Chapter 3

Materials

(A) Material Control

I. Introduction

A major objective of Cost accounting is Cost Control. Every element of cost has to be effectively controlled. Out of the three elements of cost i.e., Material, Labour and Expenses, Materials form a major chunk of cost of production. An analysis of financial statements of a large number of private and public sector organisations reveals that about 55% of cost of production consists of material cost, on an average. It is essential, therefore, for every organisation to devise a suitable system of material control from the time of placement of purchase requisition to the time of final consumption of the material.

II. Meaning of Material Control

Material Control is a system which ensures required quantity of material of the required quality at the right time and place with minimum investment of capital. It may be defined as "The regulation of the functions of an organisation relating to the procurement, storage and usage of materials in such a way as to maintain an even flow of production without excessive investment in material stock".

An efficient material control system can improve the input output ratio. It is an effective integration of various aspects and includes scheduling the requirements, purchasing, receiving and inspection, maintaining stock records and stock control. Material control is accomplished through periodical reports and records relating to purchasing, receiving, inspection and issue of materials. It is also effected by establishment of functional organisation and fixation of responsibilities through standard forms of accounting records and reports.

III. Need for/objectives of Material control

As a major portion of cost of production consists of material cost, the cost accounting system can be effective only when there is an efficient material control. The following are the objectives of material control.

1. ***Ensuring supply of adequate quantity of materials***

Sufficient quantity of material should be made available for all the activities and departments in the organisation so that uninterrupted production can be carried on and work does not stop due to non availability of materials.

2. *Optimum investment in materials*

Keeping the amount invested in materials under control is a central objective of material control. Locking up of funds in stocks results in mismanagement of working capital. Overstocking should be avoided in view of its disadvantages. Excessive investment and over stocking can be avoided by fixing maximum stock level for all major items of materials.

3. *Favourable terms of purchase*

The purchase price and other terms of purchase should be of maximum advantage to the firm. At the same time, quality and specifications of the materials should be as per requirements.

4. *Control of Wastage*

Wastage of material during storage and handling on the production floor should be minimised. Standards can be fixed for wastage and efforts can be made to keep the actual wastage below the standard level. Pilferage, theft, etc. should be minimised to keep material cost within control.

5. *Control of obsolescence and spoilage*

Loss due to materials becoming out of date or getting spoiled and unusable is a major cause for material losses. Fixing stock levels and utilising materials in time can minimise such losses.

6. *Proper reporting to Management*

Management has to be informed frequently about stock of raw materials so that production is planned. This is possible only if there is proper reporting system and updating of records by the store keeper.

7. *Prevention of misappropriation of materials*

Proper internal check of receipts, issues and consumption of raw materials helps in prevention of misappropriation of materials by the employees.

8. *Proper control system for settlement of invoices*

Suppliers' invoice is to be paid only after verifying the physical receipt of materials to avoid excess payment to the suppliers.

IV. Essentials of Material Control

The process of material control is divided into four stages – Purchase control, Stores control, Issue control and Control of material losses. These four types of control are discussed in detail later in the chapter. A brief outline of various aspects of material control is discussed below:

1. *Co-ordination :* Effective control of material requires effective co-ordination among the departments involved in purchasing – receiving and inspection, storage, production, sales and accounting departments so that adequate materials are available for continuous production and sales. At the same time excessive investment in materials and over stocking are avoided.

2. *Centralised Purchasing* : In order to economise the buying and to avoid reckless buying of raw materials the purchasing function is to be centralised.

3. *Proper scheduling* of materials requirements ensures availability of materials at the right time.

4. *Classification and codification* of material leads to easy identification and proper control of materials.

5. *Receipt of Materials* : Checking and inspection of material by receiving department ensure correct quantity and quality of material as ordered by the organisation.

6. *Usage of Forms* : Standard forms are to be designed and used for purchase requisition, purchase order, receiving of materials, requisition of materials and transfer of material from jobs to stores or to other jobs.

7. *Storage* of materials should be entrusted to a qualified store keeper to plan effective storage and avoid losses due to obsolescence, pilferage and theft.

8. *Issue of Materials* : A good method of issue of materials to various jobs, processes and orders should be devised to ensure delivery of right material at the right time and right quantity and quality for smooth flow of production.

9. *Stock taking* : Perpetual inventory should be followed for stock verification to reveal differences in stock due to pilferage theft and wastage. Moreover perpetual inventory system avoids closing down of factory for stock verification and valuation.

10. *Levels of stocks* are to be maintained in the form of reorder level, maximum level and minimum level to avoid shortage and over stocking of materials.

11. *Economic ordering quantity* is to be operated for each type of materials to optimise the cost of buying and storage.

12. *Pricing of Issues* : A suitable method of pricing is to be followed for correct valuation of material cost of jobs, orders, processes and valuation of closing stocks.

13. *Control of materials during the production process*: Proper Accounting and records are to be maintained to avoid wastage of materials during consumption.

14. *Suitable reporting system* helps management to take decisions regarding investment in materials and avoidance of obsolete, dormant and slow moving materials.

V. Advantages of Material Control

An effective material Control system –

1. Ensures availability of material for production.
2. Reduces wastage of raw materials.
3. Achieves economy of buying and storage cost.

4. Reduces pilferage, theft, obsolescence and other material losses.
5. Avoids excessive investment in stocks.
6. Helps in maintaining perpetual inventory system to furnish information to management regarding materials.
7. Helps in ascertaining value of jobs, processes and orders.

VI. Materials Management and Organisation of Material Control

Material management aims at minimising the cost through coordination of planning, purchasing, receiving, storing and control of materials in an effective manner. In these days of mechanisation and specialisation, logistics of purchasing and integrated management are practised. This has resulted in professional development of managers which will make them proficient in satisfying the requirements of an integrated materials management to bring together complex, conflicting and related functions of materials management.

The policies of government to tackle inflation through credit squeeze requires professional management of materials. In order to perform inter-related functions through integration, the materials manager should be efficient enough to coordinate and control with a overall view to balance the conflicting objectives of various individual functions and aspects of materials.

The main merits of Integrated materials management are performance, growth, accountability and adaptability to electronic data processing.

Organisation of Material Control

Material Control is effected through cooperation and co-ordination of various departments involved such as purchasing department, receiving and inspection department, stores, production and stock control departments.

The role and function of each of these department is discussed below:

(a) Purchasing department is to make the purchase of required quantity of various items of materials at the right time of good quality at the most economical price. The following are the functions of purchasing department:

1. Receiving of purchase requisitions from various departments.
2. Inviting quotations from different suppliers to deliver materials as per the specifications of purchase requisitions.
3. Preparing a comparative statement of quotations of suppliers.
4. Selecting a supplier from the comparative statement of quotations, one who offers most favourable terms with due regard to quality.
5. Drafting of purchase order and sending it to the supplier.
6. Following-up of purchase order to receive the materials at the specified time.
7. Checking various documents and certifying that materials of requisite quantity and quality are received; and
8. Passing purchase invoice for payment if everything is in order.

