A STUDY ON INVENTORY MANAGEMENT IN JSW STEEL

A COURSE PROJECT

SUPPLY CHAIN AND INVENTORY MANAGEMENT

INDUSTRIAL ENGINEERING AND MANAGEMENT

DEPARTMENT OF MECHANICAL ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, CALICUT

BY: CHANDRAKANT VERMA

Certificate

This is to certify that the Project entitled "A STUDY ON INVENTORY MANAGEMENT IN JSW STEEL " is a bonafide record of the project done by CHANDRAKANT VERMA (Roll No.: M240797ME) , in partial fulfilment of the requirements for the award of the degree of Master of Technology in Industrial Engineering and Management from National Institute of Technology Calicut, and his work has not been submitted elsewhere for the award of a degree.

***Place*: NIT Calicut**

Date:

DECLARATION

I hereby declare that except where specific reference is made to the work of others, the contents of this course project are original and have not been submitted in whole or in part for consideration for any other degree or qualification in this, or any other university. This course project is my own work and contains nothing which is the outcome of work done in collaboration with others, except as specified in the text and Acknowledgements.

Signature

Name : **chandrakant verma**

Roll No : **M240797ME**

NIT Calicut 17/12/2024

Abstract

The study on *Inventory Management* at JSW Steels Ltd. highlights the critical role of effective inventory practices in ensuring competitiveness in the metals manufacturing industry. JSW Steels, being among the top performers in inventory turnover, typically maintains only three to four days' worth of raw materials in stock. This research adopts a rigorous analytical approach, leveraging robust and reliable data spanning four years. The study focuses on optimizing inventory management across raw materials, work-in-process (WIP), and finished goods to establish greater control and operational efficiency at JSW Steels Ltd.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER I

INTRODUCTION

Inventory management is a structured process that focuses on the efficient sourcing, storage, and distribution of inventory, including raw materials, semi-finished products, finished goods, and packaging materials. It plays a critical role in ensuring that the right stock is available at the right time, in the right quantity, at the right location, and at an optimal cost. This systematic control of inventory supports a company's ability to meet customer demand while minimizing operational and holding costs.

Inventory can be categorized into four main types:

1. Raw Materials – Basic inputs used in the production process.
2. Semi-Finished Products – Work-in-process (WIP) inventory that is partially completed.
3. Finished Goods – Completed products ready for sale.
4. Packaging Products – Materials required for product storage, protection, and transportation.

Effective inventory management aims to reduce direct and indirect costs associated with holding inventory while optimizing production flow and sales processes. The importance of inventory management is particularly significant in industries with substantial investments in inventory, as it directly impacts profitability and operational efficiency.

In India, the steel industry has witnessed tremendous growth due to strong domestic and global demand. The rapid economic development, driven by infrastructure projects, real estate growth, and the expanding automotive sector, has strengthened the position of the Indian steel industry on a global scale.

According to the International Iron and Steel Institute (IISI), India ranks as the world's tenth-largest steel producer. The Indian steel sector is broadly divided into three segments:

- Main Producers – Key players like Tata Steel, SAIL (Steel Authority of India Limited), and RINL (Rashtriya Ispat Nigam Limited).

- Other Major Producers – Companies such as ESSAR, ISPAT, and JSW Steel.
- Secondary Producers – Smaller steel manufacturers and re-rollers.

Given the growing demand for steel, managing inventory effectively in this sector is crucial to ensuring smooth operations, reducing costs, and maintaining a competitive edge in the market.

1.1 INDUSTRY PROFILE :

Steel is a versatile and essential material, forming the backbone of any nation's economy. As both a basic and core industry, iron and steel are crucial inputs for industrialization, with strong historical links to economic and technological progress.

The growth of steel capacity is a natural outcome of industrialization programs, as steel has extensive backward and forward linkages, making it indispensable for infrastructure and development. Steel is a key indicator of a nation's economic strength, as production levels and per capita consumption often measure industrial growth and reconstruction. Despite being capital, labour, and energy-intensive, steel remains the dominant metal globally, accounting for 85% of total metal production. As an internationally significant industry, the focus remains on enhancing quality, increasing production, and reducing costs, cementing steel's strategic role in building a self-reliant industrial base.

The *"Indian Steel Industry Outlook to 2024"* offers a comprehensive analysis of India's steel sector, including production, consumption, trading, and demand across key industries like automotive, aerospace, consumer durables, power, railways, telecom, and housing. It categorizes the finished steel market into **Alloy** and **Non-Alloy** segments and forecasts continued growth across various sectors.

- Steel consumption in India has continued to grow, maintaining a **CAGR of 7%** through FY 2024.
- The government remains on track to achieve its target of doubling rural steel consumption from **19.6 kg per capita** to **38 kg per capita** by 2030-31.
- As per the Indian Steel Association, steel demand has shown consistent growth, maintaining an average of **7.2%** annually through FY 2024.

1.2 COMPANY PROFILE:

JSW steel ltd, the flagship company of the jsw group, is an integrated steel manufacturer in India with an installed steel-making capacity of 18 million tonnes per annum(MTPA).

JSW Steel has emerged as a resilient leader in the steel industry, demonstrating its ability to survive through challenging times with a commitment to producing BIS standard-compliant, high-quality products. Backed by a strong technical team and low employee turnover, the company efficiently utilizes its infrastructure to deliver flexible designs and accommodate small-batch production needs.

With a focus on innovation, JSW Steel aims to capture opportunities in value-added products and meet the growing demand for galvanized towers in power transmission and telecom sectors. The company is well-positioned to benefit from the robust growth in infrastructure and housing, while increasing its presence in export markets as tariff barriers reduce.

