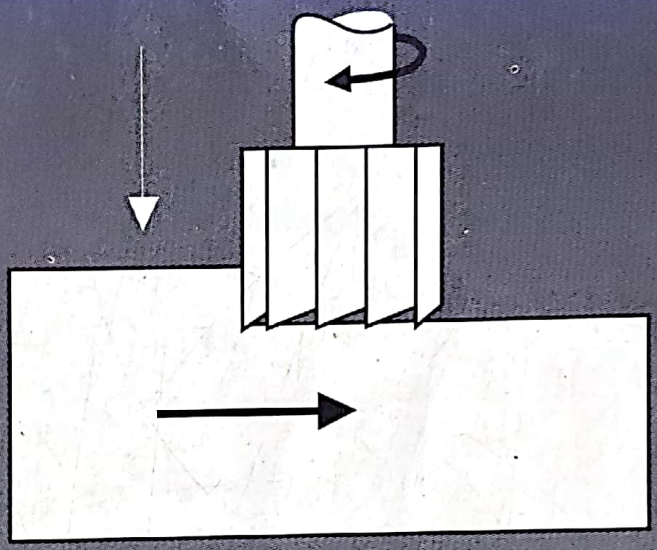
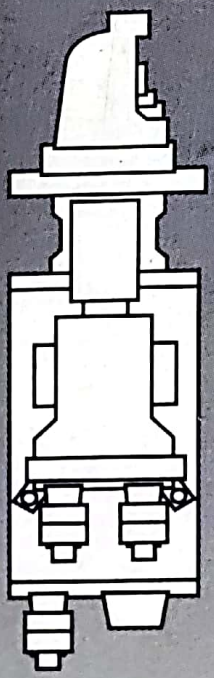
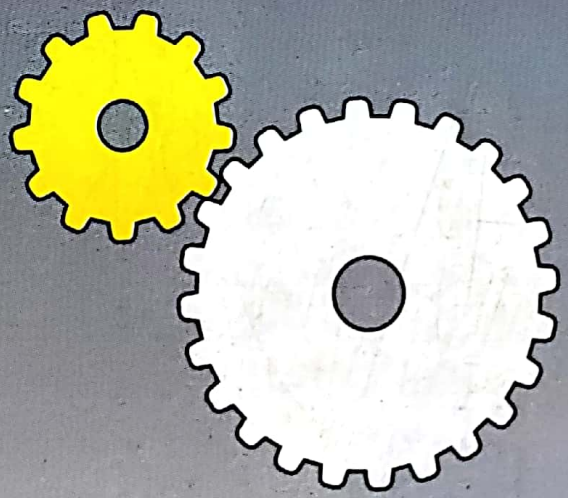
PRODUCTION AND MATERIALS MANAGEMENT







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UNIT-5

Materials Management

Materials Management is one of the areas covered by the whole process of management. For a balanced growth and effective running of the enterprise, it is necessary that material cost, material supply and material utilisation are so controlled that they lead to (i) maximisation of production, (ii) reduction in the cost of production and distribution and (iii) maximisation of the profit. Materials management helps in reducing materials cost, preventing huge amount of capital being locked up for a longer period, improving the capital turnover ratio and achieving higher profitability.

Classification of Materials

The materials manager is responsible for classifying the materials before they are sent for inspection, entered into the stock ledger, and binned. Therefore, broad classification of materials according to their nature, use and service becomes essential before the job of identification is undertaken.

Various items carried in a store are generally divided into the following major types in order to help the materials executives and staff in maintaining the records, laying down the broad principles of preservation and the internal organisation of the store room.

1. Raw materials
2. Purchased Components
3. Work-in-Progress
4. Finished Goods
5. Spares
6. Consumables
7. Machinery and Equipment
8. Inflammables
9. Chemicals
10. Furniture
11. General Stores
12. Scrap Materials
13. Packing Materials
14. Fuel Stock

Definition of Materials Management

Bailey and *Farmer* define materials management as the management of flow of materials into an organisation to the point where these materials are converted into the firm's end product.

Ammer defines it as the "process by which an organisation is supplied with goods and services that it needs to achieve its objectives. The materials management begins with the supplier and ends when the material is consumed or incorporated into some other product. The executives who engage in materials management are concerned with three basic activities – buying, storage of materials and movement".

