effective planning and scheduling improve machine capacity utilization?

It ensures that machines are used efficiently without idle time, prevents scheduling conflicts, and helps meet project deadlines with optimal productivity.

3. What factors should be considered when allocating tasks to team members?

Skill level, past experience, availability, physical capability, and the complexity of the task should all be considered to match the right person to the right job.

4. How does clear communication contribute to a productive work environment?

It minimizes misunderstandings, ensures that everyone knows their responsibilities, promotes collaboration, and boosts team morale and efficiency.

5. What role does timely job card submission play in project tracking?

It provides up-to-date data for monitoring progress, resource usage, and productivity, helping supervisors make informed decisions and maintain proper documentation.

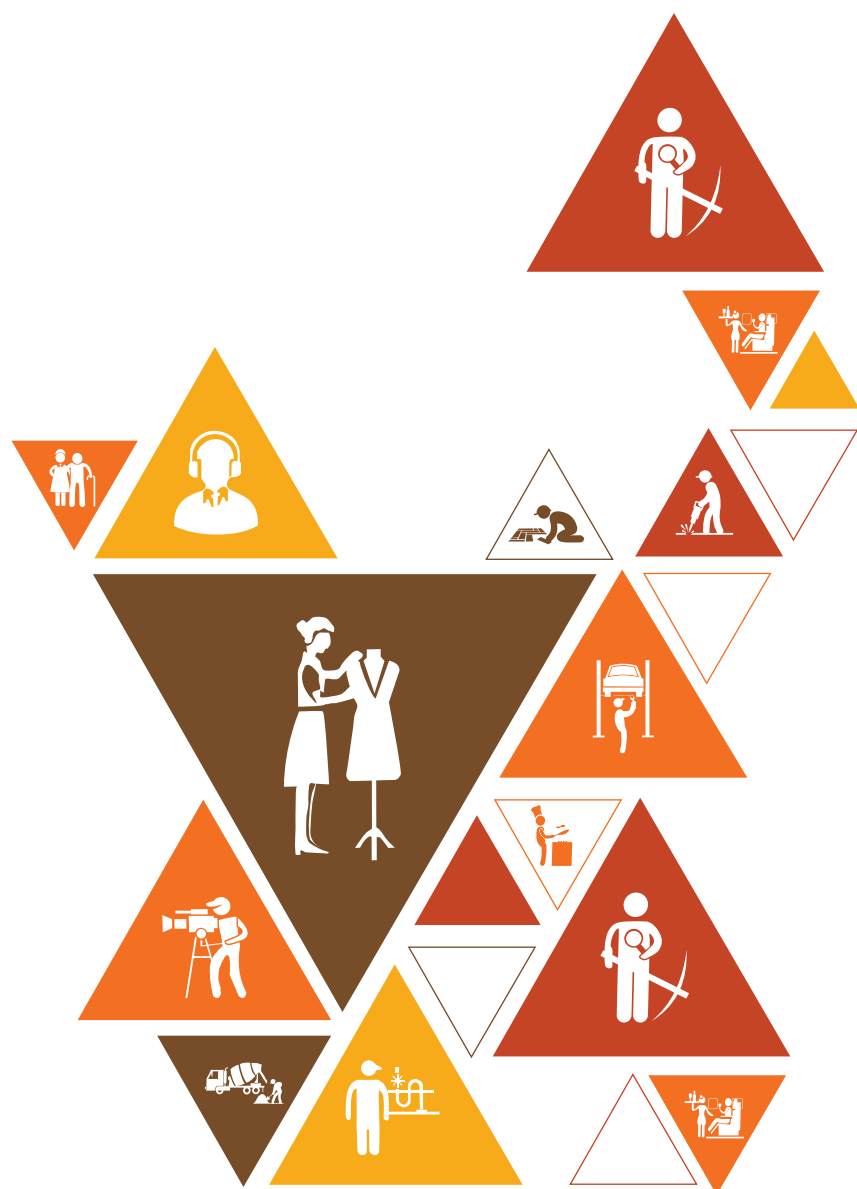
Fill in the Blanks:

1. Analyzing work orders and project details ensures that job requirements are accurately identified.
2. Proper planning and scheduling maximize the efficiency of machine operations.
3. Assessing team members' skills helps in allocating tasks effectively.
4. Effective communication helps in clarifying job roles and improving teamwork.
5. Job card submission is essential for maintaining accurate project tracking and reporting.

True/False Questions:

1. **False:** Work orders should be analyzed before starting the job to plan properly.
2. **False:** Scheduling and planning are crucial for enhancing machine productivity.
3. **True:** Task allocation based on skills leads to higher efficiency.
4. **False:** Communication is vital for teamwork and collaboration.
5. **True:** Timely job card submission ensures accurate and up-to-date project documentation.

[illegible]



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Key Learning Outcomes

At the end of this module, you will be able to:

1. Discuss the parameters involved in evaluating team members' performance and provide constructive feedback.
2. Explain the process of grievance redressal and conflicts management within the team promptly.
3. Perform documentation of deliverables accurately based on the project scope and organizational requirements.

UNIT 5.1: Managing Team Effectively

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the process of evaluating team members' performance and providing constructive feedback and guidance for improvement.
2. Describe the steps involved in addressing performance issues and conflicts within a team promptly.
3. Explain the significance of documenting deliverables accurately based on the project scope and organizational requirements.
4. Discuss the importance of providing regular work updates to the supervisor for effective coordination and progress tracking.
5. Evaluate team members' performance effectively, provide constructive feedback, and offer guidance to facilitate their improvement and growth.
6. Demonstrate how to address performance issues and conflicts within the team promptly, utilizing conflict resolution strategies and problem-solving techniques effectively.
7. Perform documentation of deliverables accurately, adhering to project documentation standards, templates, and organizational requirements.
8. Provide timely and accurate work updates to the supervisor at regular intervals, utilizing appropriate communication protocols and reporting formats.

Resources to be Used

Theory:

- Chart paper and markers for brainstorming
- Sample feedback forms and performance appraisal templates
- Templates for documentation and work update formats
- Role cards for team conflict resolution scenarios

Practical:

- Performance review form (mock template)
- Work update email/report formats
- Conflict scenario role-play scripts
- Checklist of deliverables for documentation activity

Say



- “Managing a team effectively goes beyond assigning tasks — it’s about observing performance, guiding growth, resolving issues, and ensuring everyone is aligned to the goals. In this unit, we will learn how to handle team dynamics professionally and document work progress efficiently.”

Ask



- Have you ever worked in a team where someone was not performing well? What happened?
- Why do you think feedback and documentation are important for team success?
- What would you do if two team members were not getting along?

Please feel free to share your experiences with the group. I’ll be noting down your ideas on the whiteboard.

Elaborate



- Introduce the performance evaluation process – setting expectations, observing behavior, and providing constructive feedback.
- Discuss conflict resolution techniques – listening to both sides, identifying the root cause, and finding a win-win solution.
- Describe the importance of proper documentation and how it helps in tracking deliverables.
- Explain the benefits of regular updates to supervisors for transparency and better coordination.

Activity-1



Evaluating A Team Member's Performance and Delivering Constructive Feedback

- **Objective:**
 - ✓ To practice evaluating a team member's performance and delivering constructive feedback that motivates improvement.
- **Materials Needed:**
 - ✓ Sample performance review form
 - ✓ Mock employee performance data (case studies)
 - ✓ Role-play name tags or role cards
 - ✓ Feedback checklist (for facilitator observation)

- **Procedure:**
 - ✓ Divide trainees into pairs (Supervisor & Team Member).
 - ✓ Provide each “Supervisor” with a mock performance profile.
 - ✓ Supervisors review the profile and fill out the evaluation form.
 - ✓ Role-play a one-on-one feedback session, focusing on using positive language and suggesting improvements.
 - ✓ Rotate roles and repeat.
 - ✓ Group debrief to reflect on what made the feedback helpful or unhelpful.
- **Outcome:**
 - ✓ Trainees will be able to give constructive, specific feedback using real data and appropriate tone, supporting their team member's development.

Activity-2



Addressing A Team Conflict Scenario Using Effective Communication and Resolution Techniques

- **Objective:**
 - ✓ To practice addressing a team conflict scenario using effective communication and resolution techniques.
- **Materials Needed:**
 - ✓ Pre-written conflict scenarios (3–4 types: misunderstanding, poor communication, unequal workload, etc.)
 - ✓ Conflict resolution framework (steps on board or printed)
 - ✓ Role cards (Team Leader, Team Member A, Team Member B)
- **Procedure:**
 - ✓ Form groups of 3 and assign roles based on a conflict scenario.
 - ✓ Participants act out the scenario and then shift to resolution mode.
 - ✓ The “Team Leader” uses a conflict resolution framework to address and resolve the issue.
 - ✓ After each enactment, participants share what techniques worked.
 - ✓ Facilitator provides feedback and suggests alternatives where needed.
- **Outcome:**
 - ✓ Trainees will gain confidence in identifying root causes, listening actively, and resolving team conflicts using structured approaches.

Activity-3



Fill Out a Deliverables Report Based On a Simulated Work Assignment Using Standard Templates

- **Objective:**
 - ✓ To fill out a deliverables report based on a simulated work assignment using standard templates.
- **Materials Needed:**
 - ✓ Sample deliverables template (physical or digital)
 - ✓ Mock project scope and task completion sheet
 - ✓ Sample organizational documentation policy (1-pager)
- **Procedure:**
 - ✓ Share a sample project scenario (e.g., 3-day machine operation assignment with outputs).
 - ✓ Trainees fill out the deliverables form, documenting what was completed, by whom, and when.
 - ✓ They also attach supporting notes or updates as per organization guidelines.
 - ✓ Review submissions in pairs for accuracy and completeness.
 - ✓ Facilitator highlights best practices and areas for improvement.
- **Outcome:**
 - ✓ Trainees will be able to document job deliverables clearly, concisely, and as per standards, ready for use in real-world project tracking.

Activity-4



Practice Drafting and Presenting Work Updates to A Supervisor in A Clear, Professional Manner

- **Objective:**
 - ✓ To practice drafting and presenting work updates to a supervisor in a clear, professional manner.
- **Materials Needed:**
 - ✓ Sample progress data from a mock task (e.g., shift reports, status updates)
 - ✓ Work update format (email/report template)
 - ✓ Role-play instructions (Supervisor & Worker)

- **Procedure:**

- ✓ Provide trainees with a brief containing task progress, challenges, and next steps.
- ✓ Individually, trainees draft a work update using a given format (email or verbal report).
- ✓ In pairs, one trainee acts as the worker reporting to a “Supervisor.”
- ✓ Role-play the update delivery and allow for supervisor questions.
- ✓ Peer feedback and facilitator summary on clarity, completeness, and tone.

- **Outcome:**

- ✓ Trainees will be able to prepare and deliver work updates that are timely, structured, and meet reporting standards for effective coordination.

Say



- “By understanding your team, giving constructive feedback, resolving conflicts, and keeping the documentation up-to-date, you become a leader who not only manages but inspires the team. Let’s carry these practices forward in every project we take on.”

Notes for Facilitation



- Use real-life examples to make scenarios relatable.
- Encourage role-play reflection – what worked, what could improve.
- Emphasize soft skills (tone, empathy, listening) during feedback and conflict resolution.
- Check documentation for clarity, completeness, and adherence to format.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. Why is it important to evaluate team members' performance regularly?

Regular performance evaluation helps identify strengths, areas for improvement, and training needs. It ensures accountability, motivates growth, and aligns efforts with team goals.

2. What are the key steps in resolving conflicts within a team?

Key steps include identifying the issue, listening to all parties, analyzing the root cause, applying appropriate conflict resolution strategies, and following up to ensure the solution is effective.

3. How does accurate documentation of deliverables benefit a project?

It ensures clarity, transparency, and alignment with project goals. Accurate documentation supports tracking progress, maintaining accountability, and simplifying audits or reviews.

4. Why should employees provide regular work updates to their supervisors?

Regular updates keep supervisors informed of progress, help in early identification of issues, facilitate timely decisions, and promote effective coordination.

5. How can constructive feedback improve team performance?

Constructive feedback helps team members understand their strengths and weaknesses, encourages learning, and fosters a culture of continuous improvement.

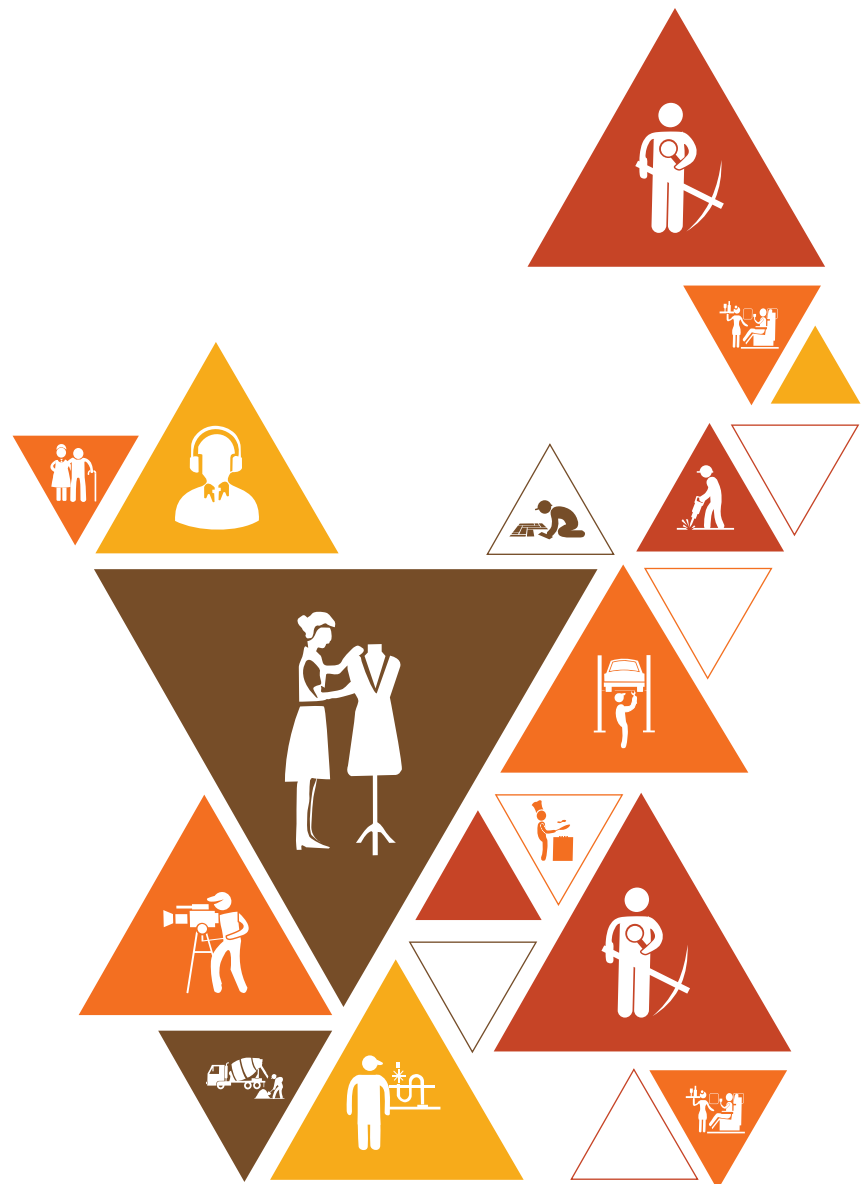
Fill in the Blanks:

1. Providing constructive feedback helps team members improve their performance and skills.
2. Conflict resolution in a team requires communication and problem-solving techniques.
3. Documenting deliverables accurately ensures alignment with project scope and organizational standards.
4. Regular work updates to the supervisor help track progress effectively.
5. Performance evaluation should be regular and based on clear assessment criteria.

True/False Questions:

1. **False:** Performance evaluation should be regular, not only when problems arise.
2. **False:** Conflict resolution is essential to address underlying issues and maintain a healthy team environment.
3. **True:** Proper documentation ensures transparency and accountability in projects.
4. **False:** Supervisors need regular updates to manage the team and project effectively.
5. **True:** Constructive feedback guides team members toward self-improvement and enhanced performance.

[illegible]



FFS/N1011

Key Learning Outcomes

At the end of this module, you will be able to:

1. Discuss the process of interpreting drawings, part lists, cuttings lists, material lists, tools and equipment to determine job work requirements accurately.
2. Discuss and list different machining methods, tools, equipment, and consumables for a given machining task.
3. Organize and maintain all necessary tools, materials, and components based on job work requirements effectively.
4. Explain the process of verifying the availability and quality of materials accurately to comply with drawing and specifications.

UNIT 6.1: Organize and Oversee Worksite for Machine Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the process of analysing technical drawings, part lists, cuttings lists, material lists, tools and equipment to determine job work requirements.
2. Differentiate various machining methods, tools, equipment, and consumables for specific machining tasks.
3. Describe the importance of organizing tools, materials, and components based on job work requirements.
4. Explain the importance of verifying the availability and quality of materials to comply with drawing and specifications accurately.
5. Discuss the significance of maintaining health and safety requirements, including the proper use of personal protective equipment (PPE), during machine operations.
6. Describe the importance of regular cleaning and maintenance of the worksite for efficient and safe panelworks machine operations.
7. Analyse technical drawings, part lists, cuttings lists, material lists, tools and equipment to determine accurate job work requirements.
8. Identify and select appropriate machining methods, tools, equipment, and consumables for a given machining task, ensuring efficiency and quality.
9. Demonstrate skills in organizing necessary tools, materials, and components based on job work requirements.
10. Verify the availability and quality of materials to ensure compliance with drawing and specifications.
11. Maintain health and safety (WHS) requirements, including the correct utilization of personal protective equipment (PPE), to ensure a safe working environment during panelworks operations.
12. Perform the cleaning and maintenance of the worksite at regular intervals, ensuring a clean and organized environment.

Resources to be Used

Theory:

- Sample technical drawings, part lists, and material lists
- Charts showing different machining tools, methods, and consumables
- Illustrated guide/manual on organizing worksite layout
- WHS (Workplace Health & Safety) guidelines and PPE usage handbook

- Project documentation formats and standards
- Whiteboard, markers, projector
- PowerPoint presentations and handouts

Practical:

- Real or mock technical drawings and material kits for analysis
- Tools, equipment, and consumables used in panelworks/machining
- Labelled tool boards and storage racks for organizing worksite
- PPE kits (helmet, gloves, goggles, apron, etc.)
- Sample materials (metal sheets, plastic panels, etc.) for quality check
- Cleaning tools (brush, cloth, dustbin, etc.) and maintenance checklist
- Workstation setup for mock layout and cleaning demo

Say

- "Before starting any machining task, it's essential to prepare the worksite properly. Today we'll learn how to analyze job requirements, select the right tools and materials, and ensure everything is set up safely and efficiently before machine operation begins."

Ask

- "Have you ever seen a machine operator stop work due to missing tools or wrong materials?"
- "Why do you think it's important to keep the worksite clean and organized?"
- "What could go wrong if the wrong material is used in a machine task?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate

- Job Work Analysis: Walk through a sample technical drawing and part list. Explain how to read and extract material, tool, and task requirements.
- Tool/Method Selection: Introduce various machining tasks and match them with appropriate tools and consumables.
- Worksite Organization: Explain the standard layout of a machine operator's work area and best practices for tool/material placement.

- **Material Verification:** Describe quality checks (e.g., dimensions, defects, type) and methods to confirm materials match drawings/specifications.
- **WHS and PPE:** Demonstrate standard PPE used in machine operations and highlight how each protects the operator.
- **Cleaning and Maintenance:** Explain the schedule and procedures for cleaning machines and maintaining a clutter-free and safe workspace.

Activity-1



Technical Drawing Analysis

- **Objectives:**
 - ✓ To enhance the trainees' ability to analyze job-related technical documents to understand material, tool, and task requirements.
 - ✓ To ensure trainees can extract and interpret information from technical drawings and lists to determine job needs.
- **Materials Needed:**
 - ✓ Sample technical drawings (blueprints)
 - ✓ Part lists, cutting lists, and material lists
 - ✓ Pens, pencils, highlighters
 - ✓ Whiteboard and markers
- **Procedure:**
 - ✓ Present the sample technical drawing to trainees.
 - ✓ Explain the various sections of the drawing, including dimensions, materials, and specific instructions.
 - ✓ Provide trainees with associated lists (part lists, cutting lists, and material lists).
 - ✓ Guide the trainees through cross-referencing the lists with the drawing to identify job requirements.
 - ✓ Have the trainees mark the tools, materials, and other requirements needed for the task.
- **Outcome:**
 - ✓ Trainees will be able to accurately extract and cross-reference job work requirements from technical documents, ensuring clarity and precision in task preparation.
 - ✓ Improved ability to match material and tools to specific machine tasks.

Activity-2



Machining Method & Tool Selection

- **Objectives:**
 - ✓ To develop skills in selecting the appropriate machining methods, tools, and equipment for specific tasks.
 - ✓ To ensure that trainees can optimize the machining process for quality and efficiency.
- **Materials Needed:**
 - ✓ List of various machining methods (e.g., drilling, milling, grinding, etc.)
 - ✓ Different types of tools and equipment (mock or real)
 - ✓ Consumable materials (e.g., lubricants, cutting fluids, abrasives)
 - ✓ Whiteboard, projector, or handouts for reference
- **Procedure:**
 - ✓ Introduce the different machining methods and their applications to trainees.
 - ✓ Explain the factors influencing the selection of tools, equipment, and consumables, such as material type, task complexity, and precision requirements.
 - ✓ Show real or mock examples of tools and equipment.
 - ✓ Present a machining scenario and ask trainees to choose the appropriate methods and tools for that specific task.
 - ✓ Discuss the rationale behind each selection and ensure the trainees understand the reasoning.
- **Outcome:**
 - ✓ Trainees will be able to identify and select the appropriate machining methods and equipment to achieve the desired task outcome.
 - ✓ Trainees will ensure that the tools and consumables they choose align with the job requirements, leading to increased operational efficiency.

Activity-3



Tool & Material Organization

- **Objectives:**
 - ✓ To develop organizational skills in setting up a worksite based on job requirements.
 - ✓ To enhance the trainees' ability to prepare materials and tools efficiently to avoid delays during machine operation.

- **Materials Needed:**

- ✓ A variety of tools, materials, and components (real or mock)
- ✓ Workstation setup area
- ✓ Tool and material organization boards or racks
- ✓ Labels or markers for identification

- **Procedure:**

- ✓ Explain the importance of organizing tools, materials, and components before starting a task.
- ✓ Demonstrate proper organization techniques, including sorting and labeling tools, equipment, and materials.
- ✓ Have the trainees organize a set of tools and materials for a given task using the methods demonstrated.
- ✓ Evaluate the organization, ensuring everything is easily accessible and arranged by task requirements.

- **Outcome:**

- ✓ Trainees will gain proficiency in organizing a worksite efficiently, ensuring that tools and materials are readily accessible during operation.
- ✓ The ability to set up the work area quickly and systematically, reducing downtime and enhancing operational efficiency.

Activity-4



Material Verification

- **Objectives:**

- ✓ To equip trainees with the skills to check the quality and availability of materials before beginning a machining task.
- ✓ To ensure that trainees can ensure materials meet the required specifications for compliance with technical drawings.

- **Materials Needed:**

- ✓ Sample materials (metal sheets, plastic components, etc.)
- ✓ Quality checklists or specification sheets
- ✓ Measuring tools (e.g., calipers, micrometers)
- ✓ Sample technical drawings with material specifications

- **Procedure:**

- ✓ Introduce the concept of material verification and the importance of quality checks.
- ✓ Provide trainees with sample materials and specification sheets that match a given technical drawing.
- ✓ Show how to measure and verify material dimensions, defects, and overall quality using appropriate tools.
- ✓ Have trainees perform a quality check on the materials based on drawing specifications.
- ✓ Review results and discuss potential issues if materials do not meet requirements.

- **Outcome:**

- ✓ Trainees will be able to verify materials for job suitability and quality before machine operations begin.
- ✓ Enhanced ability to maintain high-quality standards by confirming that all materials match drawing specifications.

Activity-5



Workplace Safety & PPE Usage

- **Objectives:**

- ✓ To ensure trainees are aware of health and safety standards in machine operations.
- ✓ To demonstrate how to properly use PPE to protect themselves during operations.

- **Materials Needed:**

- ✓ Full set of PPE (gloves, goggles, helmets, aprons, etc.)
- ✓ Safety manuals or WHS guidelines
- ✓ Safety signs or hazard markers
- ✓ Workstation with machine or simulated machine environment

- **Procedure:**

- ✓ Introduce the importance of workplace health and safety, especially in machine operations.
- ✓ Explain the role of PPE in protecting against potential hazards.
- ✓ Demonstrate how to properly use each piece of PPE.
- ✓ Have trainees wear the PPE and practice its use in a mock machine setup or simulated environment.

- ✓ Review common safety practices, such as ensuring machines are turned off during setup or cleaning.
- **Outcome:**
 - ✓ Trainees will understand the importance of maintaining health and safety standards during panelwork operations.
 - ✓ They will be able to utilize PPE properly and follow basic safety protocols, ensuring a safe work environment.

Activity-6



Worksite Cleaning & Maintenance

- **Objectives:**
 - ✓ To teach trainees how to maintain a clean, organized, and safe worksite.
 - ✓ To ensure trainees understand the importance of regular cleaning and maintenance in preventing accidents and promoting operational efficiency.
- **Materials Needed:**
 - ✓ Cleaning tools (brushes, cloths, cleaning agents)
 - ✓ Dustbins or waste disposal containers
 - ✓ Worksite maintenance checklist
 - ✓ Sample work area or machine area for cleaning
- **Procedure:**
 - ✓ Discuss the significance of regular cleaning and maintenance in a machining environment.
 - ✓ Demonstrate proper cleaning techniques for tools, machines, and the work area.
 - ✓ Assign trainees to clean specific areas of the worksite, such as tool racks, floors, and machinery.
 - ✓ Have trainees follow a checklist to ensure no area is overlooked.
 - ✓ Evaluate the effectiveness of the cleaning and discuss the benefits of regular maintenance.
- **Outcome:**
 - ✓ Trainees will learn how to keep the worksite clean and well-maintained, promoting a safe and organized environment.
 - ✓ The ability to implement a cleaning and maintenance routine that prevents accidents and promotes productivity.

Say

- “Now you understand how important it is to plan and prepare your workspace before starting machine operations. Clean, organized, and safe worksites lead to better productivity and fewer mistakes.”

Notes for Facilitation

- Emphasize real-world relevance using local examples.
- Encourage teamwork in organizing the mock worksite.
- Monitor for correct PPE use during safety demonstration.
- Use job scenarios that mimic actual work orders from industry.
- Ensure each trainee gets hands-on exposure to reviewing drawings and identifying tools.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. **Why is it important to analyze technical drawings, part lists, and material lists before starting a job?**
To accurately understand the job requirements, ensure the availability of correct materials and tools, and avoid mistakes during machining.
2. **How do different machining methods affect the quality and efficiency of a task?**
The choice of method influences precision, speed, surface finish, and material wastage, ultimately impacting overall task efficiency and quality.
3. **What is the significance of verifying the availability and quality of materials before starting a project?**
It ensures that the right materials are used, reduces delays, and guarantees that the final output meets design specifications.
4. **Why should tools, materials, and components be organized based on job work requirements?**
Proper organization helps streamline the workflow, reduces search time, minimizes errors, and increases productivity.
5. **How does regular cleaning and maintenance of the worksite contribute to safe and efficient operations?**
It prevents accidents, ensures proper machine functioning, maintains a hygienic workspace, and improves efficiency.

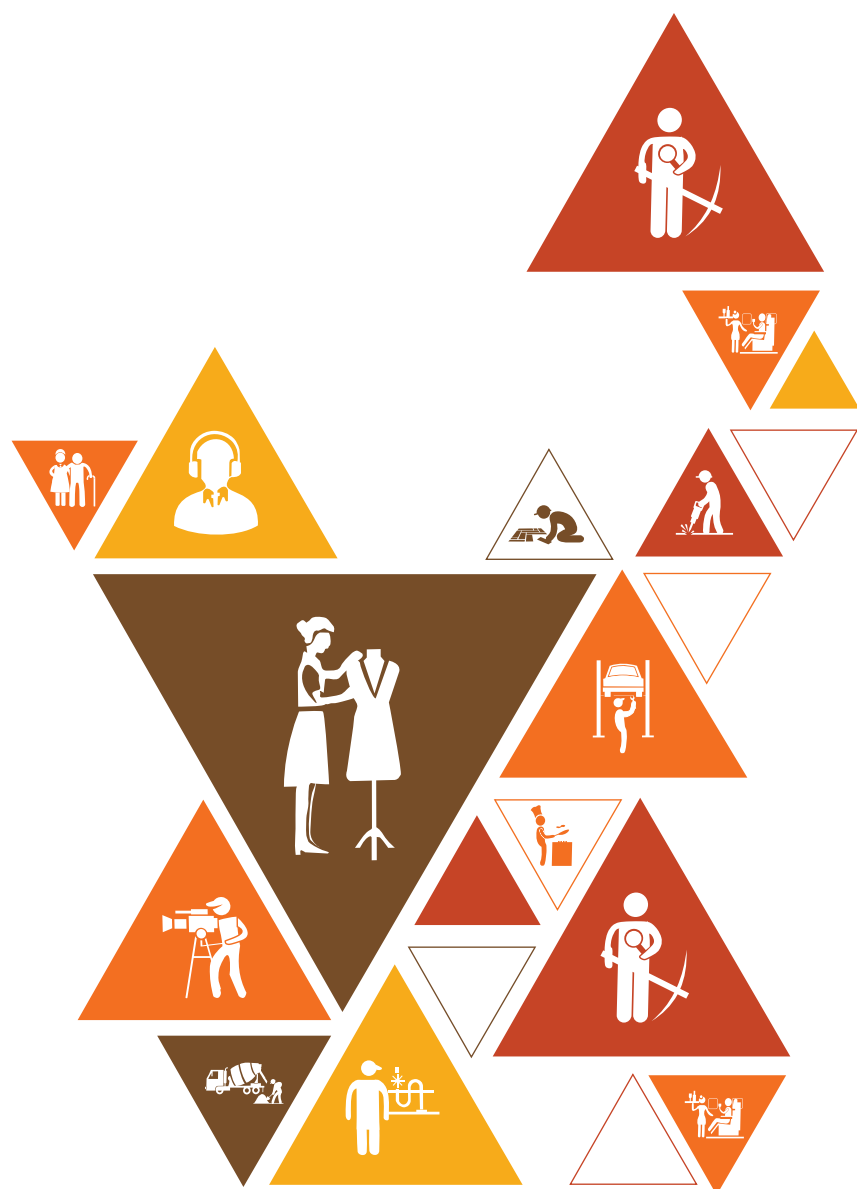
Fill in the Blanks:

1. **Material** lists help in determining the exact materials required for machining tasks.
2. Selecting the correct **machining method** ensures efficiency and precision in machining tasks.
3. Proper **organization** of tools and materials improves workflow and reduces errors.
4. Ensuring the **quality** of materials is crucial to meeting design specifications.
5. **Regular cleaning and maintenance** helps prevent workplace hazards and ensures compliance with safety regulations.

True/False Questions:

1. **False:** Technical drawings are essential for understanding and determining job requirements.
2. **True:** Incorrect machining methods can negatively affect product quality.
3. **False:** Organizing tools and materials improves efficiency and reduces mistakes.
4. **True:** Verifying material availability ensures the project meets its specifications.
5. **True:** Cleaning and maintaining the worksite is crucial for safety and operational efficiency.

[illegible]



FFS/N1011

Key Learning Outcomes

At the end of this module, you will be able to:

1. Demonstrate skills for setting out and adjusting the machining program accurately based on job work specifications.
2. Illustrate the process of selecting and feeding the suitable machine consumables based on job work details effectively.
3. Perform loading and unloading of the job work on/from the machine bed safely and efficiently.
4. Perform measurement and marking operations accurately based on job work specifications.

UNIT 7.1: Conduct Machine Setup

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the process of setting out and adjusting the machining program based on job work specifications.
2. Describe the selection and feeding process of suitable machine consumables on different machines based on job work details.
3. Explain the importance of monitoring the loading and unloading of the job work on/from the machine bed and the associated safety precautions for different machines.
4. Discuss the process of performing measurement and marking operations based on job work specifications during machine operation.
5. Set out and adjust the machining program accurately based on job work specifications, ensuring precise and efficient machining operations.
6. Select and feed the appropriate machine consumables, such as glue, adhesives, edge bands, etc., based on job work details on specific machines.
7. Monitor the loading and unloading of the job work on/from the machine bed safely and efficiently, ensuring smooth operations and minimizing risks.
8. Perform accurate measurement and marking operations based on job work specifications, ensuring precise cutting and shaping of materials on machines.

Resources to be Used

Theory

- Training manual or learner handbook
- Whiteboard/Chart paper and markers
- Sample job work specifications
- Machine operation and safety guidelines

Practical

- Panel processing machine or edge banding machine
- Workpieces (e.g., MDF, plywood sheets)
- Machine consumables (glue, adhesives, edge band rolls, etc.)
- Measuring tools (scale, measuring tape, marking tools)
- PPE (gloves, goggles, aprons, etc.)

Say



- “Today we will learn how to properly set up machines for different types of job work. This includes adjusting machine settings, feeding the correct consumables, loading and unloading materials safely, and measuring and marking materials accurately. A correct setup ensures smooth operation and high-quality output.”

Ask



- “Have you ever seen or done any machine setup before?”
- “What do you think could go wrong if a machine is not set up properly?”
- “Why do you think safety gear is so important during machine operations?”

Please feel free to share your experiences with the group. I’ll be noting down your ideas on the whiteboard.

Elaborate



- Introduce the steps involved in setting the machine program using job specifications.
- Discuss various machine consumables and how to choose the correct one.
- Explain the safety procedures during loading and unloading.
- Elaborate on measurement and marking as a critical pre-machining step.
- Use diagrams or a short video demo if available.

Activity-1



Machining Program Setup

- **Objective:**
 - ✓ To set out and adjust the machining program accurately based on job work specifications, ensuring precise and efficient machining operations.
- **Materials Needed:**
 - ✓ CNC or panel processing machine
 - ✓ Job work specification sheet
 - ✓ Machine interface (monitor/control panel)
 - ✓ PPE (gloves, goggles)

- **Procedure:**
 - ✓ Review job work specifications and part details.
 - ✓ Switch on the machine and access the machining program interface.
 - ✓ Input or adjust parameters such as dimensions, cutting depth, feed rate, etc.
 - ✓ Simulate the program run (if machine allows) to verify settings.
 - ✓ Save and confirm the program settings for execution.
- **Outcome:** Trainee accurately configures the machine with correct settings aligned to the job work, ready for precise and safe machining.

Activity-2



Feeding Machine Consumables

- **Objective:**
 - ✓ To select and feed the appropriate machine consumables, such as glue, adhesives, edge bands, etc., based on job work details.
- **Materials Needed:**
 - ✓ Machine consumables (glue, adhesives, edge band rolls, etc.)
 - ✓ Edge banding machine or gluing station
 - ✓ Job sheet indicating material type and size
 - ✓ PPE (gloves, apron)
- **Procedure:**
 - ✓ Read the job sheet to identify the type and quantity of consumables required.
 - ✓ Select appropriate glue or edge band based on the material.
 - ✓ Load consumables into the machine feed system as per machine manual.
 - ✓ Check and adjust feed settings for even distribution/application.
 - ✓ Test run to verify correct application.
- **Outcome:**
 - ✓ Trainee demonstrates correct selection and feeding of consumables, ensuring consistency in material finishing and bonding.

Activity-3



Loading and Unloading Job Work

- **Objective:**
 - ✓ To monitor the loading and unloading of the job work on/from the machine bed safely and efficiently.
- **Materials Needed:**
 - ✓ Job work panels or boards
 - ✓ Machine bed (panel saw, CNC router, etc.)
 - ✓ Lifting tools or support rollers (if applicable)
 - ✓ PPE (safety shoes, gloves)
- **Procedure:**
 - ✓ Inspect the machine bed and clear any obstructions.
 - ✓ Lift the panel using correct posture or aids.
 - ✓ Place the panel on the machine bed and align it using stoppers or guides.
 - ✓ Secure the panel (clamps or vacuum hold).
 - ✓ After machining, safely unload the panel and place it in the designated area.
- **Outcome:**
 - ✓ Trainee loads and unloads job work with minimal effort and no safety risks, following operational protocols.

Activity-4



Measurement and Marking

- **Objective:**
 - ✓ To perform accurate measurement and marking operations based on job work specifications for precise cutting and shaping.
- **Materials Needed:**
 - ✓ Measuring tools (tape, scale, calipers)
 - ✓ Marking tools (chalk, pencil, scribe)
 - ✓ Job work specification sheet
 - ✓ Workpiece panels

- **Procedure:**

- ✓ Read and interpret measurement details from the job spec sheet.
- ✓ Use measuring tools to determine the required dimensions.
- ✓ Mark cutting lines, drill points, or slots using appropriate tools.
- ✓ Re-check measurements for accuracy.
- ✓ Submit marked panels for verification before machining.

- **Outcome:**

- ✓ Trainee demonstrates the ability to mark materials accurately based on given dimensions, ensuring readiness for machine operation.

Say



- “Well done! As you’ve seen, careful machine setup is not just a technical task—it’s a safety and quality assurance process. If setup is done properly, your entire machining operation becomes smoother, faster, and safer.”

Notes for Facilitation



- Reinforce safety messages repeatedly during demonstration and practice.
- Allow each trainee a chance to perform each sub-task (program setup, feeding, loading, marking).
- Encourage peer support and collaborative troubleshooting.
- Provide corrective feedback on PPE usage, alignment, and accuracy.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. **What factors should be considered when adjusting a machining program based on job work specifications?**

Factors include dimensions, material type, cutting depth, tool path, feed rate, and tolerances required for the final product.

2. **Why is the selection of appropriate machine consumables important for different machining tasks?**

Because different tasks require different materials for bonding, finishing, or edging. The right consumables ensure quality, durability, and appearance of the final product.

3. **What are the key safety precautions to follow when loading and unloading workpieces from a machine?**

Wearing PPE, using proper lifting techniques, ensuring machine is off or in safe mode, using support tools, and avoiding pinch points are essential.

4. **How does accurate measurement and marking contribute to machining precision?**

Accurate measurement and marking ensure that material is cut or shaped exactly as per the job specifications, reducing errors and wastage.

5. **What is the impact of incorrect feeding of machine consumables on the final product?**

It can lead to weak bonding, poor finishes, visible defects, and overall reduction in product quality and durability.

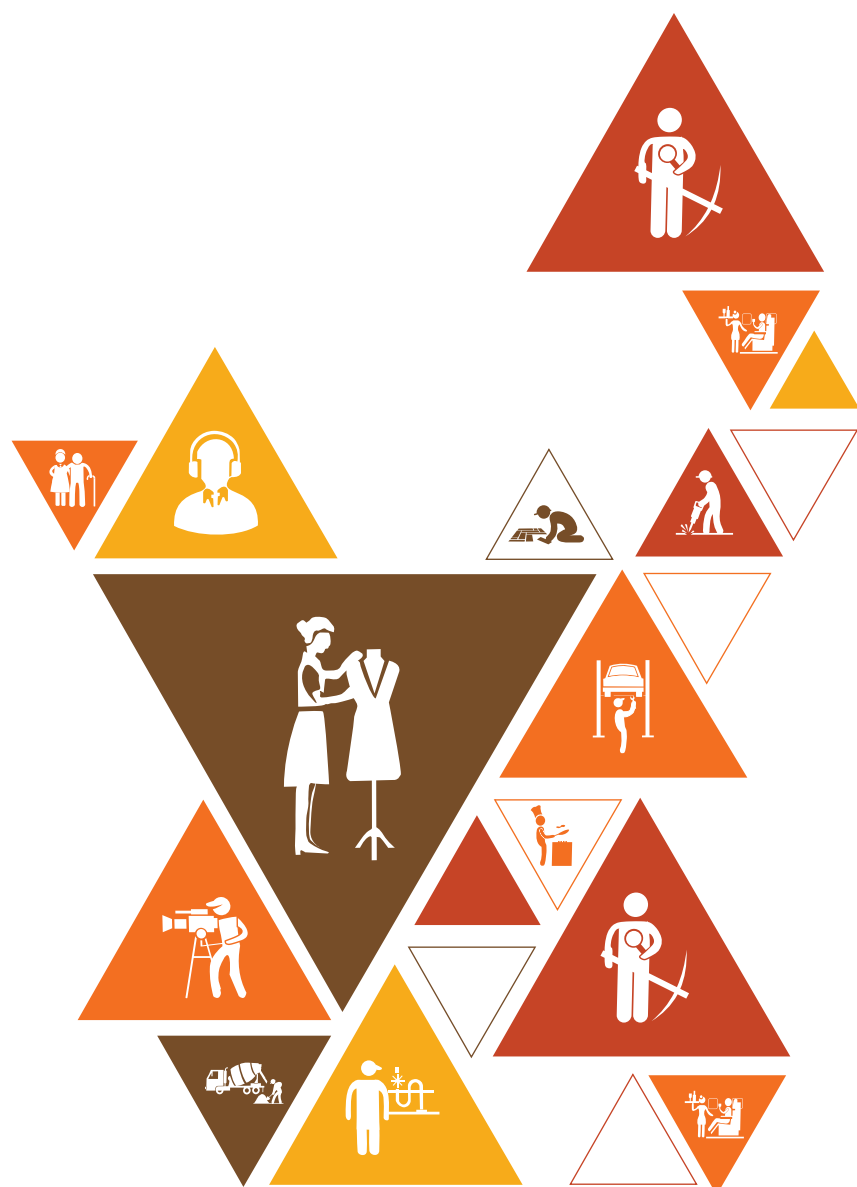
Fill in the Blanks:

1. Adjusting the **machining program** ensures that machining operations align with job specifications.
2. Proper selection of **consumables** like glue and edge bands enhances the quality of the finished product.
3. Safety precautions during **loading and unloading** help prevent workplace accidents and machine damage.
4. Accurate **measurement** and marking ensure precision in cutting and shaping materials.
5. Machine consumables should be selected based on **job work details** to achieve the best results.

True/False Questions:

1. **False:** Adjusting the machining program is essential to ensure it matches current job work specifications.
2. **True:** Consumables must match the specific needs of the task to ensure quality.
3. **True:** Neglecting safety during loading/unloading can result in injuries and equipment damage.
4. **False:** Precision in measurement and marking is crucial for product accuracy.
5. **True:** Incorrect consumables can lead to poor performance and finish.

[illegible]

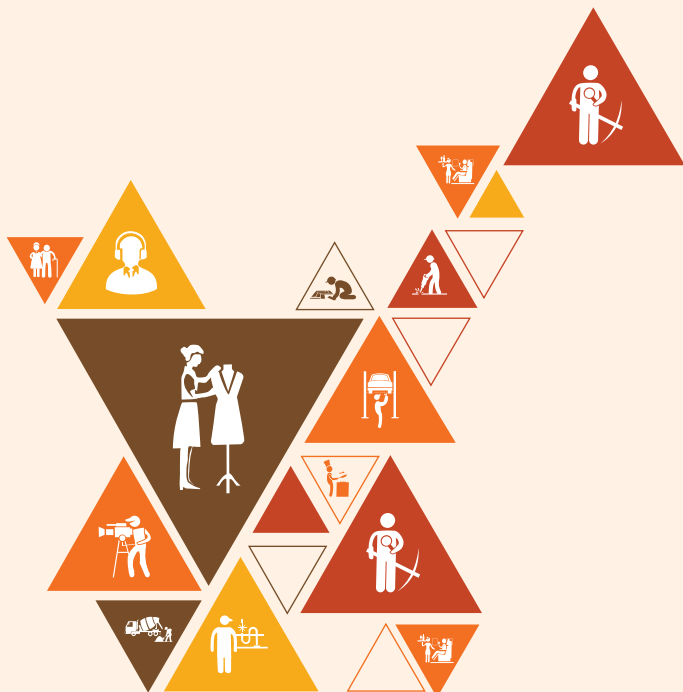




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8. Machine Initiation Process

Unit 8.1 – Machine Start-up Process



FFS/N1012

Key Learning Outcomes

At the end of this module, you will be able to:

1. Ensure the checking and maintaining of fundamental systems as per the machine initiation checklist effectively.
2. Illustrate the installation and adjustment of the appropriate tools and equipment per the project requirements effectively.
3. Display proper checking of safety equipment before machine initiation effectively.