To strengthen its global competitiveness, JSW Steel continues to identify key thrust areas, expand plant capacities, and diversify into infrastructure sectors. By maintaining international standards of excellence, JSW Steel is set to reinforce its role as a dominant player in both domestic and international markets.

1.3 PRODUCT RANGE :

1. Hot-Rolled Sheets and Coils :

Hot-rolled steel sheets or coils are produced at high temperatures (around 1700°F), making the material easier to shape. HRC is widely used in construction, pipelines, and automotive parts due to its strength, flexibility, and versatility.

2. Cold-Rolled Sheets and Coils (CRC):

Cold-rolled steel is processed at room temperature, resulting in thinner sheets with a smoother finish and precise dimensions. It is ideal for appliances, automotive body panels, furniture, and precision machinery.

3. Galvanized Steel (GI):

Galvanized steel is coated with a layer of zinc for excellent corrosion resistance. It is widely utilized for roofing, cladding, automotive parts, and electrical appliances**.**

4. Galvanized Corrugated Metal:

Made by coating steel with a layer of zinc, galvanized corrugated metal provides cost-effective corrosion resistance, making it ideal for roofing and structural applications.

5. Galvalume Steel:

Galvalume steel combines zinc and aluminum to create a sacrificial protective coating, offering higher durability, superior corrosion resistance, and longer life, although it comes at a higher cost compared to galvanized steel.

6. Hot Metal Steel:

Hot metal steel is heated to temperatures around 1700°F, allowing easy shaping and manipulation. However, the control over the final size of the product is relatively lower compared to cold steel processes.

7. Neosteel TMT Bars:

Neosteel TMT bars are made of pure steel, offering exceptional strength and durability. Their advanced rib pattern (criss-cross) ensures superior bonding with cement. With the highest Acid Resistance (AR) value, Neosteel bars enhance resistance to chemical attacks, ensuring the longevity and stability of structures.

1.4 Extensive Raw material :

1. Steel Ore: Steel ore is primarily found in Odisha, Chhattisgarh, Jharkhand, Karnataka, Maharashtra, Goa, and Andhra Pradesh. The two main types of iron ore are:

- Magnetite (Fe_3O_4): Contains 72.4% Fe.
- Hematite (Fe_2O_3): Contains 69.9% Fe.

The production process involves:
1.5 tons of steel ore → 1 ton of pig iron → Iron billets (used for further processing).

2. Coal: Coal is found in Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Uttar Pradesh, and West Bengal.

- Bituminous coal is converted into 'Coke', which serves as a reducing agent in the production process.
- Production Ratio: 1 ton of steel requires 8 tons of coal.

Coke plays a critical role in producing pure molten iron in blast furnaces.

3. Limestone: Limestone is used to:

- Create slag that binds unwanted substances during steel production.
- Act as a flux in blast furnaces to remove impurities such as silica, phosphorus oxides, nitrogen, sulfur, silicon, and excess carbon.

Additionally, alloying elements such as aluminum, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, tin, tungsten, zinc, and vanadium are added to produce different grades of steel.

4. Manganese:

Manganese is an essential alloying element that increases the hardness and strength of steel, making it suitable for high-stress applications.

5. Pig Iron:

Pig iron is a semi-finished metal produced from iron ore in a blast furnace.It contains:

- 92% iron
- Impurities such as carbon, manganese, silicon, phosphorus, sulfur, and trace amounts of other elements.

6. Fuel Gases:

Various fuel gases are used in steel production, including:

- Production Gas
- Natural Gas
- LPG (Liquefied Petroleum Gas)
- Acetylene
- Coke Oven Gas
- Blast Furnace Gas
- Converter Gas

These gases serve as important energy sources during the steel manufacturing process.

Semi-Finished Products:

1. **Slabs:**
   Thick, flat pieces of steel that are rolled into plates, sheets, or coils for further processing.
2. **Billets:**
   Long, square (or sometimes round) bars of steel, typically with a smaller cross-section than blooms. They are used to produce bars, rods, and other long products.

3. **Blooms:**
   Large blocks of steel that are rolled into structural sections such as I-beams, H-beams, and rails.
4. **Hot-Rolled Coils (HRC):**
   Steel sheets or strips produced through the hot rolling process. These are used in a variety of industries, including construction and automotive.
5. **Cold-Rolled Coils (CRC):**
   Thinner, smoother steel sheets produced by cold rolling hot-rolled coils. These are commonly used in industries requiring precise dimensions and surface finishes, such as automotive and appliances.
6. **Ingots:**
   Large blocks of steel used as raw material for further shaping into billets, blooms, or slabs.
7. **Direct Reduced Iron (DRI) / Sponge Iron:**
   Iron produced by reducing iron ore using gas or coal without melting it. This method is used in electric arc furnaces for producing steel.
8. **Steel Plates:**
   Thicker flat steel sheets, often used as semi-finished products for further processing in various industries such as shipbuilding, construction, and machinery.

Chapter 2

OBJECTIVE OF STUDY :

The primary objective of this study is to analyze the inventory management practices at JSW Steel, focusing on the handling of raw materials, semi-finished products, and finished goods. The study aims to assess how JSW Steel addresses challenges such as fluctuations in demand and inventory turnover rates. Another key objective is to evaluate the effectiveness of JSW Steel's inventory management strategies, using tools like ABC analysis to understand inventory categorization and its impact on operations.

Furthermore, the research seeks to examine the ordering levels for critical inventory components and recommend optimal levels to improve efficiency. Since inventory management plays a significant role in the company’s working capital, the study will explore how JSW Steel manages its purchasing, handling, and storage processes with

the help of inventory management software. Another goal is to investigate methods for preventing both overstocking and stockouts, ensuring that the inventory system remains balanced. Lastly, the study will focus on eliminating duplication in the ordering process and streamlining procurement to enhance overall operational efficiency.

