

# ACCOUNTING FOR MATERIAL

SUBMITTED BY :-

MS. PRIYANKA

Assistant Prof. in Commerce Department

# MATERIAL CONTROL

- “Material control is a systematic control over purchasing, storing and consumption of materials, so as to maintain a regular and timely supply of materials, at the same time, avoiding overstocking.”
- “Material control refers to the management function concerned with acquisition, storage, handling and use of materials so as to minimise wastage and losses, derive maximum economy and establish responsibility for various operations through physical checks, record keeping, accounting and other devices. ”

# Objectives of Material Control

## **(a) To enable uninterrupted production:**

The main object of material control is to ensure smooth and unrestricted production. Production stoppages and production delays cause substantial loss to a concern.

## **(b) To ensure requisite quality of materials:**

The quality of finished products depends mainly on the quality of raw materials used. If quality of the raw materials is not up to desired standards, the end product will not be of desired quality which affects the sale of the product in the market resulting in loss of profits as well as goodwill of the concern. It is of vital importance to exercise strict control and supervision over the purchases, storage and handling of materials.

### **(c) To minimise wastage:**

The loss of material may occur on account of rust, dust, dirt or moisture, bad and careless handling of materials, poor packing and many other reasons. The causes responsible for such losses must be brought to light and utmost efforts should be made to minimise the wastage of raw materials. This is possible only by introducing an efficient materials control system.

### **(d) To fix responsibility:**

A proper system of materials control also aims at fixing responsibility of operating units and individuals connected with the purchase, storage and handling of materials.

### **(e) To provide information:**

Another objective of materials control is to provide accurate information regarding material cost and inventory whenever needed by management.

# Importance of Material Control

1. For keeping the stock of raw materials within limits in the stores i.e., to avoid overstocking and understocking of raw materials, materials control is significant.
2. It ensures proper storage of materials. For the proper preservation and safety of materials, adequate storage facilities are to be provided. With the help of proper storing of materials, quantity of materials as and when required can be issued to various jobs.
3. For knowing proper cost of production, control over materials is indispensable.
4. Certain techniques and methods are developed under the system of materials control thereby ensuring optimum utilisation of materials.
5. In order to undertake continuous checking of materials, the necessity of a proper system of materials control cannot be ignored.

# Techniques of Material Control

**In order to have proper control on materials, the following levels are set:**

- (a) Re-order Level
- (b) Minimum Level
- (c) Maximum Level
- (d) Danger Level
- (e) Average Stock Level

### **(a) Re-Order Level:**

It is the point at which if stock of a particular material in store approaches, the storekeeper should initiate the purchase requisition for fresh supplies of that material. This level is fixed somewhere between the maximum and minimum levels in such a way that the difference of quantity of the material between the re-ordering level and the minimum level will be sufficient to meet the requirements of production upto the time the fresh supply of the material is received.

- Re-ordering level can be calculated by applying the following formula.  
$$\text{Ordering Level} = \text{Minimum Level} + \text{Consumption during the time required to get the fresh delivery.}$$

- **Another formula given by Wheldon in his book 'Cost Accounting' is as follows:**

$$\text{Re-ordering Level} = \text{Maximum Consumption} \times \text{Maximum Re-order Period.}$$
 Here, maximum re-order period means the maximum period taken to get the material once it is initiated. Wheldon has taken the maximum period and maximum consumption during that period so that factory may not stop in any case due to shortage of materials.

## **Illustration:**

**Calculate the ordering level of material A from the following particulars:**

- (i) Minimum Limit 500 units.
- (ii) Maximum limits 2,500 units.
- (iii) Daily requirement of material 100 units.
- (iv) Time required for fresh delivery 10 days.

## **Solution:**

Ordering Level = Minimum limit + Consumption during the time required for fresh delivery

$$= 500 \text{ units} + 100 \times 10 \text{ units} = 1,500 \text{ units.}$$

Order for the purchase of material should be placed when the material in stock reaches 1,500 units.

