Generally raw materials form a very big proportion of the total cost of production. Materials costing involves the determination of the cost of materials acquired, the cost of materials issued and the cost of the inventory. Cost of materials acquired (also called the 'acquisition cost') includes the net price paid to the vendor plus freight-in plus the costs of maintaining the purchasing department, the stores department, the accounting department and the costs of inspection, testing and insurance. A great proportion of the requisition costs consists of fixed expenses.

On account of this fixed factor and also on account of various complications, generally the materials are priced at the net amount paid to the seller. It does not mean that the cost referred to above is in any case not relevant to the concept of acquisition cost. This extra cost is generally charged to production as manufacturing overhead.

Generally the perpetual inventory system is used because it ensures a continuous book record of various materials in stock. The main advantages of a perpetual inventory system are: (i) control over inventory is easy and effective because the latest inventory position is always available and (ii) the book inventory can always be compared with the results of physical counting.

The net amount paid to the seller is entered by the stores clerks on the stores ledger cards. He enters both the unit cost and the total cost. Then the problem which arises relates to pricing the materials issued. The following methods of costing materials issued are generally used:
(i) First-in, First-out (FIFO).
(ii) Last-in, First-out (LIFO).

OBJECTIVES OF MATERIAL CONTROL

The main objectives of material control are as follows :

1. Procurement of materials and stores from suppliers at the lowest price, consistent with the standard specification as to quality and timely delivery;
2. Avoidance of production hold-up for want of materials;
3. Maintenance of even flow of control;
4. Prevention of excessive investment in material stock;
5. Avoidance of losses occasioned by deterioration due to evaporation, drayage, careless handling of materials and supplies, pilferage, obsolescence, etc., and
6. Making available, accurate and reliable information about the different items of materials and stores for proper planning and control.

ESSENTIAL REQUIREMENTS OF MATERIAL CONTROL SYSTEM

Ideally, a material control must ensure that the following

requirements are fully met :

1. There should be proper co-ordination and co-operation between various departments dealing in materials viz, Purchasing Department, Stores Departments, Receiving and Inspecting Department, Accounting Department, etc.

2. There should be central purchasing department under the control ofa competent and expert purchase manager.
3. There should be proper classification and codification of materials.
4. Material requirements should be properly planned.
5. The perpetual inventory system should be operated so that up-to-date information is available about the quantity of material in stock.
6. Adequate records should be introduced to control materials during production and quantities manufactured for stock.
7. The storage of all materials should be well planned subject to adequate safeguards and supervision.
8. The various stock levels like minimum, maximum, etc. should be fixed for each item of material.
9. Purchase of materials should be controlled through budgets.
10. An efficient system of internal audit and internal check should be operated so that all transactions involving materials are checked by reliable and independent persons.
11. There should be regular reporting to management regarding purchases, issues and stocks of materials. Special reports should be prepared for obsolete items,spoilage, returns to suppliers, etc.

TECHNIQUES OF MATERIAL CONTROL

The techniques commonly used for material control are as follows :

1. Determination of Stock Levels
2. Economic Order Quantity
3. Material Turnover Ratio
4. ABC Analysis
5. Perpetual Inventory System

Types of Stock Levels : In order to safeguard against under-stocking and over-stocking, the following stock levels are determined :

(1) Minimum Stock Level : The minimum stock level is the lowest quantity of stock which must be maintained in hand at all times so that the manufacturing activity may not stop due to non-availability of materials. The determination of minimum stock level depends upon re-order level, average usage rate, average delivery time, etc. The following formula is used to know this level : Minimum Level Re-order level — (Average usage rate x Average re-order period)

(2) Maximum Stock Level : The maximum stock level is that quantity of material above which the stock should not generally be allowed to go. If the stock, more than the maximum level is Inaintained, it increases the cost of storage, unnecessarily blocks up the capital and increases the possibility of losses on account Of deterioration and obsolescence. Thus, this level is fixed for avoiding over-stocking of the material and its associated risks. The determination of maximum stock level is affected by average usage rate, re-order level, delivery period, possibility of obsolescence, storage facilities, government restrictions, etc. The following formula is used to know this level .

