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A Study on Inventory Management

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ABSTRACT

Inventory Management includes detail study about inventory, its importance and effectively it should be managed for smooth operations of business. Inventories are assets of the firm and require investment and hence involve the commitment of firm's resources. Every firm is required to manage the inventories in such a way as to get the best returns. The objective of inventory management is to determine the optimum level of the inventory that is the level at which the interest of all the departments are taken care of. The inventory management seeks to maximize the wealth of the share holders by minimizing the cost of procuring and maintaining. The objective behind the inventory management is maintaining sufficient stock of raw materials ensuring continuous supply to production process for uninterrupted production schedule and minimizing the total annual cost of maintaining inventories. Inventories are assets of the firm and hence involve the commitment of firm's resources; managers must ensure that the firm maintains inventories at the correct level.

KEYWORDS: *ABC analysis, EOQ, Turnover ratios*

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INTRODUCTION

Inventory means stock of goods like raw material, work in progress, finished goods etc.

Inventory management means planning, organizing, handling and storing adequate level of inventory with optimized cost to meet consumer's demand.

Inventory occupy 50–80% of the total current assets of the business concern. It is very essential part of working capital management and production management.

Need for the study

- As inventory management is the essential for an organization for achieving efficiency in its operations activity.
- Inventory management is must for good production flow in an organization which leads to profit to the organization.

Scope of the study

- This study is confined to the **ULTRATECH CEMENT LTD,** only from a period of 2015-16 to 2019-20.

Objectives of the study

- To Study the inventory management techniques in Ultratech cement ltd.
- To analyses the various inventory stock levels of at Ultratech cement ltd
- To evaluate the efficiency of inventory management of Ultratech cement ltd.

Research methodology

SECONDARY DATA:

The study is based on secondary data. It was collected from the company annual reports, websites and journals.

Limitations

- The study is based on secondary data only.
- The study is limited to the only 5 years data i.e., from 2015-16 to 2019-20 at Ultratech cement ltd.

EOQ ANALYSIS

The economic order quantity is that inventory level, which minimizes the total of ordering cost and carrying cost.

It is defined as the quantity of materials to be ordered at one time which minimizes the wastage and costs.

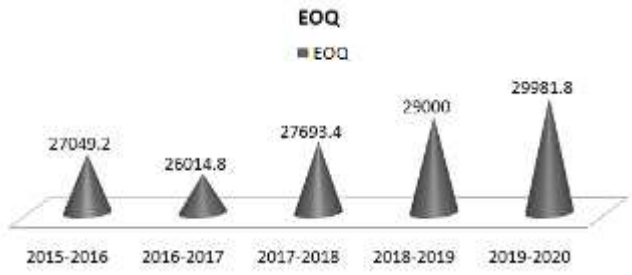
Economic Order Quantity is given by the formula:

- **EOQ=** $\sqrt{\frac{2AO}{C}}$ Where,

A = Annual consumption
O = Ordering cost and
C = Carrying cost

Calculation of EOQ during the years 2015-16 to 2019-20

Years	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Annual Consumption (in units)	995456	950080	949523	936210	980015
Ordering cost (rs)	5420	5200	5250	5300	5320
Carrying cost (rs)	14	14.6	13	11.8	11.6
EOQ	27049.2	26014.8	27693.4	29000.0	29981.8



Interpretation:
From the above graph it is observed that EOQ is lowest in the year 2016-2017 i.e.26014.8 units and it is highest in the year 2019-2020 i.e., 29981.8 units EOQ is in increasing level from 2016-2017. It means that the wastage and cost is reducing constantly which is a good sign.

ABC Analysis

ABC analysis is a basic analytical management tool. The greatest effort for the greatest results is ultimate yield of such analysis of materials.

"A item" with very tight control and accurate records,

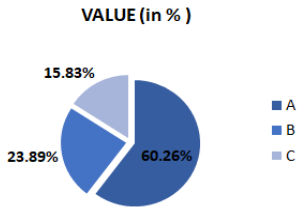
"B items" with less tightly controlled and good records, and

"C items" with the simplest controls possible and minimal records.

ABC analysis for the year 2015-2016

Raw material	Total value (in crores)	% of total value	Class
Limestone	1020.83	28.72%	A
Fly ash	527.87	14.85%	B
Sand	321.39	9.04%	B
Gypsum	305.04	8.58%	C
Aggregate	257.75	7.25%	C
Others	1120.83	31.53%	A

CLASS	VALUE (in crores)	% OF VALUE
A	2141.66	60.26
B	849.26	23.89
C	562.79	15.83

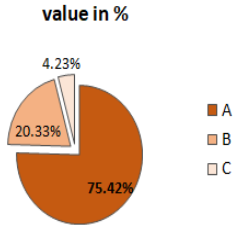


Interpretation:
In the year 2015-16 the company has invested 60.26% of total annual consumption value in A class items, 23.89% of annual consumption value in B class items and 15.83% of annual consumption value in C class items.