UNIT 8.1: Machine Start-up Process

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the importance of supervising the checking of fundamental systems as per the machine initiation checklist and the associated safety considerations.
2. Explain the process of installing and adjusting appropriate tools and equipment as per the project requirements.
3. Describe the importance of properly checking safety equipment before machine initiation and the specific checks required.
4. Discuss the process of monitoring machine trial run and the evaluation criteria for required operation, accuracy, and quality.
5. Supervise the checking of fundamental systems such as air pressure, duct collector, stabilizers, etc., as per the machine initiation checklist, ensuring proper functioning and safety compliance.
6. Install and adjust the appropriate tools and equipment, such as blades, edge bands, drill bits, etc., as per the project requirements.
7. Perform thorough checks of safety equipment, including emergency stops, gauges, guards, and controls, before machine initiation.
8. Monitor the machine trial run, evaluate the required operation, accuracy, and quality, and make necessary adjustments if required.

Resources to be Used

Theory

- Machine initiation checklist
- Safety standards & SOPs
- Manufacturer manuals for tools and machinery
- Sample project requirements

Practical

- Panel processing machines
- Safety equipment (PPE, guards, emergency stop buttons, etc.)
- Tools and consumables (blades, edge bands, drill bits)
- Checklists and quality monitoring sheets

Say



- "Before any machine can be used effectively, it must go through a structured start-up process. This ensures safety, machine health, and quality of output. Today, we'll look at how to check systems, install tools, verify safety, and perform trial runs."

Ask



- "What do you think would happen if we skip checking the air pressure or safety guards before starting a machine?"
- "Have you ever seen a machine malfunction during its first run? What caused it?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



- Importance of air pressure, duct collectors, and stabilizers during machine startup
- Step-by-step process for tool installation (e.g., blades or drill bits)
- How to inspect and test safety features before switching the machine on
- Significance of a trial run — what to monitor: sound, speed, material movement, quality

Activity-1



Supervise the Checking of Fundamental Systems

- **Objective:**
 - ✓ To ensure all essential systems (air pressure, duct collector, stabilizers, etc.) are functioning correctly and comply with the machine initiation checklist and safety norms.
- **Materials Needed:**
 - ✓ Machine initiation checklist
 - ✓ Functional machine setup (with air pressure line, duct collector, stabilizer)
 - ✓ Air pressure gauge
 - ✓ Voltage stabilizer readout
 - ✓ Dust collector unit
 - ✓ Notepad and pen

- **Procedure:**
 - ✓ Review the machine initiation checklist provided.
 - ✓ Check air pressure levels using a gauge – ensure they match operational requirements.
 - ✓ Inspect duct collector for blockage or improper suction.
 - ✓ Verify stabilizer output voltage is within safe operational limits.
 - ✓ Mark each checklist point after verification.
 - ✓ Report any abnormalities to the supervisor for rectification.
- **Outcome:**
 - ✓ Trainees will be able to confidently supervise the system checks and ensure all support systems are safe and ready for machine startup.

Activity-2



Install and Adjust Appropriate Tools and Equipment

- **Objective:**
 - ✓ To install and fine-tune the appropriate tools and attachments such as blades, edge bands, drill bits, etc., according to the specific project requirements.
- **Materials Needed:**
 - ✓ Machine setup
 - ✓ Project requirement sheet
 - ✓ Tool kit (wrenches, Allen keys, screwdrivers)
 - ✓ Blade, edge band roll, drill bits, etc.
 - ✓ PPE (gloves, goggles)
- **Procedure:**
 - ✓ Read and understand the tool requirements from the project sheet.
 - ✓ Select the correct tool type and size.
 - ✓ Wear appropriate PPE.
 - ✓ Install the tool using proper tools and methods (tightening to correct torque, alignment).
 - ✓ Adjust tool position, depth, or feed as required.
 - ✓ Double-check alignment and fit before closing guards.
- **Outcome:**
 - ✓ Trainees will be proficient in selecting, installing, and adjusting tools and attachments to match job-specific needs and ensure machining readiness.

Activity-3



Perform Thorough Checks of Safety Equipment

- **Objective:**
 - ✓ To perform detailed checks of safety equipment such as emergency stop buttons, guards, gauges, and control panels before machine initiation.
- **Materials Needed:**
 - ✓ Machine equipped with safety features
 - ✓ Safety checklist
 - ✓ Control panel layout reference
 - ✓ PPE
- **Procedure:**
 - ✓ Identify all safety mechanisms on the machine.
 - ✓ Check emergency stop button functionality — press to verify response.
 - ✓ Inspect physical guards for presence and secure attachment.
 - ✓ Test gauges and meters for correct readings.
 - ✓ Ensure control panel switches, alarms, and displays work as intended.
 - ✓ Record all observations in the checklist.
- **Outcome:**
 - ✓ Trainees will gain hands-on experience in safety validation, ensuring all safety features are functional before starting any operation.

Activity-4



Monitor the Machine Trial Run

- **Objective:**
 - ✓ To observe and evaluate the machine's trial operation, checking for accuracy, output quality, and operational soundness, and to make necessary adjustments if required.
- **Materials Needed:**
 - ✓ Machine ready with installed tool
 - ✓ Trial raw material
 - ✓ Quality check sheet
 - ✓ Sample job specification
 - ✓ Observation notebook

- **Procedure:**

- ✓ Start the machine for a trial run with the selected raw material.
- ✓ Monitor machine behavior—sound, vibrations, material feed, and tool movement.
- ✓ Check the finished piece for precision, smoothness, and dimensional accuracy.
- ✓ Compare trial result with the job specification.
- ✓ If any deviation is found, stop the machine and make necessary adjustments.
- ✓ Re-run the trial if needed and document findings.

- **Outcome:**

- ✓ Trainees will be able to monitor trial runs effectively, identify deviations in quality or performance, and execute required adjustments for final production readiness.

Do

- Let each trainee participate in at least one complete start-up sequence from checking systems to running a trial and noting results. Rotate roles to encourage cross-learning.

Say

- "Setting up a machine isn't just about turning it on—it's a process. When followed properly, it ensures safety, efficiency, and the high quality that every job demands."

Notes for Facilitation

- Ensure each trainee uses PPE during practical tasks.
- Encourage peer review while checking safety features.
- Use real checklists and job work requirements for more realism.
- Emphasize safety compliance at every stage.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. Why is it important to check fundamental systems before machine initiation?

To ensure the machine's support systems like air pressure, duct collectors, and stabilizers are functioning correctly, which is essential for safety, efficiency, and avoiding equipment damage.

2. What factors should be considered when installing and adjusting tools and equipment for a project?

Factors include the tool type and size, alignment, material compatibility, project specifications, safety requirements, and secure installation.

3. What safety equipment checks should be performed before machine initiation?

Emergency stop buttons, guards, gauges, control panels, alarms, and any automatic shut-off systems should be inspected for functionality.

4. How can monitoring a machine trial run help ensure accuracy and quality?

It allows early detection of misalignment, tool errors, or operational issues, ensuring the machine produces accurate, high-quality output before full-scale production.

5. What are some essential components to check in a machine initiation checklist?

Air pressure levels, duct collector suction, voltage stabilizer, tool installations, emergency stops, guards, and control system responses.

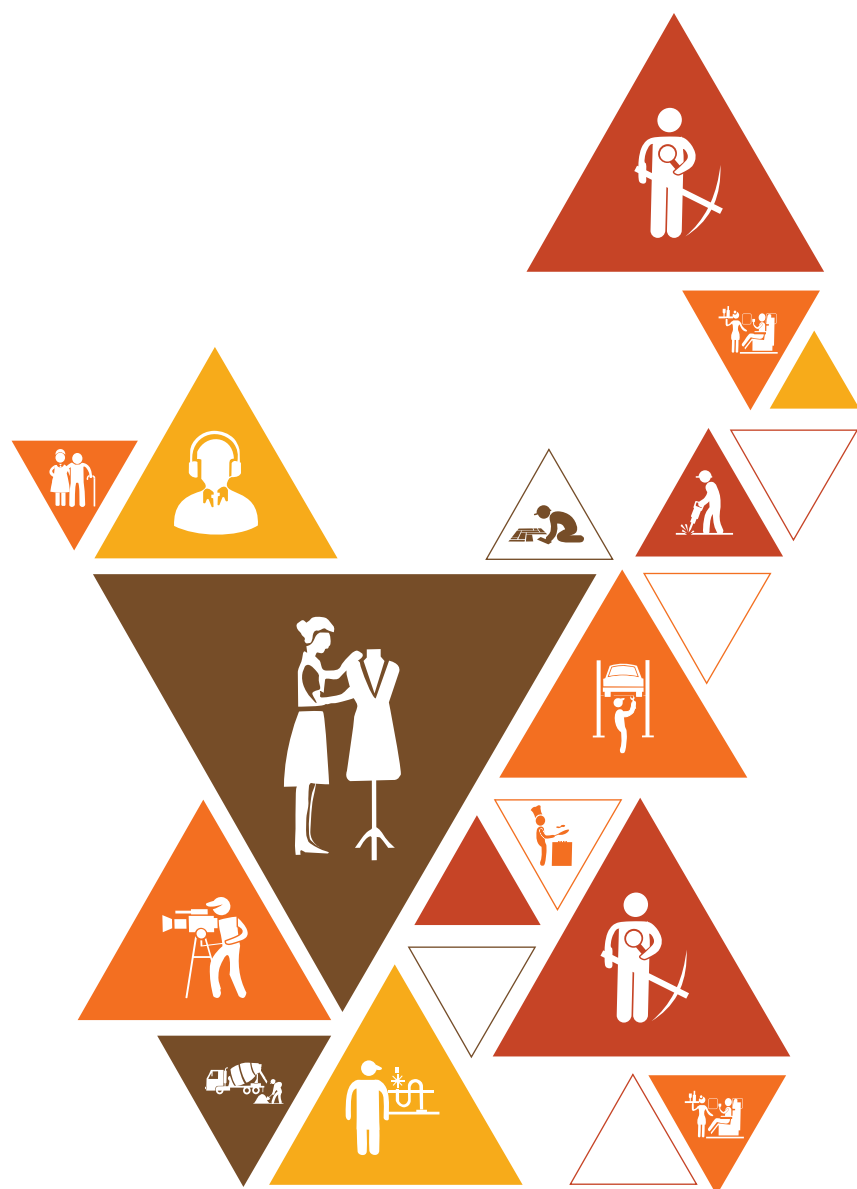
Fill in the Blanks:

1. Checking fundamental systems, such as air pressure and duct collectors, ensures proper machine functionality.
2. Proper installation and adjustment of tools like blades and drill bits help achieve precise machining.
3. Before machine initiation, safety equipment such as emergency stops and guards should be checked.
4. A machine trial run helps evaluate operation, accuracy, and quality before full-scale operation.
5. Adjustments to tools and equipment should be based on project requirements.

True/False Questions:

1. **False:** Checking air pressure, duct collectors, and stabilizers before machine initiation is essential for safe and efficient operation.
2. **True:** Proper installation and adjustment of tools can improve machining efficiency.
3. **False:** Safety equipment checks must be performed before the machine starts.
4. **True:** A machine trial run helps in identifying operational and quality issues before full production.
5. **False:** Evaluating accuracy during a trial run is crucial for maintaining machining quality.

This image shows a single page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, leaving small margins at the top and bottom. There is no handwriting or other markings on the paper.



FFS/N1012

Key Learning Outcomes

At the end of this module, you will be able to:

1. Explain the steps involved in feeding and handling of the job work in the machine using appropriate handling equipment.
2. Demonstrate the skills in operating the machine with designed capacity and purpose.
3. List standard operating procedures and safety protocols associated with different machine operations.
4. Discuss the material handling and movement involved in a machining operation.

UNIT 9.1: Performing the Essential Machining Process

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the process of proper feeding and handling of job work in the machine for the required operation and the associated safety protocols.
2. Describe the importance of performing the operation in accordance with the machine's designed capacity, purpose, and manufacturer recommendations.
3. Discuss the significance of monitoring the operation periodically to evaluate product quality and yield and the techniques involved in the assessment.
4. Explain the importance of following standard operating procedures and safety protocols during machine operation and the specific procedures and protocols to be followed.
5. Describe the role of material handling and movement after the operation and the techniques involved.
6. Discuss the importance of operating the machine to full efficiency and safety and the measures involved in achieving optimal performance.
7. Perform feeding and handling of the job work in the machine for the required operation, ensuring accuracy and adherence to safety protocols.
8. Perform the operation in accordance with the machine's designed capacity and purpose, following the manufacturer's recommendations, to ensure optimal performance and desired results.
9. Monitor the operation periodically to evaluate product quality and yield, ensuring adherence to quality standards and maximizing output efficiency.
10. Follow standard operating procedures and safety protocols during machine operation.
11. Perform storage, transportation, and organization of materials in compliance with safety guidelines after machine operation.
12. Ensure the machine is operated to full efficiency and safety, maximizing productivity while prioritizing the well-being of operators.

Resources to be Used

Theory

- Machine operating manuals
- Standard operating procedures (SOPs)
- Safety guidelines and checklists
- Manufacturer recommendations for machine use
- Quality assessment techniques

Practical

- Panel processing machines
- Material handling equipment (trolleys, cranes)
- Personal Protective Equipment (PPE)
- Job work material (raw material to be processed)
- Quality monitoring tools (gauges, calipers, checklists)

Say

- “Proper machine operation is not just about feeding material into the machine—it's about understanding the machine's capacity, following manufacturer recommendations, and ensuring both the operator's safety and the quality of the final product. In this unit, we will cover feeding and handling materials, safety protocols, and monitoring the operation to achieve optimal performance.”

Ask

- “Why is it important to follow the manufacturer's recommendations while using a machine?”
- “What do you think could happen if the material isn't fed into the machine properly?”
- “Can you share any experiences where safety protocols helped prevent an accident during machine operation?”
- “What methods would you use to evaluate whether the machine is performing to its full efficiency?”

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate

- **Feeding and Handling of Job Work:** Explain how proper material handling ensures smooth operation, prevents jams, and improves product quality. Discuss the importance of using the right technique to load material based on machine specifications.
- **Machine Capacity and Manufacturer Recommendations:** Highlight the importance of adhering to the machine's design limits to avoid overloading, reducing the risk of breakdowns, and ensuring high-quality results.
- **Monitoring and Quality Assessment:** Discuss how periodic checks can help detect issues early, such as inconsistencies in product quality, tool wear, or machine malfunctions. Explain the use of quality monitoring tools to assess yield and precision.

- **Safety Protocols During Operation:** Emphasize the importance of wearing PPE, securing workpieces, and following machine-specific safety guidelines to prevent accidents and ensure smooth operation.
- **Material Movement and Handling After Operation:** Explain the steps to safely remove, store, and transport materials after the machining process. Discuss proper techniques for organizing materials to avoid contamination or damage.
- **Operating for Full Efficiency and Safety:** Discuss techniques for optimizing machine performance, such as regular maintenance, monitoring operational indicators, and addressing any deviations in performance promptly.

Activity-1



Feed & Handle Safely

- **Objective:**
 - ✓ Ensure that trainees can feed and handle materials in the machine correctly, following safety protocols.
- **Materials Needed:**
 - ✓ Raw material (specific to machine operation)
 - ✓ Panel processing machine
 - ✓ PPE (gloves, goggles, ear protection)
 - ✓ Job work manual
- **Procedure:**
 - ✓ **Demonstration:** Instructor demonstrates the correct method for feeding materials into the machine, ensuring that the correct type and size of material are chosen.
 - ✓ **Safety Briefing:** Instructor reviews the required safety protocols, such as wearing appropriate PPE, securing loose clothing, and ensuring the machine's safety guards are in place.
 - ✓ **Trainee Practice:** Trainees practice feeding materials into the machine, ensuring proper alignment, handling, and adherence to safety protocols.
 - ✓ **Observations & Feedback:** The instructor observes the trainees' technique and provides feedback on accuracy, material handling, and safety protocol adherence.
 - ✓ **Corrective Actions:** If mistakes are observed, corrections are made in real-time, and the trainees are asked to redo the process.
- **Outcome:**
 - ✓ Trainees will be able to feed and handle materials into the machine accurately, ensuring proper alignment and safety during the operation.

Activity-2



Operate as Per Specs

- **Objective:**
 - ✓ Ensure trainees operate the machine according to its designed capacity and purpose, ensuring optimal performance.
- **Materials Needed:**
 - ✓ Machine operating manual
 - ✓ Calibration tools
 - ✓ Machine and raw material
 - ✓ PPE
- **Procedure:**
 - ✓ Review Manufacturer's Recommendations: Instructor reviews key points from the machine's operating manual, focusing on capacity limits, material types, and recommended settings.
 - ✓ Machine Setup: Trainees are instructed to set up the machine according to the manufacturer's recommendations. This includes adjusting machine settings, selecting the right tools, and ensuring the correct material is used.
 - ✓ Perform the Operation: Trainees operate the machine, ensuring they are working within the recommended capacity and settings.
 - ✓ Instructor Supervision: The instructor supervises the operation, ensuring that the machine is used according to specifications.
 - ✓ Review and Adjust: If there are issues with performance, trainees are shown how to adjust machine settings or operational techniques to optimize performance.
- **Outcome:**
 - ✓ Trainees will be able to operate the machine effectively, following manufacturer recommendations and ensuring optimal performance.

Activity-3



Monitor Quality & Yield

- **Objective:**
 - ✓ Ensure trainees can monitor operations to evaluate product quality and yield, optimizing output.

- **Materials Needed:**

- ✓ Quality monitoring tools (e.g., calipers, micrometers, gauges)
- ✓ Sample products for quality check
- ✓ Machine logs
- ✓ Calibration equipment

- **Procedure:**

- ✓ **Demonstration of Quality Monitoring:** Instructor demonstrates how to use quality monitoring tools (calipers, gauges) to evaluate product dimensions, surface finish, and tolerances.
- ✓ **Periodic Monitoring:** Trainees are tasked with monitoring the machine's operation periodically during the process, checking the product quality against specified tolerances at intervals.
- ✓ **Logging Data:** Trainees will record their findings, noting any deviations from the desired specifications.
- ✓ **Troubleshooting & Adjustments:** In case of any discrepancies, trainees must troubleshoot the issue by adjusting the machine settings or performing corrective actions.
- ✓ **Feedback & Evaluation:** The instructor reviews the logged data, providing feedback on how well the product quality is maintained and how the yield can be optimized.

- **Outcome:**

- ✓ Trainees will be able to monitor and evaluate product quality and yield during machine operation and make necessary adjustments to ensure adherence to quality standards.

Activity-4



Follow SOPs & Safety

- **Objective:**

- ✓ Ensure trainees understand and follow all safety protocols and standard operating procedures (SOPs) during machine operation.

- **Materials Needed:**

- ✓ Machine SOP documents
- ✓ PPE (gloves, goggles, ear protection)
- ✓ Machine operating checklist

- **Procedure:**

- ✓ Review of SOPs and Safety Protocols: Instructor reviews the standard operating procedures and safety protocols specific to the machine. This includes pre-operation checks, PPE requirements, emergency shutdown procedures, and safe operational practices.
- ✓ Demonstration: Instructor demonstrates how to follow the SOPs and safety protocols step-by-step.
- ✓ Trainee Operation: Trainees are tasked with operating the machine, ensuring they follow the SOPs, use PPE, and adhere to safety protocols throughout the process.
- ✓ Observation and Correction: The instructor observes each trainee to ensure that the SOPs and safety protocols are being followed. Any lapses are immediately corrected.
- ✓ Post-Operation Safety Check: At the end of the session, trainees ensure all safety procedures are followed, such as powering down the machine safely and reporting any issues.

- **Outcome:**

- ✓ Trainees will be able to operate the machine in full compliance with standard operating procedures and safety protocols, ensuring a safe working environment.

Activity-5



Store & Move Materials

- **Objective:**

- ✓ Ensure trainees can safely store, transport, and organize materials after the operation.

- **Materials Needed:**

- ✓ Finished workpieces
- ✓ Storage containers or shelves
- ✓ Material transport equipment (e.g., trolleys, cranes)
- ✓ PPE (gloves, safety shoes, safety vests)

- **Procedure:**

- ✓ Demonstration of Safe Material Handling: Instructor demonstrates how to handle, store, and transport finished materials safely. This includes using transport equipment and ensuring the materials are organized to prevent damage.
- ✓ Trainee Practice: Trainees practice transporting and storing materials, ensuring the use of proper lifting techniques and safe transport equipment.

- ✓ Safety Guidelines Briefing: Trainees are instructed on the importance of organizing materials to prevent accidents, contamination, or damage.
- ✓ Post-Operation Check: Trainees are required to inspect the storage area to ensure all materials are safely stored and organized, with a clear separation between raw and finished materials.
- **Outcome:**
 - ✓ Trainees will be able to safely store, transport, and organize materials after operation, adhering to safety guidelines and ensuring proper handling.

Activity-6



Maximize Efficiency & Safety

- **Objective:**
 - ✓ Ensure that the machine is operated efficiently and safely, prioritizing productivity and operator safety.
- **Materials Needed:**
 - ✓ Machine performance logs
 - ✓ Machine diagnostic tools
 - ✓ PPE
 - ✓ Maintenance checklist
- **Procedure:**
 - ✓ Review of Machine Efficiency & Safety: Instructor discusses the importance of machine maintenance, proper operation, and monitoring for optimal performance.
 - ✓ Monitoring Performance: Trainees are assigned to monitor the machine's efficiency, checking for performance indicators such as speed, output, energy consumption, and machine health.
 - ✓ Troubleshooting & Adjustments: If performance indicators fall below expectations, trainees must use diagnostic tools to identify and resolve any issues (e.g., tool wear, misalignment, or machine settings).
 - ✓ Safety Priorities: The instructor emphasizes the need to maintain operator safety while improving efficiency, reminding trainees about the importance of using proper ergonomics and avoiding overexertion.
 - ✓ Efficiency Review: At the end of the session, the instructor reviews the machine's performance logs with the trainees, providing feedback on how well the machine's efficiency and safety were managed.

- **Outcome:**

- ✓ Trainees will be able to operate the machine efficiently while ensuring safety, productivity, and the well-being of operators.

Do

- Have each trainee participate in at least one full operation, including feeding and handling job work, monitoring quality, following safety protocols, and post-operation material handling.

Say

- “Machine operation requires a blend of skill and safety. Following proper feeding techniques, adhering to the machine's design specifications, and regularly evaluating product quality are key to achieving efficiency and safety. Let’s move on to discussing how to monitor operations for quality and adjust settings as needed to ensure optimal performance.”

Notes for Facilitation

- Ensure each trainee is equipped with the necessary PPE during all activities.
- Encourage peer-to-peer observation and feedback to enhance learning.
- Continuously emphasize the importance of safety throughout the session.
- Use real-world scenarios for quality monitoring and material handling to make the activities as practical as possible.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. **Why is it important to follow safety protocols when feeding and handling job work in the machine?**
To prevent accidents, injuries, and damage to the machine or materials. Safety protocols ensure that operations are carried out in a controlled and secure manner.
2. **How does operating the machine within its designed capacity ensure efficiency and longevity?**
It prevents overloading, reduces wear and tear, and maintains consistent performance, thereby extending the machine's operational life.
3. **What techniques can be used to periodically monitor machine operations for quality assessment?**
Visual inspection, sample measurements, noise/vibration monitoring, and using quality checklists or gauges during operation.
4. **List three standard operating procedures that must be followed during machine operation.**
Wearing personal protective equipment (PPE), verifying safety guards are in place, and following manufacturer's operation sequence.
5. **Why is proper material handling and movement important after an operation?**
It ensures product integrity, reduces the risk of injury, prevents material loss or damage, and maintains a clean and organized workspace.

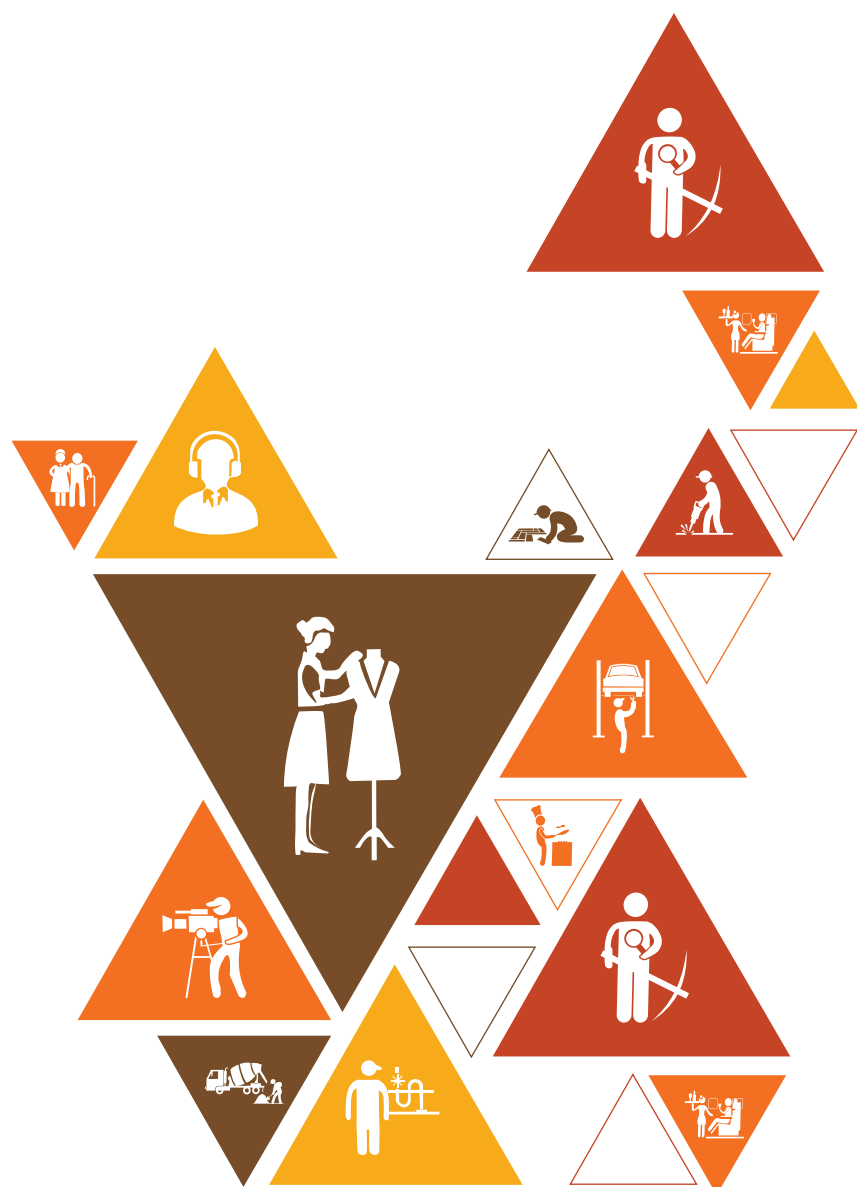
Fill in the Blanks:

1. Feeding and handling job work in the machine must follow safety protocols to prevent accidents.
2. Performing operations within the machine's designed capacity ensures optimal performance and prevents damage.
3. Periodic monitoring of operations helps in evaluating product quality and yield efficiency.
4. Following standard operating procedures ensures safety and efficiency during machine operation.
5. After an operation, proper storage, transportation, and organization of materials must be done for safety compliance.

True/False Questions:

1. **False:** Ignoring machine capacity limits can lead to reduced performance, damage, and safety risks.
2. **True:** Monitoring operations periodically helps maintain product quality and yield.
3. **False:** Standard operating procedures are mandatory for safe and efficient operation.
4. **True:** Proper material handling techniques after operation improve workplace safety.
5. **False:** Machines should be operated according to manufacturer recommendations, not always at full capacity.

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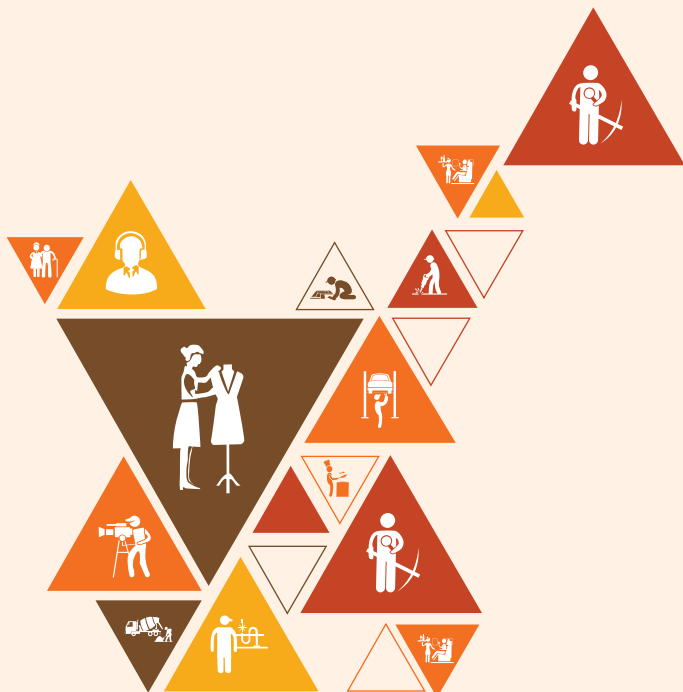




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10. Machine Maintenance

Unit 10.1 – Maintenance of Machine



FFS/N1013

Key Learning Outcomes

At the end of this module, you will be able to:

1. Discuss the steps involved in checking and reporting machine malfunctions or deviations from standard procedures effectively.
2. Demonstrate the process of conducting routine maintenance checks on machines, tools and equipment effectively.
3. List the steps involved in cleaning, lubrication, and calibration of machines effectively as per maintenance schedules.

UNIT 10.1: Maintenance of Machine

Unit Objectives

At the end of this unit, you will be able to:

1. Explain how to report machine faults and deviations from regular processes.
2. Discuss the significance of conducting routine maintenance checks on machines and the procedures involved in conducting inspections.
3. Describe the importance of performing necessary cleaning, lubrication, and calibration of machines and the procedures involved in these tasks.
4. Explain the importance of inspecting tools and equipment for wear and tear and the actions to be taken based on the inspection findings.
5. Record and report any machine malfunctions or deviations from standard procedures accurately and promptly.
6. Conduct routine maintenance checks on machines, inspecting key components and systems according to maintenance schedules.
7. Perform necessary cleaning, lubrication, and calibration of machines.
8. Inspect tools and equipment for any wear, tear, or damage, identifying signs of deterioration, and taking appropriate action.

Resources to be Used

Theory

- Presentation or posters showing maintenance steps
- Videos/animations of machine cleaning, lubrication, and inspection
- Sample maintenance schedule/checklist
- Fault report/log formats
- Maintenance SOPs (Standard Operating Procedures)

Practical

- Actual or demo machines (non-powered if needed for safety)
- Tools: wrenches, lubricants, cloth, calibration equipment, inspection lights
- Safety gear: gloves, goggles, aprons
- Sample faulty tools for inspection practice
- Maintenance logbooks or forms

Say



- “Welcome! Just like our body needs regular checkups and care, machines too require timely maintenance to work efficiently and safely. In this session, we'll learn how to inspect, clean, lubricate, and report issues—skills that make a real difference on the shop floor.”

Ask



- “Have you seen a machine break down unexpectedly? What happened?”
- “What small things can you do daily to avoid machine failure?”
- “Why do you think tool inspection is equally important as machine inspection?”

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

Reporting Faults:

- Look for signs like noise, overheating, or vibration.
- Use logbooks or report forms.
- Report immediately to avoid escalation.

Routine Maintenance Checks:

- Includes checking belts, bolts, fluid levels, and moving parts.
- Should be done daily, weekly, or monthly depending on the machine.

Cleaning, Lubrication, Calibration:

- Cleaning removes dust or debris that may affect operation.
- Lubrication reduces friction, wear and tear.
- Calibration ensures machine accuracy and quality output.

Tool and Equipment Inspection:

- Worn-out tools affect safety and product quality.
- Visual and functional checks should be regular.

Recordkeeping:

- Maintain maintenance records for tracking machine health.
- Forms/logs must include date, issue, action taken, and signature.

Activity-1



“Fault Reporting Drill”

- **Objective:** Trainees practice identifying machine faults and documenting them using standard formats.
- **Instructions:**
 - ✓ Set up a machine (or show a video/simulation) with common fault signs (e.g., unusual noise, vibration, overheating, etc.).
 - ✓ Provide a standard fault report form.
 - ✓ Ask trainees to:
 - Observe and identify the fault.
 - Fill in the form with details like machine ID, fault description, date/time, and action taken.
 - ✓ Submit their report to the trainer for feedback.
- **Resources Needed:** Sample fault report forms, pens, machine or video showing malfunction
- **Duration:** 20–30 minutes
- **Outcome:** Record and report any machine malfunctions or deviations from standard procedures accurately and promptly.

Activity-2



“Maintenance Check Walkthrough”

- **Objective:** Trainees learn to perform scheduled maintenance as per a checklist.
- **Instructions:**
 - ✓ Provide a maintenance checklist aligned with a specific machine's schedule daily/weekly/monthly).
 - ✓ Trainees work in pairs to inspect components like belts, bolts, oil levels, filters, etc.
 - ✓ Mark each item on the checklist as OK/Needs Attention.
 - ✓ Submit the completed checklist to the trainer.
- **Resources Needed:** Machine for demonstration, checklist, inspection tools, safety gear
- **Duration:** 30–40 minutes
- **Outcome:** Conduct routine maintenance checks on machines, inspecting key components and systems according to maintenance schedules.

Activity-3



“Clean & Calibrate Challenge”

- **Objective:** Trainees demonstrate machine cleaning, lubrication, and calibration procedures.
- **Instructions:**
 - ✓ Demonstrate the proper way to clean and lubricate specific machine parts.
 - ✓ Introduce a simple calibration task (e.g., aligning tool or adjusting scale).
 - ✓ Assign trainees to:
 - Clean dust and grime using cloth and brush
 - Apply appropriate lubricant using oil can
 - Perform basic calibration steps under guidance
 - ✓ Evaluate based on completeness, safety, and care.
- **Resources Needed:** Lubricants, rags, calibration tools/instruments, gloves
- **Duration:** 40–50 minutes
- **Outcome:** Perform necessary cleaning, lubrication, and calibration of machines.

Activity-4



“Tool Inspector”

- **Objective:** Trainees practice identifying defective or worn tools and decide the next steps.
- **Instructions:**
 - ✓ Display a mix of tools in different conditions—some normal, others visibly worn or damaged.
 - ✓ Provide an inspection form with criteria like cracks, rust, looseness, missing parts.
 - ✓ Ask trainees to:
 - Visually inspect each tool
 - Record observations
 - Recommend actions: continue use / repair / replace
 - ✓ Discuss results with peers and trainer.
- **Resources Needed:** Variety of hand tools, inspection checklist, magnifying lens (optional)
- **Duration:** 20–30 minutes
- **Outcome:** Inspect tools and equipment for any wear, tear, or damage, identifying signs of deterioration, and taking appropriate action.

Do**Each trainee should:**

- Perform cleaning and lubrication on a demo machine
- Inspect a tool for signs of wear or damage
- Complete a maintenance report or log entry
- Calibrate or simulate calibration steps if possible
- Use proper PPE throughout
- Trainer Supervision Required to ensure safety and accuracy.

Say

- “Great work, everyone! You’ve just practiced essential tasks that help keep machines working like new. Remember—maintenance isn’t just a technical job; it’s about responsibility, safety, and care for the tools that help us work better.”

Notes for Facilitation

- Emphasize safety practices before and during hands-on activity.
- Use role play or simulation if machines aren’t available (e.g., use props).
- Demonstrate each step first before asking trainees to perform it.
- Help low-literacy learners with pictorial logbooks or color-coded checklists.
- Reinforce the importance of recordkeeping as a habit, not a chore.
- Provide feedback during practice to correct mistakes and boost confidence.
- Encourage peer learning — pair stronger learners with those who need support.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. How should machine faults and deviations from regular processes be reported?

Machine faults should be reported promptly and accurately using the designated reporting format or logbook. The report should include the nature of the fault, date and time of occurrence, machine ID, and the action taken.

2. Why is it important to conduct routine maintenance checks on machines?

Routine maintenance helps identify issues early, ensures consistent performance, prevents unexpected breakdowns, and extends the machine's lifespan.

3. What are the key procedures involved in cleaning, lubrication, and calibration of machines?

Key procedures include:

- Cleaning machine surfaces to remove dust, oil, or debris.
- Lubricating moving parts with appropriate oils or grease.
- Calibrating measuring instruments and machine parts to ensure accuracy and alignment.

4. What steps should be taken if tools and equipment show signs of wear and tear?

Worn or damaged tools should be:

- Removed from service immediately.
- Repaired or replaced depending on the severity.
- Reported to the supervisor or maintenance team.

5. How does regular maintenance contribute to machine efficiency and safety?

It helps ensure the machine operates at peak performance, reduces downtime, avoids accidents, and maintains a safe working environment.

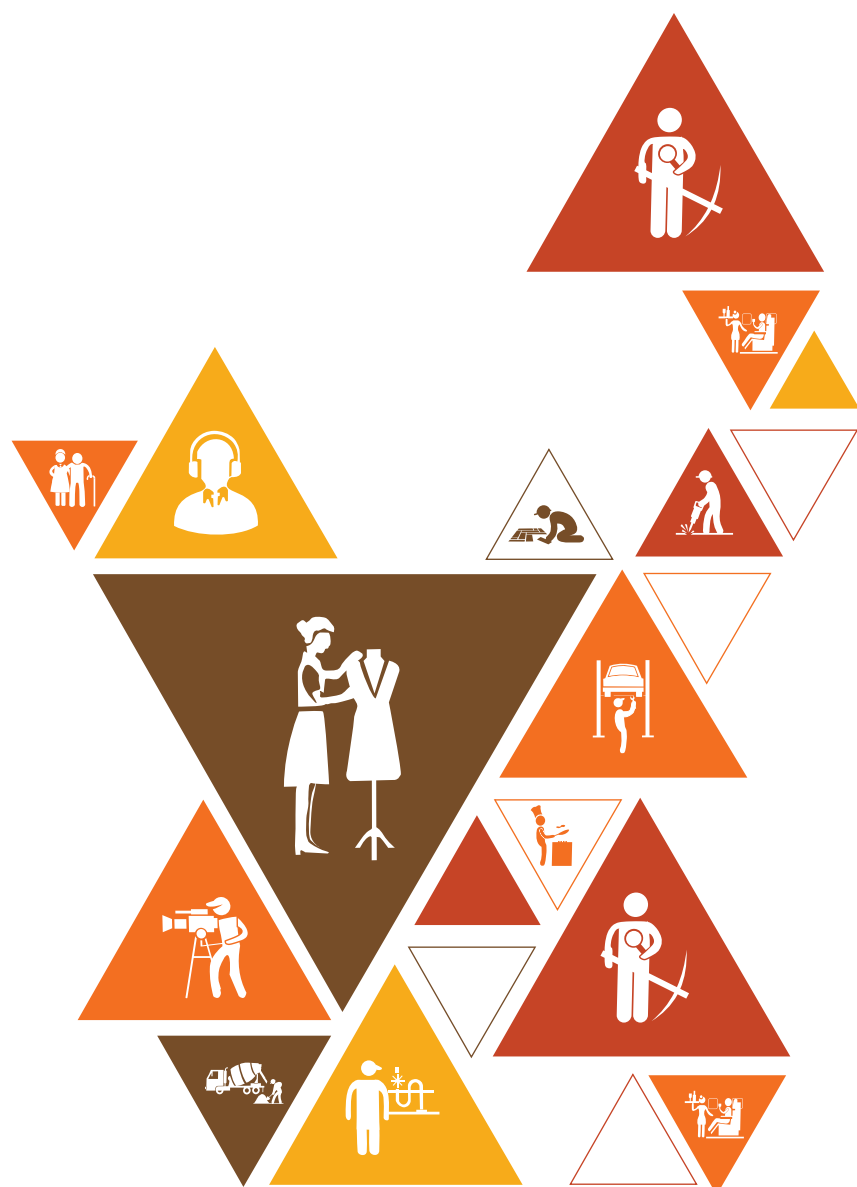
Fill in the Blanks:

1. Machine faults and deviations must be reported immediately to ensure timely corrective action.
2. Routine maintenance checks help in maintaining machine efficiency and preventing breakdowns.
3. Cleaning, lubrication, and calibration improve machine performance and extend its lifespan.
4. Tools and equipment should be inspected for wear and tear before and after use.
5. If tools show signs of wear, they should be either replaced or repaired to maintain performance.

True/False Questions:

1. **False:** Reporting must be done immediately, even if the machine is operational.
2. **True:** Regular checks help in early detection and prevention of failures.
3. **False:** Lubrication and calibration are essential for machine health and performance.
4. **True:** Worn tools can lead to poor results and safety risks.
5. **True:** All malfunctions must be properly documented and reported.

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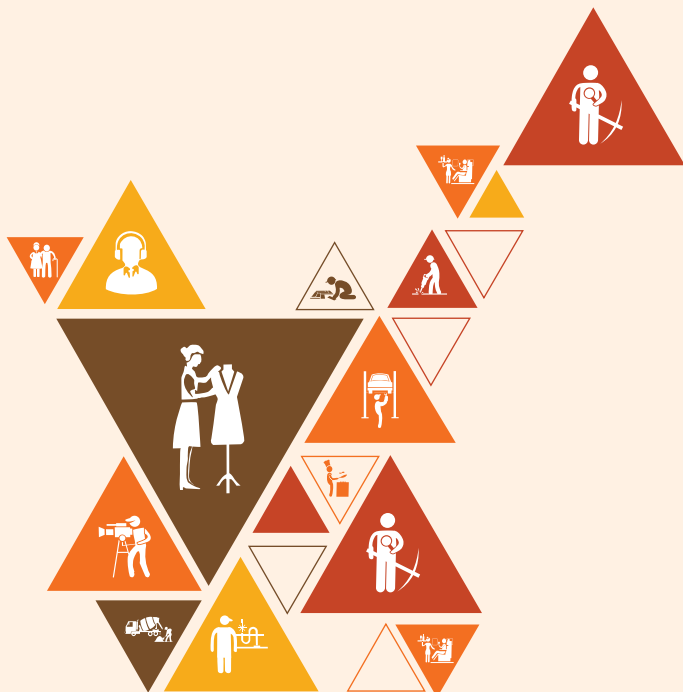




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11. Quality Control and Worksite Management

Unit 11.1 – Worksite Oversight and Quality Assurance



FFS/N1013

Key Learning Outcomes

At the end of this module, you will be able to:

1. List the constraints involved in inspecting finished panels and the feasible solutions to rectify the defects.
2. Discuss the steps involved in the identification and storage of material after machining operations for re-use effectively.
3. Ensure the collection and disposal of waste/offcut material in the designated bay effectively.
4. Supervise cleanliness at the machine station, tools, and equipment effectively.

