

ABC ANALYSIS IN CORROPACK INDUSTRIES

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ABSTRACT - The aim of this work is to highlight the importance of Inventory management as materials make considerable percentage of total capital in industry. ABC analysis is a well-known approach based on Pareto principle for determining which items should get priority in the company's inventory. Items are classified according to their usage and cost occurred for discovering the critical items which need strict vigilance. The results showed that using material management technique helps in efficient material flow, better quality control and reduced material wastages. The ABC analysis is part of inventory management which categorizes inventory items as A, B and C classes according to their annual consumption value. The objective of this paper is to study the reason behind inventory management inefficiency by the implementation of ABC analysis. Based on the data collected from the company, the necessary analysis was carried out. Our results indicate that the ABC Method can help to control the raw materials more efficiently and to reduce some of the unnecessary overhead cost items.

Key Words: ABC analysis, Pareto principle, Inventory management, Material flow and Control raw material

1. INTRODUCTION

In manufacturing industry, an organization requires to maintain a proper balance between critical stock-out and reducing inventory costs. Material cost sums up to be more than 50% of the total cost which demands for the need of managing materials. Estimation is an integral part of material management. Material management is a balancing act. It is harmonizing the functions liable to plan and control the material flow. It maximizes the usage of firm's resources and deliver the essential level of customer's service and gives great profits to the organization. The performance of the process is

dependent on the flow of materials. Selective control is required in certain extents of material management like in inventory, items criticality, outdated stocks, inspection, purchasing order and receipt of materials, store-keeping and verification of bills. It becomes nearly impossible to keep in check the numerous items. This calls the need for material management.

1.1 ABC ANALYSIS

ABC analysis is a simple and analytical management tool. ABC analysis is a technique of categorizing inventory items according to their substantial impact on the overall expenditure of an organization. It grants a solution to faulty inventory administration within the purchased items or availed services. It is based on the Pareto Principle which states that "80% of the overall consumption value is based on only 20% of total items".

The breakdown suggests that the inventories are of different values; hence it necessitates different tactics and management controls. The arrangement of categories is based on its anticipated value. ABC analysis is an "inventory categorization method" which entails the dividing items into three categories, A, B and C: "A" contains the "most valuable items" and "C" consist the "least valuable items", whereas "B" contains items ranging between "A" and "C". It aims to focus on the critical few (A-items) and not on the trivial many (C-items). In this analysis, various items are listed according to their total usage; unit cost and then total cost of items are calculated. Different parameters are listed in tabular format which make it easy for classifying items

according to their cost and usage.

This approach states that, when reviewing inventory, items should be rated among A to C by the firm, establishing its ratings on the following rules:

A-items:

These items have the “highest annual consumption value” of goods i.e. 70%- 80% of the annual consumption value of the company. Ironically, it accounts only 10%- 20% of the total inventory items. They require stringent inventory control, more protected storage areas and improved sales forecasts, re-orders should be frequent, with weekly or even daily reorder; avoiding stock-outs on A-items is a priority.

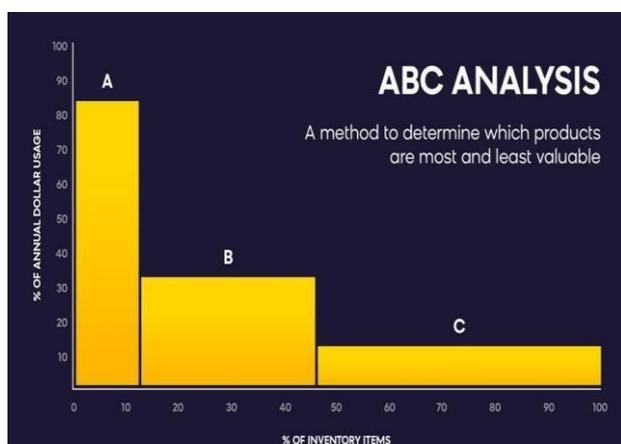
B-items

These are the interclass items, having medium consumption value i.e. 15%-25% of annual consumption value. It consumes around 30% of the total inventory items.

C-items:

These items have the “lowest annual consumption value” of goods i.e. 10%- 15% of the annual consumption value. On the contrary, it accounts for 50% of the total inventory items.