ABC analysis for the year 2016-2017

Raw materials	Total value (in crores)	% of total value	Class
Limestone	1170.97	33.76	A
Fly ash	389.65	11.23	B
Sand	650.21	18.75	A
Gypsum	794.53	22.91	A
Aggregate	315.61	9.10	B
Others	146.81	4.23	C

CLASS	VALUE (in crores)	% OF VALUE
A	2615.71	75.42
B	705.26	20.33
C	146.8	4.23

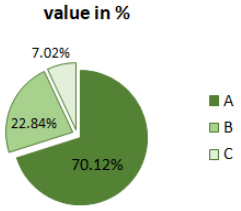


Interpretation:
In the year 2016-17 the company has invested 75.42% of annual consumption value in A class items, 20.33% of annual consumption value in B class items and 4.23% of annual consumption value in C class items.

ABC analysis for the year 2017-2018

Raw materials	Total value (in crores)	% of total value	Class
Limestone	1230	30.92	A
Fly ash	574.2	14.43	A
Sand	554.9	13.94	B
Gypsum	985.1	24.76	A
Aggregate	279.7	7.02	C
Others	354.2	8.90	B

CLASS	VALUE (in crores)	% OF VALUE
A	2789.67	70.12
B	909.05	22.84
C	279.67	7.02

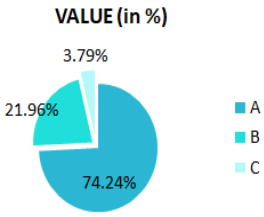


Interpretation:
In the year 2017-18 the company has invested 70.12% of annual consumption value in A class items, 22.84% of annual consumption value in B class items and 7.02% of annual consumption value in C class items.

ABC analysis for the year 2018-2019

Raw materials	Total value (in crores)	% of total value	Class
Limestone	1456.1	30.73	A
Fly ash	473.87	10.00	B
Sand	566.84	11.96	B
Gypsum	985.12	20.79	A
Aggregate	179.56	3.79	C
Others	1075.8	22.70	A

CLASS	VALUE (in crores)	% OF VALUE
A	3516.95	74.24
B	1040.71	21.96
C	179.56	3.79

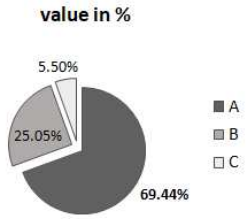


Interpretation:
In the year 2018-19 the company has invested 74.24% of annual consumption value in A class items, 21.96% of annual consumption value in B class items and 3.79% of annual consumption value in C class items.

ABC analysis for the year 2019-2020

Raw materials	Total value (in crores)	% of total value	Class
Limestone	1558	38.04	A
Fly ash	503	12.28	B
Sand	705	17.21	A
Gypsum	581	14.19	A
Aggregate	225	5.50	C
Others	523	12.77	B

CLASS	VALUE (in crores)	% OF VALUE
A	2843.979	69.44
B	1025.987	25.05
C	225.342	5.50



Interpretation:
In the year 2019-20 the company has invested 69.44% of annual consumption value in A class items, 25.05% of annual consumption value in B class items and 5.50% of annual consumption value in C class items.

STOCK LEVELS

- Reorder level = lead time * Average usage + safety stock
- Average usage = usage/total working days in a year
- Safety stock = total usage * period of safety stock / total working days in a year
- Minimum stock level = re-order level – (Average usage * Average lead time)
- Maximum stock level = re-order level + re-ordering quantity-(Minimum usage*Minimum lead time)
- Average stock level = ½(Minimum stock level + Maximum stock level)
- Danger level = Average usage * Maximum re-order period for emergency purchases

INTERPRETATION:
It is observed from the graph that all types of stock levels are increasing year by year with moderate changes. From this we can say that all types of stocks are maintaining properly but should keep a look on danger stock level as it is also increasing yearly.

Inventory Turnover Ratio
Inventory turnover ratio is concerned with the cost of goods and average inventory. Total inventory turnover ratio is showing how many times inventory is replaced during the year symbolically,

$$\text{Inventory turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average Inventory}}$$

Inventory turnover ratio			
Year	Cost of goods sold (in crores)	Avg inventory cost (in crores)	Ratio (%)
2015-2016	14322.6	1091.98	13.11611
2016-2017	14511.5	1047.75	13.85009
2017-2018	18784.3	1066.76	17.60874
2018-2019	25856.1	1298.72	19.90883
2019-2020	24422.8	1603.89	15.22723

Interpretation:

From the above graph it is observed that inventory turnover ratio is high in the year 2018-19 i.e., 19.90 and it is less in the year 2015-16 i.e., 13.11. it is continuously increasing from 2016-207 but decreased in the year 2019-2020. It means number of the times repacing the inventory has been decreased.

