

Unit II: Material Control Techniques

Meaning-Objectives of Material Control-Advantages of Material Control –Scope of Material Control –Essential Features of Material Control – Material Control Techniques – Stock Levels - Economic Order Quantity – ABC Analysis. Stores Control: Stores Ledger Vs Bin Card – Pricing Materials Issues: FIFO, LIFO, Simple and Weighted Average Method.

Meaning of Material Control:

Material control is a system which ensures that right quality of material is available in the right quantity at the right time and right place with the right amount of investment. It can be defined as a comprehensive framework for the accounting and control of material cost designed with the object of maintaining material supplies at a level so as to ensure uninterrupted production but at the same time minimising investment of funds. In simple words material control is a systematic control over the purchasing, storing and using of materials so as to have the minimum possible cost of materials.

Material control refers to the process of managing the acquisition, storage, usage, and disposal of materials within an organization to ensure efficient operations and cost-effectiveness.

Aspects of Material Control

There are two aspects of material control.

i.e. a. Accounting Aspect, b.Operational aspect

a. Accounting Aspect: This aspect material control is concerned with maintaining documentary evidence of movement of materials at every stage right from the time sales and production budgets are approved to the point when materials are purchased and actually used in production operations.

b. Operational aspect: This aspect of material control is concerned with the maintenance of material supplies at a level so as to ensure that material is available for use in production and production services as and when required by minimizing investment in materials

The objectives of material control typically include:

1. **Optimizing Inventory Levels:** Maintaining an appropriate balance of inventory is crucial to meet demand without overstocking or under stocking. Material control aims to establish inventory levels that minimize costs while ensuring sufficient materials are available to support production or operations.
2. **Cost Reduction:** Effective material control seeks to minimize costs associated with material acquisition, storage, handling, and obsolescence. By streamlining processes and implementing efficient inventory management practices, organizations can reduce overall material-related expenses.
3. **Improved Cash Flow:** Efficient material control contributes to better cash flow management by aligning inventory levels with demand. Reducing excess inventory frees

up capital that can be allocated to other areas of the business, such as investment in growth initiatives or debt reduction.

4. **Enhanced Production Planning:** Material control facilitates accurate production planning by ensuring that required materials are available when needed. By maintaining visibility into inventory levels and replenishment schedules, organizations can minimize disruptions to production schedules and meet customer demands more effectively.
5. **Quality Assurance:** Controlling the quality of materials is essential to ensure the production of goods or services that meet customer requirements. Material control processes may include inspections, quality checks, and supplier evaluations to maintain consistent quality standards.
6. **Risk Management:** Material control helps mitigate risks associated with supply chain disruptions, such as delays in material deliveries or unexpected shortages. By implementing contingency plans and establishing alternative sourcing options, organizations can reduce the impact of disruptions on operations.
7. **Compliance and Regulatory Requirements:** Adhering to relevant regulations and industry standards is critical for organizations to avoid legal and compliance issues. Material control processes may include documentation, tracking, and reporting to ensure compliance with regulations related to material handling, storage, and disposal.
8. **Resource Optimization:** Efficient material control contributes to the optimal utilization of resources, including materials, storage space, and labor. By minimizing waste and optimizing resource allocation, organizations can improve overall efficiency and productivity.

Overall, the primary goal of material control is to ensure that materials are managed effectively throughout their lifecycle, from acquisition to disposal, to support the organization's objectives while minimizing costs and risks.

Material control offers several advantages for organizations across various industries:

1. **Cost Savings:** Effective material control helps organizations reduce costs associated with excess inventory, stockouts, storage, and obsolescence. By optimizing inventory levels and streamlining procurement processes, companies can minimize unnecessary expenses and improve profitability.
2. **Improved Efficiency:** Material control streamlines processes related to material acquisition, storage, handling, and usage. This leads to improved operational efficiency, as materials are managed more effectively, reducing delays, bottlenecks, and wastage in production or operations.
3. **Better Cash Flow Management:** By optimizing inventory levels and reducing excess stock, material control frees up capital that can be reinvested in other areas of the business or used to address immediate financial needs. Improved cash flow management enhances financial stability and flexibility.
4. **Enhanced Production Planning:** With accurate and timely information on inventory levels and material requirements, organizations can plan production more effectively. Material control ensures that the right materials are available at the right time, minimizing disruptions and optimizing production schedules.

