Chapter 02

Material Cost

Introduction:

Material is the first element of cost. It constitutes more than 50% of the total cost in several industries. Therefore, a control of material cost is quite essential in achieving the objective of cost accounting.

The term material includes the following i) Raw materials ii) Spare parts & components iii) consumable stores iv) Packing materials. The term inventory includes raw materials, work in progress, finished goods and components, spares, consumable stores and sundry supplies. Thus, material is a part of inventory. The control can be exercised in three stages

1. Purchase of materials 2. Inventory control 3. Pricing of material issues

I) PURCHASE OF MATERIALS

In big concerns, a separate department is set up to purchase all types of materials required for production & maintenance. The top management lays down the purchase policy and the purchase department make the purchases accordingly. It is the duty of the purchase department to ascertain the answers for the following questions.

Purchase cycle or procedure

The purchase department normally adopts the following procedure for making purchases.

1. Purchase Requisition: A purchase requisition is a request made by the concerned person to the purchase department for making purchases. The request may be made by the storekeeper or the production planner or the department head. The regular materials, which are stored are requested by a storekeeper. The production planning requests for special materials for specific purpose.

2. Selection of Suppliers: After receiving the purchase requisition, the next step is to locate the source of supply. This is done normally with the any one of the following ways.

1) Price lists & catalogues 2) Tenders

3)Advertisements 4) Telephone & Trade Directories etc.

3. Placing order for supply: It is a record of agreement between purchaser and the seller. The purchase order should be normally prepared on the printed forms & should contain all the necessary details. It should contain the details such as quantity, quality, specifications of goods, rates approved, place and date of delivery, mode of transport, terms of payment etc.

4. Receiving and Inspection of materials: The procedure to be followed for receipt and inspection depends upon the nature and size of the organization. The concerned person checks the materials properly with purchase order. Material received report is prepared in 4 copies and submitted to the following persons:

i) Stores department

ii) Purchase department

iii) Stores Accountant or Costing department

iv) Office copy

5. Passing Invoices for Payment: It is the last step in the purchase of materials. The invoices received from supplier is passed on to the stores Accountant who checks the invoices with purchase order and material received note. He verifies full quantity, quality and rates as per agreement and even arithmetical accuracy of the invoice.

II) STORES CONTROL OR INVENTORY CONTROL

Proper storage of goods is very essential for effective production planning. All the material purchased in the organization is kept in a place called store-house. Store-house is a building specially built for preserving materials, stores & finished goods.

Functions of storekeeper

The following are the important functions of a storekeeper.

i) Receiving the goods into store ii) Entering all receipts regularly in the Bin card

iii) Keep every item of materials in a proper place.

iv) Issue the materials to job on the basis of stores requisition signed by the competent authority

v) Maintaining stocks at prescribed levels vi) Initiate purchase requisition whenever situation demands

vii) Check recorded balance with the physical quantities & ensure correctness

viii) Take preventive action against deterioration, evaporation, absorption of moisture, fire, theft, etc.

ix) Supervise the duties of subordinates x) Preventing unauthorized person from entering into the store

xi) Report to the management about slow or non-moving materials, scrap, wastages, etc.

Fixation of Stock Levels

It is a very difficult task for the store keeper to decide when to purchase at what quantity. He has to see at no point of time production should be adversely affected because of shortage of materials and at the same time there should not be over purchase which will block the capital and increase the cost of carrying. In order to get rid of this problem, fixation of stock levels is essential. The following are the various control of stores.

1. Minimum stock level 2. Maximum stock level 3. Re-order level 4. Average stock level 5. Danger level 6. Re-order quantity (Economic order quantity)

1. Minimum Stock Level

It is the stock level which is always maintained in the organization. It is the quantity below which the inventory of any item should not be allowed to fall. So that there is no risk of stoppage of production. The ordered material has to reach the stores before the stock level reaches to minimum by usage. It is also called as "Buffer stock" "Safety stock" minimum limit or minimum stock.

The minimum stock is the safety point which works as a cushion against stoppage of production. If the minimum stock is too large, the handling and carrying costs would be high. Therefore, optimum minimum stock should be fixed where the carrying and non-carrying costs are minimum. The minimum stock level is fixed by taking into the following factors

i) Re-order level

ii) Lead time (the time gap between order & receipt of materials)

iii) Average rate of consumption of materials.