2.1 Scope Of Study : Inventory management is a simple concept-don't have too much stock and don't have too little. Since there can be a substantial cost involved in staying above and below the optimal range, careful inventory management can make a huge difference in the right balance can be quite a complex and time-consuming task without the right technology. Inventory management is very important for "JSW steel ltd". It enables the business to meet or exceed expectations of the customers by making the products readily available. 28 The scope of the study includes the ABC Analysis of Raw Materials, work in progress and finished goods for four financial years. This study provides insight to the management of high value items and also brings attention of management towards movement of 'A' class items over period of 4 years.

Chapter 3

RESEARCH METHODOLOGY

3.1 Data Collection : The study is based on secondary data. Secondary data has been collected from various sources like research papers, reports published by India Brand Equity Foundation and from annual reports of the sample unit and to supplement the data different publications, various books, journals and different websites related to steel industry have been used for better reliability.

3.2 Period Of Analysis : The study period covers from Jan 2022 to December 2024

3.3 TOOLS FOR ANALYSIS :

1. ABC analysis :

- ABC analysis is an inventory categorization technique.
- A-items with very tight control and accurate records.
- B-items with less tightly controlled and good records

- C-items with the simplest controls possible and minimal records

2. EOQ(Economic order quantity) :

EOQ is the ideal order quantity a company should purchase to minimize inventory costs such as holding costs, shortage costs, and order costs.

3. ABC And EOQ Measuring Software: software made me to calculate and generate graph to minimize human efforts.

Chapter 4

DATA ANALYSIS

4.1 SETTING ON SOFTWARE: Raw Data Of 2022-23 Is Given Below

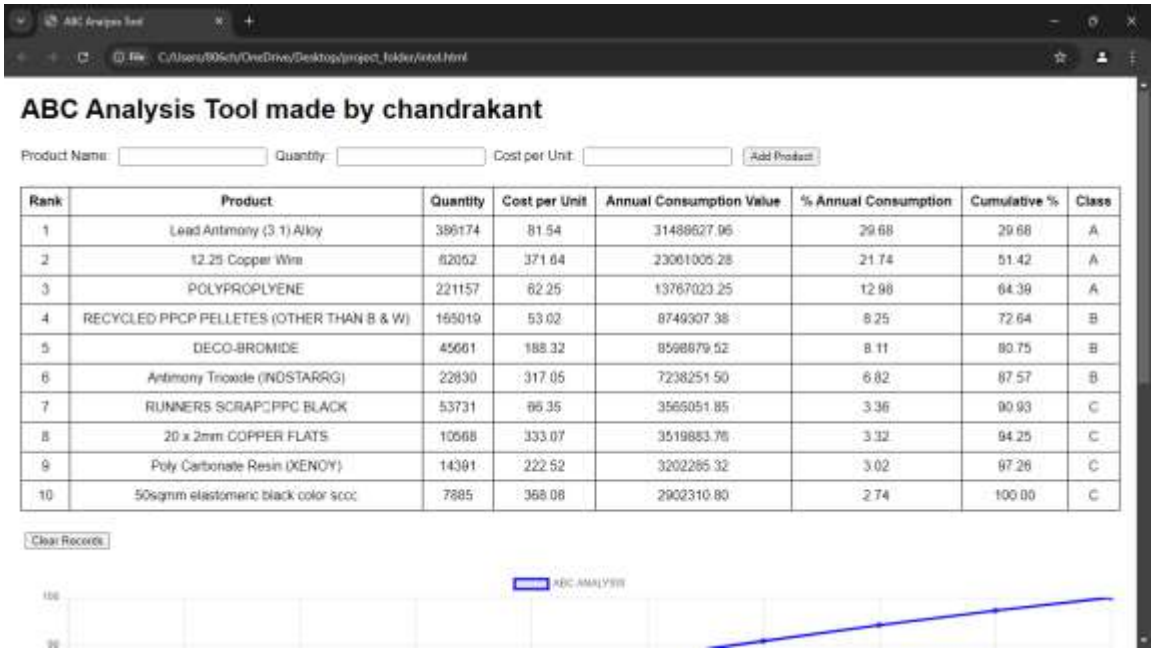
ITEM	Annual number of units purchase	Cost per unit
POLYPROPYLENE E COPOLYMER (RAD-MSP-035)	28,92,637	67.3
Lead Antimony (3.1) Alloy	3,33,295	83.39
12.25 Copper Wire	80,033	381.23
RECYCLED PPCP PELLETS (OTHER THAN B & W)	2,54,136	55.12
Antimony Trioxide (INDSTARRG)	28,510	319.85
DECO-BROMIDE	55,949	183.94
RUNNERS SCRAP-PPC BLACK	1,66,095	69.15
20 x 2mm COPPER FLATS	22,291	390.94
Poly Carbonate Resin (XENOY)	35,424	324.69
50sqmm	14,340	267.11