## **Illustration:**

**Calculate the re-ordering level from the following information:**

Maximum consumption = 300 units per day  
Minimum consumption = 200 units per day  
Re-order period = 8 to 10 days.

## **Solution:**

Re-ordering level = Maximum consumption x Maximum re-order period  
 $= 300 \text{ units} \times 10 = 3,000 \text{ units}$ .

## **(b) Minimum Level:**

This represents the minimum quantity of the material which must be maintained in hand at all times. The quantity is fixed so that production may not be held up due to shortage of the material.

**In fixing this level, the following factors are taken into consideration:**

1. Lead time i.e. time lag between indenting and receiving of the material. It is the time required to replenish the supply.
2. Rate of consumption of the material during the lead time.
3. Nature of the material. Minimum level is not required in case of a special material which is required against customer's specific order.

**• Formula for the calculation of minimum level given by Wheldon is as follows:**

Minimum Stock Level = Re-ordering Level – (Normal Consumption x Normal Re-order period)

### **(c) Maximum Level:**

It represents the maximum quantity of an item of material which can be held in stock at any time. Stock should not exceed this quantity. The quantity is fixed so that there may be no overstocking.

**The formula for the calculation of maximum stock level given by Wheldon is as follows:**

Maximum Stock Level = Reordering Level + Re-ordering Quantity – (Minimum Consumption x Minimum Re-ordering Period)

### **(d) Danger Level:**

This means a level at which normal issues of the material are stopped and issues are made only under specific instructions. The purchase officer will make special arrangements to get the materials which reach at their danger levels so that the production may not stop due to shortage of materials.

Danger Level = Average consumption x Max. re-order period for emergency purchases

### **(e) Average Stock Level:**

**This level is calculated by the following formula:**

Average Stock Level = Minimum Stock Level +  $\frac{1}{2}$  of Re-order Quantity or  $\frac{1}{2}$  (Minimum Stock Level + Maximum Stock Level)

### **Illustration:**

If the minimum stock level and average stock level of raw material A are 20,000 and 40,000 units respectively, find out its re-order quantity.

### **Solution:**

Average Stock Level = Minimum Stock Level +  $\frac{1}{2}$  Re-order Quantity

or  $\frac{1}{2}$  Re-order Quantity = Average Stock Level – Minimum Stock Level

or  $\frac{1}{2}$  Re-order Quantity = 40,000 units – 20,000 units.

Re-order Quantity = 20,000 units x 2 = 40,000 units.

## **Illustration:**

In a company weekly minimum and maximum consumption of material A are 25 and 75 units respectively. The re-order quantity as fixed by the company is 300 units. The material is received within 4 to 6 weeks from issue of supply order. Calculate minimum level and maximum level of material A.

## **Solution:**

Minimum Level = Re-order Level — (Normal Consumption x Normal Re-order Period)

$$= 450 \text{ units} - (50 \text{ units} \times 5 \text{ weeks})$$

$$= 450 \text{ units} - 250 \text{ units} = 200 \text{ units}$$

Re-order Level = Maximum Consumption x Maximum Re-order Period

$$= 75 \text{ units} \times 6 \text{ weeks} = 450 \text{ units}$$

Normal i.e., Average Consumption =  $25 \text{ units} + 75 \text{ units} / 2 = 50 \text{ units}$

Normal i.e., Average Period =  $4 \text{ weeks} + 6 \text{ weeks} / 2 = 5 \text{ weeks}$

## **Economic Ordering Quantity:**

**The total costs of a material usually consist of:**

Total acquisition cost + Total ordering cost + Total carrying cost.

### **Total Acquisition Cost:**

Total Acquisition cost through buying is usually unaffected irrespective of the quantity of material ordered at one time unless quantity discounts are available. For example whether total annual requirements of a material of 10,000 units are purchased at Rs 10 per unit in fifty orders of 200 units each or in 10 orders of 1,000 units each, total acquisition cost will be Rs 1,00,000 (i.e. 10,000 units @ Rs 10) under each alternative if no quantity discounts are available.