5. **Quality Assurance:** Material control processes include quality checks and inspections to ensure that materials meet predefined standards. By maintaining consistent quality throughout the supply chain, organizations can deliver products or services that meet customer expectations and enhance reputation.
6. **Better Supplier Relationships:** Effective material control requires close collaboration with suppliers to ensure timely deliveries and maintain quality standards. Strong supplier relationships can lead to better pricing, terms, and service levels, contributing to overall competitiveness.
7. **Risk Mitigation:** Material control helps organizations identify and mitigate risks associated with supply chain disruptions, such as supplier failures, material shortages, or natural disasters. By implementing contingency plans and diversifying sourcing options, companies can minimize the impact of disruptions on operations.
8. **Compliance and Regulatory Adherence:** Material control processes ensure compliance with relevant regulations and industry standards governing material handling, storage, and disposal. This reduces the risk of legal and regulatory non-compliance, protecting the organization from potential fines, penalties, and reputational damage.
9. **Resource Optimization:** By optimizing resource utilization, including materials, storage space, and labor, material control improves overall efficiency and productivity. This leads to better utilization of assets and resources, maximizing operational performance and profitability.
10. **Continuous Improvement:** Material control involves monitoring and analyzing key performance indicators to identify areas for improvement. By continuously evaluating processes and implementing corrective actions, organizations can enhance efficiency, reduce costs, and maintain a competitive edge in the market.

Overall, effective material control is essential for organizations to achieve operational excellence, reduce costs, mitigate risks, and maintain a competitive advantage in today's dynamic business environment.

The scope of material control encompasses a wide range of activities and processes involved in managing materials within an organization. It includes:

1. **Material Planning:** This involves forecasting material requirements based on production schedules, sales forecasts, and inventory levels. Material planners determine the quantity and timing of material purchases to meet demand while minimizing excess inventory.
2. **Procurement:** Material control includes the procurement process, which involves sourcing materials from suppliers, negotiating contracts, issuing purchase orders, and ensuring timely delivery of materials. It also involves vendor management to maintain positive relationships with suppliers and optimize purchasing costs.
3. **Inventory Management:** Material control focuses on managing inventory levels to ensure adequate stock availability while minimizing carrying costs and obsolescence. This includes inventory tracking, replenishment planning, and implementing inventory control techniques such as ABC analysis and just-in-time (JIT) inventory systems.
4. **Storage and Warehousing:** Material control includes the management of storage facilities and warehouses where materials are stored. This involves organizing storage

space, implementing efficient storage methods, and ensuring proper handling and preservation of materials to prevent damage or deterioration.

5. **Material Handling:** Material control encompasses the movement and transportation of materials within the organization, from receiving and inspection to storage and distribution. It includes handling equipment, such as forklifts and conveyors, as well as implementing safe handling practices to minimize accidents and injuries.
6. **Quality Control:** Material control involves quality assurance processes to ensure that materials meet predefined quality standards. This includes conducting inspections, quality checks, and testing to verify the quality and suitability of materials for production or use.
7. **Disposal and Scrap Management:** Material control also includes managing the disposal of excess or obsolete materials and handling scrap generated during production processes. This involves proper disposal methods, recycling initiatives, and minimizing waste to reduce environmental impact and optimize resource utilization.
8. **Documentation and Record Keeping:** Material control requires maintaining accurate records and documentation related to material transactions, inventory levels, supplier contracts, and quality control activities. This ensures traceability, compliance with regulations, and provides valuable data for analysis and decision-making.
9. **Performance Monitoring and Analysis:** Material control involves monitoring key performance indicators (KPIs) such as inventory turnover, stock accuracy, material costs, and supplier performance. This allows organizations to assess the effectiveness of material control processes, identify areas for improvement, and make data-driven decisions to optimize performance.
10. **Continuous Improvement:** Material control is an ongoing process that requires continuous monitoring, analysis, and improvement. Organizations should regularly review their material control practices, identify inefficiencies or bottlenecks, and implement corrective actions to enhance efficiency, reduce costs, and maintain competitiveness.

Overall, the scope of material control encompasses all aspects of managing materials within an organization, from planning and procurement to storage, handling, quality control, and disposal. Effective material control is essential for optimizing resource utilization, minimizing costs, ensuring quality, and maintaining smooth operations throughout the supply chain.

Essential features of Material Control

The essential features of material control encompass key elements that are necessary for effectively managing materials within an organization. These features include:

1. **Inventory Management:** Efficient inventory management is a core feature of material control. This involves maintaining optimal levels of inventory to meet demand while minimizing carrying costs, stockouts, and obsolescence. Inventory management includes processes such as stock monitoring, replenishment planning, and implementing inventory control techniques.
2. **Demand Forecasting:** Material control requires accurate demand forecasting to anticipate future material requirements. By analyzing historical data, market trends, and

sales forecasts, organizations can predict demand patterns and adjust inventory levels accordingly to avoid shortages or excess inventory.