Inventory conversion period:

INVENTORY CONVERSION PERIOD		
Year	Ratio (%)	Inventory conversion period (in days)
2015-2016	13.11611	27.82837 (28)
2016-2017	13.85009	26.35362 (26)
2017-2018	17.60874	20.72834 (21)
2018-2019	19.90883	18.33357 (18)
2019-2020	15.22723	23.97022 (24)

Interpretation:

From the above chart it is observed that the conversion priod is high in the year 2015-2016 i.e., 28 days and it is low in the year 2019-2020 i.e., 18 days. that means overall it is taking not more than a month to replace the inventory.

Raw material turnover ratio

Raw material turnover ratio is concerned with cost of raw materials consumed average raw material stock.

$$\text{Raw material turnover ratio} = \frac{\text{cost of raw material consumed}}{\text{Average stock of raw material}}$$

Raw Material Turnover Ratio			
Year	Raw material Consumed (in crores)	Average raw material cost (in crores)	Ratio (%)
2015-2016	3550.88	277.175	12.81097
2016-2017	3467.82	259.075	13.38539
2017-2018	3978.36	252.920	15.72972
2018-2019	5039.32	326.001	15.45804
2019-2020	4960.81	341.935	14.50805

Interpretation:

It is observed from the chart that raw material turn over ratio was high in year 2017-2018 i.e., 15.72 and low in the year 2015-2016 i.e., 12.81. It means the company's ability of converting raw material to finished goods has been increasing from 2015-2016 and decreased very slightly in past two years.

Work in progress turnover ratio

Work in progress turnover ratio is concerned with the cost of production and average work in progress inventory. It shows how many times work in progress inventory is replaced during the year. symbolically,

$$\text{Work in process turnover ratio} = \frac{\text{cost of production}}{\text{progress inventory}}$$

Work in process turnover ratio			
Year	Cost of Production (in Crs)	Average W.I.P (In Crs)	Ratio (In %)
2015-2016	17617.37	486.505	36.2121
2016-2017	19923.48	445.005	44.77136
2017-2018	20661.18	500.945	41.24441
2018-2019	25422.00	624.501	40.70777
2019-2020	26853.56	699.160	38.40832

Interpretation:

From the above chart it is observed that work in progress turnover ratio is high in the year 2016-2017 and it is low in the year 2015-2016. It indicates that

company is decreasing the process of converting semi finished into finished goods.

Finished goods turnover ratio

Finished goods turnover ratio is concerned with the cost of goods sold and average finished goods inventory. It indicates how many times finished goods are replacing then during the year.

$$\text{Finished goods turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average finished goods}}$$

Finished goods turnover ratio			
Year	Cost of goods sold (in crores)	Average finished goods cost (in crores)	Finished goods turnover Ratio
2015-2016	14322.6	328.305	43.6259
2016-2017	14511.5	343.675	42.22449
2017-2018	18784.3	312.895	60.03388
2018-2019	25856.1	348.225	74.25113
2019-2020	24422.8	562.795	43.39555

Interpretation:

From the above chart it is observed that finished goods turnover ratio is high in the year 2018-2019. It is low in the year 2016-2017.It means the company is selling finished goods at lower pace in 2019-2020 when compared to 2018-2019.

Findings

- A' class items are occupying 70 % in every year during these 5 years..
- **EOQ** is highest in the year 2019-2020 i.e., 29981.8 units and it is lowest in the year 2016-17 i.e., 26014.8 units.
- The Inventory turnover ratio is high in 2018-2019 i.e. 19.90 it is low in 2015-2016 i.e.,13.11. company is not taking more than a month to replace the inventory.
- The raw material turnover ratio is high in the year 2017-2018 i.e., 15.72 and low in the year 2015-2016 i.e., 12.81.
- The work in progress turnover ratio is high in the year 2016-2017 i.e., 44.77 and it is low in the year 2015-2016 i.e., 36.21.
- The finished goods turnover ratio is high in the year 2018-2019 i.e., 74.25 it is low in the year 2015-2016 i.e., 43.62. The company is taking maximum of 9 days and minimum of 5 days to sell its products in these past 5 years.

SUGGESTIONS

- It is suggested introducing the new trends like JIT for some slow moving materials will definitely show a positive impact on the costs and the variations in the average costs.
- It is suggested that the company can continue using the same inventory techniques which are maintaining from the past.
- As the danger level are increasing every year so it is better to maintain those stocks in proper manner.
- Damage control measures have to be taken up for proper management of inventory.

CONCLUSION

Implementation of inventory management and control in Ultratech cement Ltd has reduced the average costs of inventories, which has lead to reduced carrying cost due to reduction in carrying cost , it resulted in an increase in total EOQ. The company has to look over the danger stock level except that all stock level are maintaining properly. Inventory has proved to be efficient and economic for raw materials. The company is stable with their turnover and shows a gradual increase over the time period.

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