Formula for calculating minimum stock level

MSL = RL- (AC x ADP)

Where, RL=Re-order level

AC=Average consumption or normal consumption

ADP= Average Delivery Period

AC=Average consumption or normal consumption = Minimum consumption +Maximum consumption

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ADP= Average Delivery Period = Minimum delivery period + Maximum delivery period

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2. Maximum Stock Level

The maximum stock level indicates the maximum quantity of an item of material is held in stock at any time. It is the upper limit of materials to be stored. The quantity stored should not exceed this limit. The fixation of this level depends upon various factors. They are.

i) Amount of capital available ii) Space in store room iii) Cost of carrying the inventory

iv) Nature of material v) Availability of supply vi) Quantity of discount vii) Rate of consumption

viii) The time lag between order & receipt ix) Likely fluctuations in prices x) Government restrictions

xi) Re-order quantity

xii) Risk of obsolescence & deterioration

Formula for calculating maximum stock level

MSL = RL + OQ- (MC x MDP)

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RL = Re-order level

OQ = Order quantity

MC = Minimum consumption

MDP = Minimum delivery period

3. Re-order Level or Order Point

It is the point at which order for material is placed. It gives the answer for when to purchase? It is the point at which it becomes essential to initiate purchase orders for its fresh supplies. This level is fixed between the minimum and maximum stock level.

The following factors will decide the order point.

i) Lead time or Normal delivery time ii) Average rate of consumption

iii) Minimum Level iv) Variations in delivery time

Formula for calculating Re-order Level

Reorder Level = Maximum consumption x Maximum delivery period

Reorder Level = Minimum stock level + Average consumption x Average Delivery period

4. Average Stock Level

Average stock level is the level which represents the average of minimum and maximum stock level.

Formula for calculating Average Stock Level

1. Average stock level= Minimum stock level + Maximum stock level

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2. Average stock level = Minimum stock level + (1/2 x EOQ)

5. Danger Level

It is the level which is fixed below the minimum level. If stock of any material reaches this level, it indicates that there is an emergency to purchase the materials. Immediate steps should be taken to replenish the stock.

Formula for calculating Danger Level

Danger Level = Minimum Rate of Consumption x **Emergency** Delivery period

6. Economic Order Quantity (EOQ)

Economic order quantity is the quantity for which order is placed when stock reaches re- order level. It is a quantity of materials, which can be ordered at a time and purchased economically. It is also known as order quantity, optimum 'order quantity' or economic lot size. The costs associated with the EOQ are as under:

Ordering cost: This is the cost incurred for placing an order with the supplier. It includes:

1) Cost of stationery

ii) Salary of those engaged in receiving & inspection iii) Forgone discount

iv) Possibility of disruption in production

Carrying cost: This is the cost incurred for holding the inventory in store. It includes:

i) Interest on capital ii) Cost of operating the stores (Salaries, Rent, Stationery etc)

iii) Risk & obsolescence iv) Handling and transfer costs v) Wastage & loss of materials

The above two types of costs are opposite in nature. An attempt to reduce one will give rise to other. Therefore, to balance these two types of costs economic order quantity is fixed at a point where aggregate cost is minimum.

Formula for calculating Economic Order Quantity

1) EOQ $=\sqrt{2AO/C}$

Were,

EOQ Economic order Quantity

A= Annual consumption in units

O= Ordering & receiving cost per order

C = Cost of carrying per unit per annum

2) EOQ = Max. Level - Reorder level + Minimum consumption x Minimum Delivery Period

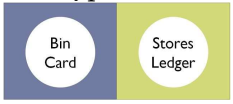
3. No. of orders to be placed in a year =Annual Consumption / EOQ

STORES RECORDS

There are normally two types of records maintained in the stores department. They are:

a) Bin card

b) Stores Ledger



a) Bin Card: A Bin card is a card showing the quantitative record of the receipts, issues and balances of the materials kept in the concerned bin. Bin is a place or box or almirah where the materials are kept. Card is a piece of paper containing the details of quantitative records of materials attached to that Bin. Therefore, it is called as Bin card. It is also known as Bin tag or stock card. It is prepared by the storekeeper.