Thus, when acquisition costs of a material remain the same, they are irrelevant and are often excluded while deciding the quantity of a material to be ordered at one time. The only costs to be taken care of are ordering costs and carrying costs.

The quantity of material to be ordered at one time is known as economic ordering quantity. This quantity is fixed in such a manner as to minimise the cost of carrying and ordering the stock.

## **Carrying Cost:**

**It is the cost of holding the materials in the store and includes:**

1. Cost of storage space which could have been utilised for some other purpose.
2. Cost of bins and racks that have to be provided for the storage of materials.
3. Cost of maintaining the materials to avoid deterioration.
4. Amount of interest payable on the money locked up in the materials.
5. Cost of spoilage in stores and handling.
6. Transportation costs in relation to stock.
7. Cost of obsolescence on account of some of the materials becoming obsolete after some time of storage either due to change in the process or product.
8. Insurance cost.
9. Clerical cost etc.

## **Ordering Cost:**

**It is the cost of placing orders for the purchase of materials and includes:**

1. Cost of staff posted in the purchasing department, inspection section and payment department.
2. Cost of stationery, postage and telephone charges.

Thus, this type of cost includes cost of floating tenders, cost of comparative evaluation of quotations, cost of paper work, and postage involved in placing the order, cost of inspection and cost of accounting and making payments. In other words, the cost varies with the number of orders.

If the price to be paid is stable, the quantity to be ordered each time can be ascertained by the following formula:

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

where

Q = Quantity to be ordered.

C = Consumption of the material concerned in units during a year.

O = Cost of placing one order including the cost of receiving the goods i.e. costs of getting an item into the firm's inventory.

I = Interest payment including variable cost of storing per unit per year i.e. holding costs of inventory.

## Illustration:

Find out the economic ordering quantity (E.O.Q.) from the following particulars:

Annual usage : ₹ 1,20,000

Cost of placing and receiving one order : ₹ 60.

Annual carrying cost : 10% of inventory value.

### SOLUTION

The formula for the calculation of the economic ordering quantity is :

$$\text{E.O.Q.} = \sqrt{\frac{2CO}{I}}$$

where

C = Annual requirement of material in rupees i.e. ₹ 1,20,000.

O = Cost of placing one order i.e. ₹ 60.

I = 10% Carrying Cost i.e. 10%.

$$\begin{aligned} \therefore \text{E.O.Q.} &= \sqrt{\frac{2 \times ₹ 1,20,000 \times ₹ 60}{\frac{10}{100}}} = \sqrt{\frac{2 \times ₹ 1,20,000 \times ₹ 60 \times 100}{10}} \\ &= \sqrt{₹ 14,40,00,000} = ₹ 12,000. \end{aligned}$$

## **Just-in-Time Inventory System:**

Keeping in view the enormous carrying cost of inventory in the stores and god-owns, manufacturers and merchandisers are asking for more frequent deliveries with shorter purchase-order lead times from their suppliers. Now-a-days organisations are becoming more and more interested in getting potential gains from making smaller and more frequent purchase orders.

In other words, they are becoming interested in just-in-time purchasing system. Just-in-time (JIT) purchasing is the purchase of material or goods in such a way that delivery of purchased items is assured before their use or demand.

Just-in-time purchasing recognizes too much carrying costs associated with holding high inventory levels. Therefore, it advocates developing good relations with suppliers and making timely purchases from proven suppliers who can make ready delivery of goods available as and when need arises.