(b) Receiving and Inspection Department : This department plays a vital role in examining the quality of raw materials and ensuring that sufficient quantity of materials as per purchase order are received. The functions of this department are as follows :

1. Receiving materials from various suppliers through various modes of transport and acknowledging the receipts.
2. Preparing a Goods received note by filling up the details of quantity, grade and other information about materials by count, weight, etc.
3. Inspection of materials to check the quality and other specifications of materials.
4. Sending the materials received to stores and other places.
5. Communicating to the purchasing department and accounts department about materials received and inform them of any damage, shortages, etc.

(c) Store keeping Department : The main functions of this department are as given below :

1. Initiate purchase requisitions for materials, based on the position of stock.
2. Maintain various levels of stock.
3. Receipt of materials from receiving and inspection department.
4. Check the materials received by comparing with purchase requisition and place them in the proper bins.
5. Issue of materials on receipt of materials requisitions from various departments.
6. Maintenance of stores records like bincards, by entering the receipt, issue and balance of materials.
7. Send periodical reports to the management regarding slow moving, dormant and obsolete materials to enable them to take suitable decisions and avoid losses.

(d) Production Department : This department plays very crucial role in optimum utilisation of raw materials and reducing material losses by performing the following functions:

1. Initiate requisition for raw materials of required quantity and quality at the right time to carry on with smooth flow of production.
2. Verification of raw material received from stores.
3. Maintain proper records of materials charged to various jobs, processes and operations.
4. Prepare proper notes for return of material, transfer of material from one job or department to another.

5. Prepare proper records regarding work-in-progress, scrap, wastage, spoilage and defectives and send periodical reports to management to minimise these losses.

(e) Stock Control Department : This department can be attached to cost accounting department or this function may be performed by the store keeping department itself. The main functions of this department are:

1. Maintenance of perpetual stock records.
2. Make suitable adjustments of stock, based on the receipt of authorised notes and
3. Ascertain the average consumption of raw materials in terms of quantity and value.

(B) PURCHASE CONTROL

I. Introduction

Efficient purchase of raw material is vital for every organisation. It is of extreme importance to a manufacturing company since it has its effect on all the factors concerning the manufacture i.e., quantity, quality, cost, efficiency, economy, prompt delivery, volume of production, etc. It is by shrewd purchasing that much money can be lost or saved.

II. Purchasing Department and its Objectives

Purchasing includes procuring of raw materials, stationery, machines, tools, spares, equipment, maintenance, supplies required for business, etc. It is a specialised activity entrusted to a separate department under the headship of a buyer or purchasing officer. This department can concentrate only on purchasing aspect to reap the benefits of specialisation over a period of time. The purchase department procures required things at the most economical price, favourable terms with maintenance of desired quality and at the right time. The objectives of establishing a separate purchase department are as follows :

1. *Specialisation :* The purchase department is to concentrate on purchase function alone; hence they can tap best sources of supply and reap all the advantages of accumulated expertise.
2. *Economy in Purchasing :* Due to bulk buying, the terms of suppliers will be favourable for the company.
3. *Optimum Investment :* Purchase of materials in reasonable quantities will rationalise the investment.
4. *Maintenance of cordial relationship* with vendors will be helpful in acquiring quick delivery of raw material, assured supply of materials, extension of credit facilities and other favourable terms for the organisation.
5. *Developing alternative sources* of supply as a precautionary measure against a particular supplier failing to meet the requirements.

6. *Adoption of best methods of purchase* to avoid financial losses, ensure delivery of raw material and avoid disputes with suppliers.
7. *Source of Information :* Purchase Department can be a reliable source of information regarding materials, suppliers prices, mode of transportation, freight charges and various terms of purchasing, etc.

To summarise, the basic objective of setting up of a purchase department is to make sure that materials are available for continuous production, economy in purchasing and availing the best terms from suppliers.

III. Centralised Vs. Decentralised Purchasing

Purchasing function may be centralised or decentralised.

Centralised purchasing refers to purchasing of requirements of the entire organisation by one particular department. It reduces the cost of administration by avoiding duplication, maintains uniformity of purchasing, avoids overlapping and can bring about reduction in cost of purchasing.

Decentralised purchasing refers to each of the departments in an organisation buying their requirements directly, when the organisation has a number of branches or divisions, to derive the advantages of localised purchasing.

Whether the organisation should have centralised or decentralised system of purchasing is a decision to be taken after considering the merits and demerits of both the methods. It is necessary to consider other factors like type of product, raw material required, number of divisions, cost of transportation, time factor, etc.

Advantages of Centralised Purchasing

1. *Favourable purchase terms :* As the entire requirements are bought in single purchase as bulk buying, more discounts and economy in transport will lead to reduction in overall material cost.
2. *Specialisation :* The purchase manager and his staff concentrate only on purchasing which leads to specialisation in purchasing and efficient buying of material of good quality and availability of material for production.
3. *Avoidance of duplication* and reduction of administration cost as different departments buying the raw material is avoided. Moreover this leads to better control over purchasing of materials.
4. *Maintenance of records :* As the purchasing staff perform only one function proper records and various documents are well maintained and preserved for various requirements.
5. *Better service to various departments:* The various departments of the organisation have to deal with purchase department for their requirements. Better service in time can be expected by them.

6. *Good relationship with suppliers* results in better credit policies and economy to vendors also, since they have to deal with only one purchase officer.
7. *Uniform policies* : As the function of purchasing is with specialised staff, uniform and consistent policies result in efficient purchasing in the quickest possible time.

Disadvantages of Centralised Purchasing

1. *Delay in purchasing* : Since different departments have to place requisitions with purchase department and then the purchase department has to initiate the purchasing procedure, there is the possibility of considerable time being consumed and delay in acquiring the materials.
2. *Lack of knowledge* of specific departments and their requirements may lead to purchase of inferior or unsuitable or lower grade materials.
3. *Non utilization* of locally available materials by different division of the organisation which are at various locations.
4. *High cost of* maintaining a separate department, when the staff of the departments concerned can purchase their requirements without additional staff being recruited for purchasing.

Compromise between Centralised and Decentralised Buying

Centralised purchasing is preferable to decentralised purchasing because of its merits over the latter. But all concerns cannot be adopting centralised buying because of differences in size, location of various divisions, etc.

Centralised buying is preferable in case of small organisations and also large organisations where different divisions are not far away from one another.

However, if various divisions are situated far away from one another due to availability of raw materials and other favourable local factors, it is better to have decentralised system which may lead to cheaper buying but loss of control.