Thus, materials management is concerned with those management functions circumscribed in the complete cycle of materials flow like purchasing, production and inventory control, material handling, packaging, traffic and distribution. All these related functions are grouped together and are under the direct control of one line manager. All the sections of the materials management strive to attain the fundamental objectives of materials management. ~~It should also be~~

Importance of Materials Management

The importance of materials management cannot be over-emphasised in this complex industrial world. It affects not only a particular industry but the entire economic activity of a whole nation. Materials contribute to the quality of the end product. The amount spent on materials is increasing in relation to the expenditure on other inputs. Materials *add* value to a product. The margin between the values of raw materials and the finished products is known as the *value added by production*. Materials form an important aspect of *current assets* in any organisation. Conservation of materials and their availability for prosperity is one of the social responsibilities of business. Hence, materials management is one of the centres of accountability for performance. Reduction in the materials cost by about 5 per cent is always possible through an efficient management of materials. Evidence is there to prove that skilful and imaginative management had been able to save even more than 5 per cent of the total cost of the final product.

Materials form the largest single expenditure item in most of the manufacturing organisations. They usually represent 50 to 60 per cent of the total cost of the final product. An analysis of the financial statement of a large number of manufacturing organisations reveals the fact that on an average about 60 per cent of the total expenditure is locked up in materials.

Table 25.1 – Average Materials Expenditure

Average Expenditure of Materials (Per cent)	*Industry Groups*
Above 75	Fabrication, Construction, Electrodes, Wool, Jute, Commercial Vehicles, Furniture.
55 – 65	Cotton Textiles, Bread, Refrigeration, Ship Building, Cables.
45 – 55	Engineering, Non-ferrous, Paper, Explosives, Ship Building, Chemicals, Tyre, Machine tools, Cement, Electricity, Pharmaceuticals.
35 – 45	Steel, Newspaper, Fertiliser, Aircraft, Cigarettes, Asbestos.

INTEGRATED APPROACH TO MATERIALS MANAGEMENT

The essence of materials management is the coordination of the various departments of a company. As the Materials department spends large sums of money on the purchase of materials, it is closely associated with the Finance department. Where *product designing* is involved, constructive coordination with the Design department becomes essential because the knowledge of materials availability or materials substitution comes only from the Materials department. The importance of pre-design value analysis needs to be stressed here. Similarly, there should be close coordination with Transport, Quality Control, and Inspection wings of the organisation.

An integrated approach to materials management is only a concentrated and coordinated effort for obtaining greater efficiency in the field of materials utilisation and costs.

Purchasing: Purchasing department procures materials as per requirements to meet quantity and time specifications. The main activities include:

(i) Selecting acceptable vendors and negotiating with them on purchase terms, price, quality and other related factors.

(ii) Interacting with vendors to develop materials specifications, to control quality and to solve problems involved in receipt and usage of materials.

(iii) Placing purchase orders for materials, and services, considering economic levels, blanket or open ordering, *make*-or-*buy* consideration, priority of orders and vendor performance.

(iv) Expediting delivery of materials.

(v) Keeping abreast of prevailing market conditions and knowing about the arival of new materials that result in cost reduction.

Receiving and Store: The *receiving and store* functions accept, store, handle and issue materials and process the necessary documents to record transactions. Their major activities include:

(i) Receipt of materials, verification of quantity and preparation of Material received reports.

(ii) Storage of materials in accordance with pre-specified use of stores by using the right facilities and equipment and practising a system to enable the easy identification of materials.

(iii) Issuing materials upon authorised requisition.

(iv) Physical check of stocks to verify accuracy of transactions through constant, special and annual inventories.

Production Control: The function of production control is increasingly being considered as a part of the materials function.

Inventory Control: Inventory control is responsible for supplying materials to fulfil production plans and schedules and ensuring that it is achieved with minimum required stocks.

Product Distribution: Product distribution receives, stores, select orders, packs and ships finished goods, processes the necessary papers to record such transactions and arranges for transportation of inbound and outbound shipments.

Materials cost control and cost reduction: As has been stated, materials cost control and cost reduction are the chief tasks of materials management.

Advantages of the Combined Materials (Stores) and Purchase Department

1. *Procurement at the right time:* The principal objective of Materials Management is to obtain raw materials, tools, general supplies, etc., at the appropriate time. This involves (i) recoupment on time by Stock control; (i) processing the purchase order and the follow-up by Purchase section; (ii) sending shortage reports by stock control as well as stores at different stages; (iv) clearing the goods from docks, railways or road transport offices in case of purchases from distant sources; and (v) verifying and taking materials into stock by stores, etc.

2. *Lead time and stock levels:* Variations may occur in delivery time, its effect on stocks and production, the necessity of adjusting the minimum and maximum levels on stock control cards, etc., will be better appreciated and more effectively tackled by a common department head than by a separate purchase officer.