UNIT 11.1: Worksite Oversight and Quality Assurance

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the process of inspecting finished panels for measurement, quality, accuracy, and the techniques and tools used in the inspection.
2. Explain the types of defects commonly found in panels, the visual inspection techniques used to identify defects, and the procedures for marking identified defects.
3. Describe the key constraints and procedures involved in identifying and storing material after machining operations for re-use purposes.
4. Discuss the process of collecting and disposing of waste/offcut material in the designated bay.
5. Illustrate the process of cleaning tools and machines after machining operations using appropriate cleaning agents and tools.
6. Describe the importance of maintaining cleanliness at the machine station, tools, and equipment and the procedures for regular cleaning and maintenance.
7. Inspect finished panels for measurement, quality, accuracy, and adherence to specifications, using appropriate measurement tools.
8. Inspect finished panels for defects such as wear & tear, paint imperfections, dents, grooves, cracks, rough edges, etc., and accurately mark the identified defects for further action.
9. Identify and properly store materials after machining operations for re-use purposes.
10. Collect and dispose of waste/offcut material generated during machining operations in the designated bay.
11. Perform internal cleaning of tools and machines after machining operations, using the appropriate cleaning agents and tools.
12. Perform cleanliness at the machine station, tools, and equipment by following the established cleaning procedures and schedules.

Resources to be Used

Theory

- Charts/images showing common panel defects
- SOP for cleaning and inspection
- Safety and waste disposal protocols
- Maintenance schedule examples

Practical

- Measuring tools (caliper, scale, square)
- Sample panels (defective and standard)
- Waste bins/designated disposal bay
- Cleaning agents, brushes, cloths
- Storage racks for reusable material

Say

- "Today's session is about how to ensure the quality and cleanliness of your worksite after machining tasks. Maintaining quality not only improves product output but also creates a safe and efficient working environment. We will also look at ways to identify defects, handle offcuts, and maintain your tools and workspace."

Ask

- "Why do you think it is important to inspect panels before sending them out?"
- "Have you ever noticed a defect in a finished product? What was it and how was it handled?"
- "What do you usually do with waste or leftover materials at the end of a task?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate

Break down the core content into easy-to-understand segments:

- **Inspection:** Use tools like calipers and measuring tapes to check for dimensional accuracy. Check visual defects like rough edges, grooves, paint issues, or cracks.
- **Defect Marking:** Use chalk/marker to identify areas needing rework or rejection.
- **Material Storage:** Keep reusable material clean, labeled, and stored properly to avoid wastage.
- **Waste Disposal:** Segregate usable vs. waste material. Use bins or designated bays for offcuts.
- **Cleaning Tools and Machines:** Wipe down with cloths, use brushes for small parts, apply lubricants or cleaning agents where needed.
- **Worksite Cleanliness:** Regularly sweep the area, clean spills, and ensure tools are returned to their designated place.

Activity-1



“Precision Check”

- **Objective:** To measure and verify the dimensions and quality of finished panels using standard measurement tools.
- **Instructions:**
 - ✓ Provide each trainee with 2–3 sample panels (some meeting specs, some not).
 - ✓ Provide measurement tools (calipers, scale, square).
 - ✓ Ask them to record dimensions and check for flatness, straightness, and accuracy against a provided specification sheet.
 - ✓ Mark any panels that don't meet specifications.
- **Resources Needed:**
 - ✓ Sample finished panels
 - ✓ Specification sheet
 - ✓ Vernier calipers, tape measure, try square
 - ✓ Markers, notepad
- **Duration:** 30 minutes
- **Outcome:** Trainees will be able to use tools correctly to verify panel measurements and identify deviations.

Activity-2



“Find the Flaw”

- **Objective:** To identify visible defects in panels through visual inspection and mark them accurately.
- **Instructions:**
 - ✓ Display 4–5 finished panels with different types of defects (cracks, rough edges, paint flaws).
 - ✓ Explain the types of common panel defects.
 - ✓ Ask trainees to inspect each panel carefully and mark defects using colored chalk or marker.
 - ✓ Discuss how these would be documented and addressed in actual operations.
- **Resources Needed:**
 - ✓ Defective sample panels
 - ✓ Chalk/markers for marking
 - ✓ Defect checklist

- **Duration:** 25 minutes
- **Outcome:** Trainees will gain hands-on experience in identifying and marking surface and structural defects in panels.

Activity-3



“Reuse or Refuse”

- **Objective:** To sort post-machining materials into reusable and waste categories and store reusable ones correctly.
- **Instructions:**
 - ✓ Present a mixed pile of machined material—some reusable (good cuts) and some waste.
 - ✓ Guide trainees to evaluate based on size, condition, and usability.
 - ✓ Ask them to sort and then place reusable material in marked bins/shelves.
 - ✓ Explain labelling and safety considerations.
- **Resources Needed:**
 - ✓ Machined material samples
 - ✓ Storage bins/shelves
 - ✓ Labels, markers
- **Duration:** 20 minutes
- **Outcome:** Trainees will be able to identify materials suitable for reuse and understand proper storage techniques.

Activity-4



“Right Place for Waste”

- **Objective:** To correctly identify, segregate, and dispose of waste material from machining.
- **Instructions:**
 - ✓ Provide mixed offcuts and machining debris.
 - ✓ Explain categories of waste and color-coded disposal bins.
 - ✓ Instruct trainees to segregate the material and dispose it in the correct bins or bay.
 - ✓ Review disposal safety precautions.

- **Resources Needed:**
 - ✓ Mixed waste/offcut materials
 - ✓ Color-coded bins or designated disposal bay
 - ✓ Waste disposal SOP chart
- **Duration:** 15 minutes
- **Outcome:** Trainees will understand and apply proper disposal practices in a machining environment.

Activity-5



“Inside Out Clean”

- **Objective:** To clean the internal parts of tools and machines post-machining using correct procedures and cleaning agents.
- **Instructions:**
 - ✓ Assign each trainee a tool or part of a machine.
 - ✓ Provide cleaning cloths, brushes, and safe cleaning agents.
 - ✓ Instruct them to clean internal parts—wiping away oil, dust, or debris.
 - ✓ Demonstrate safety measures and disposal of used cleaning materials.
- **Resources Needed:**
 - ✓ Tools/machines with machining residue
 - ✓ Cleaning agents, cloths, brushes
 - ✓ Gloves, safety gear
- **Duration:** 25 minutes
- **Outcome:** Trainees will learn how to maintain tools and machines internally for performance and safety.

Activity-6



“Spotless Station”

- **Objective:** To implement scheduled cleaning routines at the machine station, ensuring orderliness and hygiene.

- **Instructions:**

- ✓ Assign each group a machine station area.
- ✓ Provide cleaning schedules and SOP for tool/equipment cleaning.
- ✓ Trainees' clean surfaces, floors, and arrange tools as per the checklist.
- ✓ Supervisor does a final inspection and gives feedback.

- **Resources Needed:**

- ✓ Cleaning checklist
- ✓ Cleaning cloths, mop, brushes
- ✓ Organizing racks, tool holders
- ✓ Cleaning SOP

- **Duration:** 20–30 minutes

- **Outcome:** Trainees will follow systematic cleaning routines and understand the value of maintaining a safe and clean workstation.

Do

- Inspect panels using calipers or scales.
- Identify defects and use markers/chalk to label them.
- Store reusable material in racks; label them.
- Dispose of offcuts in waste bins as per color codes.
- Clean machine surfaces and tools with cloths and brushes.
- Ensure workstation is tidy and safe.

Say

- "Quality assurance and cleanliness may feel like extra tasks, but they are critical in ensuring your work is efficient, safe, and professional. A clean worksite and a well-inspected product reflect your skills and discipline as a technician."

Notes for Facilitation



- Emphasize safety while handling tools and waste.
- Allow trainees to work in pairs during inspections for peer learning.
- Give examples of real-life consequences of poor inspection (e.g., product rejection, safety incidents).
- Monitor each step of the activity closely; provide guidance especially on defect identification.
- Ensure cleaning agents are used properly and stored safely after the session.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. **What are the key techniques used to inspect finished panels for measurement, quality, and accuracy?**

Key techniques include using measuring tools like calipers, tape measures, and squares to check dimensions, conducting visual inspections for surface finish, and comparing against specification sheets for quality standards.

2. **Name at least three common defects found in panels and describe how they can be identified.**

- Dents: Detected through visual inspection or by feeling uneven surfaces.
- Paint imperfections: Spotted as bubbles, streaks, or patchy areas in the coating.
- Cracks: Found by close observation or by applying slight pressure to expose hidden breaks.

3. **What are the proper procedures for marking identified defects on panels?**

Defects should be marked clearly using colored chalk, markers, or tags. Each mark should correspond to a defect type as per the inspection checklist, and be recorded in a defect log for further corrective action.

4. **Why is it important to store materials after machining operations for re-use, and what are the key constraints in doing so?**

It reduces material wastage and cost. Constraints include limited storage space, correct labeling, and avoiding damage or contamination of reusable material.

5. **Describe the correct method for collecting and disposing of waste/offcut material in the designated bay.**

Waste/offcuts should be sorted by type (wood, metal, etc.), placed in designated color-coded bins, and transferred to the disposal bay following safety guidelines. Sharp edges should be handled with protective gloves.

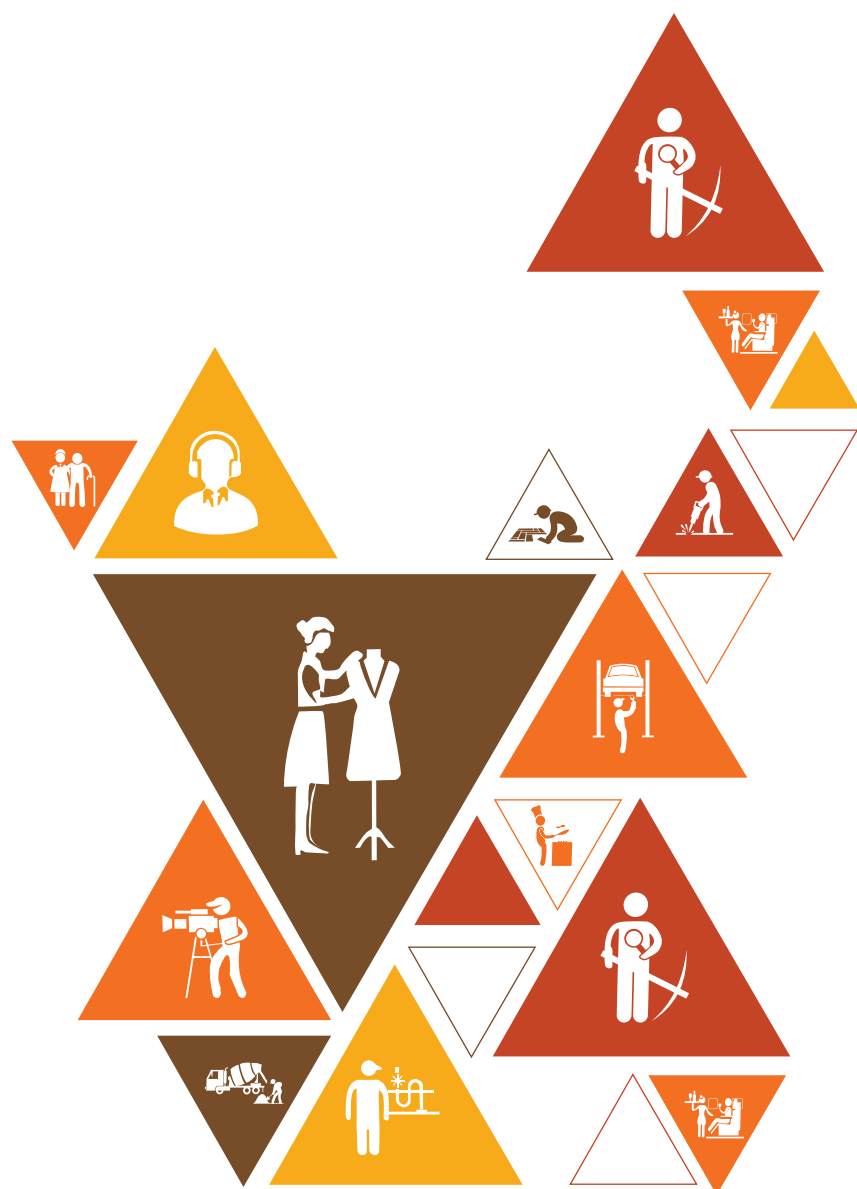
Fill in the Blanks:

1. Finished panels must be inspected for measurement, quality, and accuracy to ensure they meet specifications.
2. Common defects found in panels include cracks, dents, and paint imperfections.
3. Waste and offcut material should be disposed of in the designated bay to maintain a safe and clean work environment.
4. Cleaning tools and machines after machining operations prevent residue buildup and improve performance.
5. Materials that can be re-used should be stored properly to avoid wastage and ensure efficiency.

True/False Questions:

1. **False:** Both visual and tool-based inspections are required for a complete quality check.
2. **True:** These are indeed common defects in finished panels.
3. **False:** Offcuts should be evaluated for reuse before disposal.
4. **False:** Regular cleaning is essential for performance and longevity.
5. **True:** Proper storage reduces material cost and improves workflow efficiency.

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FFS/N8201

Key Learning Outcomes

At the end of this module, you will be able to:

1. Describe how to maintain a healthy, safe, and secure environment at the worksite.
2. Implement safety practices and optimize the use of resources.
3. Demonstrate health and safety procedures.
4. Employ personal hygiene practices at the worksite.
5. Develop the ability to follow hygiene practices.

UNIT 12.1: Worksite Health and Safety Practices

Unit Objectives

At the end of this unit, you will be able to:

1. List the types of cleaning consumables and equipment.
2. Describe the various types of waste bins as per usage.
3. Explain how to label appropriate Personal Protective Equipment (PPE) needed for a job role and application.
4. Describe the evacuation process in case of fire.
5. Explain the importance of work ethics, dress code, and personal hygiene.
6. Explain the operational guidelines for the usage of tools and equipment.
7. Describe the storage and handling procedure for hazardous substances.
8. Describe the importance of safe lifting practices and correct body postures.
9. Document all possible health, safety, and security breaches at the worksite.
10. Demonstrate the housekeeping process using appropriate equipment.
11. Demonstrate the use of personal protective equipment such as goggles, gloves, earplugs, shoes, etc.
12. Demonstrate how to use a first aid kit.
13. Demonstrate the correct way of sanitizing and washing hands.
14. Demonstrate how to maintain a dress code and a well-groomed personality at the worksite.
15. Demonstrate the correct postures while working and handling hazardous materials at the workplace.
16. Identity and interpret the given pictorial representations of safety signs and hand signals.
17. Employ different ways to check if equipment/machines are functioning as per requirements and report malfunctioning.
18. Demarcate the waste based on recyclable and non-recyclable material.
19. Demonstrate the correct techniques while moving various types of products.

Resources to be Used

Theory

- Posters of safety signs and PPE
- Charts showing waste bin color codes
- Handbook on worksite safety and first aid
- Guidelines on ergonomics and lifting techniques
- MSDS (Material Safety Data Sheets)

Practical

- PPE kit (gloves, goggles, helmets, earplugs, masks, safety shoes)
- Waste bins (color-coded)
- Housekeeping tools (mop, broom, dustpan, cleaning liquids)
- First aid kit
- Sanitizer and handwash station

Say

- "Maintaining a safe and clean worksite is everyone's responsibility. Today, we will learn how to protect ourselves, our co-workers, and the work environment by following safety and hygiene practices, using equipment correctly, and responding to emergencies efficiently."

Ask

- "Have you ever seen someone at work get injured due to not following safety rules?"
- "What do you do when you see waste scattered or a slippery floor at your workplace?"
- "Why do you think we should care about our dress code and personal hygiene while working?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate

Break down the core content into easy-to-understand segments:

- **Types of Cleaning Agents and Their Correct Use**

Cleaning agents include disinfectants, floor cleaners, degreasers, glass cleaners, and sanitizers. These are used based on surface types—e.g., acidic cleaners for toilets, mild detergent for equipment, and alcohol-based sanitizers for hands.

- **Waste Bin Color Codes and Usage**

- ✓ Green Bin: For biodegradable waste like food, paper, and organic matter
- ✓ Blue Bin: For recyclable waste like plastic, glass, and metals
- ✓ Red Bin: For hazardous or contaminated waste (especially in industrial settings)
- ✓ Black/Grey Bin: For general non-recyclable waste

Trainees must place waste correctly to ensure proper disposal and prevent contamination.

- **Personal Protective Equipment (PPE)**

Different jobs require specific PPE:

- ✓ Gloves and Goggles: For chemical handling
- ✓ Safety Shoes: In areas with heavy equipment
- ✓ Earplugs: In high-noise zones
- ✓ Masks: While sanding, cutting, or in dusty environments

Proper labeling and selection of PPE ensures maximum safety and prevents misuse.

- **Fire Evacuation Process**

In case of fire:

- ✓ Raise an alarm
- ✓ Switch off power if safe
- ✓ Do not use elevators
- ✓ Follow marked exit routes
- ✓ Assemble at the designated muster point
- ✓ Report to the safety officer

Fire drills help practice these procedures in real time.

- **Importance of Work Ethics, Dress Code, and Personal Hygiene**

Work ethics ensure punctuality, teamwork, and responsibility. A clean uniform, trimmed nails, and daily bathing reflect professionalism and reduce health hazards. Dress code often includes PPE, clean overalls, and name tags.

- **Tool and Equipment Usage Guidelines**

- ✓ Use tools only for their intended purpose
- ✓ Inspect tools before use
- ✓ Disconnect equipment before cleaning or maintenance
- ✓ Report malfunctioning tools immediately
- ✓ Follow manufacturer safety instructions

- **Handling and Storage of Hazardous Substances**

Hazardous materials must be labeled and stored in ventilated, secure areas. Use PPE while handling, and refer to MSDS (Material Safety Data Sheet) for each substance. Never mix unknown chemicals or store near heat.

- **Safe Lifting and Correct Body Posture**

- ✓ Bend knees, not back, while lifting
- ✓ Keep load close to the body
- ✓ Avoid twisting during lifting
- ✓ Use trolleys or ask for help for heavy loads

Good posture avoids long-term injuries and fatigue.

- **Documentation of Safety and Security Breaches**

Record any safety incidents, unsafe practices, or near-misses in a logbook or digital tool. Include time, location, description, and people involved. Reporting helps in prevention and policy improvement.

- **Decoding Safety Signs and Hand Signals**

Examples:

- ✓ Yellow Triangle: Warning (e.g., high voltage)
- ✓ Red Circle with Slash: Prohibited actions (e.g., no smoking)
- ✓ Blue Circle: Mandatory (e.g., wear helmet)

Hand signals are often used near machinery or during lifting, e.g., open palm for stop, pointing for direction.

- **Checking Equipment Functionality**

Before use, check tools for damage, wear, and battery/power supply. Listen for unusual sounds during operation. If anything seems off, report it to the supervisor.

- **Sanitizing and Handwashing**

Steps for proper hand hygiene:

- ✓ Wet hands
- ✓ Apply soap and lather for at least 20 seconds
- ✓ Scrub between fingers and under nails
- ✓ Rinse thoroughly
- ✓ Dry with clean towel or air dryer

Use sanitizer when water isn't available.

Activity-1



Clean Sweep

- **Objective:** To demonstrate the correct housekeeping process using appropriate equipment.
- **Instructions:**
 - ✓ Divide trainees into small groups.
 - ✓ Assign each group a workstation to clean.
 - ✓ Provide cleaning tools and agents.
 - ✓ Instruct them to follow a step-wise cleaning procedure: clear debris, wipe surfaces, sanitize, and organize tools.
- **Resources Needed:** Broom, mop, floor cleaner, disinfectant spray, gloves, dustbins.
- **Duration:** 30 minutes
- **Outcome:** Trainees will understand how to carry out routine cleaning using appropriate materials and maintain a hygienic workstation.

Activity-2



PPE Fit Check

- **Objective:** To familiarize trainees with the correct use and fitting of personal protective equipment.
- **Instructions:**
 - ✓ Show different PPE (goggles, gloves, shoes, earplugs, helmet).
 - ✓ Ask each trainee to wear the PPE correctly and identify its purpose.
 - ✓ Discuss when each is to be used and common mistakes to avoid.
- **Resources Needed:** Full PPE set for demo.
- **Duration:** 20 minutes
- **Outcome:** Trainees will be able to correctly select and wear appropriate PPE for specific tasks.

Activity-3



First Aid Familiarization

- **Objective:** To train trainees on the basic usage of a first aid kit.

- **Instructions:**
 - ✓ Open a first aid kit and explain the items inside.
 - ✓ Demonstrate how to use bandages, antiseptic wipes, and gloves.
 - ✓ Simulate a small cut scenario and have trainees practice basic dressing.
- **Resources Needed:** First aid kit, training dummy or mannequin hand.
- **Duration:** 30 minutes
- **Outcome:** Trainees will confidently respond to minor injuries and know how to use first aid supplies.

Activity-4



Sanitize the Right Way

- **Objective:** To teach correct handwashing and sanitization techniques.
- **Instructions:**
 - ✓ Demonstrate the 7-step handwashing method.
 - ✓ Use hand sanitizer with correct rubbing technique.
 - ✓ Let trainees practice using a handwash station or sanitizer bottle.
- **Resources Needed:** Soap, water, sanitizer, handwashing station or basin.
- **Duration:** 15 minutes
- **Outcome:** Trainees will be able to properly clean their hands, reducing workplace contamination.

Activity-5



Groom and Gear

- **Objective:** To instill the importance of dress code and grooming.
- **Instructions:**
 - ✓ Display examples of appropriate and inappropriate workplace attire.
 - ✓ Roleplay correct grooming standards (clean uniform, trimmed nails, hair tied, no jewelry).
 - ✓ Conduct a “grooming check” for all participants.
- **Resources Needed:** Dress code poster, mirror, grooming checklist.
- **Duration:** 15 minutes
- **Outcome:** Trainees understand and follow dress and hygiene standards.

Activity-6



Posture Perfect

- **Objective:** To demonstrate correct posture and lifting techniques.
- **Instructions:**
 - ✓ Show the right posture for standing, sitting, lifting, and carrying.
 - ✓ Provide dummy boxes and ask trainees to practice lifting and placing.
 - ✓ Give feedback and correct wrong techniques.
- **Resources Needed:** Dummy boxes, posters of correct postures.
- **Duration:** 25 minutes
- **Outcome:** Trainees avoid injuries by using proper body mechanics.

Activity-7



Decode the Signs

- **Objective:** To help trainees identify and interpret safety signs and hand signals.
- **Instructions:**
 - ✓ Display safety signs and ask trainees to name and explain each.
 - ✓ Demonstrate hand signals used for lifting/machine work.
 - ✓ Conduct a matching quiz or flashcard game.
- **Resources Needed:** Safety signs chart, flashcards, hand signal video/demo.
- **Duration:** 20 minutes
- **Outcome:** Trainees will recognize and follow safety instructions through signs and signals.

Activity-8



Function Check

- **Objective:** To teach how to check basic functioning of equipment/machines.
- **Instructions:**
 - ✓ Present a tool/machine.
 - ✓ Explain how to inspect it before use (look for damage, test movement, listen for noise).
 - ✓ Trainees inspect different machines and report findings.

- **Resources Needed:** Tools or small machines (e.g., drilling machine, grinder), checklist sheet.
- **Duration:** 30 minutes
- **Outcome:** Trainees can perform a pre-use inspection and report malfunctions confidently.

Activity-9



Bin it Right

- **Objective:** To demonstrate waste segregation.
- **Instructions:**
 - ✓ Provide sample waste items (paper, plastic, chemical-soiled cloth).
 - ✓ Place color-coded bins and ask trainees to dispose of waste correctly.
 - ✓ Discuss consequences of improper segregation.
- **Resources Needed:** Waste samples, color-coded bins (green, blue, red, black).
- **Duration:** 20 minutes
- **Outcome:** Trainees understand and follow waste segregation protocols.

Activity-10



Move It Safely

- **Objective:** To practice safe movement and lifting of various materials.
- **Instructions:**
 - ✓ Teach different movement techniques (manual, with trolleys).
 - ✓ Trainee's practice lifting and shifting lightweight and bulky items.
 - ✓ Trainer checks posture and grip.
- **Resources Needed:** Lightweight boxes, sacks, trolleys.
- **Duration:** 25 minutes
- **Outcome:** Trainees can handle materials without injury or damage using correct techniques.

Do

- Sort and segregate waste in labelled bins
- Demonstrate proper hand washing techniques using soap and sanitizer
- Practice lifting a box using correct posture
- Wear PPE based on given task scenarios
- Use and explain contents of a first aid kit
- Identify 10 different safety signs and explain their meaning
- Clean a mock workstation using broom/mop/detergent.

Say

- "Excellent work! By following these health and safety practices, you are not only protecting yourself but contributing to a safer and more efficient worksite. These skills are essential in every role you'll perform going forward."

Notes for Facilitation

- Reinforce through real-life examples of safety incidents and their consequences
- Use visual aids and hands-on demonstrations to make learning engaging
- Ensure each trainee participates in at least one demonstration
- Monitor posture and PPE use during practical activities and correct gently
- Emphasize hygiene through role plays or peer-assessment
- Repeat safety sign identification regularly as a fun quiz or flashcard game
- Link this unit with daily practices at the trainee's workplace for better retention

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. List three common cleaning consumables and their specific uses in a workplace.

- Disinfectant Spray: Used to kill germs and bacteria on surfaces.
- Degreaser: Removes oil and grease from machinery and floors.
- Glass Cleaner: Used for cleaning glass surfaces and windows to remove smudges and dust.

2. Describe the different types of waste bins and their appropriate usage.

- Green Bin: For biodegradable or organic waste like food scraps.
- Blue Bin: For recyclable waste like paper, plastic, and cardboard.
- Red/Black Bin: For non-recyclable or hazardous waste such as chemical-soiled items or broken glass.

3. How should Personal Protective Equipment (PPE) be labeled for a specific job role?

PPE should be labeled with the name of the user, job role, and date of issue, and stored in designated PPE lockers or areas. Labels may also include instructions for use and safety compliance codes.

4. Outline the step-by-step evacuation process in case of a fire.

- Raise the alarm immediately.
- Stop work and leave belongings behind.
- Follow illuminated exit signs and use the nearest safe exit.
- Walk, do not run, to the designated assembly point.
- Do not use elevators.
- Wait for further instructions from safety personnel.

5. Why are work ethics, dress codes, and personal hygiene important in a professional setting?

They ensure safety, efficiency, and professionalism at the workplace. Good hygiene reduces health risks, appropriate dress code supports safety and branding, and strong work ethics improve teamwork and productivity.

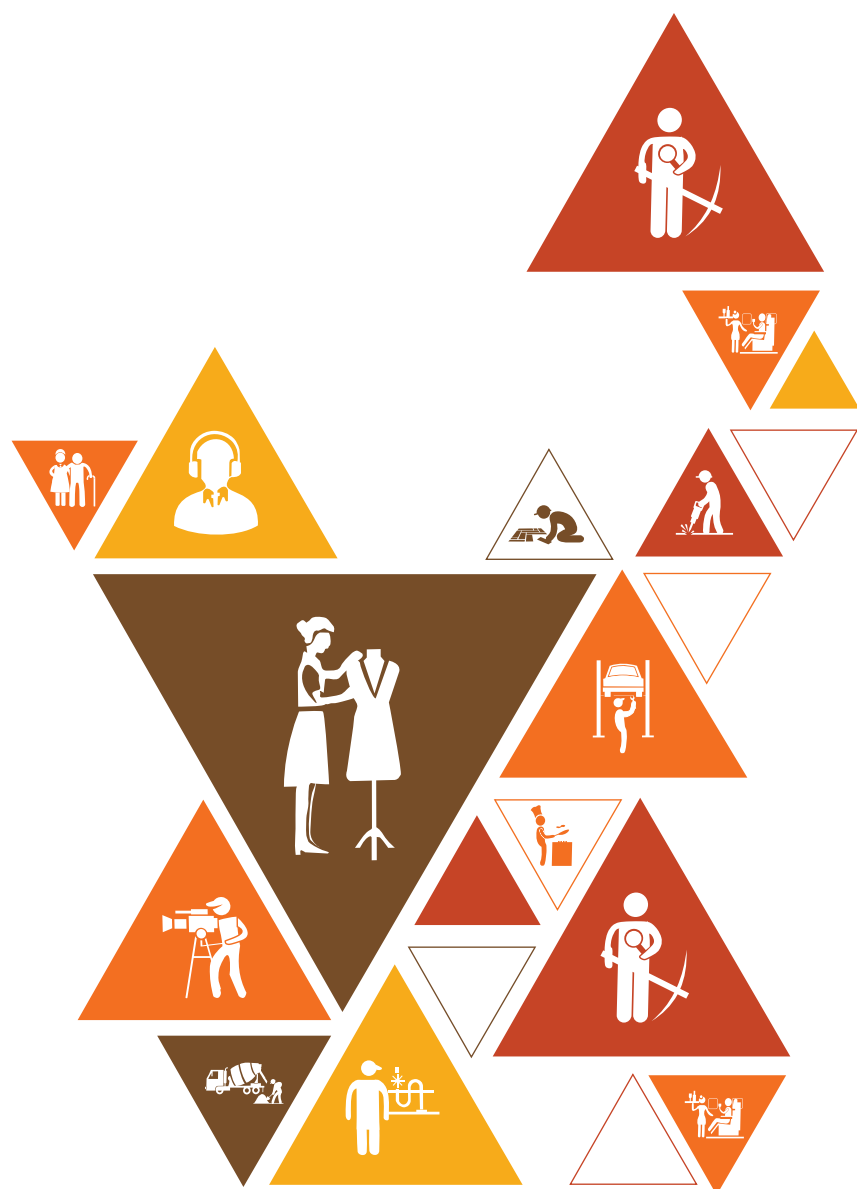
Fill in the Blanks:

1. The three primary types of PPE used in industrial workplaces are gloves, goggles, and safety shoes.
2. The correct way to lift heavy objects is by using your legs instead of your back.
3. Fire evacuation should be conducted by following the **emergency exit plan** and reaching the designated assembly point.
4. Recyclable waste should be disposed of in blue bins, while non-recyclable waste should be disposed of in black/red bins.
5. The best way to prevent workplace injuries is by following safety protocols and using the correct tools/equipment for each task.

True/False Questions:

1. **False:** PPE should be used for all relevant tasks, not just high-risk ones, to ensure consistent safety.
2. **True:** All hazardous materials must be clearly labelled and stored in ventilated, safe environments.
3. **False:** Work ethics apply to all employees, regardless of their position.
4. **False:** Hand sanitization is essential across all industries, especially post-COVID, to prevent infections.
5. **False:** Malfunctioning equipment must always be reported, even if it's still operating, to prevent accidents.

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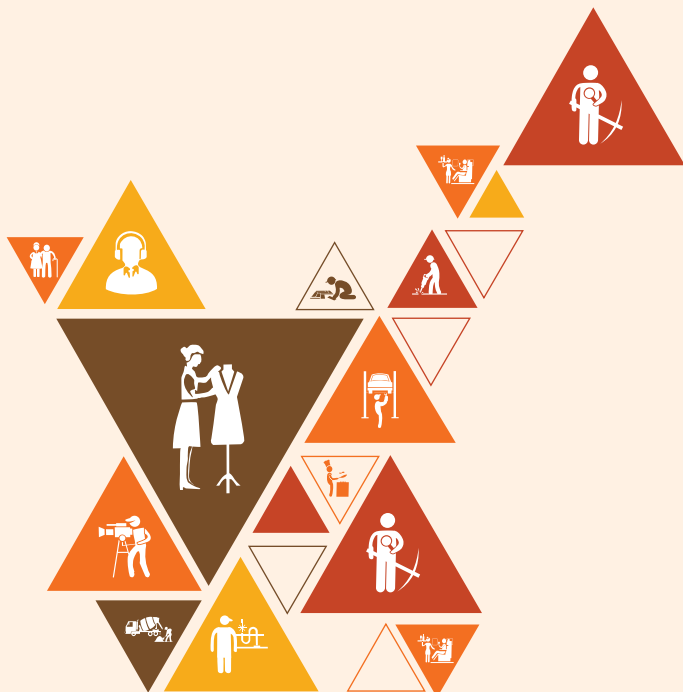




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13. Greening Practices at the Worksite

Unit 13.1 – Worksite Greening Practices



FFS/N8201

Key Learning Outcomes

At the end of this module, you will be able to:

1. Use the resources at the worksite efficiently.
2. Apply conservation practices at the worksite.

UNIT 13.1: Worksite Greening Practices

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the ways for efficient utilization and conservation of material.
2. Explain the various ways of saving energy.
3. Explain the benefits of periodic cleaning of tools and equipment.
4. Demonstrate ways for efficient utilization of material and water.
5. Employ different ways to check if tools and equipment are functioning correctly and report anomalies, if any.

Resources to be Used

Theory

- Posters on energy and material conservation
- Charts of maintenance schedules
- Case studies on green practices in the workplace
- Videos on sustainability practices and waste reduction

Practical

- Measuring jugs or water flow meters
- Checklists for tool functionality and cleaning logs
- Actual tools and equipment for inspection and cleaning
- Signage for energy-saving reminders

Say

- "Green practices are not just about planting trees—they're about making smart decisions every day at the workplace. Whether it's how we use water, conserve materials, or maintain equipment, every action counts toward a more sustainable and efficient worksite."

Ask



- "What are some everyday things you do at home to save water or electricity?"
- "Have you ever reused or repurposed a material during work? What was it?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

- **Efficient Utilization of Materials:** Use only what is needed, measure accurately, reuse where possible, and reduce scrap by precision cutting or planning.
- **Energy Conservation:** Switch off machines and lights when not in use, use energy-efficient equipment, and maintain machinery to avoid energy loss.
- **Periodic Cleaning Benefits:** Clean tools and equipment last longer, function better, and help prevent accidents.
- **Water Efficiency:** Avoid overuse, fix leaks, and use water-efficient tools or techniques during cleaning.
- **Tool and Equipment Checks:** Regularly inspect tools for proper operation, unusual sounds, or wear, and report any issue promptly to avoid breakdowns.

Activity-1



Smart Use, Less Waste

- **Objective:** To help trainees practice methods of minimizing material wastage and conserving water during routine tasks.
- **Instructions:**
 - ✓ Provide trainees with a simple task (e.g., cleaning a surface or assembling a small item).
 - ✓ Give limited quantities of material and a measured amount of water.
 - ✓ Ask them to complete the task with minimum wastage.
 - ✓ Observe their usage pattern and provide feedback.
 - ✓ After the activity, facilitate a discussion on how material and water can be reused or conserved in their real work.
- **Resources Needed:**
 - ✓ Reusable cleaning cloths
 - ✓ Measured containers of water

- ✓ Scrap wood, paper, or basic assembly items (for demonstration)
- ✓ Measuring cups/buckets
- ✓ Observation checklist
- **Duration:** 30 minutes
- **Outcome:** Trainees will learn to plan usage, avoid wastage, and reuse excess material/water wherever possible.

Activity-2



Check Before You Work

- **Objective:** To train trainees to perform basic inspection of tools and equipment and report any defects or anomalies.
- **Instructions:**
 - ✓ Give each trainee a different tool or machine (e.g., screwdriver, drill, cutter).
 - ✓ Ask them to inspect it visually and functionally (check for loose parts, unusual sounds, wear, etc.).
 - ✓ Instruct them to fill out an inspection form noting the condition.
 - ✓ If they find issues, they must demonstrate how to report it correctly to a supervisor or log it in a maintenance register.
- **Resources Needed:**
 - ✓ A set of basic tools and small machines
 - ✓ Tool inspection checklist/reporting format
 - ✓ Red and green stickers for status marking
 - ✓ Maintenance logbook/register
- **Duration:** 30 minutes
- **Outcome:** Trainees will be able to independently check tool condition and follow proper reporting procedures, improving safety and reducing downtime.

Do

- Demonstrate efficient use of material and water while performing tasks.
- Perform cleaning of tools/equipment and explain the benefits of doing so.
- Inspect a tool or machine and report whether it is functioning correctly or not

Say

- "Greening the workplace is a shared responsibility. Every effort—big or small—adds up. Whether you're saving water, avoiding waste, or just reporting a faulty tool, you're contributing to a safer, cleaner, and more sustainable future."

Notes for Facilitation

- Encourage real examples from trainees' past experiences.
- Keep the activity area clean and safe while conducting inspections or cleaning.
- Reinforce the cost-saving and safety benefits of green practices.
- Use visual aids (charts or icons) to make information more accessible.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. **List three ways to efficiently utilize and conserve materials in a workplace.**
 - Reuse leftover or offcut materials.
 - Measure materials accurately before use.
 - Store materials properly to avoid damage or spoilage.
2. **What are some effective strategies for saving energy in industrial operations?**
 - Turn off machines and lights when not in use.
 - Use energy-efficient machinery and lighting.
 - Conduct regular maintenance to ensure optimal machine performance.
3. **How does periodic cleaning of tools and equipment benefit productivity and safety?**
 - It prevents dirt buildup and mechanical failure, ensuring tools work efficiently.
 - It reduces the risk of accidents caused by malfunctioning equipment.
 - It extends the lifespan of the tools, reducing replacement costs.
4. **Describe two methods for reducing material wastage during production.**
 - Train workers to use materials efficiently with minimal scrap.
 - Optimize cutting and production processes through careful planning.
5. **Why is it important to check tools and equipment regularly for proper functioning?**
 - Regular checks help detect wear and tear early.
 - It prevents unexpected breakdowns and ensures safety.
 - It maintains productivity by reducing downtime.

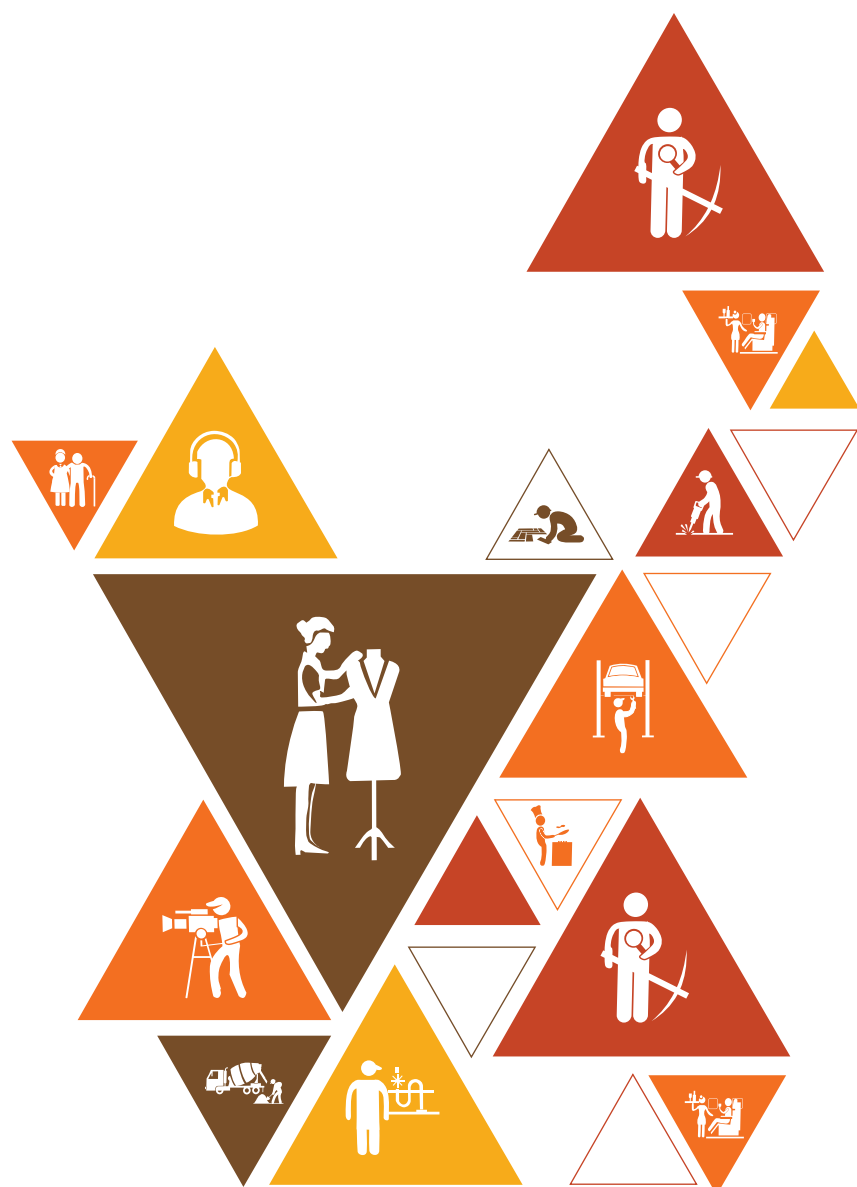
Fill in the Blanks:

1. One way to conserve material is by reusing and recycling unused resources.
2. Turning off machines when not in use helps to save energy.
3. Regular cleaning of tools prevents corrosion and extends their lifespan.
4. Efficient utilization of water can be achieved by using controlled and monitored methods.
5. Proper storage of materials helps in reducing wastage and improving efficiency.

True/False Questions:

1. **False:** Energy conservation is essential in all types of workplaces, regardless of size.
2. **True:** Cleaning tools and equipment regularly can prevent rusting and prolong their lifespan.
3. **True:** Checking equipment regularly can help identify minor issues before they turn into major problems.
4. **False:** Material wastage increases operational costs and reduces overall profitability.
5. **True:** Proper planning of raw material usage can lead to better efficiency and reduced costs.

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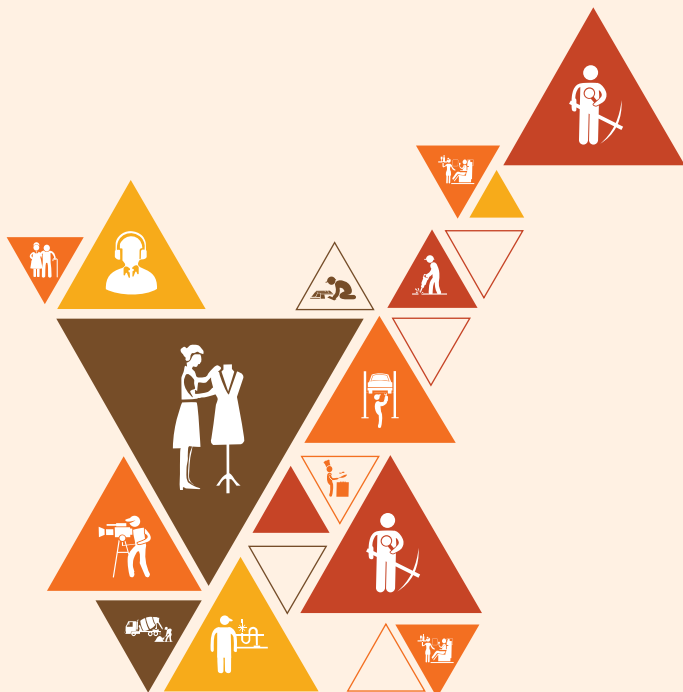
14. Setup and Operate Pasting and Pressing Machines

Unit 14.1 – Setup Worksite for Pasting/Pressing Machine

Unit 14.2 – Pasting Operation

Unit 14.3 – Pressing Operation

Unit 14.4 – Worksite Management and Quality Control for Pasting/Pressing Operation



FFS/N1014

Key Learning Outcomes

At the end of this module, you will be able to:

1. Demonstrate proficiency in ensuring materials and workpieces are prepared appropriately for pasting/pressing machine operation, meeting job specifications and quality standards.
2. List the constraints involved in identifying and selecting appropriate tools, equipment and adhesives or glue for job work.
3. Demonstrate the skills in setting up, configuring, and calibrating pasting/pressing machines for various production requirements.
4. Illustrate the process of applying adhesive or glue accurately and evenly to materials using specialized tools or equipment.
5. List the usage of different types of adhesives and their optimal parameters for pasting requirement.
6. Display skills relating to loading and unloading of the job work into the pasting/pressing equipment.
7. Demonstrate the setting up of pasting/pressing parameters for effective machine operations.
8. Discuss the process of operating and monitoring appropriate pasting/pressing machines in accordance with standard operating procedures and safety guidelines.
9. Demonstrate proficiency in performing routine maintenance tasks on the pasting/pressing machine.
10. Discuss the principles of organization and waste management after pasting/pressing operation.
11. Illustrate the process of conducting quality checks and inspections on the pasted/pressed materials.
12. Ensure proper documentation and traceability of the processes.