TAB(1).ROUGH DATA SET

software interface looks like this

FIG(1).SOFTWARE INTERFACE

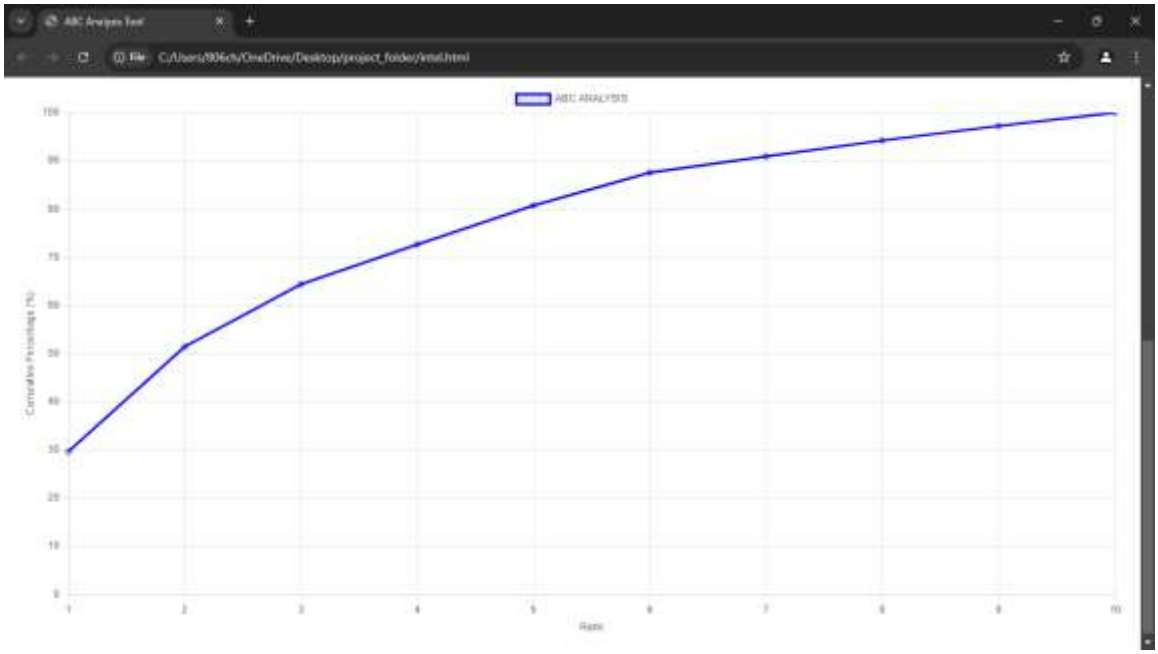
After Putting Data



Rank	Product	Quantity	Cost per Unit	Annual Consumption Value	% Annual Consumption	Cumulative %	Class
1	Lead Antimony (3 1) Alloy	386174	81.54	31488627.96	29.68	29.68	A
2	12.25 Copper Wire	62052	371.64	23061005.28	21.74	51.42	A
3	POLYPROPLYENE	221157	62.25	13767023.25	12.98	64.39	A
4	RECYCLED PPCP PELLETES (OTHER THAN B & W)	165019	53.02	8749307.38	8.25	72.64	B
5	DECO-BROMIDE	45661	188.32	8598879.52	8.11	80.75	B
6	Antimony Trioxide (INDSTARRG)	22830	317.05	7238251.50	6.82	87.57	B
7	RUNNERS SCRAP□PPC BLACK	53731	66.35	3565051.85	3.36	90.93	C
8	20 x 2mm COPPER FLATS	10568	333.07	3519883.76	3.32	94.25	C
9	Poly Carbonate Resin (XENOY)	14391	222.52	3202285.32	3.02	97.26	C
10	50sqmm elastomeric black color sccc	7885	368.08	2902310.80	2.74	100.00	C

FIG(2).SOFTWARE AFTER DATA SETUP

Software Makes Its Graph Like This



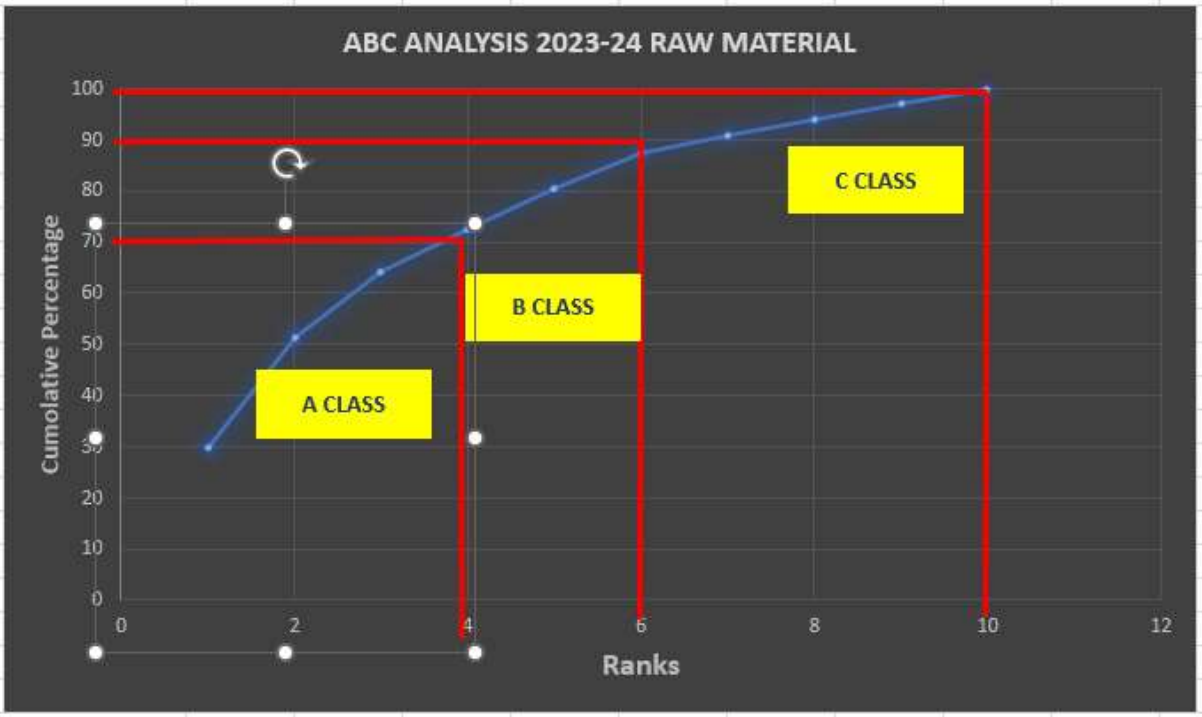
FIG(3): GRAPH OF ABC ANALYSIS.