To strike a balance between the two, a compromise may be made whereby the divisions may be asked to buy local raw materials with the knowledge of purchase department and buy the other materials through the centralised purchasing department.

IV. Purchase Manager – His/her Qualifications and Duties

Purchase Manager of a company occupies a very important position, since he/she has the power to use the large amount of working capital to be invested on materials. Any incompetent person may risk the resources of an organisation and moreover failure to acquire appropriate materials results in causing considerable damage to the company. Therefore, the organisation should appoint a skilled person as a purchase manager.

Qualifications of a Purchase Manager

1. Knowledge of organisation, industry and Products of the organisation
2. Knowledge of the process of production;
3. Knowledge of various types of materials used and required by the organisation;
4. Knowledge of sources of supply;
5. Knowledge of Government policies regarding export and import;
6. Knowledge of financial position and policies of the organisation;
7. Knowledge of economic conditions, laws of demand and supply;
8. He/she should be a person of integrity;
9. He/she should be an experienced administrator to run the department;
10. He/she should have knowledge of the Law of Contracts, Sale of Goods Act, etc.

Duties of purchase Manager

1. Preparing a purchase budget with the assistance of store keeper, production department and finance department.
2. Receiving purchase requisitions from various departments.
3. Inviting tenders or quotations from various suppliers.
4. Selection of reliable suppliers.
5. Placement of purchase orders.
6. Following up of purchase orders to receive materials as per the agreed schedules for delivery of raw materials.
7. Receiving Goods Received Notes (GRN) and verifying them with purchase orders to ensure that the quantity, quality and Price of materials received are in accordance with the orders placed.
8. Rejecting and returning the materials which are not inaccordance with agreed terms and quality.
9. Checking the invoices and passing them for payment if found in order.
10. Helping the R&D department to develop in-house production of raw materials.
11. Assisting the engineering, production and store keeping departments to properly classify and codify the materials and placement of materials in different locations for easy identification.

V. PURCHASE PROCEDURE OR ROUTINE OR CYCLE

A systematic procedure for purchase of raw materials helps in buying materials quickly with consistency. In general, purchase procedure of an organisation includes the following aspects.

(a) Receiving authorised purchase requisition;

(b) Studying the market and selecting a supplier;

(c) Issuing purchase order and following up delivery;

(d) Arranging for receiving and inspection of materials;

(e) Verifying and passing suppliers' invoice for payment.

(a) Receiving Purchase Requisition : The purchase department cannot buy the material on its own as it will not be aware of what materials are required, their quantity, quality and other details. Therefore, it will have to be intimated about the materials required by those departments which are in need of materials. This is done through purchase requisitions. The purchase manager comes to know the details of materials required by the concern through the purchase requisitions. Purchase requisition is prepared by the store keeper for materials required for regular stock items and by the other departmental heads for specific requirements which are not available in the store. This requisition has to be approved by the head of the department in addition to the person who is originating the requisition.

The purchase requisition is to be prepared in triplicate. The original copy is sent to the purchase department. The duplicate is retained by the store keeper or the department which initiates the requisition and the third copy is kept by the authorising executive.

The purchase requisition is initiated by the store keeper when materials reach the ordering levels. This is done to make fresh supplies of material available before stocks are exhausted. Specimen form of a purchase requisition is given below:

Specimen of Purchase Requisition

ABC Limited
Purchase Requisition

PR No. _____ Date _____

Date by which materials are required _____

Item No.	*Code*	*Description*	*Quantity required*	*Remarks*

Requested by ..... *Checked by* ..... *Approved by* .....

*Purchase Manager*_____

The purchase requisition given above makes it clear to the purchase department three basic aspects:

(a) What type of material is to be purchased?

(b) When the materials are required? and

(c) The quantity of materials to be purchased.

(b) Studying the market and choosing the supplier: The purchase department generally maintains a list of suppliers and other details for each type or group of materials. Tenders/quotations may be invited from these suppliers. A comparative statement of various quotations is to be prepared and the best supplier offering most favourable terms should be selected. When selecting a particular supplier the purchase department should keep various critical aspects in mind: (1) Reliability for supply of required quantity (2) Price quoted (3) Financial position of the supplier (4) Previous time schedules maintained by existing supplier (5) Terms of payment (6) Reputation of the supplier (7) Discounts offered.

All the terms being same, the price should be the lowest. The supplier should be reliable regarding quantity, quality and keeping up of time schedules for delivery of materials. The purchase manager should not be penny-wise and pound-foolish.

There should be updating of information about suppliers to eliminate from the list of suppliers those who are unreliable regarding terms of supply.

(c) Issuing purchase order and following up of delivery schedules : Once the supplier is selected the purchase order is to be prepared. The purchase order is the written commitment from purchase department to buy the materials and authorisation to the supplier to supply materials. It is the contract between the buyer and seller for stated terms and conditions. The supplier is committed to supply the materials and the buyer has to accept supply and make payment. It is also an authorisation to goods receiving department to receive the materials and to the accounts department to accept the invoice for payment to the supplier.

Generally, five copies of the purchase order are prepared and used as follows:

1. One copy is sent to the supplier.
2. One copy is retained by the purchasing department.
3. One copy is sent to the store keeper/department which has requisitioned materials.
4. One copy is sent to the receiving department.
5. One copy is sent to the accounts department.

The following is a specimen form of purchase order.

Specimen form of Purchase Order

ABC Limited
Purchase Order

No. _____

To
_____
_____
_____

Date _____
Our Ref. _____

Your quotation number ..... dated ..... has been accepted. Please supply the following items in accordance with various terms and conditions mentioned herewith:

S. No.	*Description*	*Quantity*	*Price Per unit*	*Unit*	*Total Value*	*Remarks*

Delivery terms _____
Discount _____
Excise Duty _____
Sales tax _____
Carriage and Freight _____
Terms of payment _____
Other Particulars_____

Receipt of this order may please be acknowledged
For ABC Company

Signature

For Office Use

Follow up : Acknowledgement
Received on _____
Reminder _____
Date of Delivery _____
Invoice No. _____

Date _____

The purchase order provides detailed information to the supplier regarding price, quantity, delivery terms, etc. It reduces the purchasing and clerical work into a routine.

Follow up of purchase orders by making enquiries at regular intervals as the delivery dates approach is necessary to see that materials are available at the right time. Alternative source of supply of material may be tapped if there is any difficulty in obtaining the materials on the agreed dates. Extension of time may be given based on acceptable reasons, subject to any penalty as agreed upon. This is necessary to ensure availability of materials to safeguard against disruption in production due to non availability of materials.