## **Advantages of JIT Purchasing:**

1. Investment in inventory is reduced because more frequent purchase orders of small quantities are made.
2. Carrying cost is reduced as a result of low investment in inventory.
3. A reduction in the number of suppliers to be dealt with is possible. Only proven suppliers who can give quick delivery of quality goods are given purchase orders. As a result of this, reduction in negotiated time is possible. The use of long-run contracts with some suppliers with minimal paper work involved is possible.
4. Quality costs such as inspection cost of incoming materials or goods, scraps and rework costs are reduced because JIT purchasing assures quick and frequent deliveries of small size orders which results in low level of inventories causing minimum possible wastage. Therefore, JIT purchasing is frequently applied by organisations dealing in perishable goods.
5. JIT helps in reducing waste of time of the work force and the entire production process is concentrated on the time spent in actually producing products.

## ABC Analysis:

Manufacturing organisations find it useful to divide materials into three categories for the purpose of exercising selective control on materials.

- It is a system of inventory control. It exercises discriminating control over different items of stores classified on the basis of investment involved. Usually they are divided into three categories according to their importance, namely, their value and frequency of replenishment during a period.
- 'A' category of items consists of only a small percentage i.e. about 10% of total items handled by the stores but require heavy investment about 70% of inventory value, because of their high price or heavy requirement or both.
- 'B' category of items are relatively less important—20% of the total items of material handled by stores and % of investment required is about 20% of total investment in inventories.
- 'C' category—70% of total items handled and 10% of value.

**The report of the Indian Productivity Team on “Stores and Inventory Control in U.S.A., Japan and West Germany” gives the following example of ABC Analysis:**

<i><b>Group</b></i>	<i><b>Percentage of Items</b></i>	<i><b>Percentage of Costs</b></i>
<b>A</b>	<b>8%</b>	<b>75%</b>
<b>B</b>	<b>25%</b>	<b>20%</b>
<b>C</b>	<b>67%</b>	<b>5%</b>

## **VED Analysis:**

VED—vital, essential and desirable—analysis is used primarily for control of spare parts. The spare parts can be divided into three categories—vital, essential or desirable—keeping in view the criticality to production. The spares, the stock-out of which even for a short time will stop production for quite some time and where the cost of stock-out is very high, are known as vital spares.

The spares, the absence of which cannot be tolerated for more than a few hours or a day and the cost of lost production is high and which are essential for the production to continue, are known as essential spares. The desirable spares are those spares which are needed but their absence for even a week or so will not lead to stoppage of production. Some spares, though negligible in monetary value, may be vital for the production to continue and require constant attention.

Such spares may not receive the attention they deserve if they are maintained according to ABC analysis because their value of consumption is small. So, in their cases, VED analysis is made to get the effective results. As VED analysis analyses items based on their criticality to production, it can also be used for those items of materials which are difficult to procure.

## Methods to Value Materials Issues

### **1. First in First out (Commonly Called FIFO):**

Under this method material is first issued from the earliest consignment on hand and priced at the cost at which that consignment was placed in the stores. In other words, materials received first are issued first.

#### **Advantages of FIFO Method:**

1. The main advantage of FIFO method is that it is simple to understand and easy to operate.
2. It is a logical method because it takes into consideration the normal procedure of utilising first those materials which are received first. Materials are issued in order of purchases, so materials received first are utilised first.
3. This method is useful when prices are falling.
4. Closing stock of materials will be valued at the market price as the closing stock under this method would consist of recent purchase of materials.
5. This method is also useful when transactions are not too many and prices of materials are fairly steady.

## **Illustration:**

**The “Received” side of the stores ledger account shows the following particulars:**

Jan. 1 Opening Balance: 500

Jan 5 Received from vendor: 200

Jan. 12 Received from vendor: 150

Jan. 20 Received from vendor: 300

Jan. 25 Received from vendor: 400

**Issues of material were as follows:**

Jan. 4—200 units; Jan. 10—400 units; Jan. 15—100 units; Jan. 19—100 units; Jan. 26—200 units; Jan. 30—250 units.

Issues are to be priced on the principle of ‘First in First Out’.

Write out the Stores Ledger Account in respect of the materials for the month of January.