The idea behind using the ABC analysis is to leverage the imbalances of sales. This means that each item must be given the appropriate amount of weight depending on their class:



Item A:

- a) These are subjected to strict inventory control and are given highly secured areas in terms of storage
- b) These goods have a better forecast for sales
- c) These are also the items that require frequent reorders on a daily or a weekly basis
- d) They are kept as a priority item and efforts are made to avoid unavailability or stock-out of these items

Item B:

- a) These items are not as important as items under section A or as trivial as items categorized under C
- b) The important thing to note is that since these items lie in between A and C, they are monitored for potential inclusion towards category A or in a contrary situation towards category C

Item C:

- a) These items are manufactured less often and follow the policy of having only one of its item on hand or in some cases they are reordered when a purchase is actually made
- b) Since these are low demand goods with a comparatively higher risk of cost in terms of excessive inventory, it is an ideal situation for these items to stock-out after each purchase
- c) The questions managers find themselves dealing with when it comes to items in category C is not how many units to keep in stock but rather whether it is even needed to have to these items in store at all

2. METHODOLOGY

Following are the steps for the classification of items by ABC analysis:

$$\text{The annual consumption value} = (\text{Annual Demand}) \times (\text{Item Cost per Unit})$$

1. The unit cost and the demand of each item is obtained over a given period.
2. Multiply the unit cost by the calculated annual usage to

Obtain to net cost

3. All the items are listed out and arranged in a descending annual cost.
4. Sum up the cost and add up the number of items then, compute percentage on the total inventory of total cost and for total number of items consumed.
5. Draw a graph of percentage items vs percentage cost.
6. Mark from the curve the rational limits of A, B and C categories

2.1 BENEFITS OF ABC ANALYSIS

ABC analysis is beneficial in the following ways:

1. It is a technique of allocating direct and overhead expenditures first associated with the critical activities of the firm. This process defines the areas generating maximum profit to the company in a better way.
2. It aids stringent and better controls of high-priority inventory.
3. It promotes efficient use of its resources to prioritize control of inventory over its impact on final outcome.
4. Resource allocation is more efficient during cycle counts.
5. Its objective is to achieve economy by efficiently managing the materials.
6. It safeguards control over expensive items in which a hefty amount is invested.
7. Clerical costs are substantially reduced and stock is retained at optimum level

2.2 LIMITATION OF ABC ANALYSIS

Following are the limitations of ABC analysis:

1. Conflict with other cost systems. ABC cost allocation differs from the traditional cost system allocation.

2. This method needs more resources to maintain compared to the traditional costing systems.
3. This is a continuous process which needs added data measurement and collection.
4. It needs periodical assessment and updating.
5. This analysis is built on the monetary value of the materials in use. Other important factors are ignored.

3. CALCULATIONS

Here we are categorizing the different types of materials in A, B & C category.

Percentage of contribution of usage of materials per boxes:

$$\% \text{ of contribution in usage} = \frac{\text{contribution of material per box in gram}}{\text{total weight of box in gram}} \times 100$$

By using above formula we can calculate the % of contribution of materials on the basis of usage per box.

For example; for 3-ply

$$\begin{aligned} \% \text{ contribution of sheet in} &= \frac{\text{weight of sheet per box in gram}}{\text{total weight of box in gram}} \times 100 \\ &= \frac{350}{450} \times 100 \\ &= 78\% \end{aligned}$$

In the same way by using above formula we can calculate for other materials also.

Now we are calculating the percentage cost contribution of material.

$$\% \text{ of contribution cost by material} = \frac{\text{cost of material per box in rupees}}{\text{total cost of box in rupees}} \times 100$$

Therefore for 3-ply boxes:

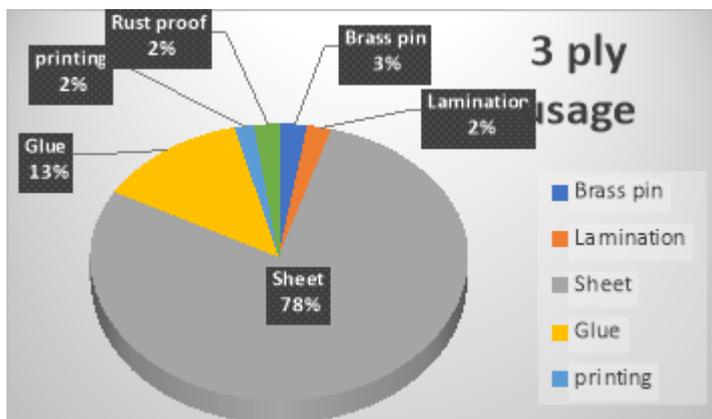
$$\begin{aligned} \text{\% of contribution cost by sheet} &= \frac{\text{cost of sheet per box in rupees}}{\text{total cost of box in rupees}} \times 100 \\ &= \frac{14.50}{26.50} \times 100 \\ &= 55\% \end{aligned}$$

In the same way by using above formula we can calculate for other materials also.