Whenever there is receipt of materials, it should be entered in the receipt column of the bin card and accordingly balance is recorded. If any material is issued, it has to be entered in the issue column and the balance is reduced to that extent.

Bin Card

Material Code:
Material Description:
Location:
Unit of Measurement:

Maximum Level:
Minimum Level:
Reorder Level:

Date	Doc No.	Received from/Issued to	Receipt	Issue	Balance	Verification with SL Date & Verified by	

b) Stores Ledger: Stores ledger is a record of stores both in quantity and value. Stores' Accountant maintains it. This record is identical with the Bin card except in respect of values. This contains an account for every item of stores and makes a record of receipts, issues and the balances. This ledger helps for pricing the materials to different jobs and the material value can be readily available at any time.

Stores Ledger

Material Code:
Bin No.:
Material Description:
Location:

Maximum Qty:
Minimum Qty:
Ordering Qty:

Date	Receipts				Issues				Balance		
	GR No	Qty	Rate	Amount	SR No	Qty	Rate	Amount	Qty	Rate	Amount

III) PRICING OF MATERIAL ISSUES

The storekeeper issues the material requisition is the document authorizing the storekeeper material requisition. The storekeeper issues the materials and gets the signatures of to issue the materials opless. He makes an entry in the bin card and she basis of t recipient on all the couples counting. The costing department, on the basis of mater requisition slip, enters in the stores ledger and records the balance. requisition slab, entreat different dates from different supplier of the sat resupplied differ Materials purchased at different de the costing records shows differed the price.

Before making entry in store ledger, the cost accounting department should decide upon the price at which materials are issued from stores department to production departments. Deciding upon the price at which the materials are issued from stores department to production department is called materials pricing or pricing of material issues.

Methods of materials pricing

There are number of methods for pricing the materials. Following are the some of the important methods of material pricing based on actual cost price and average cost price,

1. First in First out (FIFO)
2. Last in First out (LIFO)
3. Simple Average method
4. Weighted Average method

1) First in First Out (FIFO) Method

When purchases are quite few in number, this method is simple to understand & easy to operate

Under this method, the materials received first in the store are issued first. It works on the principle of First come First serve. Thus, the FIFO method charges the price of the first batch of materials purchased for all issues until all materials from that batch are fully exhausted.

1. There is no danger of over recovery or under recovery of materials cost from production.
2. The value of closing stock represents current market price.
3. During the period of declining prices, book profit will be reduced, hence, attracts lessee income tax.
4. During the period of rising prices, book profit will be inflated to the advantages management & shareholders.

Demerits: More in number during a period, pricing of materials issues

1. When purchases are becomes tedious.
2. Materials cost charged to production does not represent current market price.
3.During the period of declining prices, quotation price becomes less competitive.
4.During the period of rising prices, book profits are inflated, hence attracts more Income tax.

5. Comparison between two similar jobs becomes difficult & unjustified, if the same materials are charged to similar jobs at different prices.

2) Last in First Out (LIFO) Method

Under this method, materials received last are issued first. Issues are made from latest purchases (i.e., latest price). Materials issued to production are charged at actual cost price of the lot from which they are issued. This method is just opposite to FIFO method.

Merits:

1. When purchases are quite few in number, this method is simple to understand & easy to operate.
2. There is no danger of over recovery or under recovery of material cost from production. Because materials are issued to production at actual cost price.
3. Materials cost charged to production represents current market price.
4. During the period of rising prices, book profit will be reduced hence, attracts lesser income tax.
5. During the period of declining prices, book profit will be inflated to the advantages of management & shareholders.

Demerits:

1. When number of purchases is large, this method becomes tedious.
2. The value of closing stock does not represent current market price.
3. During the period of declining prices book-profits will be inflated. Hence, attracts more income tax.
4. During the period of rising prices, quotation price will be less competitive.
5. Comparison between two similar jobs becomes difficult & unjustified, if same materials are charged to similar jobs at different prices.

3. Simple Average Method

Under this method, materials are issued to production departments at simple average price. The average price is calculated by adding the prices at which materials on different dates were purchased during the period and dividing the total of these prices by the number of prices taken into consideration for calculating the average price. This method will not take into consideration the quantity of materials purchased. Simple average price is calculated as under.