UNIT 14.1: Setup Worksite for Pasting/Pressing Machine

Unit Objectives



At the end of this unit, you will be able to:

1. Discuss the process of preparing materials and workpieces to meet job specifications and quality standards for pasting and pressing operations.
2. Discuss the factors to consider when identifying and selecting appropriate adhesives or glue for specific job work, including bonding strength, drying time, and compatibility factors.
3. Explain the steps involved in setting up, configuring, and calibrating pasting/pressing machines for different production requirements.
4. Describe the importance of adjusting machine settings, such as time, temperature, and pressure, to achieve optimal pasting/pressing results.
5. Prepare materials and workpieces appropriately for pasting and pressing operation to meet job specifications and quality standards.
6. Identify and select the appropriate adhesives or glue for the pasting and pressing operations.
7. Set up, configure, and calibrate the pasting/pressing machine for various production requirements.
8. Adjust machine settings, such as time, temperature, and pressure, based on the job work requirements.

Resources to be Used



Theory

- Visual aids/charts showing types of adhesives and their applications
- Technical manuals for pasting/pressing machines
- Job specification sheets
- PPE (for demonstration)

Practical

- Pasting/pressing machine
- Sample workpieces (e.g., wooden panels or laminates)
- A variety of adhesives (PVA, epoxy, hot melt, etc.)
- Cleaning cloths and solvents
- Measuring tools (calipers, rulers)
- Calibration tools
- Safety gear (gloves, goggles, apron)

Say



- "Setting up the pasting or pressing machine properly is key to producing high-quality work. Whether you're bonding wood, laminates, or other surfaces, your preparation—right from choosing the right adhesive to adjusting the machine—can make or break the end result. Today, we'll go through each of these steps practically."

Ask



- "What could go wrong if the wrong glue is used for a specific material?"
- "Why do we need to adjust time and temperature settings on the machine for each job?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

- **Material and Workpiece Preparation:** The surface should be clean, dry, and accurately cut. A rough, dusty, or uneven surface weakens the bond and can lead to rework.
- **Adhesive Selection:** Selection depends on drying time, bonding strength, compatibility with material, and required finish. For example, PVA glue works well for wood but may not hold well under heat.
- **Machine Setup and Calibration:** Before use, inspect and align all moving parts, rollers, and glue trays. A dry test run helps ensure correct positioning. Calibration tools help set parameters like pressure, glue spread, and temperature.
- **Adjusting Settings:** Based on the adhesive and the material being processed, the time, temperature, and pressure must be fine-tuned. Each material and glue combination has an optimum set of settings.

Activity-1



Material and Surface Preparation

- **Objective:** To prepare workpieces for smooth and effective adhesion.
- **Instructions:** Each trainee will select a panel or sample workpiece and inspect it for any dust, oil, or rough patches. Using sandpaper or a clean cloth, they must clean and smoothen the surface so it's suitable for adhesive application. They will then align the piece for the next step in the operation.
- **Resources Needed:** Sample panels, cloth, sandpaper.
- **Duration:** 20 minutes
- **Outcome:** Trainees prepare clean and properly finished surfaces that meet pasting/pressing requirements.

Activity-2



Selecting Appropriate Adhesives

- **Objective:** To understand how to choose adhesives based on job needs.
- **Instructions:** Trainees will be presented with various adhesives and sample materials. They will read the product labels or adhesive charts and match the correct glue with the corresponding material based on bonding strength, drying time, and temperature resistance.
- **Resources Needed:** Adhesive samples, glue selection chart, sample workpieces.
- **Duration:** 25 minutes
- **Outcome:** Trainees identify suitable adhesives based on material compatibility.

Activity-3



Machine Setup and Calibration

- **Objective:** To perform machine setup and initial calibration for use.
- **Instructions:** Under supervision, each trainee will participate in cleaning the pressing machine, checking alignment, and conducting a test run with no glue. They will follow the step-by-step process outlined in the machine manual to configure the roller height, feeder tray, and glue application units.
- **Resources Needed:** Pressing machine, test panels, calibration tools, cleaning cloth.
- **Duration:** 30 minutes
- **Outcome:** Trainees complete initial setup and calibration of the machine accurately.

Activity-4



Adjusting Time, Temperature, and Pressure Settings

- **Objective:** To correctly set parameters for specific material-glue combinations.
- **Instructions:** After calibration, trainees will refer to a given job sheet and determine the recommended time, temperature, and pressure settings. They will then input these settings on the machine and observe the result on a trial piece. Adjustments will be made if needed.
- **Resources Needed:** Machine, job spec sheet, adhesive, workpiece.
- **Duration:** 25 minutes
- **Outcome:** Trainees adjust machine parameters to optimize performance based on job specifications.

Do

- Trainees will rotate through the tasks in pairs or small groups to reinforce their understanding. They will be asked to explain each step while performing it.

Say

- "Getting the basics right—from choosing the glue to setting up the machine—ensures high-quality output and minimizes rework. Your attention to detail during setup saves time and material while improving efficiency."

Notes for Facilitation

- Ensure safety gear is worn throughout.
- Use real job sheets or production specs where possible.
- Encourage questions on glue compatibility.
- Highlight the importance of test runs before actual pasting/pressing.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

UNIT 14.2: Pasting Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss various methods and tools used for applying adhesive or glue accurately and evenly to materials, such as rollers, sprayers, or applicators.
2. Describe the process of proper alignment and positioning of materials in achieving precise and consistent bonding, using guides, jigs, or templates.
3. Explain the factors that contribute to the compatibility and adherence of different material types and sizes in successful pasting operations.
4. Apply adhesive or glue accurately and evenly to the materials using specialized tools or equipment.
5. Check the alignment and positioning of materials using guides, jigs, or templates.
6. Verify the compatibility and adherence of different material types and sizes before pasting, ensuring successful bonding and desired results.

Resources to be Used

Theory

- Diagrams or videos showing different glue application techniques
- Chart explaining adhesive-material compatibility
- Product datasheets for different adhesives and their bonding properties
- Templates or reference manuals for alignment techniques

Practical

- Different adhesives (PVA, hot melt, epoxy, etc.)
- Glue application tools: rollers, brushes, sprayers, glue guns
- Sample materials (wood, laminate sheets, foam board, etc.)
- Guides, jigs, or templates for alignment
- Personal protective equipment (gloves, goggles, apron)
- Pasting workbench or flat working surface

Say



- "Applying glue might seem simple, but doing it correctly ensures a strong, neat bond without wasting materials. Today's session focuses on how to apply adhesives evenly and align materials perfectly using the right tools and techniques."

Ask



- "Have you ever applied glue that either didn't stick properly or spilled out the edges?"
- "Why do you think some materials bond well while others don't?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

- **Adhesive Application Tools:** Different jobs require different glue application tools. Rollers spread glue evenly on flat surfaces, sprayers are ideal for large or delicate areas, while brushes help with small or tricky spots. Proper selection depends on the material and the precision needed.
- **Alignment and Positioning:** Perfect alignment avoids wastage and weak bonding. Guides, jigs, or templates are used to position the material consistently, especially when handling multiple pieces or layers.
- **Material Compatibility:** Each adhesive has a bonding range—it works well with certain surfaces and under specific temperature or moisture conditions. Verifying compatibility ensures lasting adherence.

Activity-1



Adhesive Application Practice

- **Objective:** To apply adhesive uniformly using appropriate tools.
- **Instructions:** Each trainee will select a given adhesive and a sample workpiece. They will use a roller, sprayer, or brush (as applicable) to apply the glue, ensuring a thin, even coat across the surface. The instructor will check for consistency, spillover, or gaps.
- **Resources Needed:** Adhesives, sample surfaces, applicator tools.
- **Duration:** 30 minutes
- **Outcome:** Trainees apply adhesives evenly and correctly using the selected tools.

Activity-2



Material Alignment and Placement

- **Objective:** To position and align materials accurately for clean bonding.
- **Instructions:** After applying glue, trainees will use alignment jigs or templates to place the material correctly. They will ensure all edges are flush and surfaces aligned. The activity encourages handling materials carefully without shifting during bonding.
- **Resources Needed:** Pre-cut panels, guides/templates, workbench.
- **Duration:** 25 minutes
- **Outcome:** Trainees align materials precisely using positioning aids.

Activity-3



Compatibility and Adherence Check

- **Objective:** To assess material and adhesive compatibility.
- **Instructions:** Trainees will be given different material samples and adhesives. They will test small patches and observe how well each combination adheres. The instructor will guide them to identify which adhesives are best suited for which materials and why.
- **Resources Needed:** Multiple adhesives, sample boards, testing sheets.
- **Duration:** 25 minutes
- **Outcome:** Trainees identify suitable adhesive-material pairs and understand bonding strength.

Do



- Trainees will rotate through the three stations (Application, Alignment, Compatibility) in small groups, ensuring hands-on experience with all stages of the pasting operation.

Say



- "A good pasting operation is a mix of the right glue, steady application, and perfect positioning. When done right, it saves time, ensures strength, and reduces material wastage. Keep practicing these steps to master precision in your work."

Notes for Facilitation



- Ensure safety gear is worn throughout.
- Use real job sheets or production specs where possible.
- Encourage questions on glue compatibility.
- Highlight the importance of test runs before actual pasting/pressing.

[illegible]

UNIT 14.3: Pressing Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the technical details of proper loading and unloading of job work into the pasting/pressing equipment.
2. Explain the significance of setting up pasting/pressing parameters, such as pressure, thickness, and duration, to achieve desired results.
3. Describe the standard operating procedures and safety guidelines for operating pasting/pressing machines in a safe and efficient manner.
4. Discuss the importance of monitoring the pasting/pressing operation periodically to evaluate product quality and yield.
5. Perform loading and unloading of the job work into the pasting/pressing equipment, ensuring proper alignment using offcut materials.
6. Set up pasting/pressing parameters, such as pressure, thickness, and duration, to ensure optimal bonding and desired outcomes.
7. Operate appropriate pasting/pressing machines following standard operating procedures and safety guidelines.
8. Monitor the pasting/pressing operation periodically, evaluating product quality and yield to ensure adherence to specifications and desired outcomes.

Resources to be Used

Theory

- SOP manual for pressing machines
- Video demonstration of pressing workflow
- Diagrams explaining pressure, duration, and thickness adjustment
- Chart showing defect types due to incorrect pressing settings
- Handout on safety measures (e.g. dealing with hot surfaces, mechanical hazards)

Practical

- Pasting/pressing machine
- Job work materials and offcuts for alignment
- Measurement gauges (for thickness, alignment)
- PPE (gloves, goggles, apron)
- Timer, temperature controller (if applicable)
- Inspection sheet/checklist for product quality

Say



- "In pressing operations, precision and safety go hand in hand. Even a slight error in pressure or timing can impact the quality of your final product. Today we'll understand how to handle the job work safely, set the right parameters, and monitor output quality."

Ask



- "What could go wrong if materials are not aligned before pressing?"
- "Have you ever noticed marks or poor bonding on pressed products? What do you think caused them?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

- **Loading & Unloading Job Work:** Materials should be aligned accurately using offcuts or spacers to avoid shifting during pressing. Loading must be done steadily to prevent wrinkles or overlaps, and unloading should only be done once the press has cooled or opened completely.
- **Setting Parameters:** The pressing process depends on pressure, duration, and material thickness. Too much pressure or time can damage the workpiece, while too little results in poor bonding. These settings must be based on material type and product design.
- **Machine Operation and Safety:** Machines must be handled with caution—never bypass safety mechanisms. Use proper PPE, keep hands away from pressing surfaces, and always follow the start/stop procedures.
- **Monitoring Process:** Periodically checking output during pressing helps catch errors early. Use visual checks, touch/feel methods, or measurement tools to evaluate bonding strength and quality.

Activity-1



Load and Unload Job Work Using Offcut Materials

- **Objective:** To enable trainees to safely load and unload job work into pasting/pressing equipment with proper alignment using offcuts.
- **Instructions:** Trainees will begin by inspecting the pressing surface for cleanliness and readiness. Under trainer supervision, they will load the job work piece onto the pressing machine, placing offcut strips or markers along the edges to ensure correct alignment. After the pressing cycle is complete, they will carefully unload the item using safe techniques to avoid burns or product damage. Emphasis will be placed on maintaining alignment, preventing creases, and following safe hand positioning while loading and unloading.

- **Resources Needed:**
 - ✓ *Theory:* Visual guide on alignment techniques, handout on safe loading/unloading practices
 - ✓ *Practical:* Pasting/pressing machine, job work samples, offcut materials, gloves, apron
- **Duration:** 30 minutes
- **Outcome:** Trainees will demonstrate safe and aligned loading/unloading using offcuts with minimal errors.

Activity-2



Set Up Pasting/Pressing Parameters

- **Objective:** To allow trainees to configure machine settings such as pressure, thickness, and duration as per job specifications.
- **Instructions:** The trainer will first explain how to read job sheets and interpret technical data related to pressure, thickness, and pressing time. Trainees will then approach the control panel or manual setup area and adjust the machine according to provided specifications. They will be guided to re-check the settings before starting to ensure optimal bonding and avoid material damage. The trainer will test their understanding by assigning varied materials that require different configurations.
- **Resources Needed:**
 - ✓ *Theory:* Sample job sheets with parameter requirements, SOP on machine calibration
 - ✓ *Practical:* Pressing machine with adjustable settings, calibration tools, job work samples
- **Duration:** 25 minutes
- **Outcome:** Trainees set the correct parameters confidently, ensuring consistent and quality bonding.

Activity-3



Operate the Pasting/Pressing Machine Safely

- **Objective:** To train trainees in the proper use of pasting/pressing equipment in adherence to SOPs and safety norms.
- **Instructions:** Trainees will follow a step-by-step checklist to operate the machine: powering it on, loading material, initiating pressing, and powering off. The trainer will observe if safety measures are followed, such as using PPE, keeping clear of moving parts, and managing hot surfaces. Any deviation from the standard procedure will be noted and corrected through a brief feedback session after the operation.

- **Resources Needed:**
 - ✓ *Theory:* SOP document, safety signage, video on safe machine operation
 - ✓ *Practical:* Pasting/pressing machine, PPE (gloves, goggles, apron), power control tools
- **Duration:** 30 minutes
- **Outcome:** Trainees will operate the machine safely and follow the entire SOP accurately.

Activity-4



Monitor Pressing Operation and Evaluate Output

- **Objective:** To develop the skill of periodic monitoring and quality assessment of pressed products.
- **Instructions:** Once the pressing cycle begins, trainees will inspect the output after every few cycles using touch, sight, and measurement tools. They will be taught to look for defects such as misalignment, incomplete bonding, air bubbles, or overheating marks. They will record their findings in a quality control checklist and report any variations. Trainers will guide them on how to trace these defects back to specific machine settings or alignment issues.
- **Resources Needed:**
 - ✓ *Theory:* Defect chart, visual inspection checklist, QC reporting format
 - ✓ *Practical:* Pressed workpieces, calipers/gauges, quality log sheet
- **Duration:** 35 minutes
- **Outcome:** Trainees identify defects, evaluate product quality, and relate issues to machine or process parameters.

Do



- Each trainee will perform the full cycle—from setup to final monitoring—under supervision, ensuring they understand each stage thoroughly.

Say



- "A perfect press is the result of good preparation, correct settings, and careful monitoring. Whether it's alignment or pressure, every detail matters to achieve high-quality results and safe operations."

Notes for Facilitation



- Demonstrate loading and unloading techniques using offcut materials for proper alignment before trainees practice—highlight the importance of accuracy to avoid bonding errors.
- Explain and model the setting of parameters (pressure, thickness, duration) with clear examples, and link each setting to its impact on product quality.
- Emphasize safety procedures while operating machines—conduct a pre-operation safety checklist and stress the importance of using PPE and being alert around moving parts.
- Guide trainees on periodic monitoring during pressing operations—teach them how to identify early signs of misalignment, under-pressing, or overheating.
- Use defective and quality output samples to help trainees visually evaluate product standards—encourage reporting of anomalies without hesitation to build responsibility.

[illegible]

UNIT 14.4: Worksite Management and Quality Control for Pasting /Pressing Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the key constraints involved in routine maintenance tasks for pasting and pressing machines, such as cleaning, lubricating, and replacing worn parts.
2. Describe the techniques and constraints involved in workspace management, including arranging and disposing of materials after the machining operation.
3. Explain the key constraints and criteria involved in performing quality checks and inspections on pasted/pressed materials.
4. Discuss how to properly document production specs, quality control inspections, and adjustments.
5. Perform routine maintenance tasks on the pasting and pressing machine, including cleaning, lubricating, and replacing worn parts.
6. Ensure the proper management of the workspace by arranging materials in an organized manner and disposing of waste materials.
7. Perform quality checks and inspections on pasted/pressed materials, using the appropriate techniques and evaluation criteria.
8. Accurately record and maintain manufacturing specifications, quality control inspections, and modifications in the appropriate documentation.

Resources to be Used

Theory

- Presentation Slides explaining routine maintenance, workspace management, and quality checks
- Standard Operating Procedure (SOP) documents for pressing/pasting machines
- Guidelines for quality control inspections
- Visual aids (diagrams of machine parts, workspace layout)
- Industry case studies or examples
- Checklists for quality control and documentation

Practical

- Pasting/Pressing machines (or models, if unavailable)
- Cleaning materials (cloth, brushes, lubricants)
- Lubrication tools and parts for machine maintenance

- Measuring instruments (calipers, gauges)
- Sample pasted/pressed materials for quality check
- Waste bins and proper disposal systems
- Workstations for arranging materials after production

Say



- “Welcome to today’s session on Worksite Management and Quality Control for Pasting/Pressing Operation. This unit will cover how to properly maintain pasting and pressing machines, manage your workspace effectively, conduct quality checks, and keep accurate records. Ensuring that these processes are carried out correctly is key to improving production efficiency and product quality.”

Ask



- “What do you think could happen if the pressing/pasting machine is not maintained regularly?”
- “Why do you think it is important to arrange materials properly after production?”
- “Can anyone give examples of issues that might arise due to poor quality control in production?”

Please feel free to share your experiences with the group. I’ll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

- “Let’s first look at routine maintenance tasks. Routine maintenance such as cleaning, lubricating, and replacing worn parts are essential in ensuring that machines perform optimally. If any part is left unchecked, it can affect the quality of the finished product. Proper maintenance will also reduce the likelihood of breakdowns and extend the machine’s lifespan.”
- “Next, we’ll explore workspace management. After pressing or pasting, it’s essential to arrange materials efficiently and dispose of waste correctly to avoid any accidents and keep the area organized.”
- “Finally, quality control checks are necessary to ensure that the final product meets the specifications. This includes measuring dimensions, checking bonding strength, and evaluating material compatibility.”

Activity-1



Routine Maintenance Tasks on the Pasting and Pressing Machine

- **Objective:**
 - ✓ To perform routine maintenance tasks, including cleaning, lubricating, and replacing worn parts on the pasting/pressing machine.
- **Instructions:**
 - ✓ Split trainees into small groups.
 - ✓ Provide each group with a pasting/pressing machine (or a model).
 - ✓ Instruct them to clean the machine thoroughly using appropriate tools.
 - ✓ Guide them to lubricate the necessary parts of the machine.
 - ✓ Ask them to identify any worn parts and replace them if possible.
 - ✓ Discuss the importance of regular maintenance for machine longevity and product quality.
- **Resources Needed:**
 - ✓ Pasting/pressing machine (or a model)
 - ✓ Cleaning materials (cloth, brushes)
 - ✓ Lubricants (oil, grease)
 - ✓ Spare parts for replacement (if necessary)
 - ✓ Maintenance checklist
- **Duration:** 30 minutes
- **Outcome:**
 - ✓ Trainees will be able to perform routine maintenance tasks on a pasting/pressing machine, ensuring the machine operates at peak efficiency and is well-maintained.

Activity-2



Workspace Management and Waste Disposal

- **Objective:**
 - ✓ To ensure proper management of the workspace by arranging materials in an organized manner and disposing of waste materials correctly.

- **Instructions:**

- ✓ Set up a simulated work area with scattered materials and waste.
- ✓ Instruct trainees to organize materials based on type, size, and usage.
- ✓ Show them how to safely dispose of waste materials, including adhesives, packaging, and other scrap materials.
- ✓ Discuss the importance of maintaining a clean and organized workspace for safety and efficiency.
- ✓ Have trainees organize the work area and dispose of waste materials as per the guidelines.

- **Resources Needed:**

- ✓ Work materials (paper, adhesives, components)
- ✓ Waste disposal bins
- ✓ Workbenches or tables for organizing
- ✓ Labels for proper categorization
- ✓ Safety gloves (for waste handling)

- **Duration:** 20 minutes

- **Outcome:**

- ✓ Trainees will be able to efficiently organize their workspace, ensuring that materials are well-arranged and waste is disposed of safely, contributing to a clean and safe work environment.

Activity-3



Quality Checks and Inspections on Pasted/Pressed Materials

- **Objective:**

- ✓ To perform quality checks and inspections on pasted/pressed materials using appropriate techniques and evaluation criteria.

- **Instructions:**

- ✓ Provide trainees with a set of pasted/pressed materials that vary in quality.
- ✓ Ask trainees to inspect the materials based on specified criteria, such as dimensions, bonding strength, and finish.
- ✓ Demonstrate how to use measuring instruments (calipers, gauges) to check dimensions.
- ✓ Have trainees record their findings and compare the materials to the required quality standards.
- ✓ Discuss common issues in pasted/pressed materials and how to resolve them.

- **Resources Needed:**
 - ✓ Sample pasted/pressed materials (with various quality levels)
 - ✓ Measuring instruments (calipers, gauges)
 - ✓ Quality control checklist
 - ✓ Documentation forms for recording results
- **Duration:** 25 minutes
- **Outcome:**
 - ✓ Trainees will be able to conduct thorough quality checks on pasted/pressed materials, identifying any defects and ensuring that the materials meet the required standards.

Activity-4



Documentation of Manufacturing Specifications and Quality Control Inspections

- **Objective:**
 - ✓ To accurately record and maintain manufacturing specifications, quality control inspections, and modifications in the appropriate documentation.
- **Instructions:**
 - ✓ Provide trainees with sample production and quality control forms.
 - ✓ Explain the importance of accurate record-keeping and its impact on the production process.
 - ✓ Ask trainees to fill out the documentation based on a simulated production run, including details of the specifications, quality checks, and any adjustments made.
 - ✓ Emphasize how proper documentation can help track progress and ensure compliance with quality standards.
 - ✓ Review and provide feedback on the completed forms.
- **Resources Needed:**
 - ✓ Sample documentation forms (production, quality control)
 - ✓ Completed examples of filled-out forms
 - ✓ Pens, markers, or digital devices for recording (if applicable)
- **Duration:** 15 minutes
- **Outcome:**
 - ✓ Trainees will be able to accurately document manufacturing specifications, quality control inspections, and any modifications, ensuring proper records are maintained for future reference.

- **Resources Needed:**
 - ✓ *Theory:* SOP document, safety signage, video on safe machine operation
 - ✓ *Practical:* Pasting/pressing machine, PPE (gloves, goggles, apron), power control tools
- **Duration:** 30 minutes
- **Outcome:** Trainees will operate the machine safely and follow the entire SOP accurately.

Activity-4



Monitor Pressing Operation and Evaluate Output

- **Objective:** To develop the skill of periodic monitoring and quality assessment of pressed products.
- **Instructions:** Once the pressing cycle begins, trainees will inspect the output after every few cycles using touch, sight, and measurement tools. They will be taught to look for defects such as misalignment, incomplete bonding, air bubbles, or overheating marks. They will record their findings in a quality control checklist and report any variations. Trainers will guide them on how to trace these defects back to specific machine settings or alignment issues.
- **Resources Needed:**
 - ✓ *Theory:* Defect chart, visual inspection checklist, QC reporting format
 - ✓ *Practical:* Pressed workpieces, calipers/gauges, quality log sheet
- **Duration:** 35 minutes
- **Outcome:** Trainees identify defects, evaluate product quality, and relate issues to machine or process parameters.

Do



Trainer Demonstration:

- **Routine Maintenance:** Demonstrate how to clean the pressing/pasting machine, lubricate it, and replace worn parts. Highlight common issues that can occur due to lack of maintenance.
- **Quality Control Check:** Show how to measure dimensions and test bonding strength of pasted/pressed materials. Discuss common errors to look for and how to correct them.
- **Workspace Management:** Demonstrate how to properly arrange materials and dispose of waste.

Trainer Notes:

- Use clear, step-by-step demonstrations and ensure that trainees understand the tools and procedures.
- Highlight safety protocols during each demonstration.

Say



- “Now that we’ve practiced the routine maintenance tasks, quality checks, and workspace management, it’s important to note that each of these practices plays a vital role in ensuring that we maintain high standards of productivity and quality. Regular maintenance and careful workspace management ensure not only the longevity of the machines but also the safety and efficiency of the workplace.”

Notes for Facilitation



- **Time Management:** Ensure each activity is time-bound to avoid over-running. Adjust the activities based on the number of trainees and the complexity of the tasks.
- **Engagement:** Encourage trainees to ask questions and share their experiences throughout the session. Use case studies or real-world examples to reinforce learning.
- **Safety Protocols:** Always emphasize the importance of safety when demonstrating machine operations and maintenance tasks.
- **Check Understanding:** Ask questions during the activities to assess understanding and correct any misconceptions immediately.
- **Feedback:** After activities, ask trainees to reflect on what they learned and how they can apply these practices in their work environments.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. What are the key steps in preparing materials for pasting/pressing machine operations?

The key steps include cleaning and inspecting the materials, ensuring proper alignment and positioning, selecting the correct adhesive, and setting up the pasting/pressing machine with appropriate parameters like pressure, temperature, and duration.

2. List three constraints in selecting appropriate tools, equipment, and adhesives for job work.

The constraints include:

- Compatibility with the material being processed.
- Adhesive strength and drying time.
- Availability and suitability of tools and equipment for the specific job.

3. Explain the process of setting up and calibrating a pasting/pressing machine.

The process includes checking machine settings such as pressure, temperature, and duration. It involves adjusting these parameters according to the material and adhesive specifications. Calibration ensures that the machine operates within the required standards for consistent results.

4. What are the standard safety guidelines for operating a pasting/pressing machine?

Safety guidelines include wearing appropriate personal protective equipment (PPE), ensuring machine guards are in place, performing regular maintenance checks, following proper operating procedures, and handling adhesives and chemicals safely.

5. Why is proper documentation and traceability important in the pasting/pressing process?

Proper documentation ensures that each step of the process is recorded for quality control, traceability, and compliance. It helps to track any changes in specifications, quality checks, and adjustments, providing accountability and ensuring the final product meets standards.

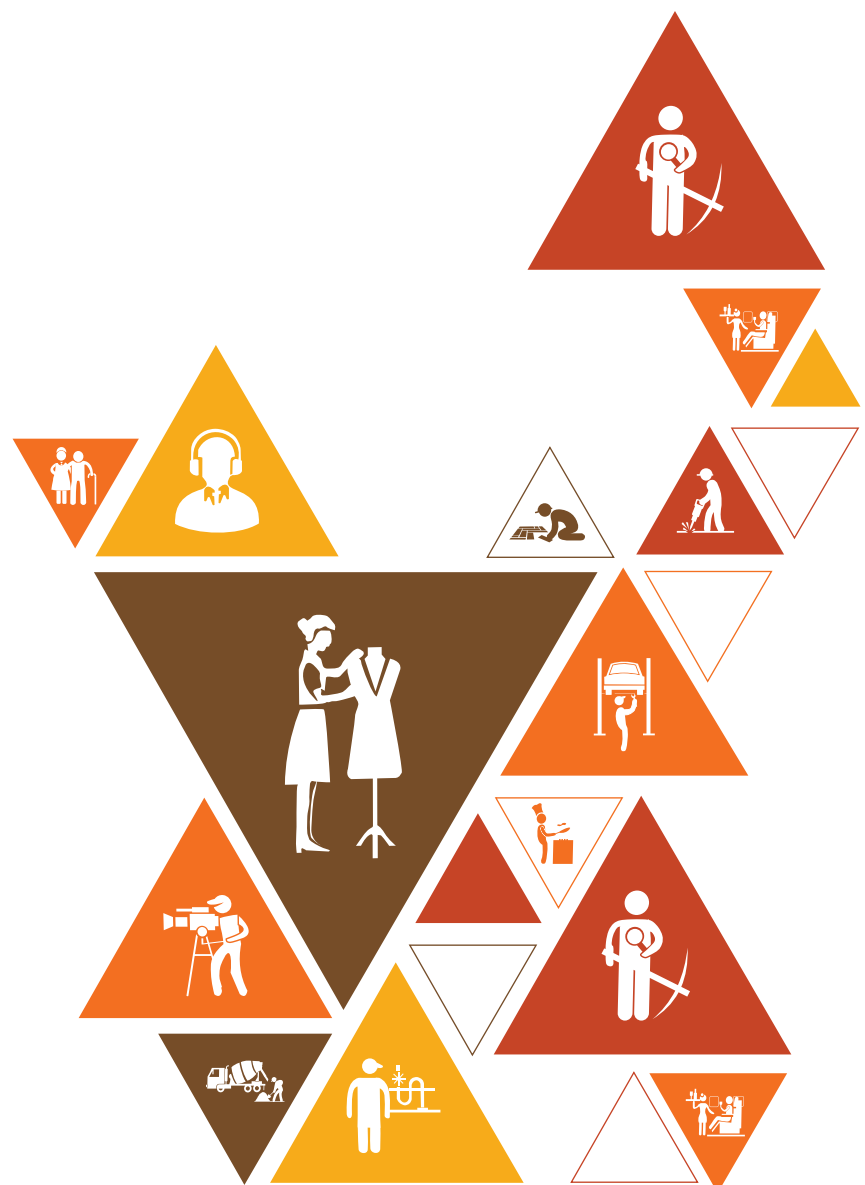
Fill in the Blanks:

1. Before operating a pasting/pressing machine, materials must be cleaned and aligned to meet job specifications.
2. The three main factors in selecting adhesives are bonding strength, drying time, and compatibility.
3. Machine calibration ensures accuracy and consistency in the pasting process.
4. The ideal temperature for adhesive application depends on adhesive type and material characteristics.
5. Quality inspection includes checking for adhesion, alignment, and defects.

True/False Questions:

1. **False:** Regular calibration is essential to ensure accurate results and consistent quality.
2. **False:** The properties of the material, such as its texture and absorbency, must be considered when selecting and applying adhesives.
3. **False:** Different adhesives have varying drying times and temperature requirements based on their composition and intended use.
4. **True:** Proper waste management ensures safety and environmental compliance, including the disposal of unused adhesives and cleaning materials.
5. **True:** Regular maintenance helps avoid machine breakdowns and ensures continuous, high-quality production.

[illegible]



FFS/N1015

Key Learning Outcomes

At the end of this module, you will be able to:

1. Demonstrate proficiency in ensuring materials and workpieces are prepared appropriately for cutting/sizing machine operation, meeting job specifications and quality standards.
2. List the constraints involved in identifying and selecting appropriate tools, and equipment for job work.
3. Demonstrate the skills in setting up, configuring, and calibrating cutting/sizing machines for various production requirements.

UNIT 15.1: Setup Worksite for Cutting/Sizing Machine

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the process of preparing materials and workpieces to meet job specifications and quality standards for cutting and sizing operations.
2. Describe the factors to consider when selecting and installing cutting blades or tools based on material type, thickness, and desired cutting outcome.
3. Explain the steps involved in setting up, configuring, and calibrating cutting/sizing machines for different production requirements.
4. Prepare materials and workpieces appropriately for cutting and sizing operations.
5. Select and install appropriate cutting blades or tools based on the material type, thickness, and desired cutting outcome.
6. Set up, configure, and calibrate cutting/sizing machines for various production requirements.

Resources to be Used

Theory

- Whiteboard and markers
- Job specification sheets
- Visual aids or charts showing different types of blades/tools
- Instruction manual or SOP for cutting/sizing machines

Practical:

- Cutting/sizing machine
- Assorted materials and workpieces (plywood, MDF, plastic sheets, etc.)
- Various blades/tools for cutting
- Measuring instruments (scale, calipers, etc.)
- Safety gear (gloves, goggles, etc.)

Say



- "Today's session focuses on how to set up a worksite for cutting and sizing operations. Whether you're working with wood, metal, or plastic, precision and safety start with correct setup. Let's understand how to prepare the materials, choose the right tools, and configure the machines for a smooth and accurate production process."

Ask



- "Have you ever used a cutting machine before? What kind of material did you cut?"
- "What do you think can go wrong if the wrong blade is installed or the machine is not calibrated?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

- **Material Preparation:** Clean, inspect, and mark materials as per job specifications. Understand grain direction, warping, or other defects.
- **Blade/Tool Selection:** Choose blades based on material hardness, thickness, desired edge finish, and cutting speed.
- **Machine Setup:** Understand the components of the machine. Configure parameters such as speed, blade depth, and alignment. Perform test runs.
- **Calibration:** Regular calibration ensures precision and prevents wastage. Use measuring tools to ensure cutting dimensions meet the required tolerance.

Activity-1



Select and Install Appropriate Cutting Blades or Tools

- **Objective:** To help trainees select the right blade/tool and install it properly based on material type and thickness.
- **Instructions:**
 - ✓ Show different sample materials (e.g., plywood, MDF, plastic sheets).
 - ✓ Ask trainees to identify suitable cutting blades based on material type and desired cut (smooth, rough, fine).
 - ✓ Demonstrate safe blade removal and installation using proper tools.
 - ✓ Trainee's practice installing the selected blade and check alignment and tightness.

- **Resources Needed:**
 - ✓ Sample materials
 - ✓ Blade/tool types with specifications
 - ✓ Cutting machine
 - ✓ Safety gloves, goggles
 - ✓ Wrenches, blade locking tools
- **Duration:** 30 minutes
- **Outcome:** Trainees will confidently select and safely install the correct blade/tool for the given material.

Activity-2



Set Up, Configure, and Calibrate Cutting/Sizing Machine

- **Objective:** To train trainees in setting up and calibrating the cutting machine for accuracy and safety.
- **Instructions:**
 - ✓ Provide a job specification sheet.
 - ✓ Guide trainees to set machine parameters – blade height, feed speed, and guides.
 - ✓ Perform a test cut and measure output accuracy using calipers/rulers.
 - ✓ Adjust settings if required and repeat test for final validation.
- **Resources Needed:**
 - ✓ Cutting/sizing machine
 - ✓ Sample workpieces
 - ✓ Job spec sheet
 - ✓ Measuring tools (ruler, caliper)
 - ✓ Safety gear
- **Duration:** 40 minutes
- **Outcome:** Trainees will be able to configure the machine correctly and make accurate cuts as per job specs.

Do

- Trainees will rotate through the tasks in pairs or small groups to reinforce their understanding. They will be asked to explain each step while performing it.

Say

- "Getting the basics right—from choosing the glue to setting up the machine—ensures high-quality output and minimizes rework. Your attention to detail during setup saves time and material while improving efficiency."

Notes for Facilitation

- Ensure safety gear is worn throughout.
- Use real job sheets or production specs where possible.
- Encourage questions on glue compatibility.
- Highlight the importance of test runs before actual pasting/pressing.

[illegible]

UNIT 15.2: Cutting/Sizing Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the steps involved in loading and unloading job work into the cutting/sizing equipment, ensuring proper alignment using offcut materials.
2. Describe the methods for positioning and securing panel materials on the machine for precise cutting/sizing.
3. Explain the importance of accurately setting up cutting/sizing parameters, such as speed, depth, or angle, for efficient and precise cutting/sizing results.
4. Describe the methods for accurately measuring and marking materials based on project specifications and cutting requirements.
5. Explain the importance of following standard operating procedures and safety guidelines when operating cutting/sizing machines.
6. Describe the advanced techniques and jigs used to achieve intricate cuts, angles, or patterns as required by project specifications.
7. Explain the importance of monitoring the cutting/sizing operation periodically to evaluate product quality and yield.
8. Load and unload the job work into the cutting/sizing equipment using offcut materials for accurate and efficient cutting operations.
9. Position and secure panel materials on the machine to facilitate accurate cutting/sizing operations.
10. Set up cutting/sizing parameters accurately, including speed, depth, or angle, to achieve efficient and precise cutting/sizing operations.
11. Measure and mark the materials accurately based on project specifications and cutting requirements.
12. Operate cutting/sizing machines in accordance with standard operating procedures and safety guidelines.
13. Apply advanced techniques and utilize jigs to achieve intricate cuts, angles, or patterns as required by the project specifications.
14. Monitor the cutting/sizing operation periodically to evaluate product quality and yield, making necessary adjustments to ensure desired outcomes.

Resources to be Used

Theory

- Whiteboard/marker
- Visual aids (charts of machine parts, safety signs)

- Samples of project specs and measurement drawings
- SOP and safety guidelines

Practical

- Cutting/sizing machine
- Variety of panels/materials for cutting
- Measuring tools (tape, scale, square)
- Offcut materials for alignment
- Jigs/templates
- PPE (gloves, goggles, earplugs)

Say



- “In this session, we will understand and perform the actual cutting/sizing operation. You’ll learn to set up your materials, position them properly, and follow safety steps to get accurate and clean cuts.”

Ask



- “Have you seen or used a cutting machine before? What kind of materials were being cut?”
- “Why do you think measuring and marking materials before cutting is important?”

Please feel free to share your experiences with the group. I’ll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

- **Loading/Unloading:** Emphasize using offcut materials for alignment and safe loading techniques.
- **Parameter Setup:** Discuss adjusting speed, depth, and angle depending on material and cut.
- **Measuring and Marking:** Explain how precision impacts final product quality.
- **Advanced Cutting:** Introduce use of jigs and templates for patterns and angled cuts.
- **Monitoring and Adjusting:** Stress the need to regularly check cut quality and recalibrate if needed.

Activity-1



Load, Position & Cut

- **Name:** Loading and Cutting with Correct Parameters
- **Objective:** To load material properly, set parameters, and perform safe cutting.
- **Instructions:**
 - ✓ Load the panel using offcuts for alignment.
 - ✓ Set machine parameters (speed, depth).
 - ✓ Secure the material using clamps.
 - ✓ Perform cutting and unload the panel.
- **Resources Needed:** Cutting machine, panels, PPE
- **Duration:** 45 mins
- **Outcome:** Trainees can cut panels safely and accurately using proper machine settings.

Activity-2



Advanced Cutting with Jigs

- **Name:** Complex Cuts Using Templates
- **Objective:** To perform intricate cuts or angles using jigs.
- **Instructions:**
 - ✓ Introduce jigs/templates and when to use them.
 - ✓ Show how to fix a jig and align the material.
 - ✓ Guide trainees to perform advanced cuts.
- **Resources Needed:** Jigs, templates, panels, cutting machine
- **Duration:** 30 mins
- **Outcome:** Trainees complete a shaped or angled cut using a jig with accuracy.

Do



- Trainees will rotate through the tasks in pairs or small groups to reinforce their understanding. They will be asked to explain each step while performing it.

Say

- "Now that you've completed both straight and complex cutting, you understand how critical setup, precision, and safety are in these operations. These skills will help you deliver high-quality outcomes in real work environments."

Notes for Facilitation

- Begin with a machine demo; emphasize safe zones and danger areas.
- Allow trainees to observe before hands-on work.
- Correct trainees gently if they skip measuring or secure materials improperly.
- Use real production tasks for advanced cutting practice to boost confidence.
- Discuss common errors like incorrect depth or misalignment and how to avoid them.

[illegible]

UNIT 15.3: Worksite Management and Quality Control for Cutting/Sizing Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the key constraints involved in routine maintenance tasks for cutting and sizing machines, such as cleaning, lubricating, and replacing worn parts.
2. Describe the techniques and constraints involved in workspace management, including arranging and disposing of materials after the machining operation.
3. Explain the key constraints and criteria involved in performing quality checks and inspections on cut/sized materials.
4. Discuss how to properly document production specs, quality control inspections, and adjustments.
5. Perform routine maintenance tasks on the cutting and sizing machine, including cleaning, lubricating, and replacing worn parts.
6. Ensure the proper management of the workspace by arranging materials in an organized manner and disposing of waste materials.
7. Perform quality checks and inspections on cut/sized materials, using the appropriate techniques and evaluation criteria.
8. Accurately record and maintain manufacturing specifications, quality control inspections, and modifications in the appropriate documentation.

Resources to be Used

Theory

- SOP manuals for maintenance
- Visual aids on workspace layouts
- Checklists for inspection and documentation
- Whiteboard and markers

Practical

- Cutting/sizing machine
- Lubricants, cleaning cloths, maintenance tools
- Waste bins, storage racks
- Sample job sheets and QC forms
- Cut/sized material samples for inspection
- PPE (gloves, masks, safety glasses)

Say



- “After operating cutting/sizing machines, managing the workspace and maintaining quality is just as important. Today, we’ll learn how to maintain machines, inspect outputs, and keep your worksite clean and organized.”

Ask



- “What problems do you think can happen if a machine is not cleaned regularly?”
- “Why do you think it's necessary to record quality checks in writing?”

Please feel free to share your experiences with the group. I’ll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

- **Maintenance:** Talk about how dust, worn parts, or dry mechanisms can affect performance.
- **Workspace Management:** Emphasize arranging materials, storing tools, and disposing of scraps to prevent accidents and improve efficiency.
- **Quality Checks:** Explain common defects (rough edges, wrong measurements, burrs) and inspection tools like calipers and squares.
- **Documentation:** Show how to fill out job sheets, record rework, and track process changes.

Activity-1



Machine Maintenance

- **Name:** Clean and Maintain the Machine
- **Objective:** To perform routine maintenance tasks to ensure machine longevity and accuracy.
- **Instructions:**
 - ✓ Switch off and unplug the machine.
 - ✓ Wipe down surfaces, remove dust from internal parts.
 - ✓ Lubricate necessary points as per SOP.
 - ✓ Check for worn-out parts and replace if required.
- **Resources Needed:** Cutting machine, cloths, lubricant, SOP guide
- **Duration:** 30 mins
- **Outcome:** Trainees perform safe and correct maintenance on the machine.

Activity-2



Workspace Organization and Disposal

- **Name:** Organize and Dispose
- **Objective:** To manage workspace layout and ensure proper waste disposal.
- **Instructions:**
 - ✓ Segregate usable offcuts and waste.
 - ✓ Arrange tools/materials in designated areas.
 - ✓ Dispose of waste as per instructions.
- **Resources Needed:** Material trays, storage bins, waste disposal instructions
- **Duration:** 20 mins
- **Outcome:** Trainees demonstrate safe and efficient worksite management.

Activity-3



Inspect and Document

- **Name:** Quality Check and Record
- **Objective:** To perform quality checks and maintain inspection documentation.
- **Instructions:**
 - ✓ Use measuring tools to check cut/sized samples.
 - ✓ Identify defects or deviations.
 - ✓ Fill out inspection forms and note any corrections made.
- **Resources Needed:** Measuring tools, sample pieces, QC checklist, job sheets
- **Duration:** 40 mins
- **Outcome:** Trainees can inspect material and complete QC records accurately.