(d) Receiving and Inspection of materials : In large organisations there may be a separate department for receiving the materials. But in small organisations, this may be entrusted to the store keeper. The functions of the receiving department are as under :

1. Keeping purchase order files in a systematic way;
2. Receiving and unpacking of materials sent by suppliers under various challans.
3. Verifying the materials received by comparing with purchase orders. This includes checking quantity, quality and physical condition of material.
4. Submitting a report of any materials to be rejected with valid reasons.
5. Preparing a Goods received note, entering the details of materials received for the information of all those concerned with materials.

Generally, five copies of goods received note are prepared and used as given below:

1. One copy is retained by the Goods receiving department.
2. Four copies are sent to the store keeper along with the materials. The store keeper will verify the entries with the actual goods, countersign them and will send one copy to the purchase department; one copy to the Accounts department; one copy to the department which initiated the requisition and one copy is retained by the store keeper.

A specimen copy of goods received note is given below :

Specimen of Goods Received Note

ABC Company
Goods Received Note

No. _____ Supplier's Name_____
Date _____ Purchase Order No. _____

S. No.	*Description*	*Code No.*	*Quantity*	*Rate*	*Amount*	*Remarks about Inspection*

Received by _____
Inspected by _____ Bin No. _____
Stores Ledger _____ Store Keeper _____

(e) Verifying and passing supplier's invoice for payment : Based on Goods Received Note, purchases are verified and payment is made to supplier. When

the invoice is received from the supplier, it is sent to the accounting department to check the authenticity as well as accuracy. The quantity, price and amount received are checked with reference to purchase order and goods received note. If everything is found in order, the accounting section approves the invoice for payment and the cashier makes the payment as per the terms agreed.

(C) STORE KEEPING AND STOCK CONTROL OR INVENTORY CONTROL

I. Meaning and Importance

Store Keeping is a specialised function involving efficient management of materials, identifying, classifying and maintenance of stock records. Since, materials form major portion of cost of production and the total cost and most of the working capital is invested in materials, the materials are to be well kept and accounted for by an efficient stores department. Effective control over materials will lead to efficient running of business. Moreover, material losses due to theft, obsolescence, careless handling, negligence in checking materials, etc. may lead to reduced profit. Hence, it is desirable to have efficient store keeping to obtain maximum benefit out of it.

Reliability of cost accounting department depends to a great extent on the performance of stores department. Store keeping includes physical custody of materials in stock and maintenance of stock records. The cost accounting department can trace the material cost of jobs, processes, orders, etc., with the help of stock records maintained by store keeper and his assistants. The cost department requires the following from the store keeper :

1. Report of quantities of materials issued from stock.
2. The job numbers, processes, operations or departments to be charged for material issued for consumption.
3. Details about materials returned with job numbers, operations, processes or departments to be credited.
4. Complete information about scrap delivered to stores from production.
5. Coordinating inventory control work along with stores auditors.

II. Duties and Responsibilities or Functions of Stores Keeper

Store keeping is a specialised activity requiring constant attention. Therefore, it is to be handled by a person with ability to maintain the stores. The stores department is kept under the control of a store keeper who is to organise the routine of store keeping and control the men under his charge. The store keeper is expected to have expertise in stores routine. His duties and responsibilities are:

1. The receive goods as per goods received note along with proper documents.
2. To place the materials in proper bins.

3. To maintain materials in good condition to avoid deterioration.
4. To issue materials against properly authorised material requisitions.
5. Proper maintenance of stores records to enter all the quantities received and issued out of stores.
6. To report to the management on obsolete, slow moving and dormant stocks to enable the management to take suitable decisions to reduce such losses.
7. To keep the stores clean and accessible.
8. To supervise and control the work of his staff in the stores.
9. To prevent unauthorised persons from entering into stores.
10. To verify bincard balances with physical quantities to complete stock verification.

III. Location and Layout of Stores

Location of stores is an important aspect to be planned and decided carefully. It should be close to the receiving department and also close to materials consuming departments. The location is to be decided at the time of construction of factory, so that the stores is located at a desirable place. As far as possible the stores should be close to roads, railway sidings and wharfs. An ideal location of stores will bring down the transport cost. If stores and consuming departments are situated far apart, sub stores in each consuming department may be setup to avoid delay in internal transmission. Layout of stores is also another important aspect to be suitably arranged. The bins, shelves and racks are to be properly located and they should be accessible from various points of stores. The stores also should be equipped with various other receptacles for keeping various items and space should be provided for movement of trucks, lifts, conveyor belts and other mechanical devices.

IV. Centralised and Decentralised stores / Central stores with sub stores

There are three types of stores (1) Centralised stores (2) Decentralised stores and (3) A central store with sub stores.

1. *Centralised Stores :* In this system, all the items of materials are received and issued by one department. The main advantages are :

1. Specialisation in store keeping leads to efficient planning and organisation.
2. Better maintenance of stores.
3. Efficient supervision of stores.
4. Better utilisation of space.
5. Optimum investment in stores as stores are minimised.
6. Better layour and control of stores.
7. Lower cost as minimum staff, equipment and stationary are used.

8. Stock taking is made easier.
9. Flow of materials is maintained as the staff are to concentrate only on store keeping.
10. Timely placement of purchase requisitions.
11. Materials can be issued quickly without any delay.

Disadvantages of Centralised Stores

1. Risk of loss by fire is more as stocks are kept at one place.
2. Delay in getting materials from centralised stores, if stores are situated far away from consuming departments.
3. Any disruption in internal transport will affect production adversely.
4. Cost of material handling will be more.
5. Specific needs of individual departments may not be given importance.
6. Keeping all materials at one place may result in congestion and will affect the operation of stores.

2. *Decentralised Stores*

Under this system, each department maintains its own stores. Receiving and issuing are done by respective consuming departments. This system avoids all the demerits of centralised stores. But the supervision and control of stores is lost as the departmental heads are not specialised in stores control.

3. *Central stores with sub stores*

This system is operated like imprest/petty cash system. It is adopted by large organisations with many production departments and the production departments are situated far away from stores. In order to avoid the delay in internal transport and minimise the handling charges, a sub store is maintained in the production department. A fixed quantity of materials is issued by the central stores to the sub-stores at the beginning of a period. At the end of the period, the central stores replenishes the quantity required to maintain the fixed quantity, determined for each store. It is similar to imprest system of petty cash.

Advantages

1. It mainly avoids delay in issuing and receiving of materials.
2. It caters to the special requirements of individual departments.
3. Easier detection of discrepancies in stores.
4. Central stores are reminded constantly the various needs of departments.
5. It minimises demerits of centralised stores.

V. CLASSIFICATION AND CODIFICATION OF MATERIALS

For an efficient store keeping, proper classification and codification of materials is essential. Materials are to be classified on the basis of their nature and they may be further classified on the basis of type, shape, colour, etc. Once the materials

are classified they are to be allotted codes which will be helpful for easy identification. Codes are usually short symbols which replace the longer names of the materials.