Maximum Level = Re-order level + Re-order quantity — (Minimum usage rate x Minimum lead time)

(3) Re-order Level or Re-order Point : The level of stock of material at which, on reaching the material in store, further order must be sent, is called re-order level or re-order point. This level is fixed somewhere between the maximum and minimum level. This is fixed in such a way that by re-ordering in the normal course of events, new suppplies will be received just before the minimum level is reached. 1 his level can be known from the following formula :

Re-order Level = Maximum usage rate x Maximum lead time

(4) Average Stock Level : The level of stock of material which is generally kept in the store is called average stock level. It is calculated by applying the following formula :

Average Stock Level = Maximum stock level/2 + Minimum stock level/2

The following formula is also used for calculating the average stock level :

Average Stock Level = Minimum stock level + (1/2 of re-order quantity).

PRICING OF MATERIALS ISSUED

To know the separate cost of each product or job, correct pricing Of materials issued is essential. But it is a difficult task. The materials issued from the store are purchased on different dates and at different prices. Generally the purchase price and the market Price is also differ. At what rate the materials issued from the store should be priced, it is an important question.

The principal methods, of pricing of material issues are as follows :

(A) COST PRICE METHODS

(i) First in First Out Method (FIFO) : Under this method, the materials first received in the store are the first issued i.e., the order in which the materials are received in the store are issued at their cost price in the same order. Thus, the FIFO method follows the principle that materials received first are issued first. After the first lot or batch of material purchased is exhausted, the next lot is taken for supply. The inventory is priced at the latest costs.

This method is most suitable in a period of falling prices because issues are charged at the oldest prices which are higher. This facilitates recovery of higher costs incurred in the past from the product. Closing stocks are valued at latest prices which are lowest. This results in lower value of closing stock; therefore lower book profits and lower tax liability.

Advantages : The following are the advantages of the method :

1. This method is easy to understand and simple to operate.

2. The old material is issued first. Thus, there remains no possibility of loss of material due to spoilage or obsolescence.

3. The price of the material in hand at the end is found almost equal to the market price of such material.

Disadvantages : The main disadvantages of the method are as follows :

1. It is very difficult to separately store the material purchased at different prices and on different dates.

2. The price of the material issued to different jobs on the same date may be different.

3. As the material is issued on old prices, the production cost may not be equal to the market price.

(ii) Last in First Out Method (LIFO) : In this method, the materials purchased in the last are first issued on the cost price. For pricing materials issues, the price of the last purchase is used unless it is fully exhausted. When it is exhausted, the material purchased

This method is suitable in a period of rising prices because material will be issued at the prices of latest purchases which are same as or close to current market price of materials. Closing stock is valued at earliest prices which are the lowest giving lower value of closing stock and therefore lower book profit. As a result the tax liability is also lower. This method thus helps in showing a lower profit because of increased charge to production during periods of

Advantages : The following are the advantages of the system :

1. This method is easy to understand and simple to calculate.

2. As the issue price remains almost equal to the market price, the cost price of the product or job can be easily known.

Disadvantages : The disadvantages of the method are as follows :

1. The closing stock is priced at a very old price which does not show the correct position of the business.

2. The method is not practical because in practice the material which is purchased first, is issued first.

3. More space is needed for separately storing the material purchased at different prices.

(iii) Weighted Average Method : Under this method, for determining the issue price, the quantity of material available in the stock and the price both are considered. •In brief, the weighted average price is calculated by dividing the total cost of available material on the date of issue, by the total quantity of available material. At this price, the material is issued. This method of pricing is suitable for those materials, the prices of which fluctuate more.

Advantages :

1. This method is scientific and argumentative because under this method, the total cost of the material available in the bin is divided by the total quantity of material. In fact, after reaching the bin, the new and old material mix up i.e., there remains no separate existence in the bin, of the material separately purchased on the different dates.

2. As regards to calculation work, this method is simple because the issue price once calculated continues till the new material is purchased.

3. This method is a mixed form of market price and cost price.

4. In this method, the balance of the closing stock is shown at appropriate price which can be used in financial accounts also.

Disadvantages :

I. If the materials is purchased again and again at short intervals, the calculation work increases.

2. As the material is issued at average price, the production cost cannot be correctly estimated.