

Study and Determination of Inventory Management Practices in Industry

BINDHU A S¹, BHAVANA U²

^{1,2}Department of Mechanical Engineering, JSS Science and Technology University, SJCE, Mysuru
Email: bindhupatel@jssstuniv.in
Email: bhavana.umanath@jssstuniv.in

Abstract:

The present work is intended to determine the industry practice in inventory management to evaluate management performance in this regards. The importance of the project is emphasized by the fact manner of administration of inventory management to a very large affects the success or failure of overall operations of the industry. The proper management of inventory management is crucial importance for the success of the same. In order to evaluate the performance of the inventory management referring the annual report of the organization the required data has been collected the computations such as stores and spares, inventory turnover ratio etc. After all the computations they analyzed and also by making use of information collected conclusions are drawn. Finally looking to the conclusion, suggestions are made for improvement.

Keywords — Inventory, Analyse, stores, spares, administration.

I. INTRODUCTION

Industry is a group of companies, which include all type of firms. In the industry so many sub units will work under main industry. One of a company's most significant assets is its inventory. The mainstay of a company's operations in industries with high inventories including retail, manufacturing, food services, and others are its raw materials and finished goods. When and where inventory is needed, a shortfall can be very harmful. In addition, inventory can be seen as a liability (if not in an accounting sense). The danger of spoilage, theft, damage, or changes in demand exists with regard to big inventories

II. OBJECTIVES

- To provide timely and accurate information to management for
 - a) Procuring materials in right quantities

b) Streamlining purchase and inventory management procedure

- To give recommendations for improving the materials inventory status and achieve the cost control.
- To make the cost analysis of the inventory in the proposed system.
- To find out the economic order quantity, considering ordering cost and inventory carrying cost.
- To make the cost analysis of the existing inventory.
- To propose an inventory model and to study the average inventory level of the proposed model.

III. METHODOLOGY OF INVENTORY VALUATION

Inventory is the single largest asset in the balance sheet of most organizations, and the valuation of inventory becomes almost important and crucial to the financial executives. Many companies raise the working capital from commercial banks by

hypothecating the inventory and hence there is a need for proper valuation of stock. Inventory valuation enables an organization to know and confine its knowledge of financial strengths and weakness. Inventory valuation converts physical quantities into monetary figures which enters balance sheet. Therefore, inventory valuation becomes very crucial in judging the performance of any industrial enterprise. Materials enter an organization in the form of raw materials, capital goods, spares, furniture and miscellaneous items. The effectiveness of the organization depends on how well it is able to convert raw materials into finished goods. By adding value and obtain a proper price for it. This can be done by valuation are:

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- FIFO- First in first out
- LIFO-Last in last out
- HIFO-Highest in first out
- NIFO-Next in first out
- Standard cost
- Stock

Simple average, weighted average etc.,

There are two main activities in a Life cycle assessment:

- The inventory analysis step, which describes the emissions that occur, and the materials and resources used during the life of a product.
- The impact assessment step, which looks at the impacts of emissions and use of resources and raw materials on the environment.

IV. INVENTORY ANALYSIS

It is imperative to undertake a systematic analysis of all items in stores for achieving the objectives of inventory control. Since organization consumes around 15,000 items a high degree of control on inventories of each item would therefore neither be

practical considering the work involved nor worthwhile since all the items are not of equal importance. It is suggested to analyse inventories for effective control as follows

Overall analysis:

This type of analysis is very useful for the top management for keeping track of inventory behaviour. This analysis takes a bird's eye view of total inventory over period of time to find out trends if any.

For the purpose of overall analysis techniques are used. The material department should calculate the index of month's consumption and report to management periodically

$$\text{Months consumption index} = \frac{\text{Average stock}}{\text{Monthly consumption}}$$

Another trend to watch closely keep an overall control of inventories is to compare purchases and consumption or receipts and issues. They can be plotted on a graph against time and if there are any persistent variations in purchases and consumption.