3. *Cost reduction and productivity:* Another objective of materials management is to increase productivity of materials. Productivity is the ratio between input and output. As far as materials management is concerned, it implies reduction of costs and increase in profit. The scope for its achievement other than in competitive bidding and negotiations lies in value analysis, standardisation, simplification, reduction of procurement cost by placing bulk orders, reduction of investment and carrying cost by low rate of delivery, avoiding obsolescence, control over consumption of materials, etc. Apart from the difficulties of coordinating all these, some factors like procurement cost and carrying cost pull in opposite directions and vitiate the issue. Therefore, a decision which will satisfy all the conflicting interests can be taken better by a common department head.

4. *Price and Quantity:* To a great extent, the price depends upon the quantity. If a decision regarding the quantity to be bought rests with a separate department, the work of the purchase officer is handicapped. In a combined department, the department head is in a position to negotiate the price effectively on the basis of the present and future requirements.

5. *Inventory reduction:* One of the objectives of materials management is to keep inventory at a low level. This can be achieved mainly by staggering deliveries and reduction, if not elimination of minimum stock (safety stock). For this purpose, there should be close co-ordination between *Stock Control* and *Purchase. Delay* in recoupment will create stock-outs. In a combined stock Control and Purchase, the head of the department is in a position to ensure that recoupment indents and shortage reports are prepared on time.

6. *Unutilised Materials:* Unutilised Materials purchased against special indents will often come to the notice of a common department head during his visits to the stores which facilitates action with the original indentors. Where stores and Purchase sections are divided, such co-ordination is difficult. Also it is far easier for a common department head to sort out surplus materials and arrange for their disposal.

7. *Classification and Codification:* The classification and codification work requires a thorough knowledge of the materials and their application or use. Often this calls for actual examination of the materials in the stores and scrutiny of the requisition letters received in the Purchase Section from the indentors of materials. If Stock Control, Stores and Purchase departments are separate, there will be inconvenience regarding classification work.

8. *Knowledge of Materials:* In a combined stores and purchase department, the head of the department pays regular visits to stores and gets more opportunities to see the actual use of materials in the factory. Thus, he gains more knowledge about them and their applications which assist him considerably in his interaction with various departments as well as suppliers. It also enables him to make suggestions regarding standardisation, quality of materials to be bought, alternatives that can be used, etc., unlike the Purchase Officer whose knowledge is derived only through paper work.

10. *Ensuring Receipt of Materials:* In the combined set up, the department head gets an opportunity to verify what is being supplied against his order and to ensure that he receives the correct material for which payment was made.

11. *Quicker issue after Arrival:* In a combined set up, a single executive is the head of both the stores and purchase. This enables him to realise the relative urgency or importance of various purchases. During his daily rounds of the Receiving section and the Stores or from daily reports, he gets first hand information regarding arrival of materials and therefore he effects quicker issue of the materials required urgently to the concerned.

12. *Return of Rejections:* The combined set up realises the necessity of quicker return and replacement of rejected materials and takes action accordingly.

13. *Bulk purchase and Storage space:* In determining the minimum stock and reorder quantities, the storage space is a factor to be taken into account. Although bulk purchases may be an advantage for a better price, they may create storage problems. If stores and purchase are separate, very often such a factor is likely to be overlooked.

14. *Common Records*: In a combined set up, the stock control will be adjacent to the purchase section. This enables the purchase section to utilise the information available on the stock control cards for the purchase work. In a separate set up, the stock control invariably goes with the stores. This means maintaining of separate records (Purchase Record Cards) by the purchase section and incurring more expenditure.

Objectives of Materials Management

Objectives of materials management are listed below:

- To ensure an uninterrupted production or operation, by maintaining a steady flow of materials.
- To effect economies in the cost of materials by purchasing materials of the right quality, in the right quantity, at the right time, from the right source, and at the right price.
- To effect economies in the costs incurred on materials purchased through storage, processing and warehousing, till the finished goods reach the customer ultimately.
- To reduce working capital requirements through proper and scientific inventory control.
- To be alive to the changes in the market in respect of new products, etc.
- To improve the quality of manufactured goods by the use of better raw materials or components and thereby increase the competitiveness of goods put on sale.
- To also increase the competitiveness of manufactured goods by reducing their prices through cost reduction and value analysis.
- To save foreign exchange through import substitution and economising on foreign purchases.
- To ensure proper co-operation among all departments of the organisation to meet objectives of the materials management, both at the corporate and functional levels.