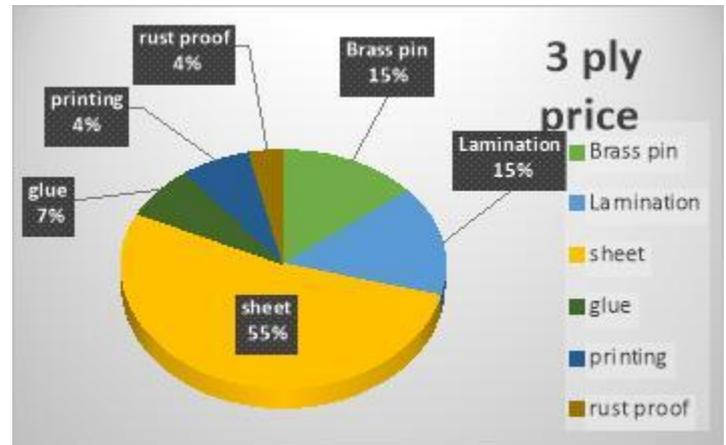
After calculating percentage for usage and cost of materials for making a single box we got the following data.

Materials	3-ply (%)	3-ply (%rupees)
Sheet	78	55
Glue(starch)	13	7
Brass pin	2.72	15
Lamination	2.66	15
Rust proofing	2.22	4
Printing(ink)	1.77	4
Total cost	100	100

Pie chart for Usage of component per box in percentage is as follows:



Pie chart for the cost percentage of materials per box is as follows:



Similarly for 5-ply,

$$\begin{aligned} \text{contribution of sheet in \%} &= \frac{\text{weight of sheet per box in gram}}{\text{total weight of box in gram}} \times 100 \\ &= \frac{490}{600} \times 100 \\ &= 82\% \end{aligned}$$

In the same way by using above formula we can calculate for other materials also.

Now we are calculating the percentage cost contribution of material.

$$\text{\% of contribution cost by material} = \frac{\text{cost of material per box in rupees}}{\text{total cost of box in rupees}} \times 100$$

For 5-ply boxes;

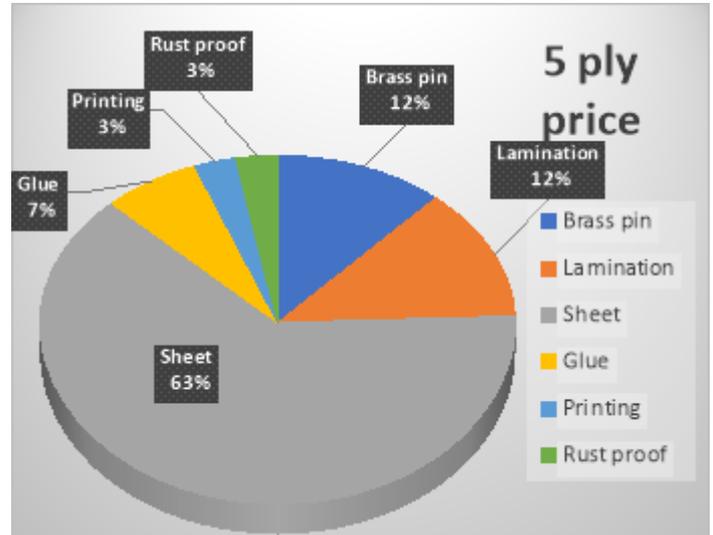
$$\begin{aligned} \text{\% of contribution cost by sheet} &= \frac{\text{cost of sheet per box in rupees}}{\text{total cost of box in rupees}} \times 100 \\ &= \frac{20.50}{32.75} \times 100 \\ &= 63\% \end{aligned}$$

In the same way by using above formula we can calculate for other materials also.