## SOLUTION

### STORES LEDGER ACCOUNT

Date	Particulars	Receipts			Issues			Balance		
		Quantity (Units)	Total Cost (₹)	Unit Cost (₹)	Quantity (Units)	Total Cost (₹)	Unit Cost (₹)	Quantity (Units)	Amount (₹)	Per Unit (₹)
Jan. 1	Balance b/d	—	—	—	—	—	—	500	2,000	4
Jan. 4	Requisition Slip No. ....	—	—	—	200	800	4	300	1,200	4
Jan. 5	Goods Received Note No. ....	200	850	4.25	—	—	—	300	1,200	4
								200	850	4.25
Jan. 10	Requisition Slip No. ....	—	—	—	300	1,200	4			
					100	425	4.25	100	425	4.25
Jan. 12	Goods Received Note No. ....	150	615	4.10	—	—	—	100	425	4.25
								150	615	4.10
Jan. 15	Requisition Slip No. ....	—	—	—	100	425	4.25	150	615	4.10
Jan. 19	Requisition Slip No. ....	—	—	—	100	410	4.10	50	205	4.10
Jan. 20	Goods Received Note No. ....	300	1,350	4.50	—	—	—	50	205	4.10
								300	1,350	4.50
Jan. 25	Goods Received Note No. ....	400	-1,600	4.00	—	—	—	50	205	4.10
								300	1,350	4.50
								400	1,600	4.00
Jan. 26	Requisition Slip No. ....	—	—	—	50	205	4.10	150	675	4.50
					150	675	4.50	400	1,600	4.00
Jan. 30	Requisition Slip No. ....	—	—	—	150	675	4.50	300	1,200	4.00
					100	400	4.00			

## **2. Last In First Out (Commonly Called LIFO) Method:**

As against the First in First Out method the issues under this method are priced in the reverse order of purchase i.e., the price of the latest available consignment is taken.

### **Advantages of LIFO Method:**

1. Like FIFO method, this is simple to operate and is useful when transactions are not too many and the prices are fairly steady.
2. Like FIFO, this method recovers cost from production because actual cost of material is charged to production.
3. Production is charged at the recent prices because materials are issued from the latest consignment. Thus, effect of current market prices of materials is reflected in the cost of sales provided the materials are recently purchased.
4. In times of rising prices, LIFO method of pricing issues is suitable because materials are issued at the current market prices which are high. This method thus helps in showing a lower profit because of increased charge to production during periods of rising prices and lower profit reduces burden of income-tax.

## SOLUTION

### STORES ACCOUNT

Date	Particulars or Reference	Receipts			Issues			Balance		
		Quantity (Units)	Total Cost (₹)	Unit Cost (₹)	Quantity (Units)	Total Cost (₹)	Unit Cost (₹)	Quantity (Units)	Amount (₹)	Unit Cost (₹)
Jan. 1	Balance b/d	—	—	—	—	—	—	500	2,000	4.00
Jan. 4	Requisition Slip No. ....	—	—	—	200	800	4.00	300	1,200	4.00
Jan. 5	Goods Received Note No. ....	200	850	4.25	—	—	—	300	1,200	4.00
								200	850	4.25
Jan. 10	Requisition Slip No. ....	—	—	—	200	850	4.25			
					200	850	4.00	100	400	4.00
Jan. 12	Goods Received Note No. ....	150	615	4.10	—	—	—	100	400	4.00
								150	615	4.10
Jan. 15	Requisition Slip No. ....	—	—	—	100	410	4.10	100	400	4.00
								50	205	4.10
Jan. 19	Requisition Slip No. ....	—	—	—	50	205	4.10			
					50	200	4.00	50	200	4.00
Jan. 20	Goods Received Note No. ....	300	1,350	4.50	—	—	—	50	200	4.00
								300	1,350	4.50
Jan. 25	Goods Received Note No. ....	400	1,600	4.00	—	—	—	50	200	4.00
								300	1,350	4.50
								400	1,600	4.00
Jan. 26	Requisition Slip No. ....	—	—	—	200	800	4.00	50	200	4.00
								300	1,350	4.50
								200	800	4.00
Jan. 30	Requisition Slip No. ....	—	—	—	200	800	4.00	50	200	4.00
					50	225	4.50	250	1,125	4.50

### **3. Average Cost Method:**

The principle on which the average cost method is based is that all of the materials in store are so mixed up that an issue cannot be made from any particular lot of purchases and, therefore, it is proper if the materials are issued at the average cost of materials in store.