Category Analysis:

This is the second level of analysis where in stock of each category (group of similar items) is analysed. Generally, it has been found that even if the overall position of stocks is satisfactory, stocks carry higher inventory of some categories and low of some other resulting in locking up of the capital in higher inventory categories

The category with too low stocks may need an upward revision and those with higher stocks may require examinations for reduction in inventory. In order to achieve optimum stock levels and effective control, the management should fix targets for each category of items according to various conditions like lead time, nature of the item etc.

1. Calculation of ordering cost for salaries and wages of purchase staff.
2. Calculation of cost of inventory carrying for salaries and wages on store personnel.

Cost of Inventory carrying

Total Expenditure Incurred:

- 1) Salaries and wages on store personnel

Table 1. Salaries and wages on store personnel

Sl No	STAFF	TOTAL No's	SALARY /WAGES	BENEFITS	TOTAL(Rs) PER Annum
a)	Officer	3	303600=00	30360=00	333960=00
b)	Workmen	6	180258=00	108025=00	198283=00
c)	Casual	3	41400=00	4140=00	45540=00
	Total				577783=00

Benefits includes: PF, ESI, Gratuity, Superannuation, canteen, Insurance and other employee related expenses (ERE).

Table 2. Inventory cost on Types of expenses

Sl.No	Types of Expenses	Total Values in Rs
1	Salaries and wages of stores personnel	577783-00
2	Stores insurance charges- 1.5% per annum on inventory holdin ²	511000-00
3	Stationary cost	15000 00
4	Cost of materials rendered obsolete 0.15% on Total annual MATL Transaction	613000-00
5	Total	1716783 00
6	Miscellaneous Expenses- 5% on total	85839 00
	Grand Total	1802622 00

- Average Inventory holding for the year. 340.84 lakhs.
- Loss of interest on capital invested in Inventory

$$= (\text{Average Inventory} * \text{Rate of interest}) / 100$$

$$= (340.64 * 19.5) / 100$$

$$= 66.42 \text{ lakhs}$$
 Inventory carrying cost = $(1+3) / 2 * 100$

$$= (1802622 + 6642000) / 34064000 * 100$$

$$= 24.79\%$$

$$= 25\%$$

Inventory carrying cost = 25%

Calculation of ordering cost

1. Salaries and wages of purchase staff

Table 3. Ordering cost Salaries and wages of purchase staff

Sl No	STAFF	TOTAL No's	Salary/wages (Rs)	Benefits (Rs)	Total (Rs) Per Annum
a)	Manager	1	245000=00	24500=00	269500=00
b)	Asst. Manager	1	177000=00	17700=00	194700=00
c)	SR. Engineer	3	446000=00	44600=00	490600=00
d)	Engineer	2	269000=00	26900=00	295300=00
e)	Officer	7	741000=00	74100=00	815100=00
f)	Dept. Asst	4	230000=00	23000=00	253000=00
g)	Typist	1	57000=00	5700=00	62700=00
	Grand total per Annum				2381500=00

Table 4. Ordering cost type of Expenses

Sl No	Type of Expenses	Total value in Rs
a)	Salaries and wages of purchase Dept	2381500=00
b)	Postage/ courier- Total for the unit- Rs 3.00 Allocation-20%	60000=00
c)	Telephone/ Fax- Total for the unit- Rs 36.50 Allocation-20%	730000=00
d)	Stationary - Total for the unit- Rs 3.65 Allocation-30%	109500=00
e)	Travelling Expenses	185000=00
f)	Total	3466000=00
g)	Miscellaneous Expenses Allocation-5% on total Expenses	173300=00
	Grand total	3639300=00

Total no of purchase order released From Jan 2008 to Dec 2009 = 9354 Therefore

$$\text{Ordering cost} = \frac{\text{Total expenditure}}{\text{Total no of orders}}$$

$$= \frac{3639300}{9354}$$

$$= \text{Rs } 390/-$$

$$= \text{Rs } 400$$

Ordering cost = Rs 400/- per order

Proposed method to find Lead time

Information from purchase requisition, purchase order and goods inward notes is collected. So as to know the administrative lead time and suppliers lead time. The sum of these two gives the total lead time. This information is collected for all the suppliers of each of the selected items.