Say



- “Maintaining your machine, managing your space, and checking your work are all essential for quality output. The better your worksite habits, the better your results.”

Notes for Facilitation



- Emphasize safety before starting any maintenance.
- Demonstrate documentation formats before letting trainee's attempt.
- Encourage teamwork during workspace management activity.
- Give constructive feedback during inspections – accuracy matters.
- Link back to earlier units to show how quality control builds on cutting operations.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. **What are the key factors to consider while selecting tools and equipment for cutting/sizing operations?**

Material type and thickness, required precision, type of cut (straight, angled, curved), production volume, and compatibility with the cutting machine.

2. **Why is calibration important in a cutting/sizing machine?**

Calibration ensures that the machine delivers accurate and consistent cuts, reduces material wastage, and maintains product quality.

3. **What are the common safety precautions to be followed while operating a cutting machine?**

Wear PPE like gloves and safety goggles, keep hands away from moving parts, use machine guards, follow SOPs, and ensure the emergency stop is accessible.

4. **How can quality be ensured after the cutting/sizing process?**

By measuring and inspecting cut pieces for accuracy, checking for defects (like burrs or uneven edges), and verifying compliance with job specifications.

5. **What should be done with excess materials or waste after cutting operations?**

Sort usable offcuts for reuse, dispose of waste in designated bins, and maintain a clean and organized worksite.

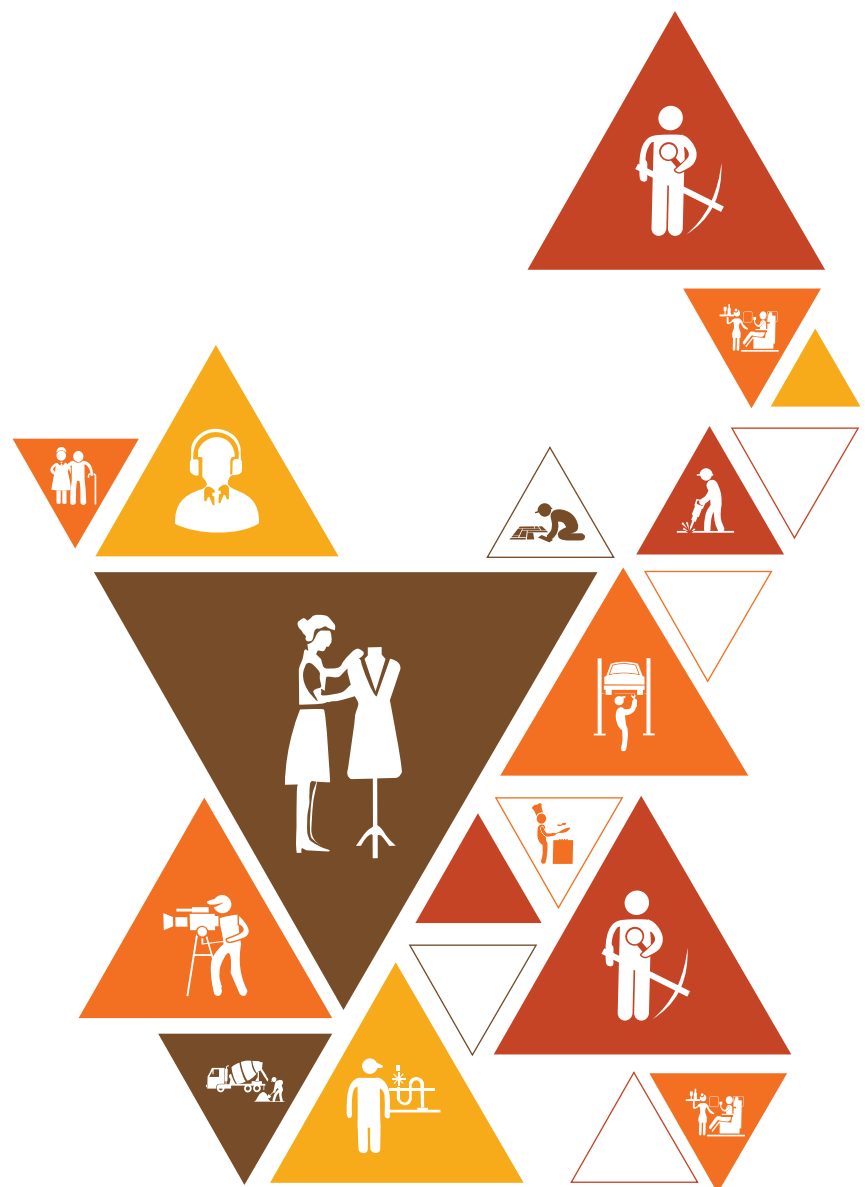
Fill in the Blanks:

1. The first step before operating a cutting/sizing machine is to ensure that the materials are properly prepared.
2. The accuracy of the cut depends on proper setup and calibration of the cutting machine.
3. Selecting the right tools and equipment is crucial for achieving precision in cutting operations.
4. Safety measures such as wearing PPE and using machine guards help prevent accidents.
5. After cutting, materials should be inspected for accuracy and defects before further processing.

True/False:

1. **False:** Proper calibration is always necessary, regardless of blade sharpness.
2. **True:** Correct tool selection improves both efficiency and product quality.
3. **False:** PPE like safety goggles and gloves is mandatory for safe machine operation.
4. **True:** Following specifications and standards ensures quality and reduces errors.
5. **False:** Waste must be disposed of properly, not randomly, to maintain safety and cleanliness.

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Key Learning Outcomes

At the end of this module, you will be able to:

1. Demonstrate proficiency in ensuring materials and workpieces are prepared appropriately for cutting/sizing machine operation, meeting job specifications and quality standards.
2. List the constraints involved in identifying and selecting appropriate tools, and equipment for job work.
3. Demonstrate the skills in setting up, configuring, and calibrating cutting/sizing machines for various production requirements.

UNIT 16.1: Setup Worksite for Edge Banding Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the process of preparing materials and workpieces to meet job specifications and quality standards for edge banding operations.
2. Describe the selection and installation process of appropriate cutting tools, edge banding materials, adhesives, and other consumables for different edge banding requirements.
3. Explain the process of adjusting machine settings, such as feed rate, temperature, pressure, and trimming tools, to ensure optimal edge banding results.
4. Prepare materials and workpieces appropriately for edge banding operation to meet job specifications and quality standards.
5. Select and install appropriate cutting tools, edge banding materials, adhesives, and other consumables based on the specific requirements.
6. Adjust machine settings, such as feed rate, temperature, pressure, and trimming tools, according to job specifications and quality standards.

Resources to be Used

Theory

- Edge banding process flow charts
- Diagrams of edge banding machines and components
- Adhesive types and usage guide
- SOP and quality standards documents

Practical

- Edge banding machine (manual/semi-auto/auto)
- Edge banding tapes, adhesives, and trimmers
- Raw wood-based panels
- PPE – gloves, safety glasses
- Calibration and setup tools (spanner, screwdriver, etc.)

Say



- "Edge banding is a finishing technique that enhances both durability and appearance of wood-based panels. Before we operate the machine, it is essential to prepare materials, select the right consumables, and configure the machine precisely to match job specifications."

Ask



- "What do you think happens if adhesive temperature is too low during edge banding?"
- "Have you seen different edge types used in furniture like tables or cabinets? What differences did you notice?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



- **Steps for preparing the material: surface cleaning, measuring, and aligning workpieces**

Before edge banding, ensure the panel surface is clean, dry, and free of dust or grease to allow proper adhesion. Measure the panel accurately as per the job sheet. Align the workpiece correctly on the machine to ensure straight and uniform banding along the edges.

- **How to select edge banding material based on panel size, thickness, and finish**

Choose the edge banding tape that matches the thickness of the panel and complements its finish (e.g., wood grain, gloss, matte). The width of the tape should slightly exceed the panel's thickness to allow for trimming. Consider durability and aesthetics while selecting the material.

- **Role of adhesives and feed rate in achieving strong and neat bonding**

Adhesives must be compatible with the edge banding and panel materials. The correct feed rate ensures the adhesive spreads evenly and bonds firmly. If the feed is too fast, bonding may be weak; too slow can cause overheating or wrinkling of the tape.

- **Machine settings: adjusting temperature, pressure, feed rate, trimming tools**

Set the machine's temperature based on adhesive type to ensure proper melting and bonding. Adjust pressure rollers to hold the tape firmly against the panel edge. Calibrate feed rate for consistent speed and use trimming tools to remove excess tape for a clean finish.

Activity-1



Material Preparation for Edge Banding

- **Objective:** To ensure that panel surfaces and edges are clean, measured accurately, and aligned properly for the edge banding process.
- **Instructions:**
 - ✓ Inspect panel surfaces for dust, grease, or burrs; clean thoroughly using a soft cloth and cleaning agent.
 - ✓ Measure panel dimensions (length, width, thickness) using a measuring tape or scale as per the job sheet.
 - ✓ Mark edges to be banded using a pencil or chalk.
 - ✓ Align the workpiece on the worktable or conveyor to ensure edges are straight and square.
- **Resources Needed:**
 - ✓ Measuring tape/scale
 - ✓ Cleaning cloth and solution
 - ✓ Pencil/marker
 - ✓ Panels and job sheet
 - ✓ Worktable or fixture
- **Duration:** 30 minutes
- **Expected Outcome:** Clean, marked, and properly aligned panels ready for edge banding, as per job specifications.

Activity-2



Selection and Installation of Tools and Materials

- **Objective:** To select and install edge banding tools, materials, adhesives, and consumables appropriate for specific edge banding operations.
- **Instructions:**
 - ✓ Review job specifications for edge type, panel material, and desired finish.
 - ✓ Select suitable edge banding tape based on thickness, width, and surface finish.
 - ✓ Choose the right adhesive compatible with both panel and tape materials (e.g., EVA hot melt).
 - ✓ Select and install appropriate cutting tools (e.g., end-trimmers, scrapers).
 - ✓ Load the adhesive and edge banding roll into the machine following manufacturer guidelines.

- **Resources Needed:**
 - ✓ Job specification sheet
 - ✓ Edge banding rolls
 - ✓ Adhesive (EVA or similar)
 - ✓ Edge banding machine
 - ✓ Tool kit (wrenches, screwdrivers)
 - ✓ Safety gloves and goggles
- **Duration:** 45 minutes
- **Expected Outcome:** Appropriate tools and materials selected and installed correctly for efficient edge banding.

Activity-3



Machine Setting Adjustment

- **Objective:** To adjust edge banding machine settings—temperature, pressure, feed rate, and trimming tools—to ensure quality and adherence to specifications.
- **Instructions:**
 - ✓ Set the adhesive temperature based on the manufacturer's recommended range (typically 180–210°C for EVA).
 - ✓ Adjust feed rate and conveyor speed to match panel size and complexity of the operation.
 - ✓ Calibrate pressure rollers to ensure consistent contact between tape and panel edge.
 - ✓ Set trimming and buffing units for clean edge finishing—test run with scrap pieces.
 - ✓ Monitor initial output and fine-tune settings if needed.
- **Resources Needed:**
 - ✓ Edge banding machine
 - ✓ Control panel for machine settings
 - ✓ Calibration gauges/tools
 - ✓ Test panels (scrap/offcut material)
 - ✓ Thermometer (if manual check needed)
- **Duration:** 45 minutes
- **Expected Outcome:** Edge banding machine set accurately for efficient operation with neat and strong bonding.

Do

- Practice aligning panels for edge banding.
- Select and install consumables with supervision.
- Adjust and calibrate machine settings as per job sheet.

Say

- “Well done! Setting up the machine properly is crucial to a quality finish. In the next unit, we’ll look at how to operate the edge banding machine safely and efficiently.”

Notes for Facilitation

- Emphasize safety—especially when adjusting heated adhesive units.
- Use job cards with clear specifications to simulate real tasks.
- Give immediate feedback on material preparation and setup.
- Pair trainees in buddy system for tool selection and setup tasks.
- Re-demonstrate any steps if trainees show uncertainty during practice.

[illegible]

UNIT 16.2: Edge Banding Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the process of setting up, configuring, and calibrating edge band machines based on job work requirements.
2. Describe the process of preparing the desired program on the machine to perform edge banding operations in the required configurations.
3. Explain the significance of preheating the machine before operation, ensuring the appropriate temperature for the glue is maintained.
4. Explain the process of operating edge banding machines in accordance with standard operating procedures and safety guidelines.
5. Describe the proper feeding and guiding techniques for panel materials in edge banding machines.
6. Explain the factors affecting proper alignment and positioning of the edge band material.
7. Describe the manual application techniques for adhesive and edge banding material to panel edges using hand or power tools.
8. Explain the importance of monitoring the edge banding operation periodically to evaluate product quality and yield.
9. Set up, configure, and calibrate edge band machines based on job work requirements, including adhesive type, panel thickness, edge band thickness, etc.
10. Prepare the desired program on the machine to perform edge banding operations in the required configurations based on job specifications and quality standards.
11. Execute the machine initialization process, ensuring the appropriate temperature for the edge banding.
12. Operate edge banding machines in accordance with standard operating procedures and safety guidelines.
13. Feed panel materials into the machine and guide them through the edge banding process accurately and smoothly.
14. Ensure proper alignment and positioning of the edge band material to achieve precise edge banding results.
15. Perform the manual application of adhesive and edge banding material to the panel edges using hand or power tools for effective edge banding.
16. Monitor the edge banding operation periodically to evaluate product quality and yield, making adjustments as necessary.

Resources to be Used



Theory

- Edge banding process notes
- Machine manual/user guide
- SOPs and safety checklist
- Instructional video clips

Practical

- Edge banding machine
- Adhesives and edge banding tape
- Sample panels for practice
- Hand/power tools for manual application
- PPE (gloves, goggles)

Say



- “Edge banding is a key finishing process that adds both durability and appearance to panel edges. Today, we’ll learn how to operate both automatic and manual edge banding processes effectively.”

Ask



- “Why do you think edge banding is important in furniture manufacturing?”
- “Have you seen or used any machine that applies edge tapes before?”

Please feel free to share your experiences with the group. I’ll be noting down your ideas on the whiteboard.

Elaborate



- **Machine Setup and Calibration:** Begin by selecting the correct edge band material and adhesive. Adjust machine settings like feed rate, temperature, and trimming tools as per panel thickness and edge band type.
- **Machine Programming:** Input the required program or job parameters into the machine interface. This ensures that the machine applies the edge band with the right configuration, speed, and precision.
- **Preheating and Glue Temperature:** Allow the machine to preheat to the recommended temperature before starting. Proper glue temperature ensures strong bonding between the edge band and panel.

- **Feeding and Guiding Techniques:** Align the panel correctly and feed it smoothly into the machine. Ensure steady pressure and correct positioning for even application.
- **Alignment and Positioning:** Make sure the edge band material aligns precisely with the panel edge. Misalignment can lead to overhangs or gaps in the finish.
- **Manual Edge Banding:** For small jobs or intricate edges, use hand tools or a manual edge banding device. Apply glue evenly and press the edge band firmly for a neat finish.
- **Monitoring the Operation:** Keep an eye on the output during the process. Check for uniform bonding and trimming accuracy, and adjust settings if needed to maintain quality.

Activity-1



Set up, configure, and calibrate edge band machines

- **Objective:** To correctly set up the edge banding machine according to job specifications.
- **Instructions:**
 - ✓ Check the job sheet for panel and edge band material specifications.
 - ✓ Set parameters for adhesive type, panel thickness, and edge band thickness.
 - ✓ Calibrate the feed rate, pressure rollers, and trimmer units.
- **Resources Needed:** Edge banding machine, job sheet, edge band rolls, calibration tools.
- **Duration:** 30 minutes
- **Expected Outcome:** Machine is accurately set up and ready for edge banding as per required specifications.

Activity-2



Prepare the desired program on the machine

- **Objective:** To input and configure the correct program for the job.
- **Instructions:**
 - ✓ Access the machine interface.
 - ✓ Enter panel dimensions, glue temperature, speed, and edge band width.
 - ✓ Save and activate the program.
- **Resources Needed:** Edge banding machine, control panel interface, job specifications.
- **Duration:** 20 minutes
- **Expected Outcome:** Program is loaded successfully and matches the job requirements.

Activity-3



Execute the machine initialization process

- **Objective:** To initiate machine startup and ensure it reaches operating temperature.
- **Instructions:**
 - ✓ Start the heating unit and monitor glue pot temperature.
 - ✓ Check roller movement and trimming tools for readiness.
- **Resources Needed:** Edge banding machine, thermometer (if required), adhesive.
- **Duration:** 15 minutes
- **Expected Outcome:** Machine is warmed up and ready for operation.

Activity-4



Operate edge banding machines following SOP and safety guidelines

- **Objective:** To safely operate the edge banding machine.
- **Instructions:**
 - ✓ Wear PPE.
 - ✓ Ensure guards and emergency stops are functional.
 - ✓ Follow machine operation steps and monitor the process.
- **Resources Needed:** PPE (gloves, goggles), edge banding machine, SOP manual.
- **Duration:** 20 minutes
- **Expected Outcome:** Machine operates safely and efficiently with proper safety compliance.

Activity-5



Feed panel materials and guide through the edge banding process

- **Objective:** To correctly feed panel boards for edge banding.
- **Instructions:**
 - ✓ Align the panel with the guide fence.
 - ✓ Feed it steadily into the machine.
 - ✓ Maintain consistent speed and pressure.
- **Resources Needed:** Panel materials, edge banding machine.
- **Duration:** 15 minutes per batch
- **Expected Outcome:** Panels are fed correctly and edge banded smoothly without misalignment.

Activity-6



Ensure proper alignment and positioning of edge band material

- **Objective:** To achieve precise edge band placement.
- **Instructions:**
 - ✓ Check the alignment of the edge band roll.
 - ✓ Adjust the coil holder and guide rollers.
 - ✓ Run a test piece and inspect placement.
- **Resources Needed:** Edge band coil, edge banding machine.
- **Duration:** 10 minutes
- **Expected Outcome:** Edge band material aligns well with panel edges with no overlaps or gaps.

Activity-7



Perform manual application using hand/power tools

- **Objective:** To apply edge banding manually on irregular or small pieces.
- **Instructions:**
 - ✓ Apply adhesive evenly on panel edge.
 - ✓ Press the edge band using roller or power trimmer.
 - ✓ Trim excess material using manual tools.
- **Resources Needed:** Adhesive, edge band tape, hand roller, trimmer, panels.
- **Duration:** 20 minutes
- **Expected Outcome:** Neat and uniform edge banding on manually treated panel edges.

Activity-8



Monitor edge banding operation periodically

- **Objective:** To maintain quality during edge banding production.
- **Instructions:**
 - ✓ Inspect output at intervals for bonding strength and straightness.
 - ✓ Look for glue overflow or trimming errors.
 - ✓ Make necessary adjustments.

- **Resources Needed:** Caliper, measuring tape, visual inspection sheet.
- **Duration:** Ongoing throughout operation
- **Expected Outcome:** Consistent quality and minimal defects in edge banded products.

Do



Trainees will:

- Program machine based on job spec
- Run and monitor edge banding operations
- Apply edge banding manually
- Inspect edge quality and record observations

Say



- “Well done! Edge banding requires precision at every step — from setting temperature to feeding panels. The more you practice, the more accurate and neater your finish will be.”

Notes for Facilitation



- Ensure adhesive temperature is correctly set before starting machine.
- Emphasize safety, especially during trimming or manual application.
- Rotate roles so all trainees experience both machine and manual operations.
- Provide immediate feedback on edge quality and glue bonding.

[illegible]

UNIT 16.3: Worksite Management and Quality Control for Edge Banding Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the key constraints involved in routine maintenance tasks for edge banding machines, such as cleaning, lubricating, and replacing worn parts.
2. Describe the techniques and constraints involved in workspace management, including arranging and disposing of materials after the machining operation.
3. Explain the key constraints and criteria involved in performing quality checks and inspections on finished materials.
4. Discuss how to properly document production specs, quality control inspections, and adjustments.
5. Perform routine maintenance tasks on the edge banding machine, including cleaning, lubricating, and replacing worn parts.
6. Ensure the proper management of the workspace by arranging materials in an organized manner and disposing of waste materials.
7. Perform quality checks and inspections on finished materials, using the appropriate techniques and evaluation criteria.
8. Accurately record and maintain manufacturing specifications, quality control inspections, and modifications in the appropriate documentation.

Resources to be Used

Theory

- Visual aids (charts, diagrams)
- SOP manuals for maintenance and inspection
- Sample quality checklists

Practical

- Edge banding machine
- Cleaning and lubrication kits
- Sample workpieces (finished and unfinished)
- Documentation sheets and logbooks

Say



- "Maintaining your machine and workspace is just as important as operating it. In this session, we'll focus on how to manage the worksite efficiently, carry out basic maintenance tasks, ensure product quality, and document everything properly."

Ask



- "What do you usually do when a machine starts making unusual sounds?"
- "Have you ever checked a finished product and found an edge defect? What did you do?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



- **Routine Maintenance:** Cleaning dust and glue build-up, oiling moving parts, and replacing worn cutters help prevent breakdowns.
- **Workspace Management:** Organizing tools, storing materials properly, and cleaning the area reduces hazards and improves efficiency.
- **Quality Inspection:** Checking for glue squeeze-out, misaligned bands, and smooth edges ensures customer satisfaction.
- **Documentation:** Keeping records of machine settings, quality outcomes, and maintenance helps in traceability and audits.

Activity-1



Perform routine maintenance tasks on the edge banding machine

- **Objective:** To carry out basic machine maintenance including cleaning, lubricating, and replacing worn parts to ensure smooth operation.
- **Instructions:**
 - ✓ Switch off and unplug the machine.
 - ✓ Clean dust and adhesive build-up from all surfaces.
 - ✓ Lubricate moving components as per manufacturer's guidelines.
 - ✓ Identify and replace any visibly worn parts (e.g., trimmer blades or feed rollers).

- **Resources Needed:** Cleaning cloths, brushes, lubricants, maintenance toolkit, replacement parts (if required), PPE (gloves, goggles).
- **Duration:** 45 minutes
- **Expected Outcome:** Machine is clean, well-lubricated, and worn parts are replaced. Maintenance checklist is completed.

Activity-2



Ensure proper management of the workspace

- **Objective:** To maintain a safe and efficient work environment by organizing materials and disposing of waste properly.
- **Instructions:**
 - ✓ Segregate usable materials, off-cuts, and waste.
 - ✓ Store usable materials systematically (labelled stacks or racks).
 - ✓ Dispose of scrap and glue waste as per center guidelines.
 - ✓ Keep tools in designated areas.
- **Resources Needed:** Bins for waste, storage shelves, labels, cleaning tools (broom, dustpan), gloves.
- **Duration:** 30 minutes
- **Expected Outcome:** Clean and organized work area with properly stored materials and tools.

Activity-3



Perform quality checks and inspections on finished materials

- **Objective:** To inspect edge-banded panels for visual and dimensional quality as per job standards.
- **Instructions:**
 - ✓ Visually inspect for glue squeeze-out, alignment, trimming finish, and edge adhesion.
 - ✓ Measure edge overhang or gaps with a scale or caliper.
 - ✓ Identify any surface defects.
 - ✓ Classify pieces as 'OK' or 'Rework Needed.'
- **Resources Needed:**
 - ✓ Sample edge-banded panels, quality checklist, calipers, scale, marker/labels.
- **Duration:** 40 minutes
- **Expected Outcome:** Defective pieces are identified; acceptable pieces meet quality parameters.

Activity-4



Accurately record and maintain documentation

- **Objective:** To document maintenance, inspection, and production parameters in a structured and traceable format.
- **Instructions:**
 - ✓ Fill maintenance logs (date, parts cleaned/lubricated/replaced).
 - ✓ Complete quality control checklists.
 - ✓ Record any machine adjustments or rework decisions.
 - ✓ Store documents in designated folders or files.
- **Resources Needed:** Maintenance logbook, QC checklist, pen/pencil, file/folder.
- **Duration:** 20 minutes
- **Expected Outcome:** Accurate and legible records of maintenance, inspection, and machine adjustments.

Do



Trainees will:

- Clean the edge banding machine and apply lubrication.
- Organize tools and dispose of waste material.
- Inspect finished materials for quality defects.
- Record inspection results and machine settings.

Say



- “Good job today! Remember, an organized workspace and a well-maintained machine not only make your work easier but also increase the quality of your final product.”

Notes for Facilitation



- Ensure all safety protocols are followed during maintenance.
- Provide real examples of poorly maintained machines or failed quality checks if available.
- Use checklists and samples to make inspections more hands-on and visual.
- Pair trainees for inspection and documentation tasks to encourage collaboration.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. What are the key factors to consider when selecting adhesives for edge banding?

Adhesive selection depends on the panel material, type of edge banding, operating temperature, bonding strength, and drying time.

2. Why is proper calibration important in edge banding machine setup?

Calibration ensures the machine settings match the job specifications, resulting in accurate bonding, minimal errors, and high-quality output.

3. What are some common quality issues in edge banding operations?

Common issues include poor adhesion, glue overflow, edge misalignment, gaps between the band and panel, and rough trimming.

4. What safety measures should be followed while operating an edge banding machine?

Always wear PPE, follow lockout procedures, avoid loose clothing, stay clear of moving parts, and never bypass safety guards.

5. Why is proper documentation important in edge banding processes?

It ensures traceability, quality assurance, maintenance tracking, and helps in identifying areas for improvement.

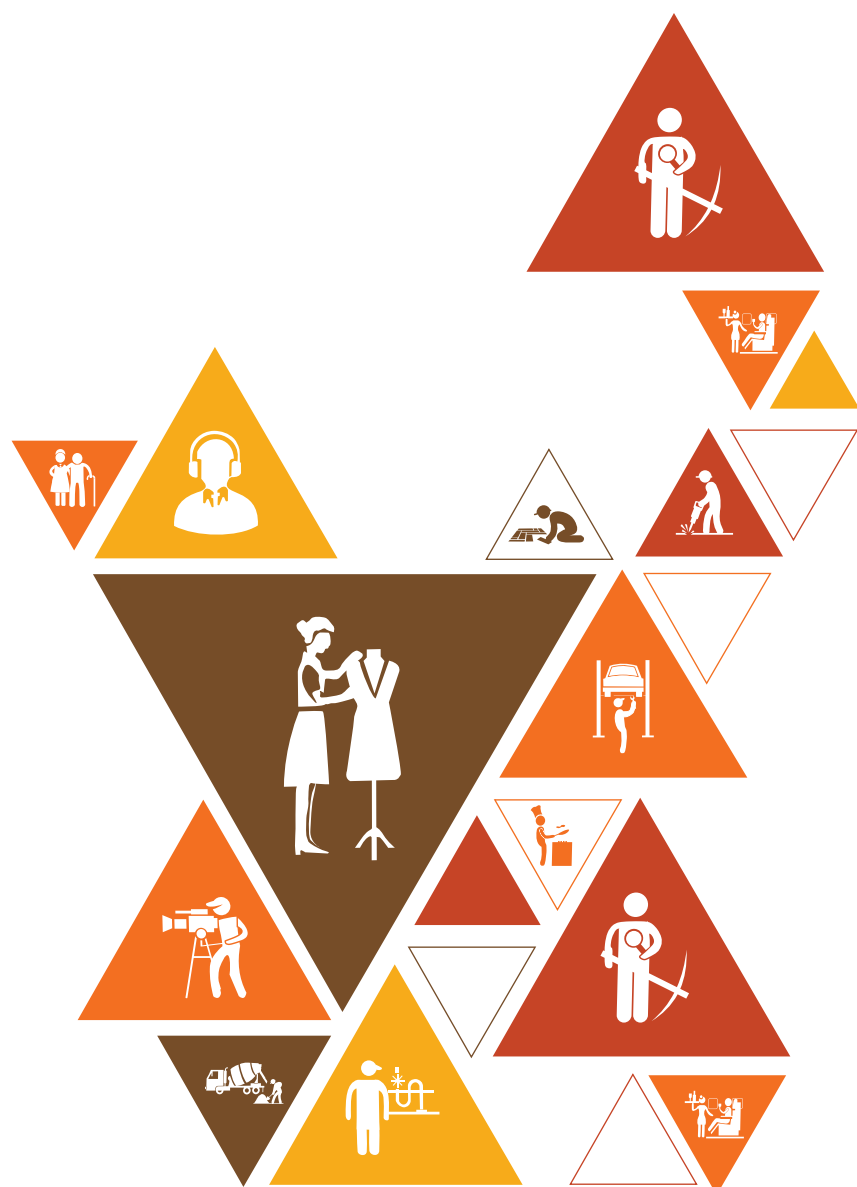
Fill in the Blanks:

1. The primary goal of the edge banding operation is to ensure durability and aesthetic finish of the finished workpiece.
2. Proper selection of adhesive and edge banding material is essential for a successful edge banding process.
3. The edge banding machine must be correctly configured and calibrated to meet job specifications.
4. Regular cleaning and lubrication of the edge banding machine ensure its smooth operation.
5. Conducting quality checks helps maintain product quality and adherence to standards.

True/False:

1. **False:** Calibration is essential regardless of blade sharpness to ensure dimensional accuracy.
2. **True:** Regular maintenance supports consistent performance and product quality.
3. **True:** Incorrect adhesives can lead to poor bonding and reduced durability.
4. **False:** Periodic monitoring is crucial to catch issues that may arise during operation.
5. **False:** Safety protocols must be followed during all machine operations, not just when handling hazardous materials.

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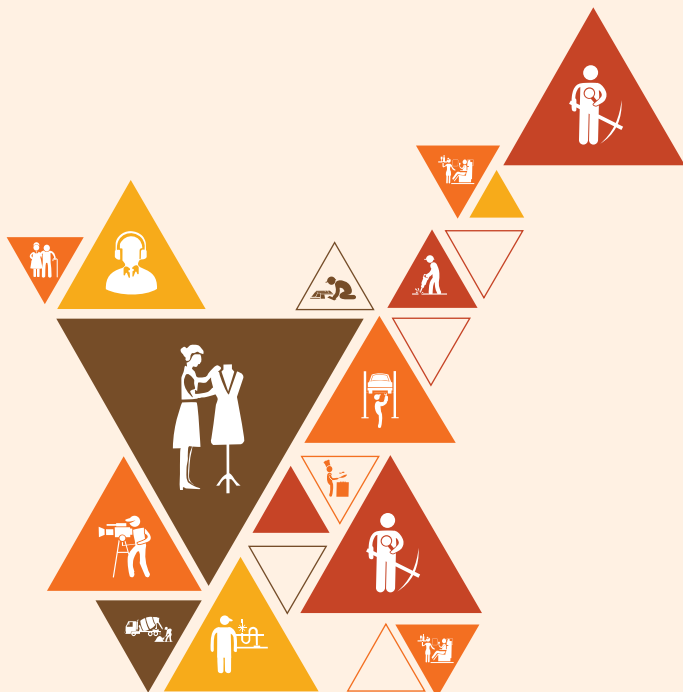
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17. Setup and Operate Drilling Machines

Unit 17.1 – Setup Worksite for Drilling Operation

Unit 17.2 – Drilling Operation

Unit 17.3 – Worksite Management and Quality Control for
Drilling Operation



FFS/N1017

Key Learning Outcomes

At the end of this module, you will be able to:

1. Demonstrate proficiency in ensuring materials and workpieces are prepared appropriately for drilling machine operation, meeting job specifications and quality standards.
2. List the constraints involved in identifying and selecting appropriate tools, and equipment for job work.
3. Demonstrate the skills in setting up, configuring, and calibrating drilling machines for various production requirements.
4. Demonstrate proficiency in performing loading and unloading of job work into the drilling machine, ensuring proper alignment using offcut materials.
5. Discuss the importance of effective positioning and securing panel materials on the machine.
6. Demonstrate the steps involved in setting up, configuring, and calibrating the drilling machine.
7. Operate and monitor the drilling machines in accordance with standard operating procedures and safety guidelines.
8. Demonstrate proficiency in performing routine maintenance tasks on the drilling machine.
9. Discuss the principles of organization and waste management after drilling operation.
10. Illustrate the process of conducting quality checks and inspections on the drilling materials.
11. Ensure proper documentation and traceability of the processes.

UNIT 17.1: Setup Worksite for Drilling Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the process of preparing materials and workpieces to meet job specifications and quality standards for drilling operations.
2. Explain the criteria for selecting and installing appropriate drill bits and cutting tools.
3. Describe the steps involved in setting up, configuring, and calibrating drilling machines for different production requirements.
4. Prepare materials and workpieces appropriately for drilling operation to meet job specifications and quality standards.
5. Select and install the appropriate drill bits and cutting tools for the drilling machine.
6. Set up, configure, and calibrate the drilling machine for various production requirements.

Resources to be Used

Theory

- Whiteboard/Marker
- Presentation on drilling tools and machine setup
- Handouts with drill bit selection chart and calibration steps

Practical

- Drilling machine
- Range of drill bits and cutting tools
- Workpieces (wood, MDF, particle board)
- PPE (goggles, gloves)
- Measuring tools (scale, caliper)

Say



- “Today, we will learn how to set up your worksite for drilling operations. This includes how to prepare the material, choose the correct tools, and make sure the drilling machine is calibrated properly to ensure precision and safety.”

Ask



- “Have you ever seen or used a drilling machine before? What was it used for?”
- “What do you think happens if we use the wrong drill bit for a material?”

Please feel free to share your experiences with the group. I’ll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

- Preparing materials and workpieces: Clean, measure, and mark the material accurately. Clamp securely to prevent movement during drilling.
- Selecting drill bits and tools: Choose bits based on material type (wood/metal), hole size, and depth. Consider tip angle and coating.
- Setting up and calibrating the drilling machine: Adjust table height, set spindle speed based on material, and ensure alignment between bit and marked hole.

Activity-1



Prepare materials and workpieces appropriately for drilling operation to meet job specifications and quality standards

- **Objective:** To prepare the material and workpiece accurately for a drilling task by measuring, marking, and securing it as per job specifications.
- **Instructions:** Clean the surface of the material. Use measuring tools to mark the correct drilling points. Secure the workpiece firmly using clamps to ensure stability during drilling.
- **Resources Needed:** Measuring scale, pencil/marker, clamps, workpiece (wood/MDF/particle board), cleaning cloth.
- **Duration:** 20 minutes
- **Expected Outcome:** Trainees will have a clean and accurately marked workpiece clamped securely, ready for drilling.

Activity-2



Select and install the appropriate drill bits and cutting tools for the drilling machine

- **Objective:** To correctly identify and install the most suitable drill bit based on the material and required hole dimensions.
- **Instructions:** Review the drilling chart for drill bit selection. Match the bit size to the marked hole dimensions. Fit and tighten the drill bit into the chuck securely using appropriate tools.
- **Resources Needed:** Drill bits (various sizes and types), drill bit selection chart, drilling machine, chuck key, PPE (gloves, goggles).
- **Duration:** 15 minutes
- **Expected Outcome:** Drill bit is correctly selected and installed, ready for operation, ensuring safety and job suitability.

Activity-3



Set up, configure, and calibrate the drilling machine for various production requirements

- **Objective:** To set up and adjust the drilling machine's height, speed, and alignment in line with specific material and drilling requirements.
- **Instructions:** Adjust table height and bit position based on workpiece thickness. Set the spindle speed according to the material type. Calibrate alignment to ensure drilling accuracy.
- **Resources Needed:** Drilling machine, material specification chart, speed setting guide, PPE.
- **Duration:** 25 minutes
- **Expected Outcome:** Drilling machine is configured accurately with proper settings for speed, height, and bit alignment, ready for safe and precise operation.

Do



- Allow each trainee to go through the setup process under supervision. Give feedback on each step.

Say



- "Well done! Setting up the worksite correctly is the first step to achieving high-quality drilling results. In the next unit, we'll move into actually performing the drilling operation."

Notes for Facilitation

- Emphasize tool safety and proper handling.
- Observe closely during bit installation and machine calibration.
- Reinforce that proper preparation affects drilling accuracy and finish.

[illegible]

UNIT 17.2: Drilling Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the importance of safely loading and positioning workpieces onto the machine table or holding fixtures.
2. Describe the process of machine initiation and guiding workpieces through drilling operations, maintaining proper feed rates and tool engagement.
3. Explain the importance of following standard operating procedures and safety guidelines when operating drilling machines.
4. Describe the process of setting up drilling parameters accurately, such as speed, depth, or angle.
5. Explain the importance of monitoring the drilling operation periodically to evaluate product quality and yield.
6. Safely load and position workpieces onto the machine table or holding fixtures, ensuring they are securely clamped or held in place for safe and stable drilling operations.
7. Perform the machine initiation and guide the workpieces through the drilling operations, maintaining proper feed rates and tool engagement.
8. Operate drilling machines in accordance with standard operating procedures and safety guidelines.
9. Set up drilling parameters accurately, such as speed, depth, or angle, for efficient and precise drilling results according to job requirements and quality standards.
10. Monitor the drilling operation periodically to evaluate product quality and yield, making adjustments as necessary.

Resources to be Used

Theory Resources

- Drilling machine manual (for theoretical setup and parameters)
- Work instructions or SOP (Standard Operating Procedures) documents
- Material charts for selecting appropriate drilling parameters (speed, feed, depth, etc.)
- Training presentation slides (explaining machine functions, safety, and procedures)
- Speed and feed charts for different materials
- Quality control documentation (for post-operation evaluation)

Practical Resources

- Drilling machine
- Workpieces (e.g., metal, wood, plastic)
- Clamps and holding fixtures
- PPE (Personal Protective Equipment – gloves, goggles, ear protection)
- Calipers, micrometers for measuring depth and alignment
- Measuring tools (for ensuring correct feed rate and alignment)
- Drilling bits and cutting tools (for installation)
- Lubricants and cleaning materials (for machine maintenance and operation)

Say



- "Today, we will explore the key processes involved in safely operating a drilling machine, from correctly positioning the workpiece to adjusting machine settings to achieve the required results. By the end of this session, you will be able to load, guide, and monitor your workpieces efficiently and safely during drilling operations."

Ask



- "Can anyone share an experience where positioning a workpiece improperly led to issues in machining? What could have been done differently to ensure safety and precision?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



- **Safely loading and positioning workpieces:** Properly loading and positioning your workpiece is crucial to prevent accidents and ensure the hole is drilled at the correct location and depth. Always ensure that the workpiece is securely clamped or held in place before starting the operation.
- **Machine initiation and guiding workpieces:** Proper machine initiation ensures the machine is set up for safe operation. Guiding the workpiece at the correct feed rate helps maintain tool engagement, ensuring accurate results and preventing tool wear.
- **Drilling parameters setup:** Adjusting parameters such as speed, depth, and angle ensures that the drilling operation is optimized for the material and the required specifications.
- **Monitoring the operation:** Periodic monitoring helps to evaluate the quality of the drilled hole and ensures the drilling operation is progressing as per the standards.

Activity-1



Load and Position Workpieces for Drilling Operation

- **Objective:** To safely load and position the workpiece for a drilling operation, ensuring it is properly secured and aligned.
- **Instructions:** Clean the workpiece surface, align it according to the marked drilling positions, and secure it firmly using clamps or holding fixtures on the machine table.
- Ensure that the workpiece is stable and properly aligned before starting the machine.
- **Resources Needed:** Drilling machine, clamps, workpieces, measuring tools, PPE.
- **Duration:** 15 minutes
- **Expected Outcome:** The workpiece is securely positioned on the drilling machine, ready for operation.

Activity-2



Set Up Machine Parameters (Speed, Depth, Angle)

- **Objective:** To set up the drilling machine parameters (speed, depth, angle) for the specific operation and material.
- **Instructions:** Refer to the machine's manual and material chart to adjust the machine's speed and drill depth. Ensure the drill bit is set to the correct angle if needed, and double-check the setup before starting the operation.
- **Resources Needed:** Drilling machine, speed and feed charts, depth gauge, PPE.
- **Duration:** 20 minutes
- **Expected Outcome:** Drilling machine is correctly set up with the right parameters for the job.

Activity-3



Perform Drilling Operation

- **Objective:** To initiate the machine and guide the workpiece through the drilling operation, maintaining proper feed rates and tool engagement.
- **Instructions:** Turn on the machine, start feeding the workpiece into the drill at the specified rate. Monitor the machine as it drills and adjust feed rate if necessary. Make sure the tool engages properly and that the workpiece is stable.
- **Resources Needed:** Drilling machine, workpieces, PPE.
- **Duration:** 30 minutes
- **Expected Outcome:** Successful drilling of the workpiece, with smooth tool engagement and proper feed rate.

Do

- Allow each trainee to go through the loading and machine initiation process under supervision. Give feedback on each step.

Say

- “Now that we’ve gone over the key tasks involved in setting up and operating the drilling machine, remember that careful machine setup, proper feed rate, and monitoring during operation are essential for ensuring high-quality results and safety. Let’s move on to monitoring the operation for quality checks.”

Notes for Facilitation

- Always emphasize the importance of safety at each stage, particularly while positioning the workpieces and setting machine parameters.
- Ensure trainees follow the standard operating procedures and safety guidelines throughout the activities.
- Provide hands-on assistance to ensure trainees understand the correct methods for setting up parameters and loading workpieces.
- Remind trainees to check and monitor the drilling operation periodically for quality.

[illegible]

UNIT 17.3: Worksite Management and Quality Control for Drilling Machine

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the key constraints involved in routine maintenance tasks for drilling machines, such as cleaning, lubricating, and replacing worn parts.
2. Explain the process of regular inspections of machine components and the procedures for checking, sharpening, and tightening as needed.
3. Describe the techniques and constraints involved in workspace management, including arranging and disposing of materials after the machining operation.
4. Explain the key constraints and criteria involved in performing quality checks and inspections on finished materials.
5. Discuss how to properly document production specs, quality control inspections, and adjustments.
6. Perform routine maintenance tasks on the drilling machine, including cleaning, lubricating, and replacing worn parts.
7. Conduct regular inspections of the drilling machine's components, checking for loose screws, belts, bearings, and taking appropriate actions.
8. Ensure the proper management of the workspace by arranging materials in an organized manner and disposing of waste materials.
9. Perform quality checks and inspections on finished materials, using the appropriate techniques and evaluation criteria.
10. Accurately record and maintain manufacturing specifications, quality control inspections, and modifications in the appropriate documentation.

Resources to be Used

Theory Resources:

- Maintenance manual of the drilling machine
- Safety and SOP guidelines
- Checklists for quality control
- Sample documentation formats/log sheets
- Visuals/illustrations of common defects in drilled components

Practical Resources:

- Drilling machine
- Cleaning materials (brushes, cloth, cleaning fluid)
- Lubricants
- Spanners, screwdrivers, files, belts, etc.
- Faulty and sample-finished components for inspection
- PPE (gloves, goggles, apron)
- Bin/containers for waste materials
- Inspection tools (vernier caliper, micrometer, depth gauge)
- Maintenance logbook, quality inspection sheet

Say

- “Once the drilling operation is complete, our job isn’t over. Keeping your machine well-maintained and your workspace organized ensures safety, accuracy, and longer machine life. Today, we’ll also learn to inspect finished components for quality and how to document every step of the process.”

Ask

- “Why do you think regular maintenance is important even if the machine seems to be working fine?”
- “Have you ever seen a workplace where poor maintenance led to bigger issues?”
- “What would happen if no one recorded changes or quality issues on the shop floor?”

Please feel free to share your experiences with the group. I’ll be noting down your ideas on the whiteboard.