Purchase Management

Purchasing is a function of procuring goods and services from sources external to the organisation. In the words of *Alford* and *Beary* "Purchasing is the procuring of materials, supplies, machine tools and services required for the equipment, maintenance and operation of a manufacturing plant". Thus, purchasing is the function of procuring materials, tools, stores (or supplies) and services required for the manufacture of a product, maintenance of the machines, and uninterrupted running of the manufacturing plant in a manner that guarantees marketing of the company's products in the quantities desired, at the time agreed upon and at the competitive price, consistent with quality desired. Purchasing in essence is the task of buying goods of right quality, in the right quantities, at the right time, at the right source and at the right price.

Traditionally, purchasing was regarded as one of the activities of the production management. However, many progressive managements have already realised that in view of changing business conditions, growing competition, continual escalation in the cost of inputs, purchasing must be given status equal to that of other major functions (*i.e.*, production, sales, and finance). The purchase department is headed by a Purchase Manager/Officer. In some firms, the head of the purchase department is also called the Commercial Manager or Purchase Chief.

Basic Elements in Purchase Transaction

There are some basic elements in the purchase transaction which is common to all. In summary, these are as follows:

(i) The need for materials is recognised and their requirements are determined. (ii) Specifications for each item are spelt out. (iii) The need is transmitted to the purchase department. (iv) A purchase plan is made out. (v) A suitable source is selected for the supply after due investigation. This can be on the basis of tenders called. Sometimes, a source may have to be developed. (vi) Rates and terms and conditions of purchase are negotiated and finalised. (vii) A purchase order is prepared and sent to the supplier. The purchase order would spell out the terms and conditions of the purchase contract. (viii) The supplier's acceptance of the purchase order is obtained. (ix) Following up is done by the purchase department with the supplier to ensure prompt delivery of the right quality of materials. (x) The material, when received, is inspected against specifications. Occasionally, it is inspected at the vendor's factory. (xi) The supplier's invoice is checked against the purchase order and the goods received are documented. (xii) A cheque is issued to the supplier towards payment for supplies received.

This is often referred to as the *purchasing cycle*, given below

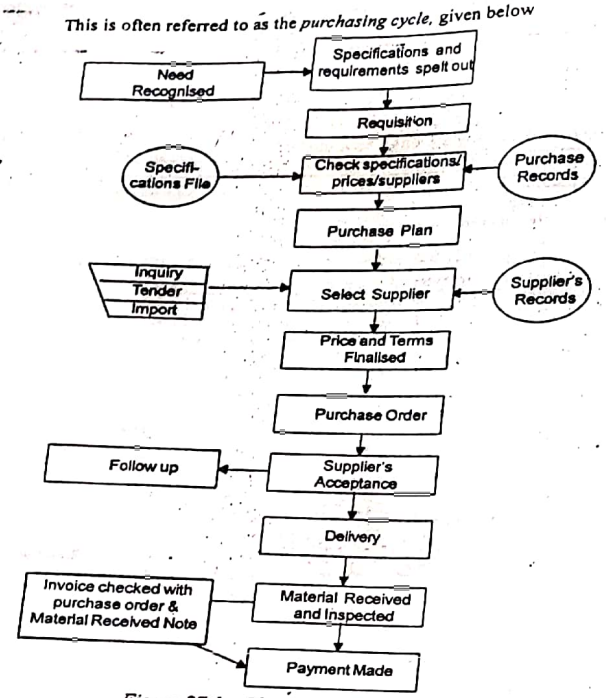

Figure 27.1 – The Purchasing Cycle

(PURCHASING) BUYING PROCEDURE

The main steps in procurement procedure are discussed below:

(a) Indenting Purchase Requirements: Procurement activity begins with the receipt of an purchase indent (purchase requisition) – which is an authority for the purchase department to initiate purchase action. Purchase indent may be received either from

(i) store keeper for stock items (*i.e.*, items of regular use)
(ii) production control department for non-stock items (*i.e.*, items required for particular order),
(iii) maintenance department for machinery spares, or
(iv) head of the department for special items such as filing cabinet, almirah, furniture, etc.

The purchase indent is generally raised in triplicate. The original copy is sent to purchase department, the second copy is retained by stores and third copy is retained by the originating department.

Proforma of Purchase Requisition

Date .....

Requisition No.....
Shop .....
Required for
I. (a) Work order No. .....
(b) Department Use.....
(c) To Stock .....

S. No.	Description of material	Specification	Quantity	Approx. cost	Remarks if any

Delivery required upto .....

Signature.....
(Head of the Department)

Addresses of probable suppliers.....
.....
.....
.....

II. Report of Storekeeper .....
.....

Signature .....
(Storekeeper)

III. (For the use of purchase section)
Purchase Order No .....
Supplier .....
Date of Delivery Promised .....

Signature .....
(Chief buyer)

Part I is completed by the Indentor (Head of the Department). For quick purchasing and minimising the work of purchase section, he should mention the addresses of probable suppliers, who can supply these special materials.