A specimen calculation of finding total probable lead time is shown below for raw cotton linters

Table 5. Probable lead time

Sl No	Company	Total lead time (Days)	No of orders placed	Probability placing order	Probable lead time
a)	Marfed	20	1	0.0476	0.952
b)	Tru Textile	22	3	0.1428	3.1416
c)	Modern Mills	9	2	0.0952	0.8568
d)	Andra sugar	9	3	0.1428	1.2852
e)	S.S.D Oil	7	3	0.1428	0.9996
f)	GADAG	15	2	0.0952	1.428
g)	CAPOL	7	3	0.1428	0.9996
h)	Sabarkant	16	1	0.0476	0.7616
i)	Raghunath	15	3	0.1428	2.142

Total probable lead time 11days Proposed method to find lead time

Information from purchase requisition, purchase order and goods inwards notes is collected. So as to know the administrative lead time and suppliers lead time. The sum of these two gives Total lead time. This information is collected for all suppliers of each of the selected items.

A specimen calculation of finding total probable lead time is shown

1. Total no of order placing during 2008-2009=21
2. Probability of placing order=
$$\frac{\text{Number of order placed}}{\text{Total no of order placed}}$$
3. Probable lead time (PLT): Total lead time*probability of placing order
4. Total probable lead: Sum of PLTs of all companies
5. Total lead time: 11 days

Avg daily consumption in tons/day=70 ton

Quantity consumed during lead time =TPLT
(days)*consumption in tons/day
= 77 tons

B. Acetic acid

TABLE 6. PROBABLE LEAD TIME TO FIND ACETIC ACID

SI No	Company	Total lead time(Days)	No of order placed	Probability placing order	Probable lead time
a)	Mysugar	2	13	0.240	0.48
b)	KAPChem	5	10	0.185	0.925
c)	Trichy distillery	7	9	0.166	1.162
d)	Somaiya organics	10	4	0.074	0.74
e)	ujChem	10	5	0.092	0.92
f)	Trade base	12	3	0.055	0.66
g)	Chemox	6	3	0.055	0.33
h)	Nandi Chemicals	10	5	0.092	0.92
i)	Sharp ac.ency	8	1	0.018	0.44
q)	Shriman	2	1	0.018	-
	Total probable lead time				6.281

1. Total no of order placing during 2008-2009 = 54
2. Probability of placing order=
$$\frac{\text{Number of order placed}}{\text{Total no of order placed}}$$

3. Probable lead time (PLT): Total lead time*probability of placing order
Avg daily consumption in tons/day = 18.51

Quantity consumed during lead time = TPT
(days)*consumption in tons/day
= 7*18.51
= 130 tons

C. Sulphuric acid

Table 7. Probable lead time of Sulphuric acid

SI No	Company	Total lead time	No of order placed	Probability or placing orders	Probable Lead time
a)	Shrimidhi Chemicals	15	3	0.33	4.99
b)	Kecrthi Pvt Ltd	14	3	0.33	4.66
c)	Gem Enterprise	16	3	0.33	5.33

Total probable lead time= 15 days

Total no order of placed 2008-09 = 9

Avg daily consumption= 0.831 tons

Quantity consumed during lead time = 0.831*15
= 12.465 tons

Total cost of each material is tabulated below:

Table 8. Total Probable lead time

Material	R. C. L	Acetic	H2SO4	MG02	CL
Avg Inventory	459.6	220.68	20.00	9.43	3.5
Cost of material (Rs/kg)	6.50	14.00	32.00	3.00	2.70
Avg Inventory cost (In lakhs.)	29.87	30.89	0.64	0.29	0.09
Inventory carrying costs (In Lakhs)	8.36	8.64	0.17	0.08	0.025
Ordering cost (Rs/order)	1000	1000	1000	1000	1000
No of order	21	54	9	2	6
Total ordering cost	21000	54000	9000	2000	6000
Total Cost (in lakhs)	38.44	40.07	0.90	0.39	0.17

ANALYSIS ON INVENTORY RATIOS

The data collected through primary and secondary sources were processed and presented in the chapter Data Analysis by various table and explanations. The table thus obtained were

analysed by calculating averages, percentages, Ratios and they are followed in respect of the stock of raw material , spares, work in progress, sales, Inventory control procedures and thus to draw conclusions from the analysis done.

Inventory Turnover Ratio:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average inventory}}$$

Table 9. Showing Cost of Goods Sold, Average Inventory and Inventory Turnover ratio.

Year	Cost of Goods Sold.	Average inventory.	Inventory turnover ratio
2006-07	1476119771	673028384	2.19
2007-08	1683166457	728050811.5	2.31
2008-09	1523331345	471920162	3.22

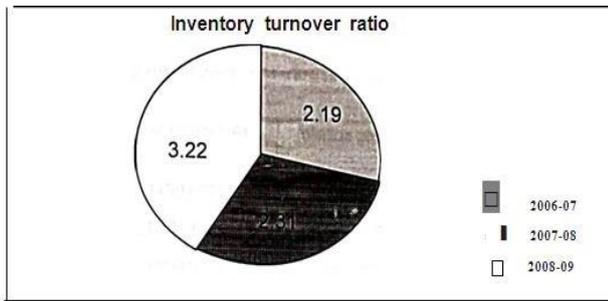


Fig 1. Inventory turnover ratio

Interpretation:-

From the above table we come to know that the ratio is fluctuated during the study period the ratio is varied between in the period 06-07 is 2.19, in the year 07-08 is 2.31 and in the year 08-09 is 3.22. So the company is having good inventory turnover ratio.

Inference:

The inventory turnover ratio is increased year by year so that the company's efficiency is increasing.

Work in progress Turnover Ratio:

$$\text{Work In Progress Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Work in process}}$$

Table 10. Showing cost of goods sold work in progress, & work in progress turnover ratio

Year	Cost of Goods Sold.	Work in progress.	Work in progress turnover ratio.
2006-07	1476119771	57436130	37.06488908
2007-08	1683166457	50636739	33.24002473
2008-09	1523331345	54067550	28.17459539

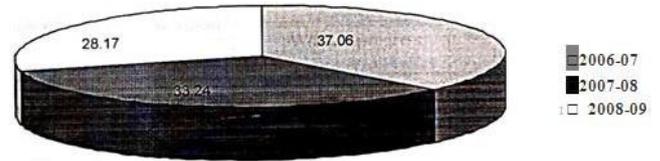


Fig 2. Work in progress ratio

Interpretation:

In the above table we come to know that the ratio is fluctuated during the study period varied between 4 to 5 times. Company is converting work in progress in to finished goods very fastly.

Inference:

Company is converting work in progress in to finished goods very fastly so that the company is using Jess working capital efficiently.

Inventory to Current asset Ratio:

$$\text{Inventory to Current Assets Ratio} = \frac{\text{Inventory}}{\text{Working capital}}$$

Table 11. Showing Current Assets; inventory Percentage of inventory to current assets.