Advantages

1. Quick and easier identification of materials.
2. Elimination of purchase and issue of wrong materials.
3. Secrecy of materials description is maintained.
4. Proper material control.
5. Better accounting by identifying materials with jobs, etc., by mechanised accounting methods.
6. Clarity for quick work.
7. Economy in material handling cost.

Types of Coding

1. *Alphabetical method :* An alphabet is allotted to each item of stores. For example 'A' for nut, 'B' for bolt, etc. This system is not flexible. If the organisation is large, where there are number of items of stores, this method is not suitable.
2. *Mnemonic :* It is an improvement over the alphabetical method. In this method, the first sound of the name is considered for each material. For example Petrol can be 'PT', Diesel as 'DS', Kerosine as 'KS', etc. The material can be easily traced without referring to index.
3. *Numerical Method :* A number is allotted to each material for example 01, 02, 03, 04 and so on. When large number of items are there, this method is suitable. there are two types of numbering – Straight numbering and Block numbering.
4. *Alphabetical-cum-Numerical method :* In this method, alphabet and numerals are used in combination. For example, Steelwire-1 "Swl, Copper wire2" - CW2, brasswire 1"- BW1 etc.
5. *Standardisation and Simplification :* Standardisation and simplification aim at inventory control by reducing the number of varieties of materials stocked in stores. For each item in store, specifications are allotted. This will facilitate buying of correct materials as it makes it clear to the buyer and seller the correct material are required. The specifications ensure that material of correct quality is used in production to maintain the required quality of finished output.

Standardisation is made easier, since the help of Indian Standards Institute (ISI), International Organisation for Standardisation (ISO) and other specialised agencies may be taken for standardisation of stores.

Simplification is a corollary of standardisation and aims at minimising the number of items carried in the stores so that carrying cost and investments in materials may be reduced.

Standardisation and variety reduction is a continuous process.

Advantages :

1. *Effective stores control :* Standardisation and simplification are tools of inventory control to optimise the number of materials carried in stores.
2. *Economy :* Since items of stores are reduced, lower carrying cost will reduce the material cost.
3. *Control of material losses :* Losses on account of obsolescence, slow moving items and dormant materials are reduced.
4. *Quality of output :* As standardised materials are purchased and consumed, the quality of output is maintained.
5. *Reduction of Inspection cost :* A standardised material need not be put for rigourous tests which leads to reduction of Inspection and material overhead cost.

VII. Receipt and Issue of Materials

The Goods Receiving and Inspection departments receive, inspect and approve the materials. These materials are passed on to the appropriate stores together with the Goods Received Note. The store keeper arranges to keep various items in their appropriate bins and makes entries in the receipt column of appropriate bincards. For easy identification of material, assigning location code to each bin will be helpful. Moreover location codes help in mechanised accounting and leads to efficiency in store keeping.

The Bin Card provides complete information of material placed in the bin. It shows description, material code, location code, receipt of material, issues and balance of quantity. This is an important document showing the details of Jobs or departments which have drawn material and reference of goods received notes against which material are received. The specimen is provided below.

Specimen of a Bin Card

ABC Company
BIN CARD

Material Code _____ Description _____
Location Code _____ E.O.Q. _____
Bin No. _____ Maximum level _____
Minimum level _____
Reorder level _____
Unit _____

Receipts			*Issue*			*Balance*	*Remarks*
Date	*GRN No.*	*Qty*	*Date*	*M.R. No.*	*Qty.*	*Qty.*	*Stock verification*

Issue of Materials from Stores

The department which is in need of raw materials has to specify the material requirements on a document called *material requisition* which authorises and records the issue of material for consumption. The store keeper issues the material only on receipt of materials requisition. The requisition provides detailed information regarding description, quantity, code number of material, Cost centre and the job to be charged. The requisitions are normally prepared in triplicate.

One copy is retained by the department initiating the requisition and the other two copies are sent to the store keeper. The store keeper retains one copy and makes entries in the issue column of bin card. The other copy is sent to the stock control department, which makes necessary entries and forwards it to the Cost office, where the value of materials are ascertained and this forms the voucher for accounting entries. Material requisition authorises the cost office to charge the particular job, the department, work-in-progress account, or overhead control account with the value of materials consumed and to pass a corresponding credit to the stores ledger account. A specimen of material requisition is given below:

SPECIMEN OF MATERIAL REQUISITION

ABC Company
Material requisition

No _____
Date _____

To _____
_____
_____

Deliver the following materials to _____
For Order No _____ Job No. _____

Description	*Quantity*	*Code No.*	*Office use only*		*Remarks*
			Rate	*Amount*	
Authorised by	*Issued by*	*Stores Ledger Folio*	*Received by*		*Cost office ref.* No. ____ *Priced by* ____

Material Returned to Stores

The department which has received the material may find the quantity received is in excess of requirement. The excess quantity is returned to stores together with a material return note. The return note is drawn up in the form which is similar to that of material requisition but in different colours. The stock records and cost accounts are adjusted from the details provided in the material transfer form.

Transfer of Material

Material transfer from one job to another is allowed through "*material transfer notes*". Such transfer is permitted only when an urgent job has to be executed and work on less urgent job may be postponed. The note shows data for adjusting the Cost accounts affected. The notes are sent to the Cost office for necessary adjustment in the records.

VIII. Stores or Material Records

(a) Bin Card: Each bin in which materials are kept is attached with 'bin card'. It consists of Receipt, Issue and Balance of quantity in the bin. The entries are made after each receipt and issue and the balance is updated after every entry. The Bin Cards are maintained by the store keeper. The store keeper is answerable for any differences in the physical stock and balance shown in the Bin Card. The card is helpful for control of stock. The card has details regarding minimum, maximum and reorder stock levels. As and when the quantity reaches reorder level, the store keeper can initiate purchase requisition for acquiring material in time.

Double bin system: Some organisations divide the bin into two portions namely, the smaller portion to store the minimum level quantity and the other portion to keep the remaining quantity. The quantity in the smaller portion is not issued as long as quantity is available in the other portion. It helps in physical verification and acts as signal to buy when the quantity in smaller portion is to be used.

(b) Stores ledger card: The stores ledger card is maintained in the costing department. It has similar details as contained in the Bin card regarding Receipts, Issues and Balance of materials quantity. In addition to quantity the stores ledger card contains information in terms of values also. The pricing of materials issued is done in the stores ledger account.

Utility or benefits of stores ledger card or stores ledger :

(a) It provides information for pricing of material issues

(b) Quantity and monetary value of each item in store can be obtained whenever required.

(c) It provides counter check to the Bincard because it is maintained by costing department from independent sources.

The specimen of stores ledger card is given below.