Elaborate

- **Routine Maintenance:** Includes scheduled cleaning, lubrication, replacing belts or worn parts. Failure to maintain can lead to breakdowns or inaccurate drilling.
- **Machine Inspection:** Involves checking for wear and tear—loose belts, blunt bits, missing fasteners, etc. These checks should be part of daily or weekly routines.
- **Workspace Management:** Organizing tools, disposing of scrap properly, and reducing clutter help avoid accidents and improve productivity.
- **Quality Control:** Check depth, angle, and position of holes; identify burrs or cracks.
- **Documentation:** Serves as proof of checks, helps trace problems, and is useful during audits.

Activity-1



Perform Routine Maintenance Tasks

- **Objective:** To carry out scheduled cleaning, lubrication, and part replacement on the drilling machine.
- **Instructions:** Use cleaning supplies to remove debris from machine parts. Apply lubricant to moving parts as per the maintenance manual. Identify any worn or loose parts and replace or tighten them.
- **Resources Needed:** Cleaning tools, lubricants, maintenance checklist, hand tools
- **Duration:** 30 minutes
- **Expected Outcome:** Machine cleaned, lubricated, and ready for next operation

Activity-2



Inspect Drilling Machine Components

- **Objective:** To inspect key machine components and perform basic corrective actions.
- **Instructions:** Use the inspection checklist to go over screws, belts, bearings, drill bit condition. If any issues are found, tighten or replace as needed.
- **Resources Needed:** Maintenance checklist, screwdriver set, belt samples, files, spanners
- **Duration:** 25 minutes
- **Expected Outcome:** Machine inspected and components secured or replaced as required.

Activity-3



Manage the Workspace Post-Operation

- **Objective:** To clean up and organize the work area after drilling.
- **Instructions:** Arrange tools back in designated places, dispose of shavings and waste in bins, clean the surface of the workstation.
- **Resources Needed:** Tool rack, waste bins, brush and dustpan
- **Duration:** 15 minutes
- **Expected Outcome:** Workspace is clean, tools are stored, and waste is disposed of appropriately.

Activity-4



Perform Quality Checks and Documentation

- **Objective:** To inspect finished components for drilling quality and record observations.
- **Instructions:** Use vernier caliper, depth gauge to check drilled holes. Look for any defects like rough edges or misalignment. Fill out the quality inspection sheet and note any rework required.
- **Resources Needed:** Finished components, inspection tools, quality checklist, logbook
- **Duration:** 30 minutes
- **Expected Outcome:** Product quality is verified and findings are recorded properly.

Do



- Allow each trainee to go through the maintenance process under supervision. Give feedback on each step.

Say



- “Keeping your machine and work area in order isn’t just good housekeeping—it’s essential to maintaining quality and ensuring safe, consistent operation. With practice, these checks and clean-ups will become second nature to you.”

Notes for Facilitation



- Ensure every trainee wears PPE before starting any activity.
- Let trainees handle real tools under supervision for hands-on practice.
- Use sample defective components to help them spot real-world issues.
- Display a filled sample of documentation to guide proper recording.
- Reinforce the habit of cleaning and inspecting after every shift.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. **Why is it important to prepare materials and workpieces appropriately before drilling machine operation?**
→ Proper preparation ensures that the materials meet the required size, surface quality, and stability, which leads to accurate drilling, reduces tool wear, and enhances safety.
2. **What are some constraints to consider when selecting tools and equipment for drilling jobs?**
→ Constraints include material type, required hole size and depth, machine compatibility, tool wear, and production volume.
3. **How does proper alignment of job work using offcut materials improve drilling accuracy?**
→ Using offcuts for alignment helps simulate the final setup, ensuring the drill hits the exact point during actual operation, reducing errors and material wastage.
4. **What are the key steps involved in setting up and calibrating a drilling machine?**
→ Key steps include selecting the correct drill bit, adjusting the spindle speed and feed rate, aligning the workpiece, securing clamps, and checking depth or angle settings.
5. **Why is documentation and traceability important in drilling operations?**
→ It ensures quality control, helps track changes or rework, maintains compliance with standards, and provides a reference for audits and future jobs.

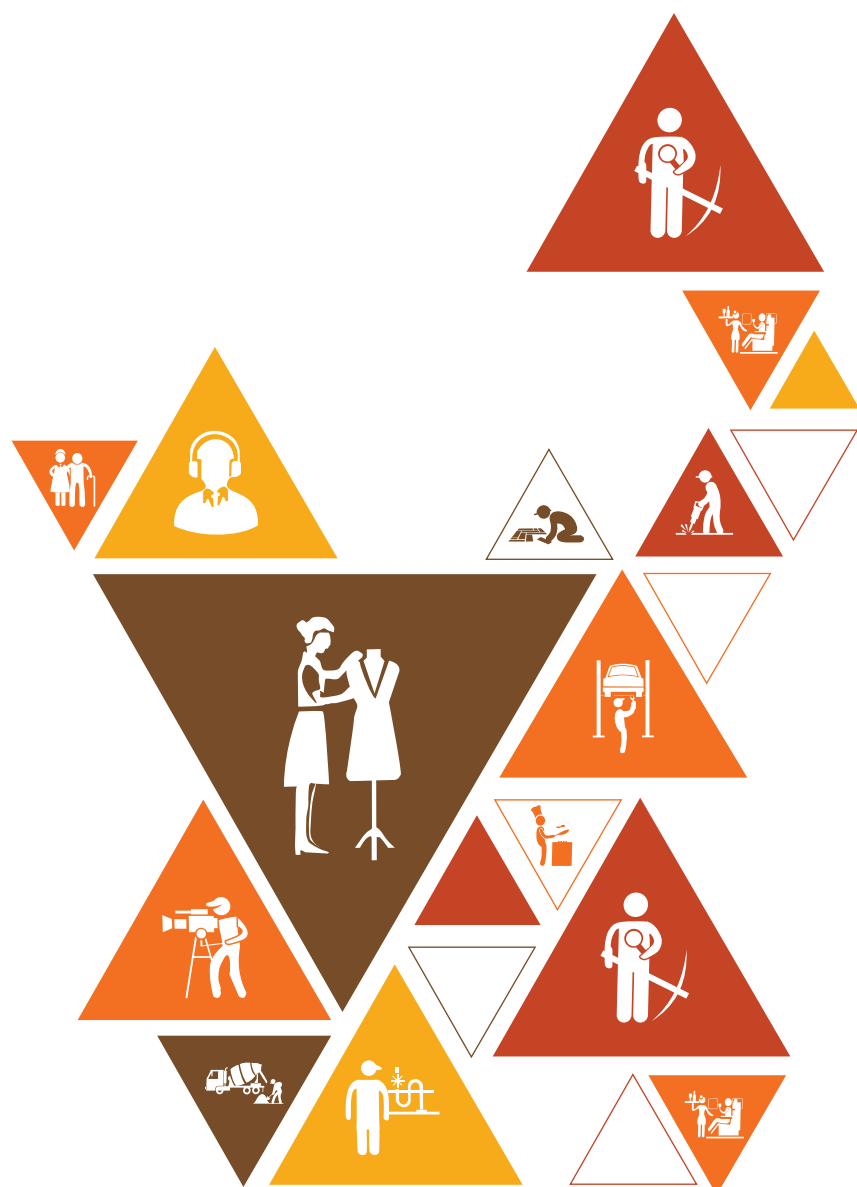
Fill in the Blanks:

1. Proper **positioning** of panel materials on the drilling machine ensures accurate drilling.
2. Selecting the right tools and **equipment** is crucial for effective drilling operations.
3. Routine **maintenance** tasks help maintain the efficiency and longevity of a drilling machine.
4. Conducting quality checks and **inspections** ensures that drilled materials meet job specifications.
5. Proper **arrangement** and disposal of waste materials after drilling is essential for a safe work environment.

True/False:

1. **False:** Proper alignment of job work using offcut materials **is necessary** for drilling accuracy.
2. **True:** Routine maintenance of a drilling machine helps in preventing malfunctions.
3. **False:** Waste management after a drilling operation **is important** in a production setup.
4. **True:** Positioning and securing materials incorrectly can lead to drilling defects.
5. **False:** Documentation is important **for all scales** of drilling operations, not just large-scale ones.

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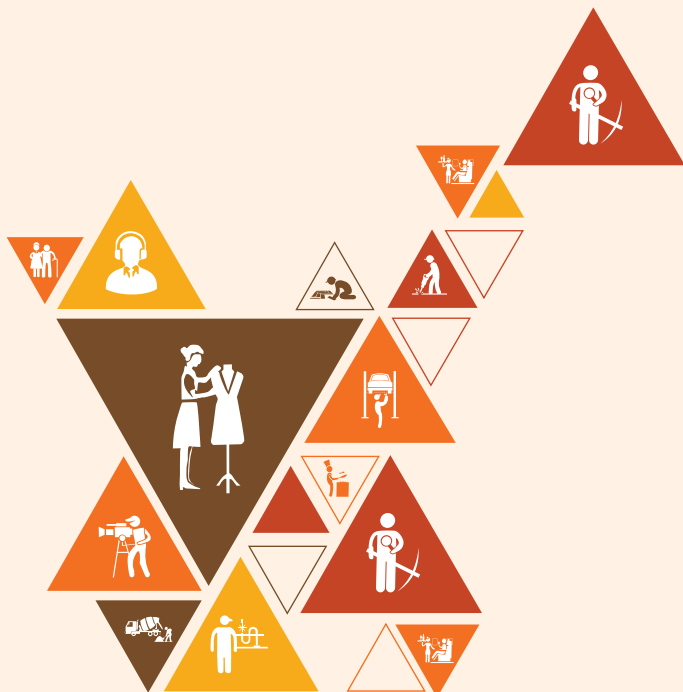
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18. Setup and Operate Routing Machines

Unit 18.1 – Setup Worksite for Routing Operation

Unit 18.2 – Routing Operation

Unit 18.3 – Worksite Management and Quality Control for
Routing Operation



FFS/N1018

Key Learning Outcomes

At the end of this module, you will be able to:

1. Demonstrate proficiency in ensuring materials and workpieces are prepared appropriately for routing machine operation, meeting job specifications and quality standards.
2. List the constraints involved in identifying and selecting appropriate tools, and equipment for job work.
3. Demonstrate the skills in setting up, configuring, and calibrating routing machines for various production requirements.
4. Demonstrate proficiency in performing loading and unloading of job work into the routing machine, ensuring proper alignment using offcut materials.
5. Discuss the importance of effective positioning and securing panel materials on the machine.
6. Demonstrate the steps involved in setting routing machine.
7. Operate and monitor the routing machines in accordance with standard operating procedures and safety guidelines.
8. Demonstrate proficiency in performing routine maintenance tasks on the routing machine.
9. Discuss the principles of organization and waste management after routing operation.
10. Illustrate the process of conducting quality checks and inspections on the routing materials.
11. Ensure proper documentation and traceability of the processes.

UNIT 18.1: Setup Worksite for Routing Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the process of preparing materials and workpieces to meet job specifications and quality standards for routing operations.
2. Explain the criteria for selecting and installing appropriate router bits and cutting tools.
3. Describe the steps involved in setting up, configuring, and calibrating routing machines for different production requirements.
4. Prepare materials and workpieces appropriately for routing operation to meet job specifications and quality standards.
5. Select and install the appropriate router bits and cutting tools for the routing machine.
6. Set up, configure, and calibrate the routing machine for various production requirements.

Resources to be Used

Theory:

- Whiteboard and markers
- Job specification sheets
- Charts showing types of router bits and cutting tools
- Safety posters and operational SOPs

Practical:

- Routing machine
- Sample wood/PVC/MDF panels
- Set of router bits and cutting tools
- Measuring tape and marking tools
- Calibration tools (e.g., gauge blocks, alignment jigs)
- PPE (gloves, safety goggles, ear protection)

Say



- "Routing is a precision operation that shapes edges and grooves on workpieces using high-speed rotating bits. A correct setup is crucial for achieving clean cuts and high-quality finishes. In this unit, we'll learn how to prepare materials, choose the right tools, and calibrate routing machines based on production requirements."

Ask



- "Have you ever seen or used a router machine before?"
- "What might happen if we install the wrong bit or don't align the material properly?"
- "Why do you think calibration is important for different routing tasks?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

- **Material and Workpiece Preparation:** Materials must be cut to size, cleaned of dust, and properly marked. The workpiece surface should be smooth and flat to avoid chipping or uneven cuts.
- **Tool Selection and Installation:** Router bits are selected based on the required cut shape—straight, rounded, decorative, etc. The bit must be compatible with the router and securely fastened to avoid vibration or breakage.
- **Machine Setup and Calibration:** Adjustments include setting the routing depth, securing the workpiece on the table, checking the spindle speed, and ensuring alignment using measuring tools.

Activity-1



Prepare materials and workpieces appropriately for routing operation to meet job specifications and quality standards

- **Objective:** Trainees will learn to measure, mark, and inspect materials to ensure they are suitable and ready for routing operations as per specifications.
- **Instructions:**
 - ✓ Read and interpret job specifications.
 - ✓ Select appropriate material based on the routing requirement.

- ✓ Clean the workpiece and mark reference lines accurately.
- ✓ Check for surface flatness, warping, and material defects.
- ✓ Align and clamp the material on the router table securely.
- **Resources Needed:**
 - ✓ **Theory:** Job specification sheets, material preparation SOPs, marking guidelines
 - ✓ **Practical:** MDF/wood/PVC panels, measuring tape, square, marking tools (pencil, scribe), clamps, workbench
- **Duration:** 1 hour
- **Expected Outcome:** Trainees will be able to prepare clean, marked, and flat materials accurately as per job specs, ready for routing operations.

Activity-2



Select and install the appropriate router bits and cutting tools for the routing machine

- **Objective:** Trainees will be able to identify, select, and safely install the correct router bit according to the operation and job requirements.
- **Instructions:**
 - ✓ Understand types of router bits and their functions (e.g., straight, flush trim, round-over).
 - ✓ Match bit type with routing job.
 - ✓ Follow safety steps to install the bit securely in the collet/spindle.
 - ✓ Use the appropriate wrench or locking mechanism as per machine design.
 - ✓ Ensure proper tightening and test the bit rotation manually before machine power-on.
- **Resources Needed:**
 - ✓ **Theory:** Router bit identification chart, tool selection SOP
 - ✓ **Practical:** Router bits (various types), routing machine, spanners/wrenches, PPE (gloves, goggles)
- **Duration:** 1 hour
- **Expected Outcome:** Trainees will correctly select and safely install router bits suitable for the specific operation and material type.

Activity-3



Set up, configure, and calibrate the routing machine for various production requirements

- **Objective:** Trainees will learn to configure routing depth, guide fences, speed, and secure the workpiece, ensuring precision in operation.
- **Instructions:**
 - ✓ Power off and unplug the machine.
 - ✓ Set routing depth using depth gauge or machine settings.
 - ✓ Adjust guide fence and backstop for straight or pattern routing.
 - ✓ Calibrate spindle speed (if applicable) based on material and bit.
 - ✓ Perform a test run on scrap material and inspect cut accuracy.
 - ✓ Make fine adjustments if required.
- **Resources Needed:**
 - ✓ **Theory:** Calibration checklist, bit speed charts, setup SOPs
 - ✓ **Practical:** Routing machine, router bits, depth gauge, guide fence, scrap panels, PPE
- **Duration:** 1.5 hours
- **Expected Outcome:** Trainees will be able to configure and calibrate the routing machine accurately, enabling efficient and safe operations as per job standards.

Do



Ask trainees to:

- Individually prepare a sample workpiece.
- In pairs, install a router bit and set routing depth.
- As a group, discuss what issues they faced and how they resolved them during calibration.

Say



- "Good work! You've now learned how to prepare and align everything before beginning a routing operation. Proper setup saves time, reduces waste, and helps you maintain quality standards in production."

Notes for Facilitation



- Use real-life examples to explain improper setup consequences (e.g., burnt edges, tool damage).
- Emphasize tool safety—show how to unplug the machine before changing bits.
- Reinforce checking calibration on sample runs before starting full production.
- Encourage peer observation and correction during the setup activity.

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UNIT 18.2: Routing Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the importance of safely loading and positioning workpieces onto the machine table or holding fixtures.
2. Describe the process of machine initiation and guiding workpieces through routing operations, maintaining proper feed rates and tool engagement.
3. Explain the process of routing operations for creating holes or recesses in the workpieces according to the specified locations and dimensions.
4. Explain the importance of following standard operating procedures and safety guidelines when operating routing machines.
5. Describe the process of setting up routing parameters accurately, such as speed, depth, or angle.
6. Explain the importance of monitoring the routing operation periodically to evaluate product quality and yield.
7. Safely load and position workpieces onto the machine table or holding fixtures, ensuring they are securely clamped or held in place for safe and stable routing operations.
8. Perform the machine initiation and guide the workpieces through the routing operations, maintaining proper feed rates and tool engagement.
9. Perform routing operations, accurately creating holes or recesses in the workpieces according to the dimensions for precise and quality outcomes.
10. Operate routing machines in accordance with standard operating procedures and safety guidelines.
11. Set up routing parameters accurately, such as speed, depth, or angle, for efficient and precise routing results according to job requirements and quality standards.
12. Monitor the routing operation periodically to evaluate product quality and yield, making adjustments as necessary.

Resources to be Used

Theory:

- Training handout on routing operations
- SOPs for machine handling
- Tool and bit selection chart
- Safety guidelines poster

Practical:

- Routing machine (manual/CNC based on center)
- Various router bits (flush trim, straight, round-over, etc.)
- Wood/MDF/PVC panels
- Marking tools, clamps, calipers
- PPE (goggles, gloves, ear protection)

Say

- "Routing is an essential wood and composite material machining operation that allows us to create precise holes, recesses, and shaped edges. Today, we will explore how to perform routing safely and accurately—from loading the material to monitoring the final output."

Ask

- "Have you ever used or seen a routing machine before?"
- "What do you think might happen if the workpiece isn't properly clamped?"
- "Why do you think different routing speeds and depths are required for different materials?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate

Break down the core content into easy-to-understand segments:

1. Loading & Positioning Workpieces:

- Emphasize the importance of using clamps or jigs to securely hold the workpiece on the machine table.
- Demonstrate incorrect vs. correct clamping and how loose materials can cause misrouting or accidents.
- Talk about balancing the workpiece to avoid vibrations during operation.

2. Machine Initiation and Safe Start-up:

- Walk trainees through the machine's control panel or manual switch system.
- Show how to visually inspect the machine before starting (look for dust, loose parts, or leftover chips).
- Demonstrate proper hand positioning before switching on the router to avoid kickback.

3. Router Bit Selection & Feed Control:

- Introduce different types of router bits (e.g., straight, dovetail, flush-trim, round-over).
- Discuss material compatibility: e.g., softwoods vs. hardwoods, MDF vs. plywood.
- Explain how improper feed rate (too fast/too slow) can lead to burning, chipping, or tool damage.
- Demonstrate the concept of “climb cutting” vs. “conventional cutting”.

4. Setting Parameters (Speed, Depth, Angle):

- Discuss how different materials require different RPMs and cutting depths.
- Use a parameter chart or router bit packaging to explain selection.
- Explain depth incrementing: never plunge to full depth in one go—use multiple passes.

5. Routing Execution & Monitoring:

- Perform a full routing pass while explaining:
- How to hold the material or guide the router along the fence/template.
- Listening for abnormal sounds that may indicate tool wear.
- Watching for visual cues: burn marks, splinters, or uneven edges.
- Encourage pausing and checking after the first few centimeters to ensure alignment.

6. Safety Guidelines & SOPs:

- Stress no distractions during operation.
- Demonstrate emergency stop.
- Emphasize safe handling of hot or sharp router bits.
- Always wait for the bit to stop spinning before making adjustments or removing the workpiece.

Activity**Perform a Basic Routing Operation**

- **Objective:** Trainees will perform a simple routing task (e.g., creating a straight groove or rounded edge) on a panel using appropriate bits, parameters, and safety procedures.
- **Materials Provided:**
 - ✓ Pre-cut MDF or plywood boards (minimum 2 per trainee)
 - ✓ Clamps, measuring tape, ruler/scale
 - ✓ Router with guide fence and assorted bits
 - ✓ Safety gear (goggles, gloves, ear plugs)

- **Steps:**
 - ✓ **Workpiece Preparation:**
 - Mark the routing path on the workpiece using a pencil and ruler.
 - Ensure the surface is clean and free of debris.
 - ✓ **Machine Setup:**
 - Select the appropriate router bit and install it with guidance.
 - Adjust the depth of cut and secure it.
 - Set the routing speed (RPM) based on the material.
 - ✓ **Clamping:**
 - Clamp the workpiece securely to the machine table or workbench.
 - Ensure it does not wobble or shift when pressure is applied.
 - ✓ **Dry Run (Optional):**
 - Without turning the machine on, guide the router along the path to check ergonomics and stability.
 - ✓ **Routing Execution:**
 - Start the router.
 - Slowly feed the router along the marked path maintaining consistent pressure and feed rate.
 - Finish the cut and inspect for clean edges.
 - ✓ **Inspection & Feedback:**
 - Compare the finished output with expected dimensions or sample.
 - Look for routing defects like burning, tear-out, or waviness.
 - Discuss what went well and what could be improved.
- **Facilitator Role:**
 - ✓ Assist with bit installation and parameter setting.
 - ✓ Observe hand positioning and technique.
 - ✓ Provide immediate feedback and safety corrections during operation.

Do**Ask trainees to:**

- Individually prepare a sample workpiece.
- In pairs, install a router bit and set routing depth.
- As a group, discuss what issues they faced and how they resolved them during calibration.

Say

- "Good work! You've now learned how to prepare and align everything before beginning a routing operation. Proper setup saves time, reduces waste, and helps you maintain quality standards in production."

Notes for Facilitation

- Use real-life examples to explain improper setup consequences (e.g., burnt edges, tool damage).
- Emphasize tool safety—show how to unplug the machine before changing bits.
- Reinforce checking calibration on sample runs before starting full production.
- Encourage peer observation and correction during the setup activity.

[illegible]

UNIT 18.3: Worksite Management and Quality Control for Routing Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the key constraints involved in routine maintenance tasks for routing machines, such as cleaning, lubricating, and replacing worn parts.
2. Explain the process of regular inspections of machine components and the procedures for checking, sharpening, and tightening as needed.
3. Describe the techniques and constraints involved in workspace management, including arranging and disposing of materials after the machining operation.
4. Explain the key constraints and criteria involved in performing quality checks and inspections on finished materials.
5. Discuss how to properly document production specs, quality control inspections, and adjustments.
6. Perform routine maintenance tasks on the routing machine, including cleaning, lubricating, and replacing worn parts.
7. Conduct regular inspections of the routing machine's components, checking for loose screws, belts, bearings, and taking appropriate actions.
8. Ensure the proper management of the workspace by arranging materials in an organized manner and disposing of waste materials.
9. Perform quality checks and inspections on finished materials, using the appropriate techniques and evaluation criteria.
10. Accurately record and maintain manufacturing specifications, quality control inspections, and modifications in the appropriate documentation.

Resources to be Used

Theory:

- Whiteboard/flipcharts
- Maintenance SOP (Standard Operating Procedure) manual
- Sample maintenance logs and QC documentation formats
- Photos or diagrams of routing machine parts
- PPE safety guide

Practical:

- Routing machine
- Tool kit (spanner, Allen key, lubrication oil, cleaning cloth)
- Dustbin or disposal bags
- Inspection tools (caliper, gauge, straight edge)
- Logbooks/inspection sheets

Say

- "Before and after routing operations, it's important to manage the worksite efficiently and ensure both the machine and work environment are safe and productive. In this session, we will learn how to perform routine maintenance, manage materials, and ensure product quality through inspection and documentation."

Ask

- "Have you ever seen a machine stop working suddenly? What do you think caused it?"
- "What happens when a workspace is full of leftover materials and dust?"
- "Why do you think checking the final product is important before packaging?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate

Break down the core content into easy-to-understand segments:

1. Routine Maintenance Tasks:

- Cleaning the routing machine after use (dust buildup can cause overheating or fire hazards).
- Lubrication of bearings and moving parts to ensure smooth operation.
- Replacing worn bits and belts on a schedule or as per wear indicators.

2. Regular Inspections:

- Check for loose screws, cracked parts, frayed wires, worn router bits.
- Demonstrate how to sharpen or replace router bits, tighten loose fixtures, and test run the machine.

3. Workspace Management:

- Keep tools organized, materials labeled and stacked properly.
- Remove sawdust, offcuts, and spills regularly.
- Dispose of waste as per safety and environmental guidelines.

4. Quality Checks:

- Use measuring tools to verify dimensions and surface finish.
- Check for burn marks, chipping, rough edges, and alignment errors.

5. Documentation:

- Use logbooks or QC checklists to record daily maintenance, inspection findings, and production changes.
- Discuss the importance of traceability and consistent records.

Activity**Worksite Management and QC Walkthrough**

- **Objective:** Trainees will practice daily maintenance, workspace cleaning, and quality checks under supervision.
- **Steps:**
 - ✓ **Machine Maintenance (15 min)**
 - Switch off and unplug the router.
 - Wipe down surfaces, apply lubrication, and replace any worn parts.
 - Check for tightness of fixtures and loose electrical connections.
 - ✓ **Workspace Cleaning (10 min)**
 - Organize leftover materials.
 - Clean the bench and dispose of waste.
 - Store tools safely.
 - ✓ **Quality Control Checks (15 min)**
 - Use measuring tools to evaluate finished pieces.
 - Check for dimensional accuracy and surface quality.
 - Document findings in QC logs.
 - ✓ **Documentation Task (10 min)**
 - Fill sample logbook entries for maintenance and quality check.

Do**Ask trainees to:**

- Trainees form small groups and rotate through maintenance, workspace cleaning, and QC tasks.
- Facilitator supervises each group and gives feedback on technique and documentation accuracy.

Say

- “Well-maintained machines and clean workspaces reduce errors and accidents. Proper inspections help you deliver quality products and keep the machines running longer. Let’s make this a habit after every routing operation.”

Notes for Facilitation

- Emphasize hands-on practice with actual tools and logs.
- Provide real examples of defective vs. well-machined parts.
- Encourage teamwork in cleaning and inspection.
- Ensure PPE is used during maintenance.
- Use roleplay or demonstration for documenting errors or changes in production settings.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

1. **Why is it important to prepare materials and workpieces properly before routing machine operation?**
Proper preparation ensures that the materials meet job specifications and quality standards, reducing errors, enhancing precision, and ensuring safety during the routing process.
2. **What are some constraints to consider when selecting tools and equipment for routing jobs?**
Constraints include material type, thickness, router bit compatibility, required finish quality, machine limitations, and safety requirements.
3. **How does proper alignment of job work using offcut materials enhance routing precision?**
It allows for accurate positioning and calibration, preventing misalignment and ensuring the dimensions and shapes are routed correctly.
4. **What are the key steps involved in setting up and calibrating a routing machine?**
Steps include securing the workpiece, selecting and installing the correct router bit, setting the depth and speed, calibrating the machine controls, and performing a trial run.
5. **Why is documentation and traceability crucial in routing operations?**
It ensures accountability, supports quality control, helps identify sources of defects, and allows for repeatability in production processes.

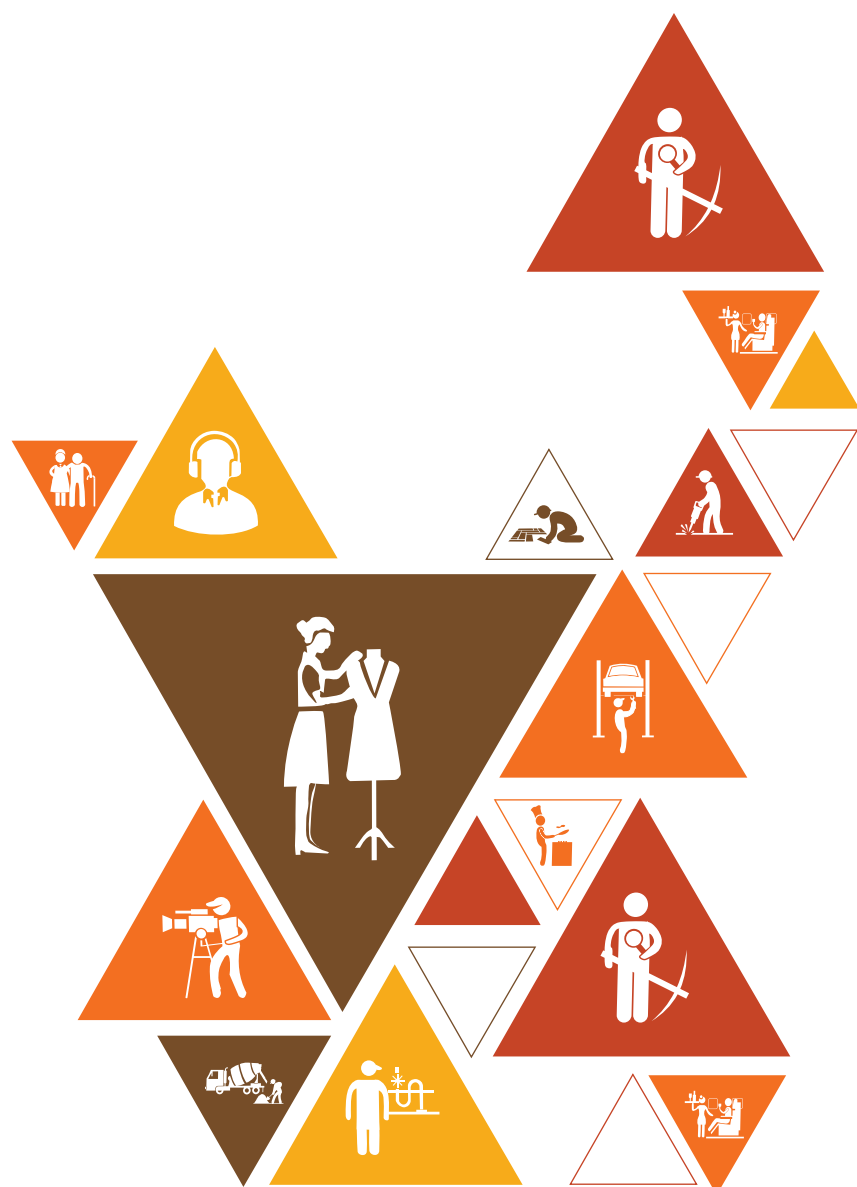
Fill in the Blanks:

1. Effective positioning of panel materials on the routing machine ensures precision.
2. Selecting the appropriate tools and equipment is essential for efficient routing operations.
3. Routine maintenance tasks help maintain the performance of a routing machine.
4. Conducting quality checks and inspections ensures the routed materials meet required standards.
5. Proper cleaning and waste disposal after routing operations contribute to a safe workspace.

True/False:

1. **False:** Proper alignment of job work using offcut materials is essential for routing accuracy.
2. **True:** Routine maintenance of a routing machine helps prevent operational failures.
3. **False:** Waste management is necessary in a production setup to ensure safety and efficiency.
4. **True:** Incorrect positioning and securing of materials can lead to routing defects.
5. **False:** Documentation is important for all routing operations, regardless of scale.

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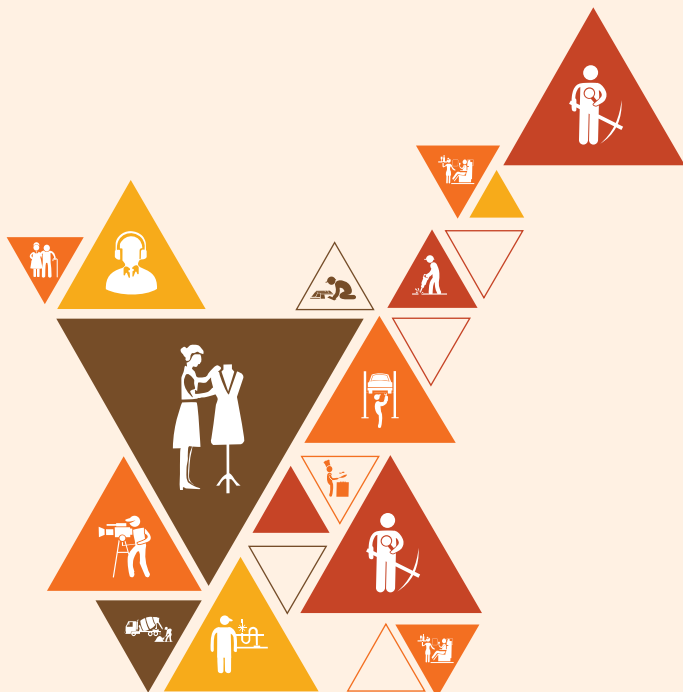
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19. Setup and Operate Veneer Cutting/Splicing Machines

Unit 19.1 – Setup Worksite for Veneer Cutting/Splicing Operation

Unit 19.2 – Veneer Cutting/Splicing Operation

Unit 19.3 – Worksite Management and Quality Control for Veneer Cutting/Splicing Operation



FFS/N1019

Key Learning Outcomes

At the end of this module, you will be able to:

1. Demonstrate proficiency in ensuring materials and workpieces are prepared appropriately for veneer cutting/splicing machine operation, meeting job specifications and quality standards.
2. List the constraints involved in identifying and selecting appropriate tools, equipment and adhesives or glue for job work.
3. Demonstrate the skills in setting up, configuring, and calibrating veneer cutting/splicing machines for various production requirements.
4. Demonstrate proficiency in performing loading and unloading of job work into the veneer cutting/splicing machine, ensuring proper alignment using offcut materials.
5. Prepare the veneer sheets in desired shape by marking and measurement of job work based on required specifications.
6. Demonstrate the steps involved in setting veneer cutting/splicing machine.
7. Operate and monitor the veneer cutting/splicing machines in accordance with standard operating procedures and safety guidelines.
8. Demonstrate proficiency in performing routine maintenance tasks on the veneer cutting and splicing machine.
9. Discuss the principles of organization and waste management after veneer cutting and splicing operation.
10. Illustrate the process of conducting quality checks and inspections on the cut/spliced veneer materials.
11. Ensure proper documentation and traceability of the processes.

UNIT 19.1: Setup Worksite for Veneer Cutting/Splicing Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the process of preparing materials and workpieces to meet job specifications and quality standards for veneer cutting and splicing operations.
2. Explain the criteria for selecting and usage of appropriate tools, adhesives, veneer materials
3. Describe the steps involved in setting up, configuring, and calibrating veneer cutting and splicing machines for different production requirements.
4. Prepare materials and workpieces appropriately for veneer cutting and splicing operation to meet job specifications and quality standards.
5. Select the appropriate tools, adhesives, and veneer materials for the veneer cutting and splicing operation.
6. Set up, configure, and calibrate the veneer cutting and splicing machine for various production requirements.

Resources to be Used

Theory:

- Training manual or presentation on veneer types, splicing methods, and cutting techniques
- SOPs (Standard Operating Procedures) for veneer cutting/splicing machines
- Sample quality standards and job specifications
- Tool and adhesive selection charts

Practical:

- Veneer cutting and splicing machine
- Variety of veneer sheets (different grain, thickness, wood types)
- Adhesives (hot melt, PVA, etc.)
- Measuring tools, clamps, cutting tools, cleaning supplies
- Sample job orders/specifications for practice

Say



- "Today, we will learn how to properly set up a worksite for veneer cutting and splicing operations. This is a foundational step that ensures the final product meets both aesthetic and technical standards. The accuracy of your setup and the quality of your materials directly impact the output."

Ask



- "Have you ever handled real wood veneer sheets before? What challenges did you face?"
- "Why do you think splicing veneer requires such precision?"
- "What could go wrong if the wrong adhesive or veneer type is selected?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

1. Preparing Materials and Workpieces

- Begin by identifying and inspecting veneer sheets. Trainees should check for defects such as cracks, knots, discoloration, and warping. Discuss how to condition veneer sheets by adjusting moisture levels and flattening curled edges if needed.
- Key Points:
 - ✓ Importance of uniform thickness and grain direction.
 - ✓ Methods for trimming and squaring edges before cutting/splicing.
 - ✓ Significance of selecting matching veneer sheets for grain continuity.

2. Selecting Tools, Adhesives, and Veneer Materials

- Introduce trainees to the types of veneer splicing machines and tools—manual vs. semi-automatic. Explain how to choose adhesives (e.g., PVA, hot melt, urea-formaldehyde) based on the type of veneer and application.
- Key Points:
 - ✓ Criteria for selecting adhesives (drying time, strength, compatibility).
 - ✓ Importance of using clean and sharp blades or cutters.
 - ✓ Safety gear and personal protective equipment (PPE) required.

3. Setting Up and Calibrating Veneer Cutting/Splicing Machine

- Guide trainees through the steps of configuring the machine based on veneer dimensions and required cut/splice type. Emphasize alignment, setting of guide fences, feed rollers, and temperature/pressure adjustments for adhesive bonding (if applicable).
- Key Points:
 - ✓ Ensuring correct machine alignment to avoid miscuts.
 - ✓ Setting parameters like cut width, feed rate, and heating time (if applicable).
 - ✓ Performing trial runs to test settings before production.

Activity-1



Veneer Inspection and Preparation

- **Objective:** To identify suitable veneer sheets for splicing and prepare them to job specifications.
- **Materials Needed:** Sample veneer sheets, measuring tools, trimming knife, sandpaper.
- **Instructions:**
 - ✓ Trainees will inspect a batch of veneer sheets for defects.
 - ✓ Select sheets with similar grain patterns and thickness.
 - ✓ Trim edges to ensure clean joints for splicing.
- **Expected Outcome:** Trainees can visually inspect and prepare veneers correctly for further processing.

Activity-2



Tool and Adhesive Selection

- **Objective:** To understand the criteria for selecting appropriate tools and adhesives for veneer splicing.
- **Materials Needed:** Tool catalogues, adhesive samples, veneer types, job cards.
- **Instructions:**
 - ✓ Review the job card detailing the veneer type and final product requirement.
 - ✓ Select a suitable adhesive and splicing method (manual or automatic).
 - ✓ Justify the choice to the trainer or peers.
- **Expected Outcome:** Trainees can make informed selections based on material properties and production requirements.

Activity-3



Machine Setup and Calibration

- **Objective:** To configure and calibrate the veneer cutting/splicing machine for production.
- **Materials Needed:** Veneer splicing machine, test veneers, adhesive (if applicable), PPE.
- **Instructions:**
 - ✓ Trainees will set up the machine as per provided specifications (thickness, width, cut angle).
 - ✓ Calibrate guides, set blade position, feed rate, and adhesive settings (if automatic).
 - ✓ Conduct a trial splice using test veneer and evaluate alignment and bond quality.
- **Expected Outcome:** Trainees demonstrate correct machine setup, safe operation, and identify errors in trial results for correction.

Do



Ask trainees to:

- Supervised Practice: Each trainee completes one setup cycle independently — choosing veneer, selecting tools, setting up the machine, and performing a test splice.
- Peer Review: Trainees inspect each other's work for alignment, adhesion quality, and accuracy.

Say



- "You've now experienced how critical it is to prepare the worksite before even beginning the cutting or splicing. In the next unit, we'll focus on actually performing the splicing operations and maintaining consistency throughout production. Remember, the success of those operations depends heavily on what you've just practiced today."

Notes for Facilitation



- Encourage trainees to compare different veneer sheets and discuss why some may be unsuitable.
- Keep safety protocols visible and reinforced, especially during machine demonstrations.
- Provide feedback at each step—especially during machine setup—to correct errors in alignment or calibration.
- Use real job specifications to make the task realistic.

This image shows a full page of a blank document with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page, providing a template for writing or drawing. There are no margins, text, or other markings present.

UNIT 19.2: Veneer Cutting/Splicing Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the importance of safely loading and positioning workpieces onto the machine table or holding fixtures, ensuring they are securely clamped or held in place.
2. Describe the process of machine initiation and guiding workpieces through the veneer cutting/splicing machine.
3. Explain the importance of measuring, marking out, and cutting veneers within specified tolerances to meet specifications.
4. Describe the process of jointing veneers using a veneer splicing machine, ensuring edges are correctly aligned with required tolerances and without distortion.
5. Explain the importance of preparing veneer sheets with the desired size, shape, and pattern by marking, tracing, cutting, and joining techniques.
6. Explain the importance of monitoring the veneer cutting/splicing operation periodically.
7. Safely load and position workpieces onto the machine table or holding fixtures, ensuring they are securely clamped or held in place for safe and stable veneer cutting/splicing operations.
8. Perform the machine initiation and guide the workpieces through the veneer cutting/splicing machine for efficient and accurate cutting/splicing operations.
9. Measure, mark out, and cut veneers within the specified tolerances using a veneer cutting machine to meet specifications accurately.
10. Operate veneer splicing machine for joining ends of veneers with required tolerances and without distortion
11. Prepare the veneer sheets with the desired size, shape, and pattern by marking, tracing, cutting, and joining the veneer sheets accurately.
12. Monitor the veneer cutting/splicing operation periodically to evaluate product quality and yield, making adjustments as necessary to ensure desired outcomes.

Resources to be Used

Theory:

- Whiteboard/Smartboard with markers
- Visual charts of veneer types, defects, and joint types
- SOPs for machine operation and safety

- Sample veneer cutting/splicing instruction manual
- PPE demonstration kit (gloves, goggles, apron)
- Multimedia video of real-life veneer operations

Practical:

- Veneer cutting machine (guillotine or rotary type)
- Veneer splicing machine (manual or automatic)
- Assorted veneer sheets (various grains and thickness)
- Measuring tools (tape measure, scale, marking gauge)
- Clamps, adhesives, glue brushes
- Waste collection bins
- Templates or pattern guides
- Job specification sheets

Say

- "Welcome! Today's session will take you through hands-on operations of veneer cutting and splicing—a key process in woodworking and panel furniture manufacturing. Since veneers are thin and delicate, accuracy and care are essential at every stage—from handling to jointing."

Ask

- "What kind of wood or panel surfaces do you think use veneers?"
- "What would happen if veneer sheets are not joined properly?"
- "Why do you think safety is especially important when handling thin materials and cutting equipment?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate



Break down the core content into easy-to-understand segments:

1. Safe Loading and Positioning

- Explain how veneer sheets must be laid flat, without bending or creasing, and fixed using clamps or fixtures. Emphasize the importance of using personal protective equipment (PPE) and following SOPs to avoid injury or material damage.

2. Machine Initiation and Guiding Workpieces

- Explain how to start the machine safely, check calibration, and guide veneer manually or via automated rollers. Trainees should understand speed control and pressure settings.

3. Measuring, Marking, and Cutting

- Discuss the steps of:
 - ✓ Reading job specs
 - ✓ Measuring accurately using scales/tape
 - ✓ Marking the veneer
 - ✓ Cutting along precise lines using cutting machines
 Highlight tolerance levels (± 1 mm) and grain matching.

4. Splicing and Jointing

- Describe methods for edge alignment, glue application, and joining under pressure. Discuss common jointing errors (gaps, overlaps, misalignment).

5. Pattern Preparation

- Explain techniques like book-matching and slip-matching. Discuss how to trace, mark, and cut for visual symmetry and pattern flow.

6. Monitoring Operations

- Highlight the importance of periodic checks for joint strength, alignment, surface smoothness, and glue setting.

Activity-1



Load and Secure Veneer Sheets

- **Objective:** To safely position veneer sheets on the machine table.
- **Instructions:**
 - ✓ Select a sheet and align it on the machine bed.

- ✓ Secure it with clamps without bending the edges.
- ✓ Check for flatness and grain alignment.
- **Resources Required:**
 - ✓ Veneer sheets
 - ✓ Clamps
 - ✓ Worktable
 - ✓ PPE (gloves, goggles)
- **Expected Outcome:** Sheets are secured without damage, and correctly aligned for cutting.