Year	Inventory	Working capital	Ratio
2006-07	845856031	1403050339	0.60
2007-08	610245492	924055041	0.66
2008-09	333594732	735692334	0.45

Inventory to current assets ratio

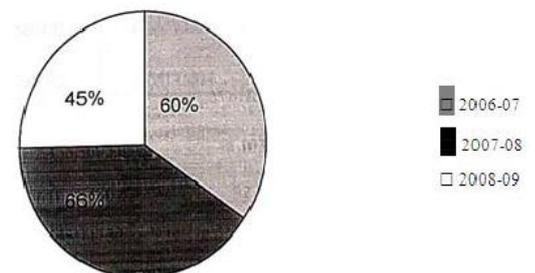


Fig 3. Inventory to current asset ratio

Interpretation:

From the above table we come to know that the company's inventory to current assets ratio shows

that in the year 2007, 62% thereafter increased to 71% in the year 2008. but in 2009 it again decreased to 45%.

Inference:

From the above calculations we may conclude that inventory to current ratio of the company ups & down in these years it is because of decrease in the inventory level so it shows firm wants to increase its sales.

Inventory to total assets:

$$\text{Inventory to Total Assets} = \frac{\text{Inventory}}{\text{Total Assets}}$$

Table 12. Showing ratio of inventory to total assets

Year	Inventory	Total Assets.	Inventory to Total Assets Ratio
2006-07	845856031	2326864061	36.35%
2007-08	610245492	1866693577	32.69%
2008-09	333594732	1854113814	17.99%

Inventory to total assets ratio

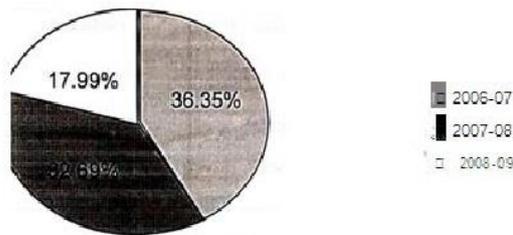


Fig 4. Inventory to total assets ratio

Interpretation:

From the above table we came to know that 2006-07 is 36%. In the year 2007-08 decreased to 32% and in the year 2008-09 again decreased to 18% so inventory in the chemical is decreasing in the past three years.

Inference:

From the above calculations we may conclude that the inventory to total assets ratio is decreased year by year so the company is using remaining resources profitably.

Inventory to Working Capital Ratio.

$$\text{Inventory to working capital ratio} = \frac{\text{Inventory}}{\text{Working capital}}$$

Table 13: showing inventory, working capital and its ratio

Year	Inventory	Working Capital	Ratio
2006-07	845856031	1403050339	0.6
2007-08	610245492	924055041	0.66
2008-09	333594732	735692334	0.45

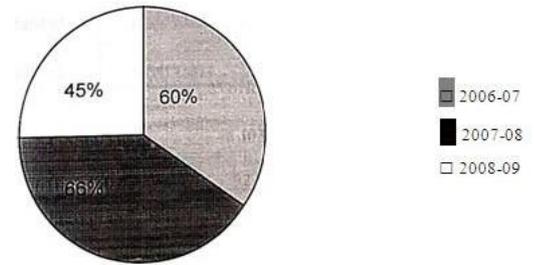


FIG 5: INVENTORY TO WORKING CAPITAL RATIO

Interpretation:

Above table shows that in the year 2006 the ratio of inventory to working capital is 60%. In the year 08 increased to 66% and in 09 it again decreased to 45%.

Inference:

From the above calculations we can say that the ratio of inventory to working capital is ups & down so it shows that company is trying to reduce amount of capital in the inventory which is blocked p out of total working capital of the company.

Material cost ratio

$$\text{Material cost ratio} = \frac{\text{Material consumed}}{\text{Sales}} \times 100$$

Table 14. Showing material cost ratio

Year	Material consumed	Sales	Ratio
2005-2006	1476119771	2660270413	55.48
2006-2007	1683166457	2834283422	59.38
2007-2008	1523331345	3009522714	50.61

Interpretation:

From the above table we came to know that the 50% to 60% of material cost is included in the sales.

Inference:

From the above calculation we can conclude that the ratio of material cost is decreased as compare to last two years so the company is trying to reduce the cost of raw material.