Similar Work Can Done For Data Of 2023-24

ITEM	Rank	%Annual purchase	Cumolative Percentage
POLYPROPYLENE E COPOLYMER (RAD-MSP-035)	1	29.64	29.64
Lead Antimony (3.1) Alloy	2	21.64	51.28
12.25 Copper Wire	3	12.96	64.24
RECYCLED PPCP PELLETS (OTHER THAN B & W)	4	8.24	72.48
Poly Carbonate Resin (XENOY)	5	8.09	80.57
RUNNERS SCRAP-PPC BLACK	6	6.81	87.38
DECO-BROMIDE	7	3.36	90.74
Antimony Trioxide (INDSTARRG)	8	3.31	94.05
20 x 2mm COPPER FLATS	9	3.01	97.06
50sqmm	10	2.87	99.93

TAB(2).RAW MATERIAL 2023-24

To Verify Data Analysis ,Excel Graphs by plotting ABC CLASSIFIRE AT 70,90 & 100%



Fig(4). GRAPH ABC CLASSIFICATION

ABC ANALYSIS FOR YEAR 2023-24

S.NO	ITEM	Annual number of units purchase	Cost per unit
1	POLYPROPYLENE E COPOLYMER (RAD-MSP-035)	2,21,157	62.25
2	Lead Antimony (3.1) Alloy	3,86,174	81.54
3	12.25 Copper Wire	62,052	371.64
4	RECYCLED PPCP PELLETS (OTHER THAN B & W)	1,65,019	53.02
5	Antimony Trioxide (INDSTARRG)	22,830	317.05
6	DECO-BROMIDE	45,661	188.32
7	RUNNERS SCRAP-PPC BLACK	53,731	66.35
8	20 x 2mm COPPER FLATS	10,568	333.07
9	Poly Carbonate Resin (XENOY)	14,391	222.52
10	50sqmm	7,885	386.08

TAB(3).RAW MATERIAL 2022-24

Applying ABC classifier lines in graph

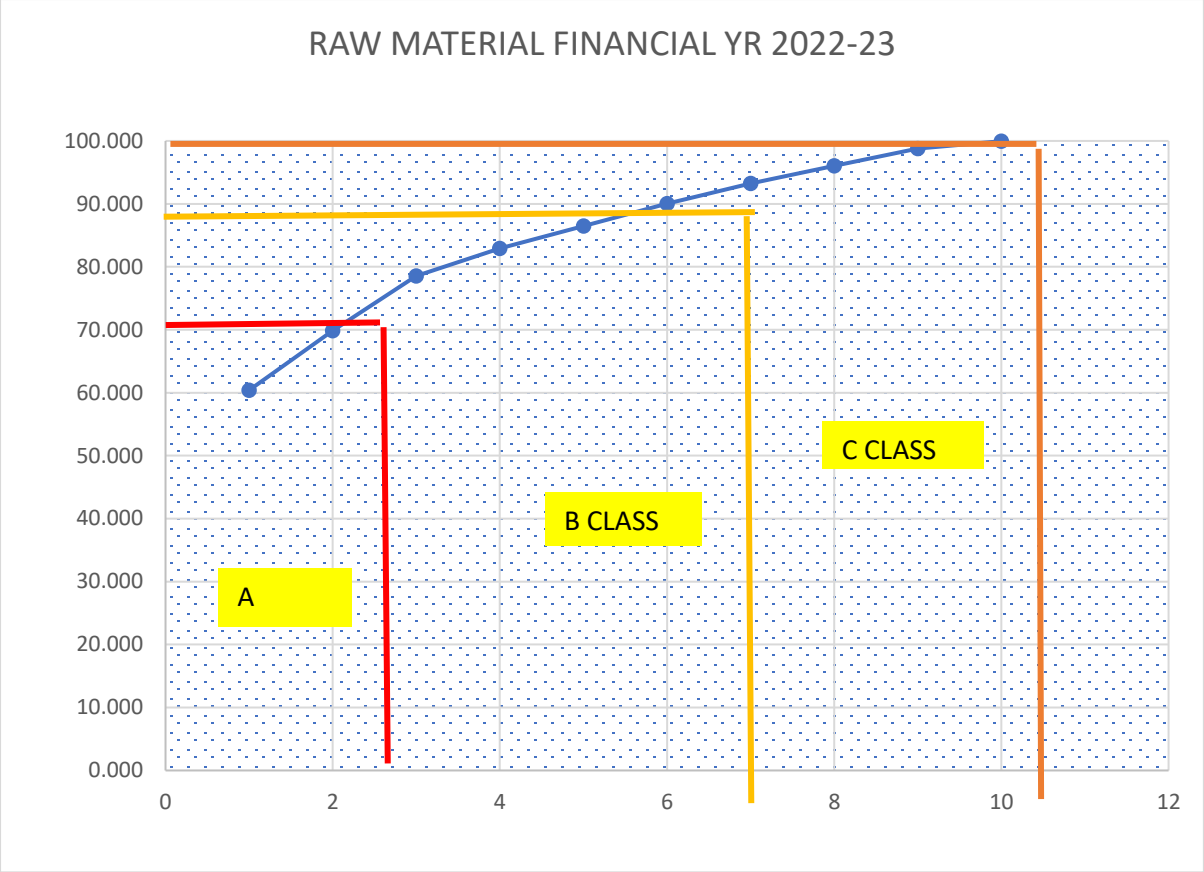


Fig (5).ABC CLASSIFICATION 2022-23

ANALYSIS OF ABC FOR FINISHED (2022-23, 2023-24)

1. Dominance of Class A Items:
    - POLYPROPYLENE E COPOLYMER alone accounts for 60.40% of the total annual consumption value.
    - Class A items are crucial to operations, as any disruption in their availability could halt production or result in significant financial loss.
    - These items require rigorous monitoring, demand forecasting, and strong supplier relationships.
2. Moderate Focus on Class B Items:
    - Class B items collectively account for 14.68% of the value.
    - These require periodic reviews and moderate control to ensure operational efficiency without excessive cost.
3. Class C Items Have Low Impact:

- Class C items contribute a very small percentage (6.73%) to the total value.
- These can be managed with simplified inventory policies, such as bulk ordering or lower monitoring frequency, as their impact on cost is minimal.