Activity-2



Measure, Mark, and Cut Veneers

- **Objective:** To measure and cut veneer sheets as per specifications.
- **Instructions:**
 - ✓ Read the job sheet dimensions.
 - ✓ Use a measuring scale and pencil to mark the cut lines.
 - ✓ Cut the veneer using the veneer cutting machine.
 - ✓ Inspect cut edges for accuracy and defects.
- **Resources Required:**
 - ✓ Measuring tools (scale, ruler)
 - ✓ Marking pencil
 - ✓ Veneer cutting machine
 - ✓ Sample job specs
- **Expected Outcome:** Veneer pieces cut to dimension with clean, accurate edges.

Activity-3



Splice Veneers Using the Machine

- **Objective:** To join two veneer edges accurately using a splicing machine.
- **Instructions:**
 - ✓ Apply adhesive to the edge.

- ✓ Align the edges correctly.
- ✓ Pass through the splicing machine or apply pressure clamps.
- ✓ Wipe off excess glue.
- **Resources Required:**
 - ✓ Veneer splicing machine
 - ✓ Adhesive and glue brush
 - ✓ Clamps (if manual method used)
 - ✓ Cleaning cloth
- **Expected Outcome:** Neat, distortion-free spliced joints with proper alignment.

Activity-4



Pattern Preparation and Monitoring

- **Objective:** To prepare decorative veneer sheets and inspect quality.
- **Instructions:**
 - ✓ Choose and trace a pattern (book match or slip match).
 - ✓ Cut and arrange veneers accordingly.
 - ✓ Check symmetry and adhesion.
 - ✓ Record observations and improvements.
- **Resources Required:**
 - ✓ Pattern templates
 - ✓ Veneer sheets
 - ✓ Measuring and cutting tools
 - ✓ Job inspection checklist
- **Expected Outcome:** Patterned veneers accurately prepared with quality inspection feedback recorded.

Do**Ask trainees to:**

- Supervised Practice: Each trainee completes one setup cycle independently — choosing veneer, selecting tools, setting up the machine, and performing a test splice.
- Peer Review: Trainees inspect each other's work for alignment, adhesion quality, and accuracy.

Say

- You've now practiced essential steps in veneer cutting and splicing—from safe handling to precision cutting and pattern matching. These are foundational to producing high-quality veneered products. Remember, precision and consistency are key—practice and attention to detail make all the difference.”

Notes for Facilitation

- Ensure proper supervision during machine use.
- Use demonstration videos or samples for better visualization.
- Encourage peer feedback during activities.
- Maintain a safety-first environment—PPE must be worn at all times.
- Use real-world examples (e.g., furniture or plywood manufacturing) to contextualize the training.

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UNIT 19.3: Worksite Management and Quality Control for Veneer Cutting/Splicing Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the key constraints involved in routine maintenance tasks for veneer cutting and splicing machines, such as cleaning, lubricating, and replacing worn parts.
2. Explain the process of regular inspections of machine components and the procedures for checking, sharpening, and tightening as needed.
3. Describe the techniques and constraints involved in workspace management, including arranging and disposing of materials after the machining operation.
4. Explain the key constraints and criteria involved in performing quality checks and inspections on finished materials.
5. Discuss how to properly document production specs, quality control inspections, and adjustments.
6. Perform routine maintenance tasks on the veneer cutting and splicing machine, including cleaning, lubricating, and replacing worn parts.
7. Conduct regular inspections of the veneer cutting and splicing machine's components, checking for loose screws, belts, bearings, and taking appropriate actions.
8. Ensure the proper management of the workspace by arranging materials in an organized manner and disposing of waste materials.
9. Perform quality checks and inspections on finished materials, using the appropriate techniques and evaluation criteria.
10. Accurately record and maintain manufacturing specifications, quality control inspections, and modifications in the appropriate documentation.

Resources to be Used

Theory:

- SOP for machine maintenance and workspace safety
- Visual aids showing machine components (blades, belts, bearings)
- Quality check guidelines and checklists
- Samples of documentation logs/forms
- Whiteboard/Smartboard for explanations
- Maintenance schedule templates

Practical:

- Veneer cutting and splicing machines
- Maintenance tools (oil, brush, screwdrivers, wrenches)
- Sample worn-out parts (blades, belts)
- PPE (gloves, goggles, apron)
- Material storage bins and waste disposal setup
- Quality inspection tools (scale, caliper, magnifying glass)
- Maintenance and inspection logbooks

Say

- "Welcome! Today we'll dive into how we maintain our worksite and machines to ensure high-quality outputs and safe working conditions. Quality doesn't just depend on operation—it depends on everything behind the scenes: from workspace setup to timely maintenance and inspections."

Ask

- "What do you think happens if we skip regular maintenance for the veneer cutting machine?"
- "Why is workspace cleanliness important even if we're done with the job?"
- "Have you ever noticed small faults in finished woodwork that were due to dull tools or machine issues?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate

Break down the core content into easy-to-understand segments:

1. Routine Maintenance Tasks

- Explain how:
 - ✓ Daily cleaning prevents dust buildup.
 - ✓ Lubrication reduces friction and extends tool life.
 - ✓ Worn-out parts like blades, belts, and bearings must be replaced regularly. Highlight safety while handling sharp parts or using tools.

2. Machine Inspections

- Elaborate the importance of:
 - ✓ Checking screw tightness and belt tension.
 - ✓ Observing vibration or noise during operation.
 - ✓ Identifying wear patterns or cracks in components. Show how to use an inspection checklist.

3. Workspace Management

- Explain:
 - ✓ Importance of clear pathways and organized tools/materials.
 - ✓ Storing usable offcuts, and discarding unusable waste safely.
 - ✓ Using proper bins and following eco-friendly disposal norms.

4. Quality Inspection

- Teach:
 - ✓ How to check veneer joints for gaps, misalignment, and glue marks.
 - ✓ Measurement accuracy using scale/calipers.
 - ✓ Surface smoothness, symmetry, and edge quality.

5. Documentation

- Show:
 - ✓ How to maintain daily logbooks for machine maintenance and inspection.
 - ✓ Recording quality checks, production details, and any deviations or rework done.
 - ✓ The role of traceability in defect identification and process improvement.

Activity-1

Perform Routine Maintenance on Machine

- **Objective:** To clean, lubricate, and inspect key components of the machine.
- **Instructions:**
 - ✓ Power down the machine.
 - ✓ Clean the surfaces using a brush and cloth.
 - ✓ Apply lubricant to moving parts.
 - ✓ Identify any worn or loose parts.

- **Resources Required:**
 - ✓ Maintenance tools (oil can, brush, spanner)
 - ✓ PPE kit
 - ✓ Machine manual
 - ✓ Cleaning materials
- **Expected Outcome:** Machine is clean, lubricated, and ready for smooth operation.

Activity-2



Conduct Machine Inspection

- **Objective:** To inspect belts, bearings, screws, and blades for faults.
- **Instructions:**
 - ✓ Use a checklist to inspect each component.
 - ✓ Check belt tension and blade sharpness.
 - ✓ Report and record any issues found.
- **Resources Required:**
 - ✓ Inspection checklist
 - ✓ Screwdriver, belt tester, feeler gauge
 - ✓ Maintenance logbook
- **Expected Outcome:** All machine parts inspected and report updated in logbook.

Activity-3



Manage and Clean Worksite

- **Objective:** To organize materials and dispose of waste after operation.
- **Instructions:**
 - ✓ Arrange tools and unused veneers properly.
 - ✓ Collect and dispose of wood shavings and glue waste.
 - ✓ Sweep and clean the work area.

- **Resources Required:**
 - ✓ Storage racks, disposal bins
 - ✓ Cleaning broom, cloth, gloves
- **Expected Outcome:** Workspace is clean, organized, and safe for next operation.

Activity-4



Perform Quality Checks on Finished Materials

- **Objective:** To evaluate finished veneers for quality and tolerance.
- **Instructions:**
 - ✓ Measure dimensions and joint gaps.
 - ✓ Check for defects: glue smears, misalignment, surface flaws.
 - ✓ Record findings in the quality control checklist.
- **Resources Required:**
 - ✓ Caliper, scale
 - ✓ Quality control checklist
 - ✓ Veneer samples
- **Expected Outcome:** Defect-free, well-finished veneers identified and recorded properly.

Activity-5



Documentation and Reporting

- **Objective:** To maintain logs for inspection, maintenance, and quality control.
- **Instructions:**
 - ✓ Fill entries in maintenance log after service.
 - ✓ Document QC findings with product specs.
 - ✓ Note any adjustments or corrective actions.
- **Resources Required:**
 - ✓ Logbooks or forms
 - ✓ Sample job report
 - ✓ Pens and markers
- **Expected Outcome:** Clear documentation available for future reference and audits.

Do**Ask trainees to:**

- Supervised Practice: Each trainee completes one setup cycle independently — maintenance of the machine, and performing a test splice.
- Peer Review: Trainees inspect each other's work for alignment, quality, and accuracy.

Say

- "Worksite management and machine care might not seem glamorous—but they are the foundation of quality production. Every step you take to maintain your space and tools reflects in the end product. Remember—clean, maintain, inspect, and document!"

Notes for Facilitation

- Demonstrate First: Before asking trainees to carry out machine maintenance or inspections, do a live demo. Emphasize safety steps like switching off power, wearing gloves, and using the right tools.
- Use Real-Life Examples: Share real or hypothetical stories of how poor maintenance or workspace negligence led to defects, machine damage, or even injuries. This helps reinforce the relevance.
- Encourage Peer Observation: During practical activities, ask trainees to observe each other and provide feedback based on checklists. This builds awareness and responsibility.
- Highlight Traceability: Emphasize why documentation matters—not just as paperwork, but as a way to trace and fix production issues, especially in case of customer complaints or audits.
- Keep Checklists Visible: Place laminated maintenance and quality checklists near machines and on workbenches. Repetition builds habit.
- Be Inclusive: Ensure that everyone gets a turn at hands-on activities like inspection, lubrication, and documentation. Rotate responsibilities if needed.
- Link to Industry Practices: Explain how such maintenance and quality routines are standard in factories and often tied to ISO or quality certification processes.
- Use Visual Aids: Display photos or diagrams of worn-out machine parts, incorrect vs. correct veneer joints, and well-organized vs. cluttered workspaces.
- Reinforce Clean-as-you-go: Encourage “clean as you go” culture to prevent end-of-shift rush cleaning and maintain safety throughout operations.
- Review Documentation Together: Show sample logbooks and entries on screen or chart paper. Let trainees practice mock documentation to reduce hesitation later.

Exercise



Key Solutions to PHB Exercise:

Short Answer Questions:

- 1. Why is it important to prepare materials and workpieces properly before veneer cutting/splicing?**
Proper preparation ensures that the veneer sheets are clean, flat, and correctly sized, which is essential for achieving accurate cuts, proper alignment, and high-quality joints without defects.
- 2. What constraints should be considered when selecting tools, equipment, and adhesives for veneer cutting/splicing?**
Considerations include the type and thickness of veneer, required finish, compatibility of adhesive with materials, machine capacity, cutting angle, and safety requirements.
- 3. How does proper alignment of job work using offcut materials improve the veneer cutting/splicing process?**
Using offcuts helps align the veneer accurately on the machine, prevents wastage, ensures uniformity in joints, and helps in setting up the machine for precision splicing.
- 4. What are the key steps involved in setting up and calibrating a veneer cutting/splicing machine?**
Key steps include checking machine condition, selecting appropriate cutting tools and settings, adjusting the machine table and pressure rollers, testing on scrap pieces, and calibrating speed, pressure, and alignment.
- 5. Why is documentation and traceability important in veneer cutting and splicing operations?**
It helps in tracking production details, identifying errors or defects, maintaining consistency, meeting quality standards, and ensuring accountability during audits or customer queries.

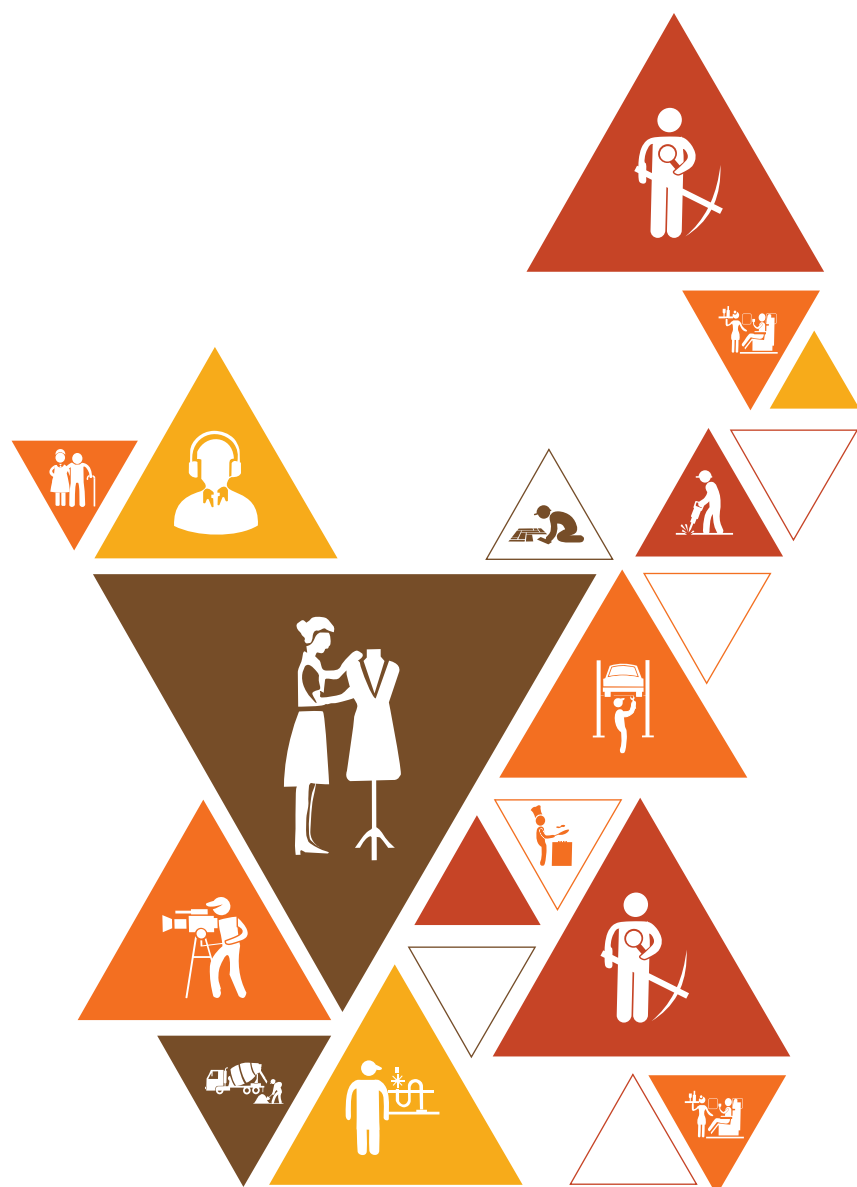
Fill in the Blanks:

1. Proper preparation of veneer sheets is essential before starting the cutting/splicing process.
2. Selecting the appropriate tools and adhesives ensures high-quality veneer splicing.
3. Routine maintenance of veneer cutting/splicing machines helps maintain efficiency.
4. Conducting quality checks ensures that the spliced veneer meets job specifications.
5. Effective workspace organization and waste management contribute to a safer and more organized workspace.

True/False:

- 1. False:** Proper alignment using offcut materials is essential for precision and quality.
- 2. True:** Routine maintenance prevents breakdowns and ensures smooth operations.
- 3. False:** Waste management is crucial to maintain safety and cleanliness.
- 4. True:** Incorrect positioning can cause defects and poor-quality output.
- 5. False:** Documentation is important even for small-scale operations to ensure quality and traceability.

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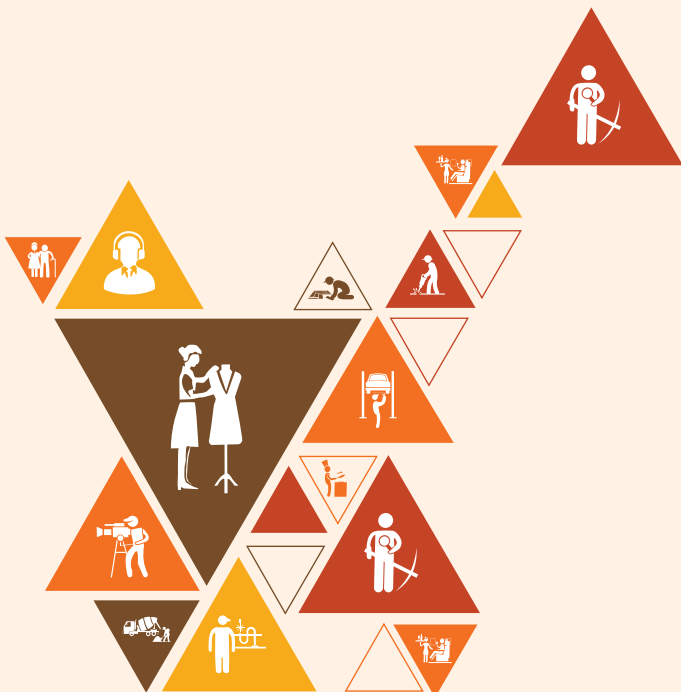
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20. Setup and Operate Panelworks CNC Machines

Unit 20.1 – Setup Worksite for Panelworks CNC Operation

Unit 20.2 – CNC Programming and Machining Operation

Unit 20.3 – Worksite Management and Quality Control for Panelworks
CNC Operation



FFS/N1020

Key Learning Outcomes

At the end of this module, you will be able to:

1. Demonstrate proficiency in ensuring materials and workpieces are prepared appropriately for panelworks CNC machine operation, meeting job specifications and quality standards.
2. List the constraints involved in identifying and selecting appropriate tools, and equipment for job work.
3. Demonstrate the skills in setting up, configuring, and calibrating panelworks CNC machines for various production requirements.
4. Demonstrate proficiency in performing routine maintenance tasks on the panelworks CNC cutting and splicing machine.
5. Discuss the importance of effective positioning and securing panel materials on the machine.
6. Demonstrate skills in measuring and marking the job work based on CNC machining requirements.
7. Assist and monitor the processing of panelworks CNC machines in accordance with standard operating procedures and safety guidelines
8. Demonstrate proficiency in performing routine maintenance tasks on the panelworks CNC machine.
9. Discuss the principles of organization and waste management after CNC operation.
10. Illustrate the process of conducting quality checks and inspections on the CNC machined materials.
11. Ensure proper documentation and traceability of the processes.

UNIT 20.1: Setup Worksite for Panelworks CNC Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the importance of proper stacking and storage of materials and workpieces for panelworks CNC machine.
2. List the key constraints involved in checking the quality of job work received for panelworks CNC machine operation.
3. Explain the process of configuring the CNC program to align with task requirements to achieve desired results.
4. Describe various parameters relating to the adjustment of machine settings and performing necessary modifications to meet job requirements.
5. Explain the factors contributing to the final adjustments to CNC programs and equipment to meet task requirements.
6. Perform stacking and storage of materials and workpieces following the specified procedures and guidelines.
7. Employ appropriate quality standards and techniques to assess the quality of job work received for panelworks CNC operation.
8. Configure the CNC program, as instructed by the operator, to align with the task requirements following the specified procedures and guidelines.
9. Adjust machine settings and perform necessary modifications based on job requirements and instructions provided by the machine and tool manufacturers.
10. Make final adjustments to CNC programs and equipment according to the task requirements, as instructed by the operator.

Resources to be Used

Theory:

- Training manual or presentation on veneer types, splicing methods, and cutting techniques
- SOPs (Standard Operating Procedures) for veneer cutting/splicing machines
- Sample quality standards and job specifications
- Tool and adhesive selection charts

Practical:

- Veneer cutting and splicing machine
- Variety of veneer sheets (different grain, thickness, wood types)
- Adhesives (hot melt, PVA, etc.)
- Measuring tools, clamps, cutting tools, cleaning supplies
- Sample job orders/specifications for practice

Say

- "Today, we will learn how to properly set up a worksite for veneer cutting and splicing operations. This is a foundational step that ensures the final product meets both aesthetic and technical standards. The accuracy of your setup and the quality of your materials directly impact the output."

Ask

- "Have you ever handled real wood veneer sheets before? What challenges did you face?"
- "Why do you think splicing veneer requires such precision?"
- "What could go wrong if the wrong adhesive or veneer type is selected?"

Please feel free to share your experiences with the group. I'll be noting down your ideas on the whiteboard.

Elaborate

Break down the core content into easy-to-understand segments:

1. Preparing Materials and Workpieces

- Begin by identifying and inspecting veneer sheets. Trainees should check for defects such as cracks, knots, discoloration, and warping. Discuss how to condition veneer sheets by adjusting moisture levels and flattening curled edges if needed.
- Key Points:
 - ✓ Importance of uniform thickness and grain direction.
 - ✓ Methods for trimming and squaring edges before cutting/splicing.
 - ✓ Significance of selecting matching veneer sheets for grain continuity.

2. Selecting Tools, Adhesives, and Veneer Materials

- Introduce trainees to the types of veneer splicing machines and tools—manual vs. semi-automatic. Explain how to choose adhesives (e.g., PVA, hot melt, urea-formaldehyde) based on the type of veneer and application.
- Key Points:
 - ✓ Criteria for selecting adhesives (drying time, strength, compatibility).
 - ✓ Importance of using clean and sharp blades or cutters.
 - ✓ Safety gear and personal protective equipment (PPE) required.

3. Setting Up and Calibrating Veneer Cutting/Splicing Machine

- Guide trainees through the steps of configuring the machine based on veneer dimensions and required cut/splice type. Emphasize alignment, setting of guide fences, feed rollers, and temperature/pressure adjustments for adhesive bonding (if applicable).
- Key Points:
 - ✓ Ensuring correct machine alignment to avoid miscuts.
 - ✓ Setting parameters like cut width, feed rate, and heating time (if applicable).
 - ✓ Performing trial runs to test settings before production.

Activity-1

Veneer Inspection and Preparation

- **Objective:** To identify suitable veneer sheets for splicing and prepare them to job specifications.
- **Materials Needed:** Sample veneer sheets, measuring tools, trimming knife, sandpaper.
- **Instructions:**
 - ✓ Trainees will inspect a batch of veneer sheets for defects.
 - ✓ Select sheets with similar grain patterns and thickness.
 - ✓ Trim edges to ensure clean joints for splicing.
- **Expected Outcome:** Trainees can visually inspect and prepare veneers correctly for further processing.

Activity-2



Tool and Adhesive Selection

- **Objective:** To understand the criteria for selecting appropriate tools and adhesives for veneer splicing.
- **Materials Needed:** Tool catalogues, adhesive samples, veneer types, job cards.
- **Instructions:**
 - ✓ Review the job card detailing the veneer type and final product requirement.
 - ✓ Select a suitable adhesive and splicing method (manual or automatic).
 - ✓ Justify the choice to the trainer or peers.
- **Expected Outcome:** Trainees can make informed selections based on material properties and production requirements.

Activity-3



Machine Setup and Calibration

- **Objective:** To configure and calibrate the veneer cutting/splicing machine for production.
- **Materials Needed:** Veneer splicing machine, test veneers, adhesive (if applicable), PPE.
- **Instructions:**
 - ✓ Trainees will set up the machine as per provided specifications (thickness, width, cut angle).
 - ✓ Calibrate guides, set blade position, feed rate, and adhesive settings (if automatic).
 - ✓ Conduct a trial splice using test veneer and evaluate alignment and bond quality.
- **Expected Outcome:** Trainees demonstrate correct machine setup, safe operation, and identify errors in trial results for correction.

Do



Ask trainees to:

- Supervised Practice: Each trainee completes one setup cycle independently — choosing veneer, selecting tools, setting up the machine, and performing a test splice.
- Peer Review: Trainees inspect each other's work for alignment, adhesion quality, and accuracy.

Say

- “You've now experienced how critical it is to prepare the worksite before even beginning the cutting or splicing. In the next unit, we'll focus on actually performing the splicing operations and maintaining consistency throughout production. Remember, the success of those operations depends heavily on what you've just practiced today.”

Notes for Facilitation

- Encourage trainees to compare different veneer sheets and discuss why some may be unsuitable.
- Keep safety protocols visible and reinforced, especially during machine demonstrations.
- Provide feedback at each step—especially during machine setup—to correct errors in alignment or calibration.
- Use real job specifications to make the task realistic.

[illegible]

UNIT 20.2: CNC Programming and Machining Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the process of proper loading and unloading techniques for safe and efficient machine operations.
2. List various methods for positioning and securing materials on panelworks CNC machines, utilizing clamps, jigs, or other appropriate methods.
3. Describe the importance of measurement and marking for panelworks CNC operations.
4. Describe the importance of operating the machine within its designated capacity, intended purpose, and manufacturer's recommendations.
5. Explain the importance of actively monitoring machine operations to ensure quality and identify any irregularities or defects.
6. Support the machine operator in loading and unloading workpieces onto and off the machine table or holding fixtures.
7. Employ appropriate methods in positioning and securing of materials on panelworks CNC machines.
8. Assist in performing accurate measurement and marking on-the-job work for panelworks CNC operations, applying the principles and techniques discussed.
9. Operate the Panelworks CNC machine within its designated capacity, intended purpose, and the manufacturer's recommendations.
10. Assist in monitoring machine operations, actively looking for irregularities or defects, and promptly communicating them to the machine operator.

Resources to be Used

Theory:

- CNC operation training manual or presentation
- Machine manufacturer's operating and safety guidelines
- SOPs for material loading, measurement, and monitoring
- Job cards/work orders with design specifications
- Diagrams showing CNC positioning systems and tool paths

Practical:

- Panelworks CNC machine
- Sample workpieces (MDF, plywood, etc.)

- Measuring tools (tape, calipers, angle rulers)
- Clamps, jigs, vises
- PPE (gloves, goggles, ear protection)
- Marking tools (pencils, chalks, scribes)
- Defect reference charts

Say



- "Today, we're stepping into the world of CNC operations in panelworks production. From setting materials correctly to monitoring precision cuts, every step counts. If we follow procedures well, we avoid errors, improve safety, and ensure quality in every finished piece."

Ask



- "Have any of you worked with or observed a CNC machine in operation before?"
- "What could happen if a material isn't secured properly on a CNC bed?"
- "Why do you think it's important to follow the manufacturer's operating limits strictly?"

Encourage students to share experiences or concerns they've seen in machine operations.

Elaborate



1. Material Loading and Unloading

- Demonstrate how to safely and efficiently load and unload workpieces.
- Discuss balance, placement, and clearance.
- **Key Points:**
 - ✓ Always power down before handling.
 - ✓ Maintain ergonomic posture to avoid injury.
 - ✓ Check for obstructions and ensure secure footing.

2. Positioning and Securing Materials

- Show how clamps, jigs, and fixtures hold materials firmly.
- Explain importance of material alignment and flatness.

- **Key Points:**

- ✓ Prevents shifting during machining.
- ✓ Accurate clamping = precise output.
- ✓ Check tightness of fixtures before starting.

3. Measurement and Marking

- Teach measuring methods before machining begins.
- Use calipers, rulers, and markers based on the job order.
- **Key Points:**
 - ✓ Proper reference points ensure precision.
 - ✓ Double-checking reduces scrap.
 - ✓ Marking helps validate placement before cutting.

4. Machine Capacity and Safe Operations

- Discuss how exceeding capacity can damage the machine or material.
- Emphasize following technical specs from manufacturers.
- **Key Points:**
 - ✓ Know the cutting limits (depth, speed, load).
 - ✓ Use only compatible materials.
 - ✓ Keep machine logs updated.

5. Monitoring Machine Operations

- Introduce methods to observe, listen, and respond to machine behavior.
- Teach how to identify tool wear, misalignment, or abnormal sounds.
- **Key Points:**
 - ✓ Early detection = fewer defects.
 - ✓ Communicate with senior operators immediately.
 - ✓ Use inspection charts to identify visual defects.

Activity-1



Safe Loading and Positioning

- **Objective:** Practice loading a panel onto the CNC bed safely and accurately.
- **Materials Needed:** Panel sheet, clamps, CNC bed
- **Instructions:**
 - ✓ Load the panel using proper lifting techniques.
 - ✓ Position the panel according to machine zero point.
 - ✓ Secure with clamps without over-tightening.
- **Expected Outcome:** Trainees handle material safely and align it properly for machining.

Activity-2



Measurement and Marking Practice

- **Objective:** Perform accurate measurements and markings per a sample job card.
- **Materials Needed:** Measuring tape, pencil/scribe, sample panel
- **Instructions:**
 - ✓ Read job card and identify required dimensions.
 - ✓ Measure and mark on the panel accordingly.
- **Expected Outcome:** Trainees mark reference points correctly and justify measurements.

Activity-3



Machine Operation and Monitoring

- **Objective:** Simulate or observe a CNC machine operation and note observations.
- **Materials Needed:** Running CNC machine, observation sheet
- **Instructions:**
 - ✓ Watch the CNC process and look for any irregularities (vibrations, tool marks, noise).
 - ✓ Record observations and discuss with instructor.
- **Expected Outcome:** Trainees demonstrate awareness of machine performance and recognize basic defects.

Do**Ask trainees to:**

- Load a material onto the CNC machine bed under supervision.
- Measure and mark based on a sample job card.
- Observe a machine cycle and report back one defect or concern they noted.

Say

- "You now understand that proper preparation, measurement, and safe handling form the backbone of successful CNC operations. In the next session, we'll explore how to input CNC programs and interpret G-code for controlling machine movements. Every good result begins with a good setup."

Notes for Facilitation

- Emphasize safe handling, especially with large panels.
- Allow each trainee to load/unload a piece at least once.
- Encourage questioning during machine monitoring – even 'small' changes matter.
- Relate activities to real production outcomes (e.g., what happens to quality or cost when errors occur).

[illegible]

UNIT 20.3: Worksite Management and Quality Control for Panelworks CNC Operation

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the specific cleaning procedures for the panelworks CNC machine and its components, ensuring proper maintenance.
2. Describe the principles of organizing and managing the workspace for panels storage and waste disposal procedures.
3. Explain the key constraints and criteria involved in performing quality checks and inspections on finished materials.
4. Discuss how to properly document production specs, quality control inspections, and adjustments.
5. Assist the operator in cleaning and maintaining the panelworks CNC machine and its parts.
6. Organize and manage the workspace effectively, implementing proper storage techniques for panels and adhering to waste disposal procedures.
7. Perform quality checks and inspections on finished materials, using the appropriate techniques and evaluation criteria.
8. Accurately record and maintain manufacturing specifications, quality control inspections, and modifications in the appropriate documentation.

Resources to be Used

Theory:

- Cleaning and maintenance manual for CNC machines
- Workplace organization and 5S system guidelines
- Quality control standards and inspection checklists
- Sample documentation formats (production log, inspection sheets)
- Waste disposal SOPs

Practical:

- Panelworks CNC machine
- Cleaning equipment (brushes, vacuum, air blower, cloths)
- Lubricants, oil cans, dust masks
- Quality tools (straight edges, measuring tape, gauges)

- Sample defect reference panels
- Logbook or software for QC records
- Panel storage racks and waste bins

Say



- "Clean machine, clean results! Today we focus on maintaining your CNC machine and workspace — the key to high-quality panel production. You'll also learn how to inspect output and document findings like a pro."

Ask



- "Why do you think it's important to clean CNC machines regularly?"
- "What problems could arise from poor organization or panel storage?"
- "How can proper documentation help in future troubleshooting or rework?"

Encourage learners to share their views on how clean, organized work affects safety and product quality.

Elaborate



1. CNC Machine Cleaning and Maintenance

- Demonstrate cleaning of the spindle, bed, vents, and debris collection trays.
- Explain lubricating moving parts as per the schedule.
- **Key Points:**
 - ✓ Prevent dust buildup and overheating.
 - ✓ Use non-abrasive materials.
 - ✓ Follow lock-out/tag-out procedures before cleaning.

2. Worksite Organization and Waste Disposal

- Show how panels should be stacked, labeled, and protected from moisture or bending.
- Demonstrate segregation of panel waste, dust, and offcuts.
- **Key Points:**
 - ✓ Use vertical racks or horizontal padding.
 - ✓ Avoid mixing usable and unusable scraps.
 - ✓ Keep aisles and CNC surroundings clear.

3. Quality Control and Inspection Criteria

- Present common defects (chipping, dimension errors, surface marks).
- Teach visual checks, tactile inspection, and dimensional verification.
- **Key Points:**
 - ✓ Compare with job specifications.
 - ✓ Mark defective pieces clearly and document.
 - ✓ Use go/no-go gauges when applicable.

4. Documentation and Record Keeping

- Review how to complete a quality control inspection sheet.
- Walk through a sample log entry for rework or deviation.
- **Key Points:**
 - ✓ Record time, operator, machine ID, shift, issue noted, corrective action.
 - ✓ Keep logs organized chronologically or batch-wise.
 - ✓ Use checklists for consistency.

Activity-1

CNC Machine Cleaning Drill

- **Objective:** Practice cleaning major components of the CNC machine under supervision.
- **Materials Needed:** Brushes, vacuum, dust masks, lubricants
- **Instructions:**
 - ✓ Identify key parts needing daily and weekly cleaning.
 - ✓ Follow procedure to clean and re-lubricate as needed.
- **Expected Outcome:** Trainees clean machine effectively and understand its maintenance needs.

Activity-2

Workspace Management Simulation

- **Objective:** Organize raw panel storage and waste bins for a simulated workstation.
- **Materials Needed:** Panels (raw & cut), racks, bins, labels

- **Instructions:**
 - ✓ Stack panels according to size/type.
 - ✓ Label usable offcuts.
 - ✓ Separate and place waste in correct bins.
- **Expected Outcome:** A clean, logical setup for storing materials and managing waste.

Activity-3



Quality Inspection and Reporting

- **Objective:** Perform a mock quality check on a finished panel.
- **Materials Needed:** Sample finished panels (some defective), measuring tools, defect checklist, report sheet
- **Instructions:**
 - ✓ Compare actual panel to job order specs.
 - ✓ Identify any visual or dimensional defects.
 - ✓ Record findings and actions in the report.

Expected Outcome: Trainees perform inspection using defined criteria and fill out documentation accurately

Do



Ask trainees to:

- Participate in cleaning a CNC machine and explain what was done and why.
- Organize panel storage in a mock layout and demonstrate waste segregation.
- Inspect a completed panel, identify issues, and record it using the inspection format.

Say



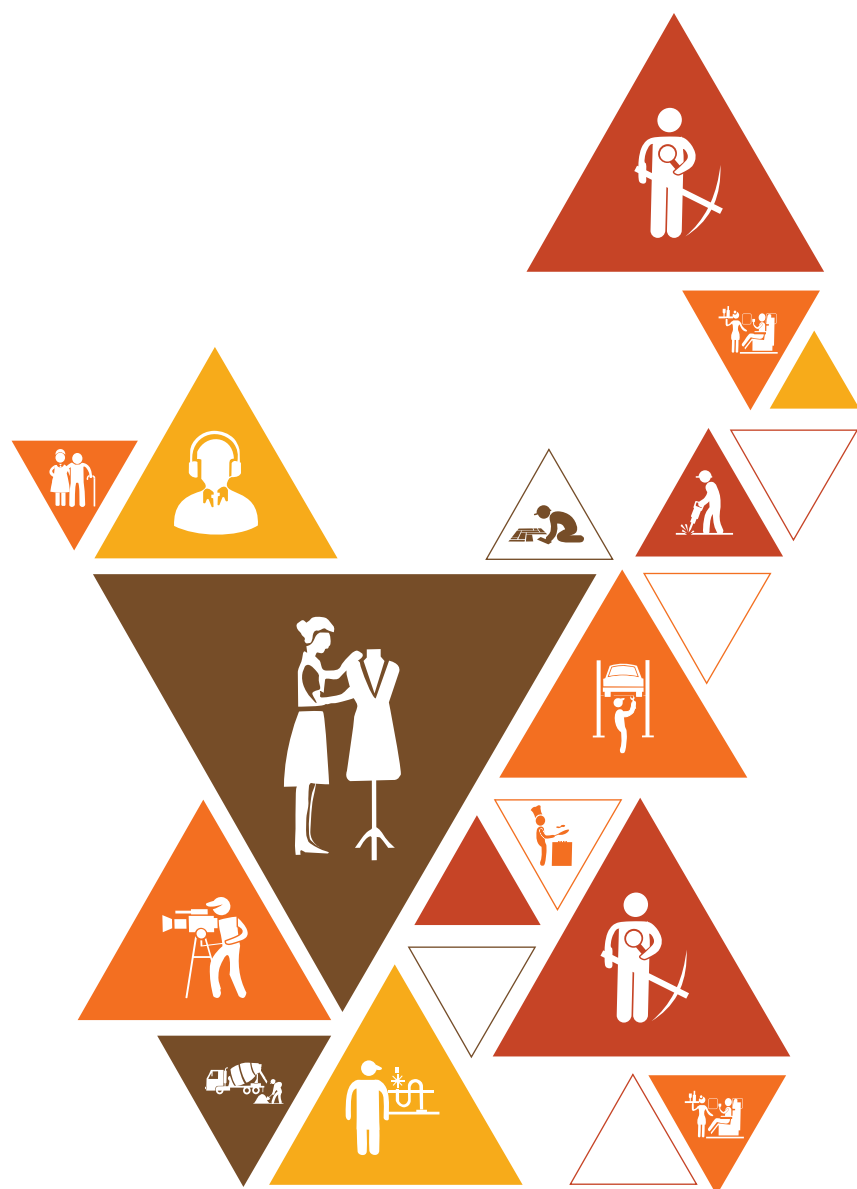
- "You've just practiced some of the most critical habits in precision manufacturing — cleaning, organizing, inspecting, and documenting. These habits ensure both safety and product consistency, making you an asset in any CNC operation."

Notes for Facilitation



- Use real-life dirty/dusty parts for cleaning practice where safe.
- Emphasize PPE usage during maintenance activities.
- Encourage students to design their own QC checklist.
- Consider evaluating trainees' inspection accuracy by using both correct and intentionally defective sample panels.

[illegible]



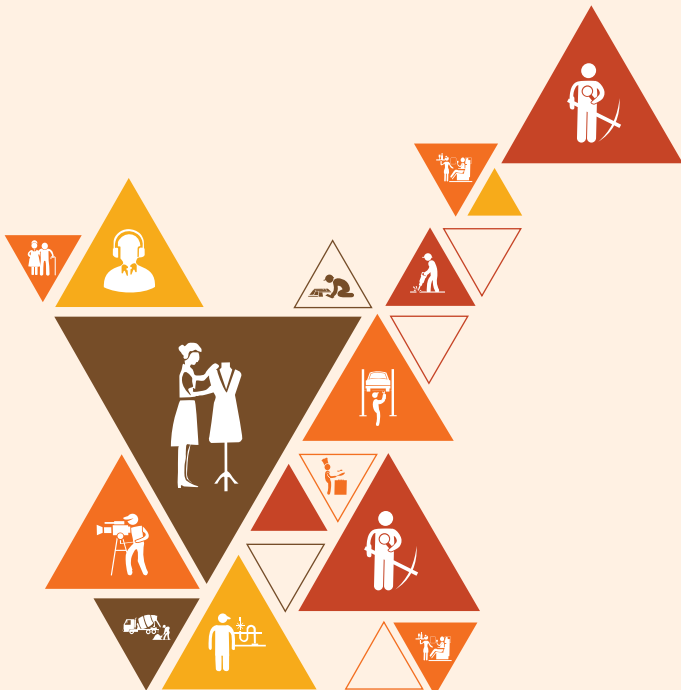


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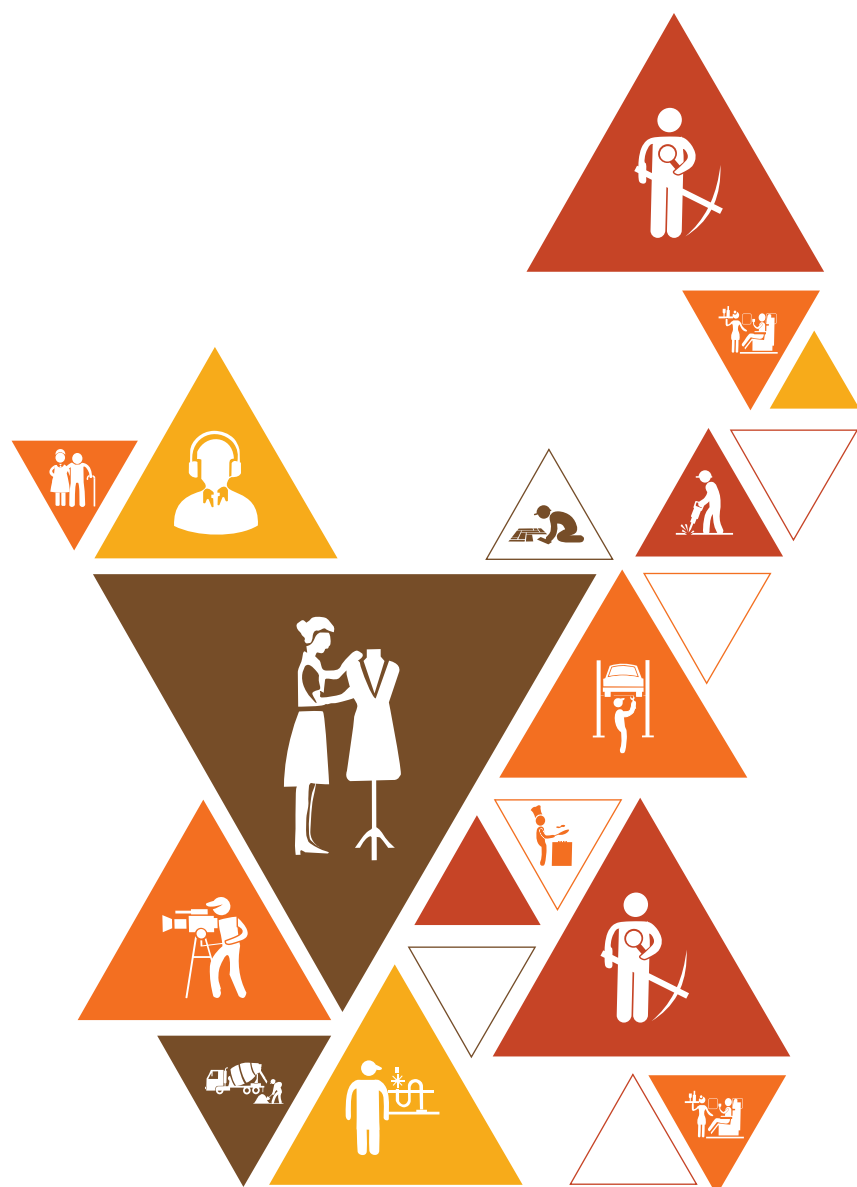
21. Employability Skills (60 Hours)

It is recommended that all training include the appropriate. Employability Skills Module. Content for the same can be accessed

<https://www.skillindiadigital.gov.in/content/list>



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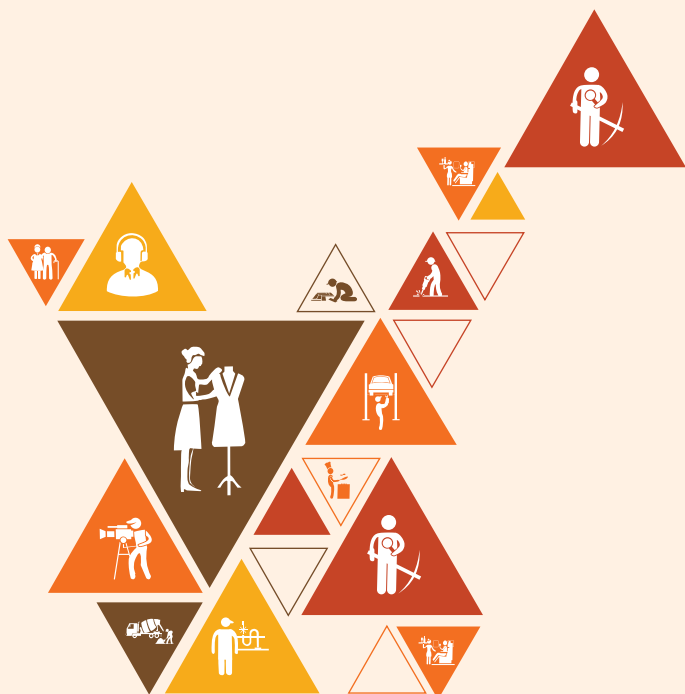
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22. Annexure

Annexure I -Training Delivery Plan

Annexure II -Assessment Criteria

Annexure III -QR Codes–Video Links



Annexure-I

Training Delivery Plan

Training Delivery Plan			
Program Name:	Panelworks Machine Operator		
Qualification Pack Name & Ref. ID	Panelworks Machine Operator, FFS/Q1002		
Version No.	1.0	Version Update Date	31-08-2023
Pre-requisites to Training (if any)	Completed 1st year of 3-year/ 4-years UG Or Pursuing 1st year of 3-year/ 4-years UG and continuing education Or Pursuing 3rd year of 3-year diploma after 10th and continuing education Or Completed 3-year diploma after 10th Or Completed 1st year of 2-year diploma after 12th Or Pursuing 2nd year of 2- year diploma after 12 and continuing education Or Grade 12 Pass with 1 year of relevant experience Or Grade 10 pass with 2 years of any combination of NTC/NAC/CITS or equivalent with 1 year of relevant experience Or Grade 10 pass with 3 years of relevant experience Or Previous relevant Qualification of NSQF Level 4 (Assistant Panelworks Machine Operator) with 1.5 years of relevant experience		
Training Outcomes	By the end of this program, the participants will be able to: • Display comprehensive understanding of the Interiors, Furniture, and Allied industry, including its key aspects, trends, and practices. • Explain the organizational context and workplace policies specific to the Interiors, Furniture, and Allied industry.		