**Average may be of two types:**

- (i) Simple Arithmetic Average
- (ii) Weighted Arithmetic Average.

**Advantages of Average Cost Method:**

1. **Average** price method is considered to be the best method when prices fluctuate considerably because this method tends to smooth out fluctuations in prices.
2. Issue prices are not to be calculated each time issues are made. Issue prices are changed only when new lot of materials is received.
3. This method recovers the cost of materials from production.
4. This method maintains the issue prices as near to the market prices as possible.
5. This method eliminates the necessity for adjustments in stock valuation.

## Illustration:

Following transactions took place in respect of an item of material:

	<i>Receipts Quantity</i>	<i>Rate ₹</i>	<i>Issue Quantity</i>
2-9-2011	200	2.00	
10-9-2011	300	2.40	
15-9-2011			250
18-9-2011	250	2.60	
20-9-2011			200

Record the above transactions in the Stores Ledger, pricing the issues at :

(a) Simple average rate ; (b) Weighted average rate.

### SOLUTION

(a) *Simple Average Rate*

#### STORES LEDGER ACCOUNT

<i>Date</i>	<i>Reference</i>	<i>Receipts</i>			<i>Issues</i>			<i>Balance</i>	
		<i>Quant- ity</i>	<i>Total Cost</i>	<i>Cost per Unit</i>	<i>Quant- ity</i>	<i>Total Cost</i>	<i>Cost per Unit</i>	<i>Quant- ity</i>	<i>Amo- unt</i>
2-9-2011	Goods Received Note No. ....	200	₹ 400	₹ 2.00	—	—	—	200	₹ 400
10-9-2011	Goods Received Note No. ....	300	₹ 720	₹ 2.40	—	—	—	500	₹ 1,120
15-9-2011	Requisition Slip No. ....	—	—	—	250	₹ 550	₹ 2.20*	250	₹ 570
18-9-2011	Goods Received Note No. ....	250	₹ 650	₹ 2.60	—	—	—	500	₹ 1,220
20-9-2011	Requisition Slip No.....	—	—	—	200	₹ 500	₹ 2.50**	300	₹ 720

$$* \left( \frac{₹ 2 + ₹ 2.40}{2} \right) = ₹ 2.20$$

$$** \left( \frac{₹ 2.40 + ₹ 2.60}{2} \right) = ₹ 2.50$$

**(b) Weighted Average Rate**

**STORES LEDGER ACCOUNT**

Date	Reference	Receipts			Issues			Balance	
		Quantity	Total Cost	Cost per Unit	Quantity	Total Cost	Cost per Unit	Quantity	Amount
			₹	₹		₹	₹		₹
2-9-2011	Goods Received Note No. ....	200	400	2.00	—	—	—	200	400
10-9-2011	Goods Received Note No. ....	300	720	2.40	—	—	—	500	1,120
15-9-2011	Requisition Slip	—	—	—	250	560	2.24*	250	560
18-9-2011	Goods Received Note No. ....	250	650	2.60	—	—	—	500	1,210
20-9-2011	Requisition Slip No.....	—	—	—	200	484	2.42**	300	726

$$* \left( \frac{₹ 400 + ₹ 720}{200 + 300} \right) = ₹ 2.24$$

$$** \left( \frac{₹ 560 + ₹ 650}{250 + 250} \right) = ₹ 2.42$$