4. Pareto Principle Applied:
   - The analysis follows the 80/20 rule:
     - 3 items (30% of total items) contribute nearly 80% of the value.
     - The remaining 7 items (70%) contribute only 20% of the value.

From 2023-24

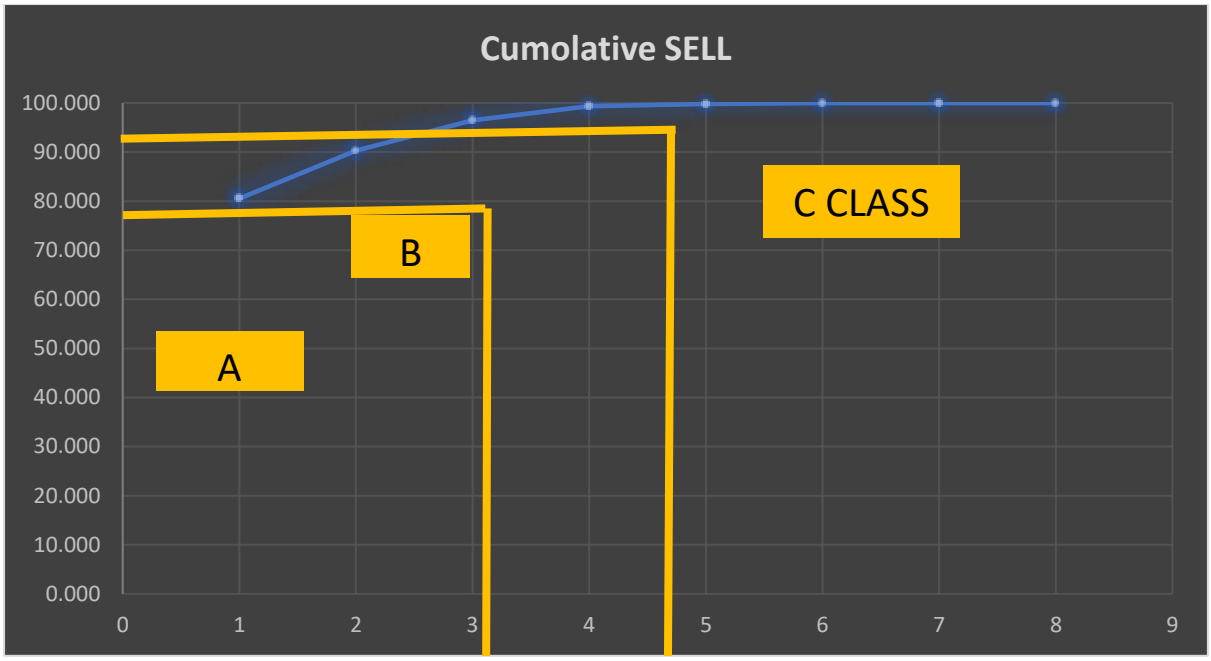
- A Class: Prioritize procurement planning, inventory optimization, and supplier management for these materials.
- B Class: Implement routine monitoring to avoid excessive costs and stockouts.
- C Class: Use automated systems or simpler approaches to reduce management overhead.

ABC ANALYSIS OF FINISHED PRODUCT

2023-24

Particulars	Tonnes (31-Mar-24)	₹ in crores (31-Mar-24)	Annual sell volume	% Annual sell	Rank
MS slabs	34,068	154	52,46,472	0.00046	8
Hot rolled coils/steel plates/sheets	1,26,45,890	72,131	9,12,16,06,91,590	80.54116	1
Galvanised coils/sheets	8,76,274	6,334	5,55,03,19,516	0.49008	5
Color coated Galvanised coils/ sheets	1,67,752	1,429	23,97,17,608	0.02117	7
Cold rolled coils/sheets	22,12,739	14,763	32,66,66,65,857	2.88437	4
Steel billets & blooms	5,30,048	3,058	1,62,08,86,784	0.14312	6
Long rolled products	44,07,636	25,076	1,10,52,58,80,336	9.75912	2
Iron ore	1,00,33,136	6,954	69,77,04,27,744	6.16053	3