- Comprehend the responsibilities and tasks associated with the role of a Panelworks Machine Operator in the manufacturing process.
- Demonstrate the ability to plan and delegate tasks effectively, ensuring efficient workflow and utilization of resources in the workplace.
- Develop skills in team management, including effective communication, collaboration, and coordination with team members to achieve common goals.
- Prepare and manage the worksite for machine operations, ensuring proper setup, organization, and safety measures.
- Demonstrate skills in setting up machines, including calibration, tooling, and alignment, to ensure accurate and efficient operation.
- Demonstrate the ability to initiate and operate machines following standard procedures, ensuring proper safety precautions and quality control.
- Perform the necessary machining operations with precision, accuracy, and adherence to specifications and quality standards.
- Learners will understand and apply regular machine maintenance procedures, including cleaning, lubrication, and minor troubleshooting to ensure optimal machine performance.
- Employ quality control measures and effectively manage the worksite, ensuring adherence to quality standards, productivity, and efficiency.
- Demonstrate a strong understanding and practice of health and safety protocols, including hazard identification, PPE usage, and safe work practices.
- Display and skills related to greening practices in the workplace, including waste management, energy conservation, and sustainable resource usage.
- Develop essential employability skills, such as communication, teamwork, problem-solving, time management, and adaptability, relevant to the industry.
- Set up the worksite for pasting/pressing operations, ensuring proper material positioning and preparation, and implementing safety measures.
- Perform pasting operations effectively, including applying adhesives, positioning materials accurately, and using appropriate tools and techniques.
- Demonstrate proficiency in pressing operations, including operating the pressing machine, setting appropriate parameters, and achieving proper bonding of materials.
- Manage the worksite during pasting/pressing operations, ensuring quality control, adherence to specifications, and maintaining a safe and organized work environment.

- Develop practical skills and proficiency in operating pasting/pressing machines during on-the-job training, including machine setup, operation, troubleshooting, and maintenance.
- Set up the worksite for cutting/sizing operations, ensuring proper material positioning, tool selection, and implementing safety measures.
- Perform cutting/sizing operations accurately, employing appropriate techniques, tools, and machinery to achieve precise and desired dimensions of furniture components.
- Manage the worksite during cutting/sizing operations, implementing quality control measures, monitoring specifications, and maintaining a safe and organized work environment.
- Develop practical skills and proficiency in operating cutting/sizing machines during on-the-job training, including machine setup, operation, troubleshooting, and maintenance.
- Prepare the worksite for edge banding operations, including material preparation, tool selection, and configuring edge banding parameters for desired results.
- Perform edge banding operations skilfully, including applying edge banding materials, trimming excess, and ensuring a seamless finish on furniture edges.
- Manage the worksite efficiently during edge banding operations, maintaining quality control, verifying adherence to specifications, and promoting a safe and organized work environment.
- Develop practical skills and proficiency in operating edge banding machines during on-the-job training, including machine setup, operation, troubleshooting, and maintenance.
- Set up the worksite for drilling operations, including material positioning, tool selection, and configuring drilling parameters based on project requirements.
- Perform drilling operations accurately, employing proper drilling techniques, maintaining alignment and precision, and ensuring the desired outcomes are achieved.
- Manage the worksite during drilling operations, implementing quality control measures, monitoring specifications, and maintaining a safe and organized work environment.
- Develop practical skills and proficiency in operating drilling machines during on-the-job training, including machine setup, operation, troubleshooting, and maintenance.
- Prepare the worksite for routing operations, including material setup, selection of appropriate router bits, and configuring routing parameters for desired results.

- Perform routing operations effectively, using appropriate routing techniques, controlling depth and speed, and achieving precise cuts and shapes in furniture components.
- Manage the worksite proficiently during routing operations, ensuring quality control, verifying specifications, and promoting safety and organization in the work environment.
- Develop practical skills and proficiency in operating routing machines during on-the-job training, including machine setup, operation, troubleshooting, and maintenance.
- Set up the worksite for veneer cutting/splicing operations, including material preparation, positioning, and utilizing appropriate tools and techniques.
- Demonstrate proficiency in veneer cutting/splicing operations, ensuring accurate cuts, precise alignment, and proper adhesion to achieve desired veneer patterns and finishes.
- Manage the worksite during veneer cutting/splicing operations, implementing quality control measures, monitoring specifications, and maintaining a safe and organized work environment.
- Develop practical skills and proficiency in operating veneer cutting/splicing machines during on-the-job training, including machine setup, operation, troubleshooting, and maintenance.
- Prepare the worksite for panelworks CNC operations, including material setup, programming CNC parameters, and ensuring proper tooling and fixturing.
- Perform panelworks CNC operations proficiently, including loading and unloading materials, running CNC programs, monitoring machine operation, and ensuring accurate machining of furniture components.
- Manage the worksite effectively during panelworks CNC operations, implementing quality control measures, monitoring specifications, and maintaining a safe and organized work environment.
- Develop practical skills and proficiency in operating panelworks CNC machines during on-the-job training, including machine setup, operation, troubleshooting, and maintenance.

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
1.	Introduction to the Interiors, Furniture, and Allied industry (Bridge Module) T- 04:00 P- 00:00 (HH:MM)	Unit 1.1: Overview of the Interiors, Furniture, and Allied Sectors	1: Industry Overview	- Know industry scope and segments - Identify furniture types and roles	Bridge Module	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 04:00 P- 00:00
2.	Introduction to the Organizational Context and Workplace Policies (Bridge Module) T- 04:00 P- 18:00 (HH:MM)	Unit 2.1: Organizational Framework and Workplace Guidelines	1: Teamwork and Communication	- Know team goals and coordination - Understand briefing and conflict resolution	Bridge Module	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 01:30 P- 06:00
			2: Digital Tools and Platforms	- Identify computer parts and MS Office functions - Use WhatsApp, Facebook, and Twitter effectively				T- 01:30 P- 06:00
			3: Workplace Systems and Hygiene	- Understand payment systems and escalation steps - Follow hygiene practices and				T- 01:00 P- 06:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				report breaches				
3.	Introduction to the Role of a Panelworks Machine Operator (Bridge Module) T- 04:00 P- 00:00 (HH:MM)	Unit 3.1: Role of a Panelworks Machine Operator	1: Role and Responsibilities of a Panelworks Machine Operator	- Understand job role, duties, and skills required - Learn organizational protocols and documentation	Bridge Module	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 04:00 P- 00:00
4.	Task Planning and Delegation (FFS/N1010) T- 06:00 P- 24:00 (HH:MM)	Unit 4.1: Work Planning and Task Allocation	1: Understanding Work Orders and Planning	- Learn to analyze work orders and project details - Understand basics of planning and scheduling	FFS/N1010 PC1, PC2, PC3, PC4, PC5 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 01:30 P- 06:00
			2: Team Assessment and Task Allocation	- Assess team skills and capabilities - Allocate tasks effectively for productivity				T- 01:30 P- 06:00
			3: Communication and Coordination	- Communicate tasks clearly to team members - Promote collaboration at the				T- 01:30 P- 06:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				worksite				
			4: Documentation and Tracking	- Fill and submit job cards correctly - Maintain accurate project tracking				T- 01:30 P- 06:00
5.	Team Management (FFS/N1010) T- 06:00 P- 24:00 (HH:MM)	Unit 5.1: Managing Team Effectively	1: Evaluating and Guiding Team	- Evaluate team performance - Provide feedback and guidance	FFS/N1010 PC6, PC7, PC8, PC9, PC10	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 01:30 P- 06:00
			2: Conflict and Issue Resolution	- Address performance issues - Resolve team conflicts effectively	KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12,			T- 01:30 P- 06:00
			3: Project Documentation	- Document deliverables accurately - Follow project documentation standards	KU13, KU14, KU15, KU16, KU17			T- 01:30 P- 06:00
			4: Work Updates and Reporting	- Share regular work updates - Use proper communication formats	GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10			T- 01:30 P- 06:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
6.	Prepare and Manage Worksite for Machine Operation (FFS/N1011) T- 04:00 P- 18:00 (HH:MM)	Unit 6.1: Organize and Oversee Worksite for Machine Operation	1: Understand Job Requirements	- Analyze technical documents - Identify tools and methods	FFS/N1011 PC1, PC2, PC3, PC4, PC5, PC6 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 01:30 P- 06:00
			2: Organize Materials and Resources	- Arrange tools and components - Verify material availability and quality				T- 01:30 P- 06:00
			3: Maintain Safety and Cleanliness	- Follow health and safety practices - Clean and maintain the worksite				T- 01:00 P- 06:00
7.	Perform Machine Setup (FFS/N1011) T- 08:00 P- 30:00 (HH:MM)	Unit 7.1: Conduct Machine Setup	1: Understand Job Specifications	- Read and interpret job specs - Identify required machine settings	FFS/N1011 PC7, PC8, PC9, PC10 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15,	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 01:30 P- 06:00
			2: Setup Machining Program	- Adjust machine program - Ensure accuracy in setup				T- 01:30 P- 06:00
			3: Select	Choose				T- 01:30

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
			and Feed Consumables	suitable consumables Feed materials correctly	KU16, KU17 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10			P- 06:00
			4: Handle Job Loading Safely	- Load/unload workpieces - Follow safety precaution				T- 01:30 P- 06:00
			5: Perform Marking and Measuring	- Measure materials precisely - Mark job work as per spec				T- 02:00 P- 06:00
8.	Machine Initiation Process (FFS/N1012) T- 08:00 P- 24:00 (HH:MM)	Unit 8.1: Machine Start-up Process	1: Supervising System Checks	- Oversee fundamental system checks - Ensure safety compliance during checks	FFS/N1012 PC1, PC2, PC3, PC4, PC5 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 02:00 P- 06:00
			2: Install and Adjust Tools	- Install required tools and equipment - Adjust tools per project specs				T- 02:00 P- 06:00
			3: Safety Equipment Checks	- Verify safety equipment functionality - Perform required safety checks				T- 02:00 P- 06:00
			4: Monitor Machine	Monitor machine trial				T- 02:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
			Trial Run	- run - Evaluate operation and adjust as needed				P- 06:00
9.	Performing Required Machining Operation (FFS/N1012) T- 04:00 P- 24:00 (HH:MM)	Unit 9.1: Performing the Essential Machining Process	1: Feeding and Handling Job Work	- Feed and handle job work accurately for machine operation - Follow safety protocols during the operation	FFS/N1012 PC6, PC7, PC8, PC9, PC10, PC11 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 01:00 P- 06:00
			2: Operation and Machine Capacity	- Perform operations per machine's capacity and recommendations - Ensure optimal performance and desired results				T- 01:00 P- 06:00
			3: Monitoring Operations and Quality	- Monitor operations for quality and yield - Evaluate product quality using assessment techniques				T- 01:00 P- 06:00
			4: Material Handling	Handle materials				T- 01:00 P- 06:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
			and Efficiency	post-operation according to safety guidelines • Operate the machine efficiently, prioritizing safety				
10.	Machine Maintenance (FFS/N1013) T- 08:00 P- 30:00 (HH:MM)	Unit 10.1: Maintenance of Machine	1: Reporting Faults and Deviations	• Report machine faults and deviations from regular processes • Document and communicate machine malfunctions	FFS/N1013 PC1, PC2, PC3, PC4 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 01:30 P- 06:00
			2: Routine Maintenance Checks	• Perform routine maintenance checks on machines • Conduct inspections according to scheduled procedures				T- 01:30 P- 06:00
			3: Cleaning,	• Perform				T- 01:30

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
			Lubrication , and Calibration	cleaning, lubrication, and calibration on machines • Ensure machines are ready for efficient operation				P- 06:00
			4: Inspecting Tools and Equipment	• Inspect tools and equipment for wear and tear • Take corrective actions based on inspection findings •				T- 01:30 P- 06:00
			5: Reporting and Record Keeping	• Record maintenance actions and machine malfunctions accurately • Ensure timely reporting and documentation of machine status				T- 02:00 P- 06:00
11.	Quality Control and Worksite Management (FFS/N1013)	Unit 11.1: Worksite Oversight and Quality Assurance	1: Inspection of Finished Panels	• Inspect finished panels for measurement , quality, accuracy, and	FFS/N1013 PC5, PC6, PC7, PC8, PC9, PC10	Classroom lecture, games, group participation , group	Trainer Guide & Participant Handbook, Presentations,	T- 01:30 P- 06:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
	T- 04:00 P- 18:00 (HH:MM)			defects. • Use appropriate tools and techniques for inspection and defect marking.	KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10	activity	Whiteboard, Marker, Projector, Laptop, Video	
			2: Material Handling and Waste Disposal	• Identify and store materials after machining for re-use. • Collect and dispose of waste/offcut material as per guidelines.				T- 01:30 P- 06:00
			3: Cleaning and Maintenance Procedures	• Clean tools and machines after machining operations. • Maintain cleanliness at the machine station and ensure regular upkeep.				T- 01:00 P- 06:00
12.	Health and Safety Practices at the Worksite (FFS/N8203)	Unit 12.1: Worksite Health and Safety Practices	1: Health and Safety Equipment and Procedures	• Understand and identify the required health and safety equipment	FFS/N8203 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8,	Classroom lecture, games, group participation, group	Trainer Guide & Participant Handbook, Presentations,	T- 02:00 P- 04:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
	T- 08:00 P- 12:00 (HH:MM)			for the job. • Learn the emergency evacuation process in case of fire.	PC9, PC10, PC11, PC12, PC13, PC14, PC15, PC16, PC17	activity	Whiteboard, Marker, Projector, Laptop, Video	
			2: Safe Practices and Hygiene at Worksite	• Practice safe lifting techniques and proper use of PPE. • Adhere to the workplace dress code and maintain personal hygiene standards.	KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16,			T- 01:30 P- 04:00
			3: Housekeeping, Waste Management, and Equipment Safety	• Maintain a clean work environment and handle waste appropriately. • Apply proper techniques when moving materials and ensure equipment functioning.	KU17, KU19, KU24 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10			T- 01:30 P- 04:00
13.	Greening Practices at the Worksite (FFS/N8203) T- 04:00 P- 06:00	Unit 13.1: Worksite Greening Practices	1: Material and Energy Conservation	• Learn efficient methods for utilizing and conserving materials and energy. • Understand	FFS/N8203 PC18, PC19, PC20, PC21, PC22,	Classroom lecture, games, group participation, group	Trainer Guide & Participant Handbook, Presentations, Whiteboard	T- 02:00 P- 03:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
	(HH:MM)			the benefits of periodic cleaning of tools and equipment.	PC23, PC24	activity	d, Marker, Projector, Laptop, Video	
			2: Tool Functionality and Resource Efficiency	- Apply techniques for efficient utilization of materials and water. - Monitor tools and equipment functionality and report any issues.	KU18, KU19, KU20, KU21, KU22, KU23 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10			T- 02:00 P- 03:00
14.	Setup and Operate Pasting and Pressing Machines (FFS/N1014) T- 12:00 P- 48:00 (HH:MM)	Unit 14.1: Setup Worksite for Pasting/Pressing Machine	1: Material Preparation and Adhesive Selection	- Prepare materials for pasting and pressing. - Select appropriate adhesives for the job.	FFS/N1014 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14, PC15	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 01:00 P- 05:00
			2: Machine Setup and Calibration	- Set up and calibrate pasting/pressing machines. - Adjust machine settings for optimal results.	KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14,			T- 01:00 P- 05:00
		Unit 14.2: Pasting	1: Adhesive Application	Apply adhesive				T- 04:00 P- 08:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
		Operation	and Material Alignment	- evenly using proper tools. - Align materials accurately using guides and jigs.	KU15, KU16, KU17, KU18, KU19, KU20, KU21, KU22, KU23 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10			
			2: Material Compatibility and Bonding	- Check material compatibility for pasting. - Ensure proper adherence for successful bonding.				T- 04:00 P- 08:00
		Unit 14.3: Pressing Operation	1: Loading, Unloading, and Machine Setup	- Load and unload job work into pasting/pressing equipment. - Set pasting/pressing parameters (pressure, thickness, duration).				T- 02:00 P- 08:00
			2: Operation and Monitoring	- Operate pasting/pressing machines safely and efficiently. - Monitor the operation to evaluate product quality and				T- 02:00 P- 08:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				yield.				
		Unit 14.4: Worksite Management and Quality Control for Pasting/Pressing Operation	1: Maintenance and Workspace Management	- Perform routine maintenance on pasting/pressing machines. - Manage workspace by organizing materials and disposing of waste.				T- 01:00 P- 03:00
			2: Quality Control and Documentation	- Perform quality checks on pasted/pressed materials. - Document production specs, quality control, and adjustments.				T- 01:00 P- 03:00
15.	Setup and Operate Cutting and Sizing Machines (FFS/N1015) T- 12:00 P- 48:00 (HH:MM)	Unit 15.1: Setup Worksite for Cutting/Sizing Machine	1: Material Preparation and Tool Selection	- Prepare materials and workpieces for cutting and sizing operations. - Select and install cutting blades or tools based on material type and desired outcome.	FFS/N1015 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8,	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 02:00 P- 08:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
		Unit 15.2: Cutting/Sizing Operation	2: Machine Setup and Calibration	- Set up and configure cutting/sizing machines for production requirements. - Calibrate cutting/sizing machines	KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17, KU18, KU19, KU20, KU21 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10			T- 02:00 P- 08:00
			1: Loading, Positioning, and Securing Materials	- Load and unload job work into the cutting/sizing equipment - Position and secure materials on the machine for accurate cutting.				T- 01:30 P- 06:00
			2: Setting Up Cutting/Sizing Parameters	- Set up cutting/sizing parameters. - Measure and mark materials based on project specifications.				T- 01:30 P- 06:00
			3: Operating Cutting/Sizing Machines	- Operate cutting/sizing machines following SOPs and safety guidelines. - Apply				T- 01:30 P- 08:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				advanced techniques and jigs for intricate cuts or patterns.				
			4: Monitoring and Quality Control	- Monitor the cutting/sizing operation periodically to assess product quality and yield. - Make adjustments to maintain desired outcomes and quality standards.				T- 01:30 P- 06:00
		Unit 15.3: Worksite Management and Quality Control for Cutting/Sizing Machine	1: Maintenance and Workspace Management	- Perform routine maintenance on cutting/sizing machines. - Organize materials and dispose of waste correctly.				T- 01:00 P- 03:00
			2: Quality Control and Documentation	- Conduct quality checks on cut/sized materials. - Document production specs and				T- 01:00 P- 03:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				inspections.				
16.	Setup and Operate Edge Band Machines (FFS/N1016) T- 12:00 P- 48:00 (HH:MM)	Unit 16.1: Setup Worksite for Edge Banding Operation	1: Preparation and Material Selection	- Prepare materials and workpieces for edge banding to meet specifications. - Select and install appropriate tools, adhesives, and consumables.	FFS/N1016 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14, PC15 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17, KU18, KU19, KU20, KU21, KU22 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 02:00 P- 08:00
			2: Machine Setup and Adjustment	- Adjust machine settings for optimal edge banding results. - Ensure proper calibration of feed rate, temperature, pressure, and trimming tools.				T- 02:00 P- 08:00
		Unit 16.2: Edge Banding Operation	1: Machine Setup and Configuration	- Set up, configure, and calibrate edge band machines. - Prepare the desired program on the machine for the edge				T- 01:30 P- 06:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				banding operation.				
			2: Preheating and Safety Guidelines	- Preheat the machine to ensure the appropriate temperature for the glue. - Operate the edge banding machine.				T- 01:30 P- 08:00
			3: Feeding and Aligning Materials	- Feed panel materials into the machine and guide them through the edge banding process. - Ensure proper alignment and positioning of the edge band material for precision.				T- 01:30 P- 06:00
			4: Manual Application and Monitoring	- Apply adhesive and edge banding material manually using hand or power tools. - Monitor the edge banding operation periodically to assess quality				T- 01:30 P- 06:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
		Unit 16.3: Worksite Management and Quality Control for Edge Banding Operation		and yield.				
			1: Maintenance and Workspace Management	- Perform routine maintenance tasks on the edge banding machine - Manage the workspace by arranging materials and disposing of waste properly.				T- 01:00 P- 03:00
			2: Quality Control and Documentation	- Perform quality checks and inspections on finished materials. - Document production specifications, quality control inspections, and any adjustments made.				T- 01:00 P- 03:00
17.	Setup and Operate Drilling Machines (FFS/N1017) T- 12:00 P- 48:00	Unit 17.1: Setup Worksite for Drilling Operation	1: Preparation and Tool Selection	Prepare materials and workpieces for drilling operations to meet job specifications and quality standards.	FFS/N1017 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector,	T- 02:00 P- 08:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
	(HH:MM)			Select and install the appropriate drill bits and cutting tools for the drilling machine.	KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17, KU18, KU19, KU20 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10		Laptop, Video	
			2: Machine Setup and Configuration	- Set up, configure, and calibrate the drilling machine for different production requirements. - Ensure the drilling machine is configured correctly to achieve optimal results.				T- 02:00 P- 08:00
		Unit 17.2: Drilling Operation	1: Workpiece Loading and Machine Initiation	- Load and position workpieces onto the machine table or holding fixtures for stable drilling. - Perform machine initiation and guide workpieces through drilling				T- 01:30 P- 06:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				operations				
			2: Machine Operation and Safety	• Operate drilling machines following standard operating procedures and safety guidelines. • Understand and apply the importance of safety during the drilling operation.				T- 01:30 P- 06:00
			3: Setting Up Drilling Parameters	• Set up drilling parameters accurately. • Adjust drilling parameters based on job requirements and quality standards.				T- 01:30 P- 08:00
			4: Monitoring and Quality Control	• Monitor the drilling operation periodically to ensure product quality and yield. • Make necessary adjustments to maintain high				T- 01:30 P- 06:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				standards and achieve desired outcomes.				
		Unit 17.3: Worksite Management and Quality Control for Drilling Operation	1: Maintenance and Inspections	- Perform routine maintenance on drilling machines. - Conduct machine inspections for loose components.				T- 01:00 P- 03:00
			2: Workspace, Quality Control, and Documentation	- Manage workspace and dispose of waste. - Perform quality checks on finished materials. - Document production specs and inspections.				T- 01:00 P- 03:00
18.	Setup and Operate Routing Machines (FFS/N1018) T- 12:00 P- 48:00 (HH:MM)	Unit 18.1: Setup Worksite for Routing Operation	1: Material Preparation and Tool Selection	- Prepare materials and workpieces for routing operations. - Select and install the appropriate router bits and cutting tools.	FFS/N1018 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14 KU1, KU2,	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop,	T- 02:00 P- 08:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
		Unit 18.2: Routing Operation	2: Machine Setup and Configuration	- Set up, configure, and calibrate routing machines for production requirements. - Ensure proper machine calibration for different routing tasks.	KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17, KU18, KU19, KU20, KU21 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10		Video	T- 02:00 P- 08:00
			1: Workpiece Loading and Machine Initiation	- Safely load and position workpieces on the routing machine. - Initiate the machine and guide workpieces through the routing operation.				T- 01:30 P- 06:00
			2: Routing Operations for Holes and Recesses	- Perform routing operations to create holes or recesses in workpieces. - Ensure accurate location and dimension of the routing process.				T- 01:30 P- 06:00
			3: Standard	Follow SOPs				T- 01:30

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
			Operating Procedures and Parameter Setup	- and safety guidelines during routing operations. - Set up routing parameters like speed, depth, and angle.				P- 08:00
			4: Monitoring and Quality Control	- Monitor the routing operation for quality and yield. - Adjust the operation as needed to maintain product quality.				T- 01:30 P- 06:00
		Unit 18.3: Worksite Management and Quality Control for Routing Operation	1: Maintenance and Inspections for Routing Machines	- Perform routine maintenance tasks for routing machines. - Conduct regular machine inspections				T- 01:00 P- 03:00
			2: Workspace Management and Quality Control	- Manage the workspace effectively. - Perform quality checks on finished materials and document				T- 01:00 P- 03:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				production specs and inspections.				
19.	Setup and Operate Veneer Cutting/Splicing Machines (FFS/N1019) T- 12:00 P- 48:00 (HH:MM)	Unit 19.1: Setup Worksite for Veneer Cutting/Splicing Operation	1: Material Preparation & Tool Selection	- Prepare materials and workpieces as per job specifications. - Select appropriate tools, adhesives, and veneer materials.	FFS/N1019 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17, KU18, KU19, KU20, KU21 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 02:00 P- 08:00
			2: Machine Setup & Calibration	Set up, configure, and calibrate veneer cutting and splicing machines for production needs.				T- 02:00 P- 08:00
		Unit 19.2: Veneer Cutting/Splicing Operation	1: Loading & Machine Operation	- Safely load and position workpieces for operation. - Initiate machine and guide workpieces accurately.				T- 01:30 P- 06:00
			2: Veneer Cutting	Measure, mark, and cut veneers within specified				T- 01:30 P- 06:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				tolerances. • Prepare veneers using tracing and cutting techniques.				
			3: Veneer Splicing	• Operate splicing machine to join veneer ends with accuracy. • Ensure joints are aligned without distortion.				T- 01:30 P- 08:00
			4: Monitoring & Finishing	• Monitor ongoing operations for quality and yield. • Make adjustments to ensure desired outputs.				T- 01:30 P- 06:00
		Unit 19.3: Worksite Management and Quality Control for Veneer Cutting/Splicing Operation	1: Machine Maintenance & Inspection	• Perform routine maintenance (cleaning, lubricating, replacing parts). • Inspect machine components and perform sharpening				T- 01:00 P- 03:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				and tightening.				
			2: Workspace & Quality Management	- Organize materials and dispose of waste properly. - Conduct quality checks and document production and inspections.				T- 01:00 P- 03:00
20.	Setup and Operate Panelworks CNC Machines (FFS/N1020) T- 12:00 P- 48:00 (HH:MM)	Unit 20.1: Setup Worksite for Panelworks CNC Operation	1: Material Handling & Quality Check	- Stack and store materials/workpieces properly for CNC operation. - Check the quality of received job work using proper standards and techniques.	FFS/N1020 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10,	Classroom lecture, games, group participation, group activity	Trainer Guide & Participant Handbook, Presentations, Whiteboard, Marker, Projector, Laptop, Video	T- 02:00 P- 08:00
			2: CNC Program Configuration & Final Setup	- Configure CNC programs as per task needs. - Adjust machine settings and make final modifications	KU11, KU12, KU13, KU14, KU15, KU16, KU17, KU18, KU19,			T- 02:00 P- 08:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
		Unit 20.2: CNC Programming and Machining Operation	1: Loading & Securing Workpieces	- Safely load/unload workpieces onto/from the CNC machine. - Position and secure materials using clamps, jigs, etc.	KU20, KU21 GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9, GS10			T- 01:30 P- 06:00
			2: Measurement & Marking	- Measure and mark as per CNC job specifications.				T- 01:30 P- 06:00
			3: Machine Operation	Operate the CNC machine within defined capacity and according to manufacturer's recommendations.				T- 01:30 P- 08:00
			4: Monitoring & Communication	- Assist in monitoring machine operations. - Identify and communicate defects or irregularities to the operator.				T- 01:30 P- 06:00
		Unit 20.3:	1: Cleaning	Assist in				T- 01:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
		Worksite Management and Quality Control for Panelworks CNC Operation	& Workspace Management	cleaning and maintaining CNC machines. Organize workspace and handle storage and disposal efficiently.				P- 03:00
			2: Quality Check & Documentation	- Conduct quality checks on finished materials. - Record production specs, inspection results, and necessary adjustments.				T- 01:00 P- 03:00
21.	DGT/VSQ/N0102: Employability Skills (60 Hours)	Unit 21.1: Employability Skills	1. Introduction to Employability Skills	Discuss the Employability Skills required for jobs in various industries. List different learning and employability related GOI and private portals and their usage.	DGT/VSQ/N0102 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18,	Classroom lecture, games, group participation, group activity, field visit	Handbook	T: 00:45 P: 00:45
			2. Constitution	Explain the constitutional		Classroom lecture,		T: 00:45 P: 00:45

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
			nal values - Citizenship	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. Show how to practice different environmentally sustainable practices.	PC19, PC20, PC21, PC22, PC23, PC24, PC25, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC33. KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17, KU18, KU19.	games, group participation, group activity, field visit		
			3. Becoming a Professional in the 21st Century	Discuss importance of relevant 21st century skills. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive	GS1, GS2, GS3, GS4, GS5, GS6, GS7, GS8, GS9.	Classroom lecture, games, group participation, group activity, field visit	Handbook	T: 01:15 P: 01:15

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life. Describe the benefits of continuous learning.				
			4. Basic English Skills	Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone. Read and interpret text written in basic English. Write a short note/paragraph / letter/e - mail using basic English.		Classroom lecture, games, group participation , group activity, field visit	Handbook	T: 05:00 P: 05:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
			5. Career Development & Goal Setting	By the end of this course, participants will have the knowledge and skills to set clear, achievable career goals and develop a structured career development plan, enabling them to advance in their chosen career path and make informed decisions about their professional future.		Classroom lecture, games, group participation, group activity, field visit	Handbook	T: 01:00 P: 01:00
			6. Communication Skills	Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette. Explain the importance of active		Classroom lecture, games, group participation, group activity, field visit	Handbook	T: 02:30 P: 02:30

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				listening for effective communication. Discuss the significance of working collaboratively with others in a team.				
			7. Diversity & Inclusion	- Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD. - Discuss the significance of escalating sexual harassment issues as per POSH act.		Classroom lecture, games, group participation, group activity, field visit	Handbook	T: 01:15 P: 01:15
			8. Financial and Legal Literacy	- Outline the importance of selecting the right financial institution, product, and service. - Demonstrate how to carry out offline and online		Classroom lecture, games, group participation, group activity, field visit	Handbook	T: 02:30 P: 02:30

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				financial transactions, safely and securely. List the common components of salary and compute income, expenditure, taxes, investments etc. Discuss the legal rights, laws, and aids.				
			9. Essential Digital Skills	- Describe the role of digital technology in today's life. - Demonstrate how to operate digital devices and use the associated applications and features, safely and securely. - Discuss the significance of displaying responsible online behavior while		Classroom lecture, games, group participation , group activity, field visit	Handbook	T: 05:00 P: 05:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				browsing, using various social media platforms, e-mails, etc., safely and securely. Create sample word documents, excel sheets and presentations using basic features utilize virtual collaboration tools to work effectively.				
			10. Entrepreneurship	Explain the types of entrepreneurship and enterprises. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan. Describe the 4Ps of		Classroom lecture, games, group participation, group activity, field visit	Handbook	T: 03:30 P: 03:30

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
				Marketing-Product, Price, Place and Promotion and apply them as per requirement. Create a sample business plan, for the selected business opportunity.				
			11. Customer Service	Describe the significance of analysing different types and needs of customers. Explain the significance of identifying customer needs and responding to them in a professional manner. Discuss the significance of maintaining hygiene and dressing appropriately.		Classroom lecture, games, group participation , group activity, field visit	Handbook	T: 02:30 P: 02:30
			12. Getting	Create a		Classroom	Handbook	T: 04:00

Sl. No.	Module Name	Unit Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Aids	Duration (hours)
			Ready for apprenticeship & Jobs	professional Curriculum Vitae (CV). Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively. Discuss the significance of maintaining hygiene and confidence during an interview. Perform a mock interview. List the steps for searching and registering for apprenticeship opportunities.		lecture, games, group participation, group activity, field visit		P: 04:00

Annexure - II

Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES

For updated Assessment criteria please refer to Qualification Pack of this Job role available at <https://www.nqr.gov.in/>

Assessment Weightage	
Job Role	Panelworks Machine Operator
Qualification Pack	FFS/Q1002
Sector Skill Council	Furniture & Fittings

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down the proportion of marks for Theory and Skills Practical for each Element/ PC.
2	The assessment for the theory part will be based on a knowledge bank of questions created by the SSC.
3	Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4	Individual assessment agencies will create unique question papers for the theory part for each candidate at each examination/training center (as per assessment criteria below).
5	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6	To pass the Qualification Pack assessment, every trainee should score a minimum aggregate passing percentage of 70% for the QP and a minimum of 70% for each NOS.
7	In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

Compulsory NOS:

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FFS/N1010.Perform team & task management for required machining operations	10	48	42	-	100	10
FFS/N1011.Manage the worksite for required machine operations	12	48	36	4	100	15
FFS/N1012.Perform Machine operations for required job work	20	40	36	4	100	20
FFS/N1013.Perform machine maintenance and quality checking for required specifications	18	48	28	6	100	20
FFS/N8203.Maintain health, safety, and greening practices at the worksite	16	24	48	12	100	5
DGT/VSQ/N0102.Empl oyability Skills (60 Hours)	20	30	-	-	50	5
Total	96	238	190	26	550	75

Elective 1: Pasting and Pressing machines

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FFS/N1014.Setup and operate pasting and pressing machines	24	40	30	6	100	25
Total	24	40	30	6	100	25

Elective 2: Cutting and Sizing machines

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FFS/N1015.Setup and operate cutting and sizing machines	24	40	30	6	100	25
Total	24	40	30	6	100	25

Elective 3: Edge Band machines

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FFS/N1016.Setup and operate edge band machines	24	36	36	4	100	25
Total	24	36	36	4	100	25

Elective 4: Drilling machines

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FFS/N1017.Setup and operate drilling machines	24	42	30	4	100	25
Total	24	42	30	4	100	25

Elective 5: Routing machines

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FFS/N1018.Setup and operate routing machines	26	36	34	4	100	25
Total	26	36	34	4	100	25

Elective 6: Veneer Cutting and Splicing machines

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FFS/N1019.Setup and Operate veneer cutting and splicing machines	24	48	24	4	100	25
Total	24	48	24	4	100	25

Elective7: CNC machines

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FFS/N1020.Setup and operate panelworks CNC Machines	20	54	22	4	100	25
Total	20	54	22	4	100	25

Annexure - III

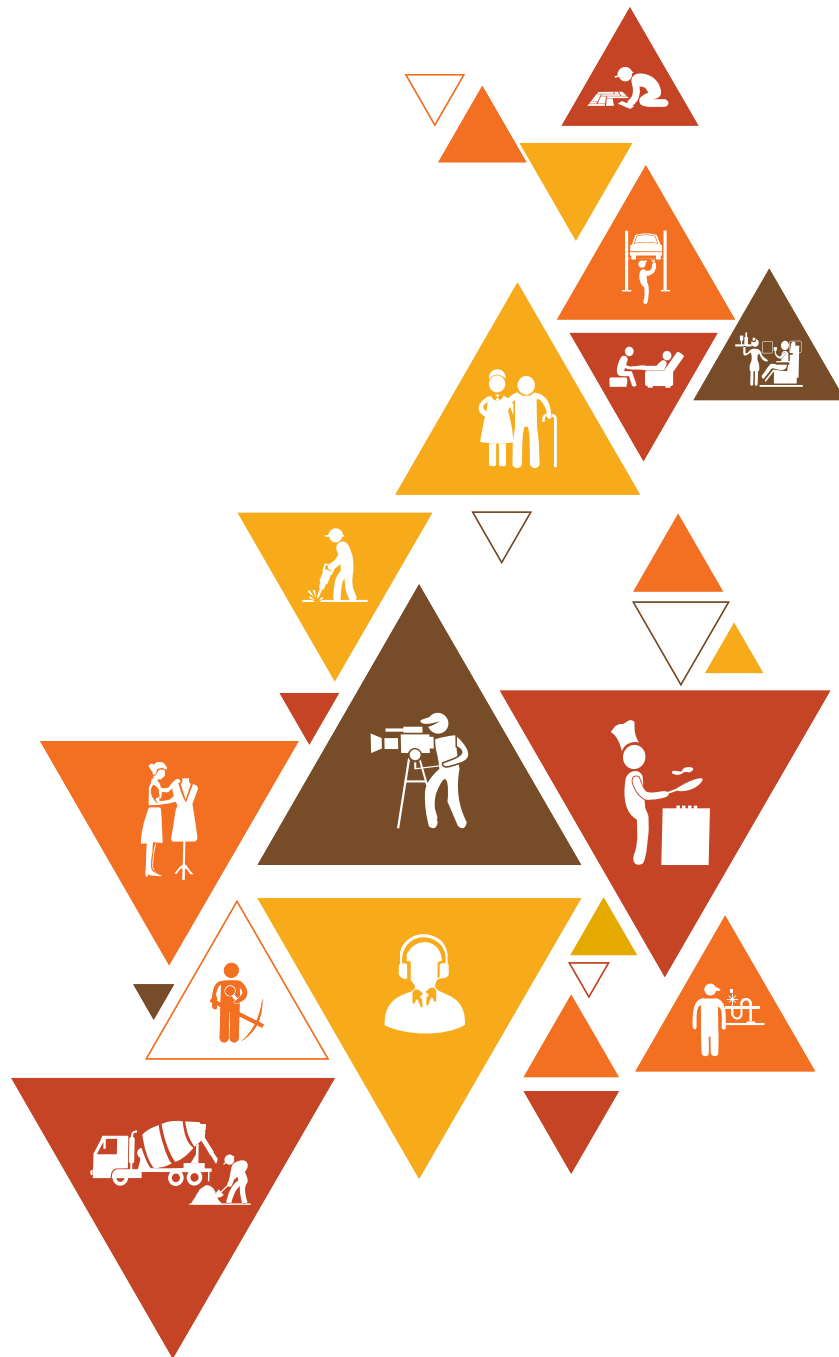
QR Codes –Video Links

Chapter Name	Unit Name	Topic Name	URL	QR Code	Video Duration
Chapter 1: Introduction to the Interiors, Furniture, and Allied Industry	Unit 1.1 – Overview of the Interiors, Furniture, and Allied Sectors	India Furniture Market	https://www.youtube.com/watch?v=Y0t6e2I_mFY		0:01:23
Chapter 3: Introduction to the Role of an Assistant Panelworks Machine Operator	Unit 3.1 – Role of an Assistant Panelworks Machine Operator	Role of Operator in Panelworks	https://www.youtube.com/watch?v=Qr2mkVuclcY		0:06:46
Chapter 5: Plan for Machine Operation	Unit 5.1 – Planning for Machine Operations	Read the Kitchen Drawing	https://www.youtube.com/watch?v=BqHR5BVDKhk		0:11:04
Chapter 7: Assist in Machine Initiation Process	Unit 7.1 – Supporting the Machine Start-up Process	Different Types of Boards used in Modular Furniture	https://www.youtube.com/watch?v=qLtUz-LucV8		0:15:57
Chapter 8: Handling Job Work during Machine Operation	Unit 8.1 – Managing Job Work During Machine Operation	Modular Kitchen, Wardrobe & Interiors making machines	https://www.youtube.com/watch?v=LZC3P1aRvMc		0:05:49

Chapter Name	Unit Name	Topic Name	URL	QR Code	Video Duration
Chapter 9: Assist in Performing required Machine Operation	Unit 9.1 – Support in Executing the Required Machine Operation	Making Minifix Cabinet after Machining Operation	https://www.youtube.com/watch?v=BZuEdms8yf0		0:10:48
Chapter 10: Clean and Maintain the Machine	Unit 10.1 – Maintain and Clean the Machine	Panel Saw Maintenance	https://www.youtube.com/watch?v=67ZE2XaGsko		0:07:22
Chapter 15: Assist in Operating Pasting and Pressing Machines	Unit 15.1 – Assist in Workplace Setup for Pasting/Pressing Machine	Cold Press Machine	https://youtu.be/gCEJcirUYLI?si=Gb_nVMnqmQsyytG3		0:06:45
	Unit 15.2 – Assist in Pasting Operation	Hot Press Machine	https://youtu.be/dstpOUH6pII?si=7EQovZFvpdenWKNC		0:10:19
Chapter 16: Assist in Operating Cutting and Sizing Machines	Unit 16.1 – Assist in Workplace Setup for Cutting/Sizing Machine	Panel Saw Machine	https://youtu.be/ILVSCdOZ_MM?si=i0AzDq3UgwBOwiF2		0:04:34

Chapter Name	Unit Name	Topic Name	URL	QR Code	Video Duration
	Unit 16.2 – Assist in Cutting/Sizing Operation	Beam Saw machine	https://youtu.be/nKC9kM9cLno?si=Slqu8feniy5qnCQQ		0:06:17
Chapter 17: Assist in Operating Edge Band Machines	Unit 17.1 – Assist in Workplace Setup for Edge Banding Machine	Edgebanding Machine - EVA Type	https://youtu.be/s4pYTrYDFSU?si=JL9g-bnxtidrKiOM		0:21:30
	Unit 17.2 – Assist in Edge Banding Operation	Edgebanding Machine - PUR Type	https://youtu.be/6r3zgX59snM?si=R6Vb9rrm5ws2ipnb		0:06:11
Chapter 18: Assist in Operating Drilling Machines	Unit 18.2 – Assist in Drilling Operation	CNC Drilling Machines	https://www.youtube.com/watch?v=TVadCpKyud8		0:05:03
	Unit 18.3 – Workplace and Equipment Management for Drilling Machine	Side Drilling Machine	https://youtu.be/xyUmvkjYiWc?si=zop67SA4dtrPUTYh		0:01:50

Chapter Name	Unit Name	Topic Name	URL	QR Code	Video Duration
Chapter 19: Assist in Operating Routing Machines	Unit 19.1 – Assist in Workplace Setup for Routing Machine	Single-Head CNC Routers Machine	https://www.youtube.com/watch?v=mhqZO7Xtk-g		0:08:54
	Unit 19.2 – Assist in Routing Operation	Multi-Head CNC Routers Machine	https://www.youtube.com/watch?v=YkwzFrtMPs		0:01:17
Chapter 20: Assist in Operating Veneer Cutting/Splicing Machines	Unit 20.2 – Assist in Veneer Cutting/Splicing Operation	Splicing Machine	https://www.youtube.com/watch?v=apkV3GLRY7Y		0:02:06





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