Specimen of Stores Ledger Card

ABC Company
Stores Ledger

Description of the Article _____ Minimum level _____
Code No. _____ Maximum level _____
Bin No. _____ Reorder level _____
Reorder quantity _____

Date	Particulars or Reference	Receipts			Issues			Balance		
		Qty	Rate	Amount	Qty.	Rate	Amount	Qty.	Rate	Amount

Bincard Vs. Stores Ledger

The differences between a Bin card and the Stores ledger are mentioned below.

Bin Card	Stores Ledger
1. It is maintained by stores department.	1. It is maintained by costing department.
2. Bin Card provides quantities received, issued and the Balance in the bin.	2. Stores ledger contains both quantity and value of receipts, issues and the balances.
3. Entries are made before the transactions take place.	3. Entries are made after the transactions take place.
4. Each and every transaction is individually entered.	4. Transactions are summarised and entries are made periodically.

IX. INVENTORY CONTROL AND ITS TECHNIQUES

Inventory control is a system which ensures the maintenance of required quantity of inventories of the required quality at the required time with minimum amount of investment.

The terms inventory includes raw materials, stores, supplies, spare parts, tools, components, assemblies partly finished goods and finished goods.

The objective of inventory control is to achieve maximum possible inventory turnover.

The quantity of inventory to be maintained is based on the following factors.

(a) Availability of Finance.
(b) Quantity discounts allowed.
(c) Storage space available.
(d) Ordering Cost.
(e) Receiving Cost.
(f) Risk of loss due to price fluctuations.
(g) Risk of loss due to evaporation, obsolescence, theft, deterioration, etc.
(h) Economic ordering quantity; and
(i) Time to obtain delivery or lead time.

The main objectives of Inventory control are as follows :

(1) Keeping required material of adequate quantity in order to avoid disruption of production.
(2) Optimising investment in inventory and reducing carrying cost.
(3) Following the policy of M.B.E. (Management by Exception) by relieving the top management from involving in each and every decision relating to inventory.

The cost accounting department has a vital role to play in inventory control

(1) Maintaining price records of all items of stores.
(2) Pricing of material issues.
(3) Preparing material abstract to identify the material cost of jobs, departments and cost centres or processes.
(4) Maintenance of stores inventory subsidiary ledgers to record receipts and balances of materials under the perpetual inventory system.
(5) Maintenance of records of material losses, scrap, defectives, etc.

The following are various inventory control techniques used in different industries :

1. Demand and supply method of stock control - Levels of stock and EOQ: This method of material control utilises the principles of planning the demand for and supply of each item of material :

* At the lowest cost possible
* With the lowest possible inventory
* Consistent with operating requirements.

Optimum quantity of purchasing and manufacturing lot sizes are determined to economise the cost of procuring, storing and consuming each item of material.

For effective demand and supply method of stock control, information of the following aspects has to be estimated for each item of raw material.

(a) Rate of consumption for a specific period.

(b) Lead time for acquiring the material.

(c) Economic ordering quantity to optimise the cost of carrying and the cost of ordering and receiving.

(d) Reserve stock to be maintained as safety stock to take care of abnormal consumption during the lead time or lead time being more than normal or a combination of both.

(e) Reorder level quantity, being the quantity to be consumed during the lead time plus reserve stock.

(f) Maximum and minimum levels of material to control overstocking and to maintain minimum quantity being available for production requirements.

With the help of accurate estimation of the above aspects, it is possible to see that actual purchasing and consumption conform to the standards set.

The various levels of stock used in demand and supply method are explained in detail below:

(a) Minimum stock level : This is the minimum quantity of material to be maintained in stores throughout the year. The following factors are essential for fixing minimum stock level –

1. Reorder level.
2. Normal consumption of material.
3. Time required to obtain material from the time of issuing purchase order too the time of physical receipt of the material.
4. Nature of material.

(b) Maximum stock level : It is that quantity above which the stock of any item should not be allowed to exceed. Fixation of this quantity depends on several factors as given below:

1. Rate of consumption required for production.
2. Availability of storage space.
3. Cost of storage.
4. Availability of finance.
5. Extent of price fluctuations.
6. Reorder level and time required to obtain delivery of supplies.
7. Availability of quality raw material.
8. Economic ordering quantities.
9. Risk of obsolescence, evaporation and natural waste.
10. Cost of insurance.

(c) Danger level : This is the stock level below the minimum level. When stocks reach this level action for immediate purchase is necessary. Issues are controlled by stopping normal issues and issuing only on special instructions.

(d) Reorder level : It is between maximum and minimum stock levels. Once the stock level reaches reorder level, the store keeper initiates purchase requisition to obtain fresh stocks. Reorder level depends on economic ordering quantity, lead time and rate of consumption of material.

Various methods are used for calculating the levels of stock. A simple model is adopted here to arrive at the levels of stock and average level.

(a)	Reorder Level	=	Maximum Consumption × Maximum reorder period
	or		
	R.L	=	M.C. × M.R.P.
(b)	Minimum Level	=	Reorder level – (Normal consumption × Normal reorder period)
	or		
	Min.L.	=	R.L.–(N.C. × N.R.P.)
(c)	Maximum Stock Level	=	Reorder Level + Reorder Quantity – (Minimum Consumption × Minimum Reorder period)
	or		
	Max.L	=	R.L. + R.Q – (Min C. × Min.R.P.)
(d)	Average Level	=	Minimum level + $\frac{1}{2}$ of reorder quantity
			or
			$\frac{1}{2}$ (Maximum level + Minimum level)
(e)	Danger Level	=	Average Consumption × Maximum reorder period for emergency purchases

ECONOMIC ORDERING QUANTITY

This is an important item of inventory control to be decided. In these days of inflationary trend, the buying costs, carrying cost and ordering costs are very high. Firms should minimise these costs to control and reduce material cost of production. Economic ordering quantity depends on many factors like cost of purchasing and receiving, normal consumption, interest on capital, availability of storage accommodation, ordering and carrying costs. Economic ordering quantity is the reorder quantity, which is the quantity to be purchased each time an order is placed.

Economic ordering quantity aims at minimising both carrying cost and cost of ordering. **(A) Carrying costs** are incurred on maintenance of materials in stores and include cost of material handling, interest on capital, obsolescence, pilferage, rent, insurance and other storage costs. **(B) Ordering costs** are incurred for acquiring material into stores. These costs are incurred each time the materials are purchased. The ordering costs include cost of processing, receiving,

inspection and general administration overhead cost of purchase department. As number of units per order is increased, ordering costs are reduced (i.e., placement of less number of purchase orders) but at the same time carrying costs are increased as quantity of material kept in the stores increases. With the equalisation of ordering and carrying costs, the economic ordering quantity will be ascertained where the total cost of inventory will be minimum. When the purchase price remains constant, the economic ordering quantity will be determined based on the following formula:

$$EOQ = \sqrt{\frac{2AB}{CS}}$$

where

EOQ = Economic Ordering Quantity
A = Annual consumption or usage of material in units.
B = Buying cost per order
C = Cost per unit
S = Storage and carrying cost percentage per annum.