3. **Procurement Planning:** Procurement planning involves determining the quantity, timing, and sourcing of materials needed to support production or operations. Material control includes developing procurement strategies, sourcing suppliers, negotiating contracts, and ensuring timely delivery of materials.
4. **Quality Assurance:** Quality assurance is an essential feature of material control to ensure that materials meet predefined quality standards. This includes conducting inspections, quality checks, and testing to verify the quality and suitability of materials for production or use.
5. **Storage and Warehousing:** Material control encompasses the management of storage facilities and warehouses where materials are stored. This includes organizing storage space, implementing efficient storage methods, and ensuring proper handling and preservation of materials to prevent damage or deterioration.
6. **Material Handling:** Material control involves the movement and transportation of materials within the organization, from receiving and inspection to storage and distribution. This includes handling equipment, such as forklifts and conveyors, as well as implementing safe handling practices to minimize accidents and injuries.
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These essential features collectively ensure that materials are effectively managed throughout their lifecycle, from procurement to disposal, to support the organization's objectives while minimizing costs, risks, and environmental impact.

Material control techniques

Material control techniques are methods and practices used by organizations to manage the acquisition, storage, usage, and disposal of materials efficiently. These techniques help optimize inventory levels, reduce costs, improve operational efficiency, and ensure the availability of

materials to support production or operations. Some common material control techniques include:

1. **ABC Analysis:** ABC analysis categorizes inventory items into three groups based on their value and usage frequency. A items are high-value items with low usage frequency, B items are moderate-value items with moderate usage frequency, and C items are low-value items with high usage frequency. This classification helps prioritize inventory management efforts and allocate resources effectively.
2. **Just-in-Time (JIT) Inventory:** JIT inventory is a strategy that aims to minimize inventory holding costs by receiving materials from suppliers exactly when they are needed for production. This technique reduces excess inventory levels, storage costs, and the risk of obsolescence, while improving cash flow and efficiency.
3. **Material Requirements Planning (MRP):** MRP is a system for planning and controlling the production schedule based on the demand for finished products. It calculates the quantity and timing of materials needed for production by considering factors such as lead times, order quantities, and production schedules. MRP helps optimize inventory levels and ensure that materials are available when needed.
4. **Economic Order Quantity (EOQ):** EOQ is a formula used to determine the optimal order quantity that minimizes total inventory costs, including ordering costs and carrying costs. By balancing the costs of ordering and holding inventory, organizations can minimize total inventory costs while maintaining adequate stock levels.
5. **Vendor-Managed Inventory (VMI):** VMI is a collaboration between a buyer and supplier where the supplier manages the buyer's inventory levels. The supplier monitors inventory levels at the buyer's location and replenishes stock as needed. VMI reduces the buyer's inventory holding costs and ensures timely replenishment of materials.
6. **Kanban System:** The Kanban system is a visual scheduling system used to control the flow of materials and production activities. It uses cards or signals to indicate when materials should be replenished or when production should be initiated. The Kanban system helps maintain optimal inventory levels, reduce waste, and improve production efficiency.
7. **Cycle Counting:** Cycle counting is a method of inventory auditing where a portion of inventory is counted on a regular basis, instead of conducting a full physical inventory count. This technique allows organizations to continuously monitor inventory accuracy, identify discrepancies, and address issues promptly.
8. **Quality Control Techniques:** Quality control techniques such as statistical process control (SPC), inspection, and testing are used to ensure that materials meet predefined quality standards. By implementing quality control measures, organizations can minimize defects, rework, and waste, leading to improved product quality and customer satisfaction.
9. **Batch Tracking and Traceability:** Batch tracking and traceability systems allow organizations to track the movement of materials throughout the supply chain. By assigning unique identifiers to batches of materials, organizations can trace the origin, usage, and disposition of materials, enabling better inventory management, quality control, and compliance with regulations.
10. **Standardization and Simplification:** Standardizing materials, components, and processes helps reduce complexity, variability, and costs in material management. By

standardizing specifications, part numbers, and processes, organizations can streamline procurement, inventory management, and production processes, leading to greater efficiency and cost savings.

These material control techniques can be tailored to suit the specific needs and requirements of different industries, organizations, and supply chains. By implementing effective material control techniques, organizations can optimize inventory management, reduce costs, improve operational efficiency, and enhance customer satisfaction.

Stock Levels: Stock levels refer to the quantity of materials or products held by an organization at a specific point in time. Maintaining optimal stock levels is crucial to ensure that materials are available to meet demand while minimizing holding costs and the risk of stockouts. Stock levels are influenced by factors such as demand variability, lead times, storage capacity, and cost considerations.

Economic Order Quantity (EOQ): EOQ is a formula used to calculate the optimal order quantity that minimizes total inventory costs, including ordering costs and holding costs. The EOQ formula takes into account factors such as the demand rate, ordering cost per order, and holding cost per unit. By determining the EOQ, organizations can optimize their ordering quantities to minimize total inventory costs while ensuring that materials are available when needed.