Simple average price on issue date = Total of unit prices in stock / No. of unit prices in stock

Features of simple average method

1. This method assumes that materials are issued to production departments on the principle of "First Come First Serve"

2. A new simple average price is to be calculated only when any of the existing lot gets exhausted or when new purchases are made.

Merits:

1. It is a simple to understand and easy to calculate. 2. It reduces clerical work.

3. It facilitates better comparison of two similar jobs, if same material is charged to similar jobs at same price.

Demerits:

1. The value of closing stock does not represent current market price.

2. The materials cost charged to production does not represent current market price. purchased lot is ignored.

3. Under this method, only the purchase price of the lot is considered, but the quantity of

4. There is a danger of over recovery or under recovery of material cost from production.

4. Weighted Average Method

Under this method, materials are issued to production departments or jobs at weighted average price. 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. Under this method a new weighted average price is to be calculated only when a new lot is purchased.

Weighted average prices calculated as under:

Weighted average price on issue date = Total cost of materials in stock /
Total quantity of materials in stock

Merits:

1. It is simple to understand & easy to operate.

2. It recovers almost entire cost of materials from production. It means, there is no danger of over recovery.

3. It gives more accurate results than simple average method as it considers both unit

4. The value of closing stock represents near market price.

Demerits:

1. Weighted average price is required to be calculated at 4 or 5 decimal points if accuracy is required. This makes the calculation tedious.

2. When purchases are frequent, new average price is to be calculated.

3. There will be some approximation in calculation hence, there may be a small amount of over recovery or under recovery of material cost from production.

4. The value of closing stock does not represent exact market price.

IMPORTANT POINTS

After the careful examination of merits & demerits of weighted average price method we can conclude that weighted average price method is considered to be the best method of material pricing when there are a greater number of purchases at different prices.

1. Pricing of return of materials

a) Materials returned to stores: Some times, materials issued to production departments may be returned to stores because of any of the following reasons

i) Materials issued are in excess of their requirements

ii) Materials issued are not suitable for the particular work

(iii) Materials issued are not in good condition

In this case, the materials returned to stores are recorded on the Bin cards and stores ledgers as receipts.

Original issue price

In this method, materials returned to stores are valued at the same price at which it was issued & entered on the receipt column at the original issue price. The return may be treated as fresh purchase and issued according to the method in use. Alternatively, it may be treated as old stock & re-issued immediately. The method used for pricing the issues is based on average price, the materials returned to the stores are valued at their original issue price and treated a new purchase and accordingly new average price is calculated for the next issue.

Current issue price

In this method, the return of materials to stores is priced on the same rate at which materials are issued on the date of return. It means the rate which is prevailing on the day of return. If there is no issue on the day of return, the issue price preceding to the date of return is considered for valuation.

b) Materials returned to suppliers or vendors

Sometimes, storekeeper may return some of the materials purchased to vendors or suppliers because of some reasons. In such case pricing of returns is treated as under.

i)Materials returned are not yet charged to issues

If the materials returned to vendors are not yet charged to any department or Job, the materials returned to vendor should be priced at their purchase price and entered in issue column of stores ledger & Bin Card.

ii) Materials returned already charged to issues

If the materials returned to vendors are charged to production departments and there is no stock of that lot in our store, in such case, it should be entered in issue column at current issue rate. The difference between issue price and purchase price should be transferred to stores overhead account or factory overheads. In

case, the concern is following any of the average cost price method of issues, the material returned to vendors should be valued at purchase price only.

2. Surplus in stock

Sometimes, on the physical verification of the stock on a particular date, there may be excess material in stock. The excess stock should be entered in the receipt column of stores ledger at the given price (if rate is given) or at the current issue price (if rate is not given).

1. Shortage in stock Sometimes, at the time of valuation of stock as on a particular date, there may be shortage in stock. Such shortage is entered in issue column of stores ledger at the current issue price.

2. Expenses incurred on materials purchased

Any expenses incurred on purchase of materials such as freight, carriage, octroi etc. should be added to the cost of materials. The new purchase price should be calculated by using the following formula

New purchase price = (Quantity purchased x Rate) + Expenses / Quantity purchased

3. In case of simple average method, the price of opening stock should be entered in the balance column, which will enable us to calculate the average price when materials are issued.