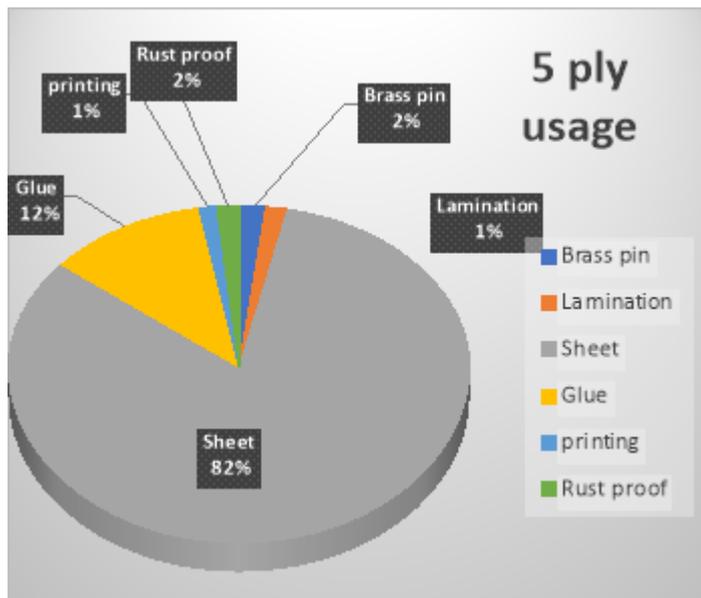
After calculating percentage for usage and cost of materials for making a single box we got the following data.

Materials	5-ply (%)	5-ply (%rupees)
Sheet	82	63
Glue(starch)	11.66	7
Brass pin	1.66	12
Lamination	2	12
Rust proofing	1.66	3
Printing(ink)	1.33	3
Total cost	100	100

Pie chart for the cost percentage of materials per box is as follows:



Pie chart for Usage of component per box in percentage



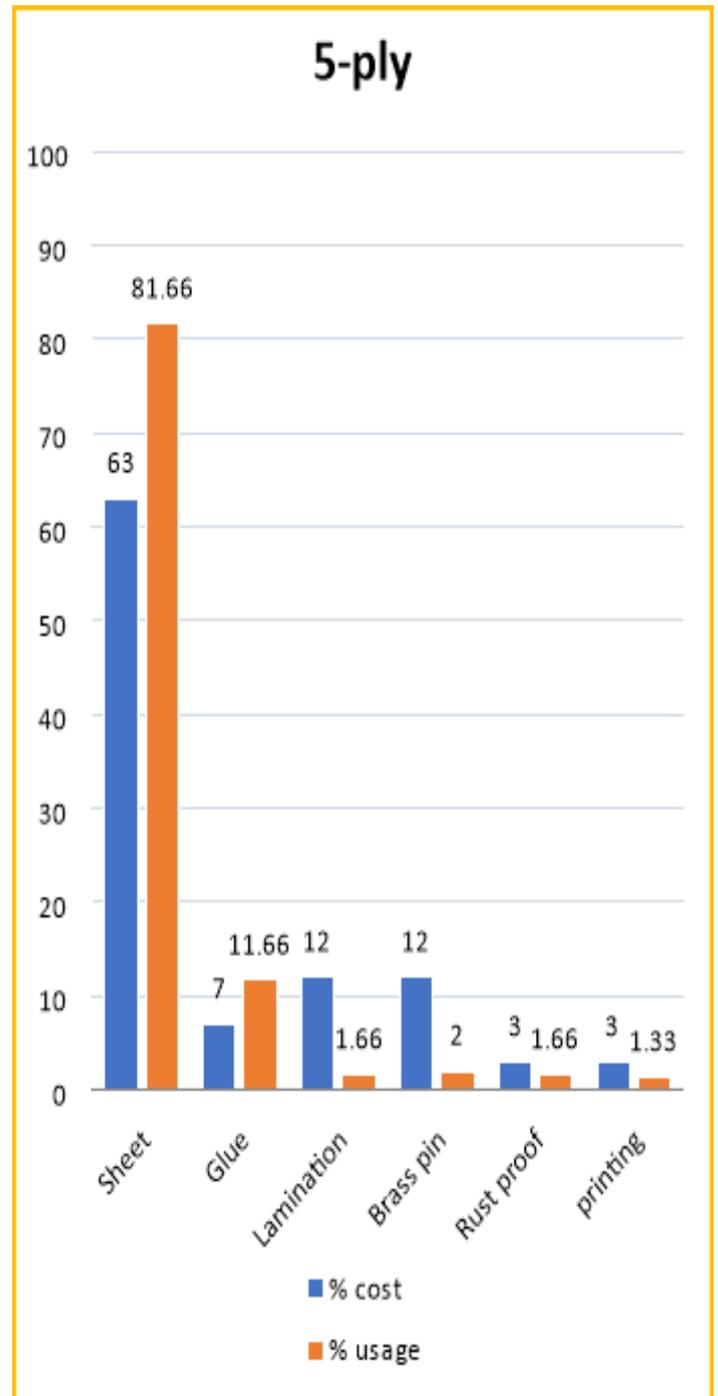
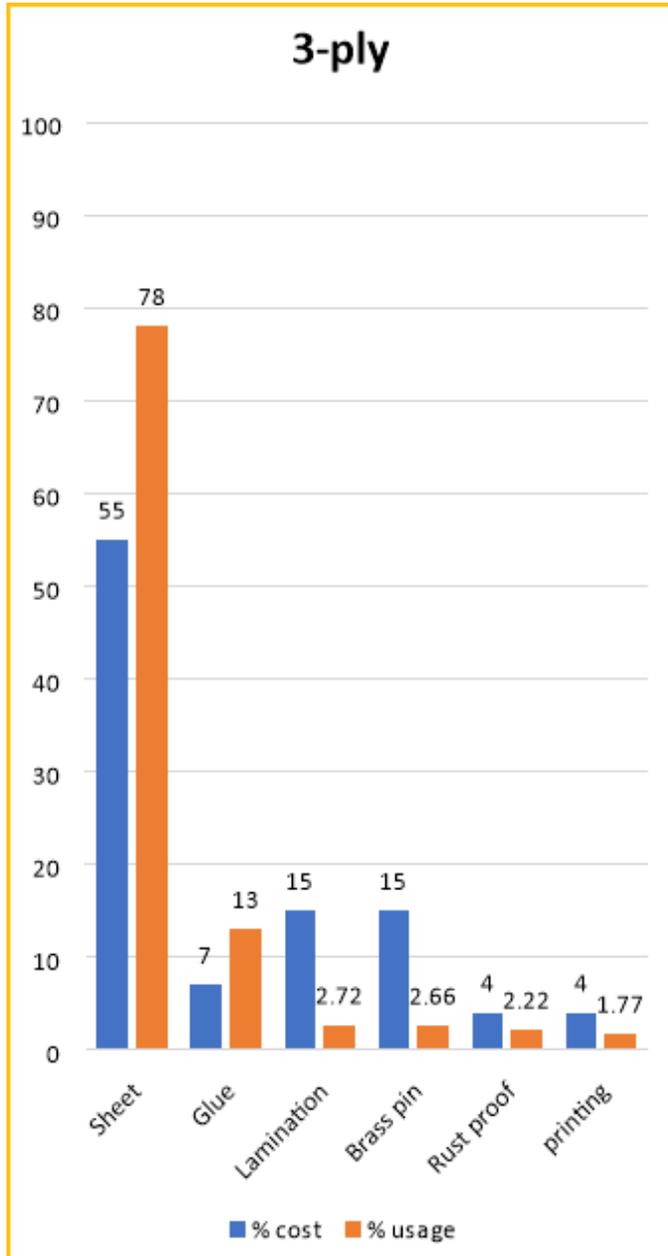
After calculating the percentage of usage of material and cost of material per box we got the following data;

Materials	3-ply %cost	3-ply %usage	5-ply %cost	5-ply %usage
Sheet	55	78	63	82
Glue(starch)	7	13	7	11.66
Brass pin	15	2.72	12	1.66
Lamination	15	2.66	12	2
Rust proofing	4	2.22	3	1.66
Printing(ink)	4	1.77	3	1.33
Total cost	100	100	100	100

4. RESULTS

Percentage contribution by material in terms of cost and usage per boxes

The graph we got from this is as follows:



5.CONCLUSION

Inventory Management plays a key role in making a project successful. This work mainly deals with the material management which is an integral part of inventory management. The following conclusions can be drawn from the work carried.

After observing all the observations and calculations we have decided to classify the given materials into three categories i.e. A, B and C.

Material	Classification into A ,B and C
Sheet	B
Glue	C
Lamination	A
Brass pin	A
Rust proof	C
Printing(ink)	C

Table-1:Classification of Materials

Particulars	A- Class Items	B- Class Items	C- Class Items
Control	High	Intermediate	Low
Requirement	Low	Intermediate	High
Check	Tight	Intermediate	Low
Safety Stock	High	Low	Rare

Table-2: Level of Supervision for Materials categorically

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