Part II is filled by the storekeeper in the remaining two copies and the store keeper remarks on it whether the required material is available in store or not.

(b) Scrutinising Purchase Indents: Every indent received in the purchase department is scrutinised to see whether

(i) it is signed by the authorised signatories
(ii) it is routed through stores department which has to mention in the purchase indent about its nonavailability, etc.
(iii) the description of the required item is correctly and clearly given,
(iv) whether or not qualified and developed sources are available,
(v) last supply of the stated item is correctly and clearly written,
(vi) quantity shown against the item is written.

Factory Code No. .....
Telephone No .....
Telegraphic Address .....
Fax No.....
E mail address.....

Purchase Order No. .....
Date .....
Requisition No. .....

To
M/s .....
.....
.....

From
M/s .....
.....
.....

Refer. Your Tender/quotation No. ..... Date ..... Please supply the following in accordance with the terms and conditions mentioned as under.

S. No.	Description of material	Quantity	Rate Rs.	Amount Rs.	Delivery Rate promised

Terms and conditions :
Date of delivery :
Place of delivery :
Terms of payment :

Signature.....
(Purchase Officer)

Proforma of a Purchase order

When an order is placed by telephone or telegraph or through fax or Email, it is a common practice to confirm the order by sending the supplier a regular purchase order. Such an order should be clearly marked "confirming" to avoid the possibility of the supplier mistaking it as a second purchase order.

All purchase orders issued shall be entered in the purchase order progression register. The register shall have the following columns:

(i) Serial number;
(ii) Purchase order number and date;
(iii) Value of the purchase order;
(iv) Name of the supplier;
(v) Due date of delivery;
(vi) No. of items;
(vii) Import licence/CCP. Number date and delivery;
(viii) Letter of credit number and validity;
(ix) Date of order acknowledgement;
(x) Dates when reminders are sent;
(xi) Despatch details;
(xii) Receipt details (to also indicate rejections if any); and
(xiii) Payment details.

(e) Order Acknowledgement: Some companies insist on order acknowledgement from the supplier acknowledging the receipt of purchase orders and agreeing to supply the items stated in the order. Seeking an acknowledgement is for obtaining a definite commitment from the supplier conforming to the terms and conditions.

(f) Follow up and Expediting: Purchase follow up is the function of ensuring that suppliers effect deliveries on time. Purchase follow up is required in two stages – pre-delivery follow up and shortage chasing.

Predelivery follow up is intended to caution the supplier of the due date and make alternative arrangements if the supplier is expected to fail in his delivery commitment.

Shortage chasing is a vital part of purchase follow up. Methods vary but the purpose is always the same – first to obtain shortage materials as soon as possible and second to create an impression at the supplier's works that it is prudent to effect deliveries on time than to have purchase department do the shortage chasing. Shortage chasing is initiated as soon as due date is over. The nature of follow up and the level at which the follow up is done depends on criticality of items, availability of alternative sources, stock on hand and coverage for future period, etc.

(g) Extension of Delivery Period: If the supplies are not effected within two weeks after the delivery date or if the suppliers ask for an extension of time, the attention of the authority who signed the order shall be drawn. If financial implications are involved, approval of the next higher authority shall be taken. While granting extension of delivery time, financial implications shall be examined and necessary concurrence obtained.

(h) Cancellation of Orders and Penalty: For cancellation of a purchase order, the approval of the next higher authority shall be obtained. Before imposing any penalty, the approval of the General Manager shall be obtained.

(i) Receiving Materials: When goods arrive, they are sent to the receiving stores, and contents are physically verified against the details provided in the purchase order. All incoming supplies from the suppliers at the receiving store are entered in the GRR (goods-receipt report) register. Discrepancies (if any) are notified to the vendors through 'Discrepancy Note'.

(j) Inspection of Goods: All supplies are subjected to inspection and testing. All items are inspected on receipt by the inward inspection section at the buyer's works as to their conformance of dimension, materials specification and performance. Conformance to the dimension is checked against component drawings. The component is subjected to both visual (to check for mutilation, burns, finish, etc.) as well as dimensional checks with gauges and measuring instruments. Conformance to materials specification is decided with the help of chemical and metallurgical tests. Small sample pieces of components and cut pieces of materials are forwarded to the laboratories for checking their harness, material composition, micro-structure and other properties. Conformance to performance is decided on the basis of tests and trial runs, e.g., machinability tests for raw materials, life test for bearing, r.p.m. test for motor, size test for broaches, etc. Inspection results are entered by quality control on the goods receipt report (GRR).