Though the above formula is the most popular the following are some other variations of the same formula with different abbreviations :

$$EOQ = \sqrt{\frac{2UO}{C}}$$

where

U = Usage in units per annum.
O = Ordering costs
C = Cost of carrying one unit in inventory during one year.

$$EOQ = \sqrt{\frac{2CO}{I}}$$

where

C = Consumption of the material in units per year
O = Ordering costs
I = Interest and other carrying cost per unit per annum.

All the formulae provide the same result. However, the first formula, which is the more popular one is used in this chapter for illustrations.

Sometimes, consumption of material may not be given in units but only in value. In such cases, the formula for EOQ is slightly altered.

$$EOQ = \sqrt{\frac{2AB}{S}}$$

where

EOQ = Economic Ordering Quantity in Rupees.
A = Annual consumption of material in Rupees.
B = Buying cost per order.
S = Storage and carrying cost %.

This formula is applicable only when consumption of material is not given in units. [See Illustration No. 3 on Page 3.52]

2. Stock Control according to value – ABC Analysis:

It is 'Management by exception' system of Inventory control. In this *Always Better Control* (ABC) technique of inventory control, the materials are classified and controlled according to value of the materials involved. It is also called *proportional parts value analysis*. Thus, high value items are paid more attention than low value items. The materials are classified under 'A', 'B' or 'C' designation on the basis of their value and importance.

'A' category consists of a few items of high value. Category 'B' includes more items of medium value and category 'C' includes all other materials of small value.

The general classification of items under ABC categories are as given below:

Category	*Percentage of total items*	*Percentage of total material cost*
A	5 to 10	70 – 80
B	10 to 20	10 – 20
C	70 to 80	5-10

From the above classification, it is clear that 'A' items are of minimum quantity and of maximum value out of total quantity and value of materials. They have to be controlled to the fullest possible extent by all methods of inventory control from the time of purchase till they are consumed in production. 'B' and 'C' items are of major portion of total quantity of raw materials but having minimum capital investment. Therefore, they are to be managed through less stringent controls.

Advantages

1. Effective control is applied on the high value items rather than concentrating on all items. This results in reduction in value of material losses.
2. Optimum investment in materials as minimum required quantity of 'A' items with high value are purchased.
3. Storage cost is kept at minimum amount as high value materials representing minimum quantity are kept in stores.

Limitations of ABC Analysis

(a) In big firms using numerous materials, dividing them into ABC categories may be cumbersome and difficult process.

(b) Division of materials into ABC categories may become a subjective process since it is difficult to lay comprehensive and precise criteria for such division.

(c) Very little attention to B & C categories of materials may affect their availability in time.

3. Perpetual Inventory System

The ICMA defines perpetual inventory as "A system of records maintained by the control department which reflects the physical movement of stocks and their correct balance". According to Wheldon "perpetual inventory system is a method of recording stores balances after every receipt and issue to facilitate regular checking and to obviate closing down for stock taking". It is clear from the above definitions that perpetual inventory system:

(a) is a method or system of recording materials.

(b) reflects the physical movement of materials and records the balance of material after every receipt and issue;

(c) facilitates regular checking and avoids the need for closing down for stock taking.

The records forming part of the system are: (1) Bin card maintained by the store keeper in which all the physical quantities of receipts, issues and balance are recorded; (2) Stores ledger cards maintained by the costing department in which quantities as well as values of receipts, issues and balance are recorded. Physical verification of the stores is also made by a programme of 'continuous stock taking'. Any shortage or surplus noted are immediately rectified. Discrepancies due to unavoidable causes are tolerated but those due to avoidable causes are given attention by fixing responsibility to individuals. Thus, bincard, stores ledger card and physical verification together constitute the perpetual inventory system.

Merits of Perpetual Inventory System

1. It is not required to close the operations to verify stocks as it has been done throughout the year.
2. Profit and Loss A/c and Balance Sheet can be prepared at any time as stores ledger accounts reveal stock quantity and value at any time of the year.
3. Continuous stock taking ensures reliable check on stocks.
4. As stock verification is done systematically more reliable figures are revealed.

5. Continuous stock taking acts as vigilance on the work of store keeper and accountant to maintain accurate records and quantities.
6. Production is planned according to the quantity of raw material available as the perpetual inventory reveals the information about stocks at all times of the year.
7. Parallel maintenance of bincard and stores ledger card facilitates operation of internal check system.
8. Shortage of stocks due to pilferage, damages, theft and other causes are revealed immediately and necessary efforts can be made to avoid or minimise such losses in future.
9. Investment in stores is controlled by comparing actual stocks with maximum and minimum levels.
10. Correct stock figures are made available to insurance company to claim against loss on account of fire.

Discrepancies in Physical Stock

Perpetual Inventory system ensures the accuracy of inventory records by physical verification of stocks. The balance of stock shown by bin cards or stores ledger may be different from actual stock as revealed by continuous or periodic stock verification. This difference may be due to avoidable and unavoidable causes.

Avoidable Causes

1. *Clerical Errors :* Wrong postings, non posting of entries, wrong casting, etc. are the clerical errors which can be rectified.
2. Pilferage and theft.
3. Damages due to mis-handling of material.
4. Issue of excess or short quantity due to faulty weighing or counting of the material.

Unavoidable Causes

1. Losses due to shrinkage and evaporation.
2. Shortage due to breakdown of fire and riots.
3. Sometimes, materials may be lost due to 'breaking up of bulk' material into smaller parts for issue.
4. Actual balances may be more due to absorption of moisture.

Operation of Perpetual Inventory System

(a) The entries for receipt or issue of the material are made in the bin card and stores ledger account and the balance is ascertained.

(b) Stores received but not inspected are not mixed up with regular stocks.

(c) Stock taking is done continuously. The stores records are compared and entered in stock verification report for suitable treatment.

4. Just-in-time Inventory (JIT)

Business concerns are giving maximum attention to reducing stock levels by establishing cardial relationship with suppliers to arrange for frequent delivery of quantities. This is called Just in-time purchasing. The objective of just-in-time purchasing is to obtain delivery of material immediately before their use. This is possible with the co-operation of the supplier. The company guarantees to purchase large quantities. The supplier guarantees good quality materials at reasonable prices. This arrangement helps in directly delivering the material to the shop floor instead of receiving into stores. Moreover the stocks consists of few items at more or less same prices where LIFO, FIFO and average cost price will be the same.

Just in time buying of raw materials recognises the disadvantage associated with high inventory cost with high inventory levels. Hence JIT advocates making timely purchases as and when need for raw materials arises. The purchases are made from proven suppliers who can make ready delivery of goods as and when need arises.