TAB(4).FINISHED PRODUCTS 2023-24

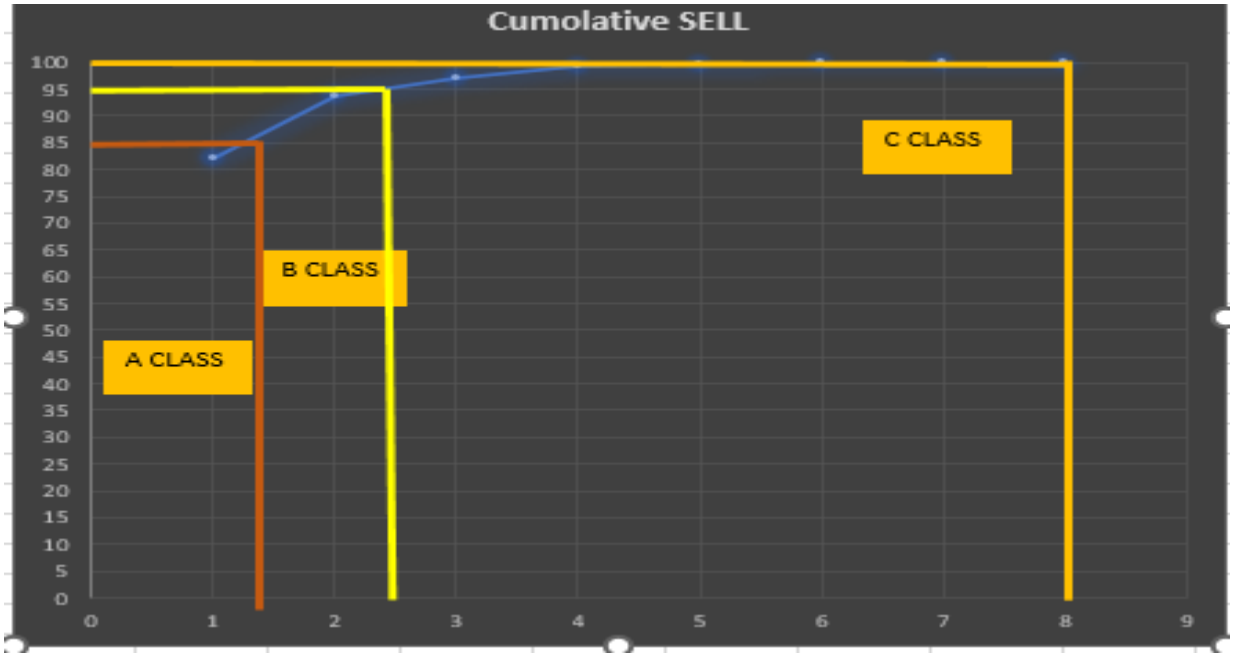


FIG(6).ABC CLASSIFICATION FINISHED PRODUCT(2023-24)

2022-23

Particulars	Tonnes (31-Mar-23)	₹ in crores (31-Mar-23)	Annual sell volume	% Annual sell	Rank
MS slabs	2,07,637	1,196	24,83,33,852	0.02454	7
Hot rolled coils/steel plates/sheets	1,17,22,357	70,771	8,29,60,29,27,247	81.97527	1
Galvanised coils/sheets	7,08,293	5,342	3,78,37,01,206	0.37388	5
Color coated Galvanised coils/sheets	99,954	804	8,03,63,016	0.00794	8
Cold rolled coils/sheets	22,10,707	16,005	35,38,23,65,535	3.49623	3
Steel billets & blooms	3,60,197	2,290	82,48,51,130	0.08151	6
Long rolled products	43,60,680	27,220	1,18,69,77,09,600	11.72884	2
Iron ores	79,14,710	2,956	23,39,58,82,760	2.31181	4

TAB(5). FINISHED PRODUCTS 2022-23



FIG(7). ABC CLASSIFICATION FINISHED PRODUCT(2022-23)

Analysis Of Finished Product Abc Graph From 2022-23

A CLASS: These items are high-value and critical for the business.They require strict inventory control, accurate demand forecasting, and priority procurement management to avoid shortages or disruptions.

B CLASS: These items are moderately significant and account for the next small portion of the cumulative sales.These materials require periodic monitoring and control but with less intensity than A class items.

C CLASS: These items have minimal impact on the total annual sales.These items require simple inventory management practices with minimal oversight, as their contribution is negligible.

EOQ ANALYSIS FOR YEAR 2024

2024				
	QUNTITY (MT)	PURCHASE COST	ORDERING COST	CARRING COST
Raw materials	3,687	16,349	3000	12%
Semi-finished/finished goods	145	16,257	3000	12%
Production consumables and stores and spares	180	3,683	3000	12%

TAB(6).ORDER INFORMATION 2024

EOQ Calculations

Raw Materials

Demand Quantity (A) = 3,687 MT

Order Cost (O) = ₹3,000 per order

Carrying Cost Rate (R) = 12%

Purchase Cost (P) = ₹16,349

Carrying Cost (h) = P × R = 16,349 × 12/100 = 1,961.88

EOQ = √(2AO / h) = √(2 × 3,687 × 3,000 / 1,961.88) = **106.19**

Number of Orders = A / EOQ = 3,687 / 106.19 = 35

Order Size = A / Number of Orders = 3,687 / 35 = 105.34

Ordering Cost = (A × O) / EOQ = (3,687 × 3,000) / 106.19 = **104,164.20**

Holding Cost = (h × EOQ) / 2 = (1,961.88 × 106.19) / 2 = 114,269.80

Total Annual Cost = (Purchase Cost × Quantity) + Ordering Cost + Holding Cost

= (16,349 × 3,687) + 104,164.20 + 114,269.80 = **₹60,487,197**

Reorder Level (Lead Time = 2 weeks) = (A × Lead Time) / 52 = (3,687 × 2) / 52 = 141.81 MT

Semi-finished/finished goods

Demand Quantity (A) = 145 MT

Order Cost (O) = ₹3,000

Carrying Cost Rate (R) = 12%

Purchase Cost (P) = ₹16,257

Carrying Cost (h) = P × R = 16,257 × 12/100 = 1,950.84

EOQ = √(2AO / h) = √(2 × 145 × 3000 / 1950.84) = **21.11**

Number of Orders = A / EOQ = 145 / 21.11 = 7

Order Size = A / Number of Orders = 145 / 7 = 20.71

Ordering Cost = (A × O) / EOQ = (145 × 3000) / 21.11 = **20,597.40**

Holding Cost = (h × EOQ) / 2 = (1950.84 × 21.11) / 2 = 20,591.30

Total Annual Cost = (Purchase Cost × Quantity) + Ordering Cost + Holding Cost

= (16,257 × 145) + 20,597.40 + 20,591.30 = **₹2,398,153.70**

Reorder Level (Lead Time = 2 weeks) = (A × Lead Time) / 52 = (145 × 2) / 52 = 5.58 MT