V. Proposed Inventory Model

Order point symbols

OP- Order point

X- Average demand LT-Lead time•

MAD-Safety stock requirement (Computed by measuring mean absolute deviation)

Order point calculation

The basic order point formula= $OP = X_{lt} + 2MAD_{lt}$

These variables are:

Last IO months demand = 3, 6, 8, 7, 4, 4, 6, 7, and 6

Demand this month= 8 Items lead time = 2 months

Smoothing factor= 10%

Safety stock= 95% desired service level (2MAD)

The following steps for calculation of items order point .

1. Average demand (X) is calculated first by dividing the sum of the last 10 month demand quantities by 10

$$X = \frac{3+6+8+7+4+4+4+6+7+6}{10} = 55/10 = 5.5$$

2. X_{lt} requires X being extended over a lead time since both X and lead time are in the same measurements. (Months) $X_{lt} = 5.5(2) = 11$

3. MAD_x is required to be calculated before $2MAD_{lt}$ is obtained. MAD_x consist of the following absolute differences of X, and the last IO months demand quantities divided by 10

$$MAD = 3 - 5.5 = 2.5$$

$$6 - 5.5 = 0.5$$

$$8 - 5.5 = 2.5$$

$$7 - 5.5 = 1.5$$

$$4 - 5.5 = 1.5$$

$$4 - 5.5 = 1.5$$

$$4 - 5.5 = 1.5$$

$$6 - 5.5 = 0.5$$

$$7 - 5.5 = 1.5$$

$$6 - 5.5 = 0.5$$

$$MAD = 14/10 = 1.4$$

$$MAD = 2(1.4) = 2.8$$

4. $2MAD_{lt} = 2MAD_x$ adjusted to lead time. Since smoothing is accomplished on MAD each demand period. The need to adjust to individual lead time is discouraged. The service level percent desired.

Placing the above calculation together, without the use of smoothing factor we have the following item forecast.

$$OP = X_{lt} + 2MAD_{lt}$$

$$= 11 + 2.8$$

$$= 13.8 \text{ or } 14 \text{ (rounded)}$$

Exhibit

Steps necessary (using these variables) to smooth average demand and safety stock, once demand averaging is established the following steps are involved.

1. smooth $X = 8(10\%) + 5.5(90\%)$
 $= 0.80 + 4.65$
 $= 5.75$

2. Calculate $X_{lt} = 5.75 * 2(\text{months}) = 11.5$

3. Smooth $MAD_{lt} = 2.8(10\%) + 1.4(90\%)$
 $= 0.28 + 1.26$
 $= 1.54$

4. Calculate $2MAD_{lt} = 1.54$

5. Calculate order point= $X_{lt} + 2MAD_{lt}$
 $= 11.5 + 3.08$
 $= 14.58$

Increasing the smoothing percentage will bring about a more rapid response to change in demand (CAD stands for current absolute deviation) and is the absolute difference between current demand and X"

Data collection on order point calculations Acetic acid

The consumption in nos for last 10 months demand = 502,513, 608,546,904,714,563,314,729,757

Demand this month = 683

Nos Lead time = 2 months

Smoothing factor = 10%

Safety stock = 95%

desired service level (2MAD)

To calculate order point without using smoothing factor

1. Average demand (X) for the last 10 months demand

X =

$$\frac{502+513+608+546+904+714+563+314+729+757}{10}$$

10

$$X = 6150/10 = 615$$

2. Xlt requires X being extruded over a lead time, since both X and lead time

$$Xlt=615*2= 1230$$

4. MAD_x is required to be calculated before 2MAD_{lt} is obtained. MAD_x consist of

the following absolute differences of X, and the last 10 months difference of X

$$MAD = 502 - 615 = 113$$

$$513 - 615 = 102$$

$$608-615 = 07$$

$$546-615 =69$$

$$904 - 615 = 289$$

$$714-615 = 99$$

$$563 -615 =52$$

$$314 - 615 = 301$$

$$729 - 615 = 114$$

$$757-615=142$$

$$MAD_x = 1288/10 = 128.8$$

$$. 2MAD_x = 2*1288 = 257.6$$

$$4. Order\ point = Xlt + 2MAD_{lt}$$

$$= 1230 + 257.6$$

$$= 1488\ Nos$$

Calculate order point using Smoothing factor

Steps necessary to smooth average demand and safety stock once demand averaging is established the following steps are involved