EOQ model assumes constant order quantity, where as Jit buying policy assumes different quantity for each order if demand fluctuates. Similarly EOQ lays stress on carrying costs where as Jit lays emphasis on all the costs and moves outside the assumptions of EOQ model. Jit purchasing provides special significance to cost of quality and timely deliveries rather than considering price alone as main factor affecting choice of suppliers.

Main Advantages of JIT Purchasing

(a) The investment in stocks is minimum.

(b) The clerical work relating to issues is minimised. As purchase price of different lots will not fluctuate much, the issue price is same. This results in reduction of clerical cost.

(c) Good rapport with vendors has several long term benefits.

(d) Carrying cost of inventories is practically negligible.

5. VED Analysis

Vital, essential and *desirable* analysis is done mainly for control of spare parts. Spares are controlled on the basis of their importance.

Vital spares are crucial for production. Non-availability may stop production. The 'Stock out cost' of these spares is very high.

Essential spares are spares the 'stock out' of which cannot be sustained for more then a few hours and cost of loss of production is high.

Desirable spares are needed but their absence for a short time may not lead to stoppage of production.

Some items of spares though negligible in value may be vital for production. Such items may not be given importance under ABC analysis method which operates on value based control.

6. FNSD Analysis

Under FNSD analysis the stores items are divided under four categories. The basis of classification is their usage rate. Decending order of usage is followed where by 'F' stands for fast moving items that are consumed quickly. 'N' stands for normal moving items which are exhausted over a period of a year or so. 'S' stands for slow moving items which are not consumed frequently but are expected to be exhausted over a period of two years or more. 'D' stands for dead items and the consumption of such items is nil.

Stock control under FNSD is done by continuous monitoring of all the four categories of items. Fast moving items are properly ordered to avoid 'Stock-out' of such items. Normal moving items are reviewed at regular intervals and orders for restoring shall be made as per a planned schedule.

Stock of slow moving items of stores are reviewed very carefully to avoid over stocking of such items. Dead stock items are taken as obsolete items which have become outmoded and have no further use. Alternative uses should be found for dead stock items or else they should be disposed of at the earliest so that their value may not deteriorate further.

7. Automatic Order System

This method of inventory control is done with the help of computers. Order for fresh purchases are automatically placed when the inventory reaches 'order point quantity' (OPQ). For each type of material, records are maintained by data processing in the form of receipts and issues. When the records show order point the staff concerned place order for necessary quantity. This system ensures that materials are always promptly replaced.

8. Ordering Cycle Method

In this method, the review of materials held in stock is done in a regular cycle. The length of cycle depends on the nature of material. Materials which are expensive and essential have a shorter review cycle and non-vital materials have longer review cycle. At the time of review order is placed to bring the inventory to the desired level.

Ordering cycle method is also called '90-60-30 cycle' method. The maximum stock level is equal to 90 days supply. When the inventory reaches 60 days supply an order is placed for 30 days supply. The reorder point is equal to 60 days supply and reorder quantity would be equal to 30 days supply.

9. Min-Max method

The demand and supply method is an improvisation of min-max method. In the min-max method, each item of material is fixed with its maximum and minimum levels. When the quantity reaches minimum level, an order is placed for such a quantity as would make the inventory reach is maximum level.

10. Inventory Turnover Ratio

Kohler defines inventory turnover ratio as "a ratio which measures the number of times a firm's average inventory is sold during a year". In his view the ratio is an indicator of a firm's inventory management efficiency. A high inventory turn over ratio indicates fast movement of material. A low ratio on the other hand indicates over investment and blocking up of working capital.

The Inventory turnover is calculated on the sales or cost of sales. It is measured in terms of value of materials consumed to the average inventory during a period. It indicates number of times the inventory is consumed and replenished. If the number of days in a year are divided by turnover ratio, the number of days for which the average inventory is held can be ascertained.

The turnover ratio differs from industry to industry. On the basis of the ratio, a decision is made to reduce investment on slow moving materials and stop overstocking of undesirable material.

(i) Inventory Turnover Ratio $= \frac{\text{Cost of Materials Consumed}}{\text{Cost of Average Stock}}$

(ii) Average Stock $= \frac{\text{Opening Stock of Material} + \text{Costing stock Material}}{2}$

(iii) Inventory Turnover in days $= \frac{\text{Days in the period}}{\text{Inventory Turnover Ratio}}$

11. Input-output Ratio Analysis

This is yet another method of inventory control. Input output ratio is the ratio of the quantity of material to production and standard material content of the actual output. This is possible in industries where the product and raw material are being expressed in same quantitative measurement such as kilograms, Metric tonnes, etc.

The input-output ratio analysis indicates whether the consumption of actual material when compared with standards is favourable or adverse. The raw material cost of the finished product can be arrived at by multiplying material cost per unit by the input-output ratio.

The ratio is obtained as given below :

$$\frac{\text{Standard cost of Actual quantity}}{\text{Standard cost of Standard quantity}}$$

12. Material (Inventory) Cost Reports :

Material control is effected by coordinating the functions of all the departments involved with material namely purchasing department, stores department, production department and costing department. Management needs information to analyse and take appropriate decisions. Material cost reports communicate facts relating to materials to the attention of various levels of management. Material control is concerned with three aspects. vis., purchase control, stores control and consumption control. Departments concerned with these aspects have the responsibility to function effectively in the specific area of their activity. The extent of efficiency of different departments is reported frequently to enable the management at different levels to check inefficiency and achieve desired level of activity. Designing appropriate material reports will ensure effective communication of material control aspects to the concerned levels of management. Types of reports and frequency of reporting is based on individual requirements of organisations. The following are some of the reports generally prepared :

(i) *Material consumption report :* This report is prepared weekly and sent to works manager. It provides information regarding quantity of materials used against standard quantity specified. It helps in controlling consumption of materials and elimination of wastage, spolage, defectives and scrap.

(ii) *Material purchase efficiency report :* This report is prepared monthly and sent to purchase committee. It contains information in respect of actual purchase prices of materials and standard prices of materials and the variance there on. The purpose of the report is to watch price movements and control cost of material.

(iii) *Purchasing report :* This report is prepared once in a month. It is also submitted to the purchase committee. It contains information in respect of actual purchases, consumption and stock figures. Objective of this report is to show the effect of policies laid down for purchasing.

(iv) *Inventory report :* This report is prepared as and when required for the top management. It reveals information regarding slow moving, dormant, and obsolete stocks. The objective of the report is to control the losses and investment in material.

(v) *Stock verification report :* This report contains details regarding discrepancies between physical balance and record's balance of stocks. This report is sent to storekeeper, The purpose of the report is to control storage of material.