Production Consumables/Spares

Demand Quantity (A) = 180 MT

Order Cost (O) = ₹3,000 per order

Carrying Cost Rate (R) = 12%

Purchase Cost (P) = ₹3,683

Carrying Cost (h) = P × R = 3,683 × 12/100 = 441.96

EOQ = √(2AO / h) = √(2 × 180 × 3000 / 441.96) = **49.43**

Number of Orders = A / EOQ = 180 / 49.43 = 4

Order Size = A / Number of Orders = 180 / 4 = 45

Ordering Cost = (A × O) / EOQ = (180 × 3000) / 49.43 = **10,926.54**

Holding Cost = (h × EOQ) / 2 = (441.96 × 49.43) / 2 = 10,926.54

Total Annual Cost = (Purchase Cost × Quantity) + Ordering Cost + Holding Cost

= (3,683 × 180) + 10,926.54 + 10,926.54 = **₹684,793.08**

Reorder Level (Lead Time = 2 weeks) = (A × Lead Time) / 52 = (180 × 2) / 52 = 6.92 MT

Summary Table

Category	EOQ (MT)	Number of Orders	Order Size (MT)	Ordering Cost (₹)	Holding Cost (₹)	Total Cost (₹)	Reorder Level (MT)
Semi-finished/finished goods	21.11	7	20.71	20597.4	20591.3	2398153.7	5.58
Production consumables/spares	49.43	4	45.0	10926.54	10926.54	684793.08	6.92
Raw Material	106.19	35	105.34	104,164.20	114,269.80	60,487,197	141.81

Table(7):summery of EOQ Analysis of different material

ANALYSIS OF TABLE

1.Semi-finished/Finished Goods:

- The EOQ and order size are closely matched, indicating efficient procurement planning.
- The total cost is balanced between holding and ordering costs, suggesting an optimized inventory system.
- A low reorder level highlights regular replenishment due to fast consumption or low safety stock.

2. Production Consumables/Spares:

- The balance between holding and ordering costs highlights effective cost optimization.
- Fewer orders per year suggest a lower consumption rate or higher batch procurement.
- A moderate reorder level indicates sufficient safety stock to avoid interruptions.

3. Raw Materials

- High EOQ and number of orders reflect the large-scale operations of JSW Steel.
- Slight imbalance between holding and ordering costs could indicate a potential to optimize further.
- The significant reorder level ensures raw material availability to meet production demands, critical for uninterrupted operations.

Chapter 5

FINDINGS AND CONCLUSION

5.1 FINDINGS:

EOQ ANALYSIS: The EOQ analysis indicates a well-structured inventory management system, with cost optimization evident across categories. Raw materials, due to their critical role and high consumption, have the highest associated costs and a robust reorder level. Semi-finished and consumable goods show efficient inventory

turnover and cost management. Opportunities may exist for further optimization in raw material holding costs and fine-tuning reorder points across categories.

ABC ANALYSIS:

1. Class A (High-Value Items)
    - Finished Products: These items are critical for business operations and require stringent inventory control, accurate demand forecasting, and priority procurement management to avoid disruptions.
    - Raw Materials: POLYPROPYLENE E COPOLYMER dominates (60.40% of total consumption value), highlighting its strategic importance. Any disruption in availability could halt production or lead to significant losses.
    - Common Strategy:
        - Rigorous monitoring and inventory control.
        - Focused supplier relationships to ensure uninterrupted supply.
        - Enhanced forecasting and procurement planning to minimize risks.
2. Class B (Moderately Significant Items)
    - Finished Products: These contribute moderately to the cumulative sales value and require periodic monitoring with less intensity than Class A.
    - Raw Materials: Class B items account for 14.68% of the value, needing periodic reviews to balance operational efficiency and cost.
    - Common Strategy:
        - Conduct periodic stock reviews and adjust inventory levels to avoid excess costs or stockouts.
        - Maintain moderate supplier engagement.

3. Class C (Low-Value Items)
    - Finished Products: These have a negligible impact on total sales and require simple inventory management practices.
    - Raw Materials: Class C items contribute just 6.73% of the value, warranting bulk ordering or low monitoring to minimize overhead.
    - Common Strategy:

- Use automated systems or simpler inventory policies to minimize management effort.
- Focus on cost-effective procurement methods like bulk ordering.

4. Pareto Principle Across Both Analyses

- Approximately 80% of value is driven by 20-30% of items (Class A), while the remaining items (Class B and C) contribute a smaller portion to the value.
- This reinforces the need to prioritize resources and management efforts on high-value (Class A) items, ensuring their availability and operational continuity.

5.2 CONCLUSION:

JSW Steel's inventory management framework effectively balances operational demands with cost optimization, ensuring uninterrupted production and profitability. By maintaining a sharp focus on Class A items and implementing tailored strategies for Class B and C categories, the company can enhance its inventory control further. Proactive measures to fine-tune holding costs, improve supplier relationships, and leverage automation will position JSW Steel to sustain and strengthen its competitive edge in the steel industry.

5.3 REFERENCES:

1. VENKATA NIMEESHA POSA/SUPPLY CHAIN PERFORMANCE MEASUREMENT AND IMPROVEMENT

2. ANNUAL REPORT FINANCIAL YR 2022-23 AND 2023-24.