ABC Analysis: ABC Analysis is a technique used to categorize inventory items based on their value and importance. It classifies inventory items into three categories:

- **A Items:** High-value items that represent a significant portion of inventory value but have a low usage frequency. These items require careful monitoring and management due to their high value.
- **B Items:** Moderate-value items that have a moderate usage frequency. These items require moderate management attention compared to A items.
- **C Items:** Low-value items that have a high usage frequency. Although they represent a small portion of inventory value individually, they collectively account for a significant portion of inventory items.

ABC Analysis helps organizations prioritize their inventory management efforts by focusing more attention on high-value items (A items) while allocating fewer resources to low-value items (C items). This classification enables organizations to optimize inventory control, storage space utilization, and procurement strategies based on the value and importance of inventory items.

By integrating these concepts into their material control practices, organizations can optimize inventory management, reduce costs, minimize stockouts, and improve operational efficiency throughout the supply chain.

Stores control is an essential aspect of material management and inventory control within an organization. Two common tools used for stores control are the Stores Ledger and the Bin Card. Let's explore the differences between these two tools:

1. Stores Ledger:

- A Stores Ledger is a comprehensive record-keeping document or system used to track the movement of materials in and out of the inventory storage area (store).
- It serves as a centralized repository of information related to inventory transactions, including receipts, issues, returns, adjustments, and stock balances.
- The Stores Ledger provides a detailed account of each inventory item, documenting its quantity, location, unit cost, date of receipt, and any relevant transactional information.
- It is typically maintained by the storekeeper or inventory controller and may be kept manually in a physical ledger book or electronically using inventory management software.
- The Stores Ledger provides an overall view of inventory levels, transaction history, and stock movements, facilitating accurate inventory management, financial reporting, and decision-making.

2. Bin Card:

- A Bin Card, also known as a Stock Card or Bin Tag, is a transactional record maintained for each individual inventory item or stock-keeping unit (SKU) stored in a specific location (bin) within the inventory storage area.
- It is a physical or electronic card attached to or associated with the storage bin or location where the inventory item is stored.
- The Bin Card records detailed information about the inventory item, including its description, stock balance, receipts, issues, transfers, and adjustments.
- Unlike the Stores Ledger, which provides an aggregate view of inventory transactions across all items, the Bin Card focuses on tracking transactions for a specific inventory item in a particular location.
- Bin Cards are typically updated in real-time or after each transaction by the storekeeper or warehouse personnel responsible for managing inventory in the respective location.

In summary, while both the Stores Ledger and Bin Card are tools used for stores control and inventory management, they serve different purposes and provide different levels of detail. The Stores Ledger provides an overall view of inventory transactions and stock balances across all items, while the Bin Card focuses on tracking transactions for individual inventory items in specific storage locations. Both tools are essential for maintaining accurate inventory records, controlling stock levels, and ensuring efficient stores management within an organization.

Pricing materials issues refers to the method used to assign costs to materials when they are issued from inventory for production or other purposes. Several common methods for pricing material issues include:

1. First-In, First-Out (FIFO):

- Under the FIFO method, the cost of materials issued from inventory is based on the assumption that the first materials purchased or received are the first ones used or issued.
 - In other words, the cost assigned to materials issued is the cost of the oldest inventory in stock.
 - FIFO is suitable for situations where inventory turnover is high or where there is a consistent increase in material costs over time.
 - FIFO results in lower costs of goods sold (COGS) during periods of rising prices, as it assigns lower, older costs to materials issued.
2. **Last-In, First-Out (LIFO):**
- LIFO assumes that the last materials purchased or received are the first ones used or issued.
 - Under the LIFO method, the cost assigned to materials issued is the cost of the most recent inventory in stock.
 - LIFO is suitable for situations where inventory turnover is low or where there is a consistent decrease in material costs over time.
 - LIFO results in higher costs of goods sold (COGS) during periods of rising prices, as it assigns higher, more recent costs to materials issued.
3. **Simple Average Method:**
- The simple average method calculates the average cost of all materials in inventory and assigns this average cost to materials issued.
 - It is calculated by dividing the total cost of materials in inventory by the total quantity of materials in inventory.
 - The simple average method is straightforward to calculate but may not accurately reflect changes in material costs over time.
4. **Weighted Average Method:**
- The weighted average method calculates the average cost of materials in inventory based on both their quantities and costs.
 - It is calculated by dividing the total cost of materials in inventory by the total quantity of materials in inventory.
 - Unlike the simple average method, the weighted average method considers both the quantity and cost of each unit of material in inventory.
 - The weighted average method is more accurate than the simple average method and is commonly used in situations where there are fluctuations in material costs over time.

Each of these pricing methods has its advantages and disadvantages, and the choice of method depends on factors such as the nature of the business, inventory turnover, cost fluctuations, and financial reporting requirements. Organizations may choose to use one method consistently or may use different methods for different inventory items or purposes. It's essential to understand the implications of each method on financial statements, tax liabilities, and decision-making processes.