

# CHAPTER 3

## MATERIAL COSTING



# MEANING OF MATERIAL

- **Materials:** The term '**materials**' refers to all commodities or components which are consumed in the process of manufacture.



# CLASSIFICATION OF RAW MATERIAL

**RAM MATERIAL**

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graph TD; A[RAM MATERIAL] --> B[DIRECT MATERIAL]; A --> C[INDIRECT MATERIAL]
```

**DIRECT MATERIAL**

**INDIRECT MATERIAL**

# INTRODUCTION & MEANING

## COST

### MATERIAL

### LABOUR

### EXPENSES

All 3 Costs are bifurcated into Direct & Indirect Costs.

Where, Materials constitute one of the Important element of Production.

Material Cost is a Cost of Material of any nature used for the purpose of production of a product or services.

✓ The Organization put maximum effort to control the material cost i.e. cost of material consumed.

- ❖ Every Purchase Department in Manufacturing concerns is usually faced with the problem of deciding the order quantity.
- ❖ After Material Purchase cost there are two Associated cost

Ordering Costs



Placement Costs

Carrying Costs



Storage Costs

## ORDERING COSTS (Placement costs)

❖ **Ordering Costs**: - The term Ordering Costs refers to  
The **Cost Incurred for Acquiring Inputs**.

These Costs Include:-

- i) **Cost of Placing an order** ( Billing cost, Postage cost, Bank Processing cost, Mailing cost etc.),
- ii) **Cost of Transportation**,
- iii) **Cost of Receiving goods**,
- iv) **Cost of Inspecting goods**.

➤ **Inverse Relationship between Order size & Ordering cost**.

➤ **Bigger Order quantity means Lower Ordering costs & vice versa**.

# CARRYING COSTS (STORAGE COSTS)

❖ Carrying Costs:- The term Carrying costs refers to

*The Cost Incurred in Maintaining a given level of Inventory.*

These costs include:-

- i) Cost of Storage space,
- ii) Cost of Handling materials,
- iii) Cost of Insurance,
- iv) Cost of deterioration or obsolescence,
- v) Cost of Store Staff,
- vi) Interest Cost ( loan taken for purchase of stock).

➤ Positive Relationship between Order size & Carrying Cost.

➤ Bigger Order quantity means Higher Carrying Costs.

# ECONOMIC ORDER QUANTITY (EOQ)

❖ If the Order Size is big, then the Storage Cost is Higher.



❖ On the other hand, If Order size is Small, then the Ordering Cost will be high.



❖ In order to minimize Ordering & Carrying cost, it is necessary to determine the order quantity which minimizes these two costs.



❖ The Size of the Order for which both Ordering & Carrying Costs are minimum(optimum) is known as Economic Order Quantity (EOQ).

**ECONOMIC ORDER QUANTITY(EOQ)**  
**FORMULA(Derived by famous mathematician**  
**Wilson)**

$$EOQ = \frac{2AO}{C}$$

Where,

A = Annual usage units / Annual Demand

O = Ordering Cost per order

C = **Annual Carrying cost of one unit,**

i.e. Cost of one unit x Carrying cost percentage p.a.

# *STOCK LEVEL*

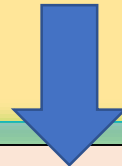
□ **NOTE:** -

- **Consumption is also called Usage.**
- **Re-order period is also called Lead Time.**
- **Normal Consumption/ Normal period can be used as Average Consumption/ Average period.**
- If Lead time for emergency purchase is not given in Question, assume any period less than minimum delivery period

# STOCK LEVEL FORMULA'S

- 1) Re-order Level = Maximum Consumption/usage x Maximum Re-order period  
OR  
= Minimum Level + [Average Consumption x Average Re-order period]
- 2) Maximum Level = Re-order Level + Re-order quantity(EOQ) – [Minimum Consumption x Minimum Re-order period]
- 3) Minimum Level = Re-order Level – (Average Consumption x Average Re-order period)
- 4) Average Level =  $\frac{\text{Minimum Level} + \text{Maximum Level}}{2}$   
OR  
= Minimum Level + [ ½ x Re-order quantity ]
- 5) Danger Level = Average Consumption x Emergency Re-order period/ Emergency Lead Time

# ABC CLASSIFICATION/ABC ANALYSIS/ABC TECHNIQUE (Value based system of a Material Control)



## CONTROL

**A**



### Highly Important Materials

- 70% Value
- 10% Quantity
- Constant Control & Strict Control.  
Check the stock level  
Periodically, check EOQ etc.

**B**



### Moderately Important Materials

- 20% Value
- 20% Quantity
- Need Based Control

**C**



### Least Important Materials

- 10% Value
- 70% Quantity
- Little Control,  
We can focus on  
Saving the Associated  
Cost

## ADVANTAGES OF ABC ANALYSIS OR ABC TECHNIQUE

- Smooth Flow :- Minimum Investment to be made without affecting production.
- Cost Savings :- EOQ helps in minimizing cost.
- Control by Exception :- Management can pay attention more on 'A' Category items.
- Standardization of Work
- Helps in Decision making

# *METHODS OF INVENTORY VALUATION*

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*First in First out Method (FIFO)*

*Weighted Average Cost Method (WAC)*

*Periodic System of Inventory*

*Perpetual System of Inventory*

## FIRST IN FIRST OUT METHOD (FIFO)

- **FIRST IN FIRST OUT METHOD (FIFO)**



**Issue of stock at oldest rate**



**Closing Stock is valued at Latest rate**

# WEIGHTED AVERAGE COST METHOD

## Periodic System of Inventory



Based on Actual Physical count/  
Physical Verification(Stores Dept.)

## Perpetual System of Inventory



Based on Book Records or  
Stock Ledger(Accounts Dept.)

## FORMULA TO CALCULATE WEIGHTED AVERAGE COST PER UNIT:-

$$\text{WAC p.u.} = \frac{\text{Opening Stock} + \text{Purchases (In Amounts)}}{\text{Opening Stock} + \text{Purchases (In Units)}}$$

## RAW MATERIAL TURNOVER RATIO/STOCK TURNOVER RATIO/INVENTORY TURNOVER RATIO

- ❖ It is one of the Technique of Inventory Control.
- ❖ It expresses the Relationship between the Cost of Material Consumed & The Average Stock Held.
- ❖ High Raw Material Turnover Ratio indicates that Raw material stock is Fast moving **Whereas**, a Low Ratio indicates Slow moving stock.
- ❖ The Raw Material Turnover Ratio gauges a company's ability to efficiently turn raw material into finished products.
- ❖ This Ratio helps company to understand the Stock out situation, whereby company can take necessary measures to prevent from Stock out situation. Like if the stocks are Fast moving then company have to make a plan that next stock will be available on time so that idle time is to be avoided.

RAW MATERIAL TURNOVER RATIO/STOCK  
TURNOVER RATIO/INVENTORY TURNOVER RATIO  
FORMULA

Raw Material Turnover Ratio =  $\frac{\text{Cost of Raw Material Consumed}}{\text{Average Stock}}$

Whereas,

1) Cost of Raw Material Consumed = Opening stock + Purchase – Closing Stock

2) Average Stock =  $\frac{\text{Opening stock} + \text{Closing stock}}{2}$

3) Average no. of days for which an  
Average Inventory is Held =  $\frac{365 \text{ days} / 12 \text{ months} / 52 \text{ weeks}}{\text{Raw Material Turnover Ratio}}$