1. Smooth X = Current month demand (10%) + X (90%)

$$= 683(10\%) + 615(90\%)$$

$$= 68.3 + 553.5 = 621.8$$

2. Calculated Xlt = 621.8*2

$$= 1243.6$$

3. Smooth MAD_{lt} = 2MAD_x (10%) + MAD (90%)

$$= 258(10\%) + 128(90\%)$$

$$= 25.8 + 115.2 = 141$$

$$4. Calculated\ 2MAD_{lt} = 141 * 2 = 282$$

5. Calculated order point = Xlt + 2MAD_{lt}

$$= 1243.6 + 282.0 = 1525.2 = 1526\ Nos$$

Increasing the smoothing percentage will bring about a more response to change in demand.

Sulphuric acid

The basic order point formula $OP = Xlt + 2MAD_{lt}$

The consumption in Nos For cast 10 months demand is 111, 129, 65, 210, 139, 172, 117, 97, 147, 153

Demand for current month = 148 Nos

Lead time = 3 months

Smoothing factor = 10%

Safety stock = 95% desired service level

To calculate order point without using smooth factor

1. Average demand

$$X = \frac{111 + 129 + 65 + 210 + 139 + 172 + 117 + 97 + 147 + 153}{10}$$

$$= 1340 / 10 = 134$$

2. Average demand on lead time

$$Xlt = 134 * 3 = 402$$

3. Safety stock required

$$MAD_x = 302 / 10 = 30.2$$

$$MAD_x = 3 * 30.2 = 90.6$$

4. Order point = Xlt + 2MAD_{lt}

$$= 134 + 90.6$$

$$= 225\ Nos$$

To calculate order point using smoothing factor:

1. Smooth x = 148(10%) + 134(90%)

$$= 14.8 + 120.6$$

$$= 135.4$$

2. **2. Calculate $X_{lt} = 135.4 \times 3$**

3. $= 406.2$

4. **3. Smooth $MAD_{lt} = 906(10\%) + 30.2(90\%)$**

5. $= 36.24$

6. **4. Calculate $2MAD_{lt} = 36.24 \times 3 = 108.72$**

5. Calculate order points = $X_{lt} + 2MAD_{lt}$
 $= 406.2 + 108.72$
 $= 514.92 = 615 \text{ Nos}$

Increasing the smoothing percentage will bring about a more response to change in demand

Magnesium oxide

The basic order point formula

$OP = X_{lt} + 2MAD_{lt}$

The consumption in no forecast 10 months demand is 2741, 3302, 5646, 1304, 186, 4441, 4840, 4736, 3696, 4480

Demand for current month = 4374

Lead time = 3 months]

Smoothing factor = 10%

Safety stock = 95% desired service level

To calculate order point without smoothing factor:

1. Average demand

$\frac{2741+3302+5646+1304+4184+4441+4840+4736+3696+4480}{10}$

10

$X = 39372/10 = 3937.2$

2. **Average demand on lead time $X_{lt} = 3937.2 \times 3 = 11811.6$**

3. Safety stock required

$MAD = 2741 - 3937.2 = 1196.2$

$3302 - 3937.2 = 635.2$

$5646 - 3937.2 = 1708.8$

$1304 - 3937.2 = 2633.2$

$4186 - 3977.2 = 248.8$

$4441 - 3977.2 = 503.8$

$4840 - 3977.2 = 902.8$

$4736 - 3977.2 = 798.8$

$3696 - 3977.2 = 241.2$

$4480 - 3977.2 = 542.8$

$MAD = 9411.6 / 10 = 941.16$

$MAD_x = 3(\text{ months}) \times 941.16 = 2823.48$

4. **Order point = $X_{lt} + 2MAD_{lt}$**

$= 11,811.6 + 2823.48$

$= 14,635.08 \text{ Nos}$

To calculate order point using smoothing factor

1. **Smooth $x = 4374(10\%) + 3937.2(90\%)$**
 $= 437.4 + 3543.48$
 $= 3980.88$

2. **Calculate $X_{lt} = 3980.88 \times 3(\text{months})$**
 $= 11,942.64$

3. **Smooth $MAD_{lt} = 2823.48(10\%) + 941.16(90\%)$**
 $= 282.35 + 847.05$
 $= 1129.4$

4. **Calculate order point = $X_{lt} + 2MAD_{lt}$**
 $= 11,942.64 + 1129.4$
 $= 13,072 \text{ Nos}$

Chlorine

The Basic order formula $OP = X_{lt} + 2MAD_{lt}$

The consumption is No fro last 10 month demand is 65to+4200+4830+6090+6265+1680+1930+8080+3360+8440

Demand for current month = 5720

Lead Time = 2 months

Smoothing factor = 10%

Safety Stock=95% desired service level (2MAD)

To calculate order point without smoothing factor

1. Average Demand

$$X = 6510 + 4200 + 4830 + 6090 + 6235 + 1680 + 1930 + 8080 + 3360 + 3360 + 8440$$

$$= 12526 \text{ Nos}$$

$$\frac{\quad}{10}$$

$$= 51,385/10 = 51.38.5$$

$$2. \text{ Average demand on lead time } X_{lt} = 5138.5 * 2$$

3 Safety stock required

$$MAD = 6510 - 5138.5 = 1371.5$$

$$4200 - 5138.5 = 938.5$$

$$4830 - 5138.5 = 308.5$$

$$6090 - 5138.5 = 951.5$$

$$6265 - 5138.5 = 1126.5$$

$$1680 - 5138.5 = 3458.5$$

$$1930 - 5138.5 = 3208.5$$

$$8080 - 5138.5 = 2941.5$$

$$3360 - 5138.5 = 1778.5$$

$$8440 - 5138.5 = 3301.5$$

$$MAD_x = 19385/10 = 1938.5$$

$$2MAD_x = 2(\text{Months})/3877 * 1938.5$$

$$4. \text{ Order point} = X_{lt} + 2MAD_{lt}$$

$$= 10277 + 3877$$

$$= 14,154 \text{ Nos.}$$

To calculate order point using smoothing factor

$$1. \text{ Smooth } x = 5720(10\%) + 5138.5(90\%)$$

$$= 572 + 4624.65$$

$$= 5196.65$$

$$2. \text{ Calculate } X_{lt} = 5196.65 * 2$$

$$= 10,393.3$$

$$3. \text{ Smooth } MAD_{lt} = 3877(10\%) + 1938.5(90\%)$$

$$= 3877 + 1744.65$$

$$= 2132.35$$

$$4. \text{ Order point} = X_{lt} + 2MAD_{lt}$$

$$= 10,393.3 + 2132.35$$

$$= 12425.65$$

Studies of industries about inventory carrying costs reveal the following

- Over 65% of most companies do not compute inventory carrying costs, they use rough estimates
- Leading logistics experts place the cost of carrying inventory between 18 % per year and 75% per year depending on the type of products and business
- The standard "rule of thumb" for inventory carrying cost is 25% of inventory value on hand.

VI. CONCLUSIONS

The amount of experience we get during this study will be very useful to us in future talking about the subject matter of our project that is inventory management the time limit of the months seems to be too short to extremely study all the aspects of store material management. Still we have made a more to cover some of the aspects of inventory management.

The main aim of study is to inventory management methods and techniques. We got a well experience related to inventory management and also we came to know that how to take control measures for wastage of raw materials.

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