



## A STUDY ON MATERIAL MANAGEMENT IN INDSIL GROUP OF COMPANIES, PALAKKAD

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### ABSTRACT

The basic goal of any industrial activity is the development and manufacture of products that can be marketed at a profit. This goal is accomplished by the appropriate blending of the five M's Men, Material, Machine, Money and Management. Of all these, material constitutes one key area where management attention should be critical. This is because the outlay in the material cost of locking up materials and the storage cost of materials constitute an important proportion of the total cost. The term material includes physical commodities used to make the final end product. It is a vital source or key input to every organization. It is the starting point from where the first operations start. Another important feature of the material is that it can be purchased in varying quantities according to the requirement of the firm whereas other elements of cost like labour and other services cannot be easily varied once they are established. From the above, it can be seen that it is the most flexible and controllable input.

An effective materials management plan means a more holistic approach to managing vehicle use and emissions, solid waste, hazardous waste, recycling, and utility services. As a result, this means a "greener," more sustainable environment and a manifestation of the many demands today for institutions to become more environmentally friendly. In fact, thanks to such environmental advantages, creative materials management plans may qualify for LEAD Innovation in Design credits. And also, an effective materials management plan can improve aesthetics. Removing unsafe and unsightly conditions, placing core services out of sight, and creating a more pedestrian-friendly environment will improve the visual and physical sense of place for those who live and work there.

**Keywords:** material management, Material, Financial ratio, Inventory, Stock, Production etc.

### INTRODUCTION

The INDSIL group, Palakkad was started in Pallatheri in Kerala in the year 1990. The group stands out globally for its product quality and pioneering efforts in process technology for speciality alloys. The Captive Power Generation facilitates at Kerala and Chhattisgarh make the respective smelters in this location internationally one of the most competitive units. This, in turn, has helped the group position itself as a key low-cost and high-quality supplier in the global low-carbon silicon manganese industry. The main objective of the company is to manufacture, sell, export and import Ferro silicon, Ferro alloys, silicon metals, calcium carbide, calcium silicate and other processes and iron and steel foundry materials.

#### INDSIL - AT A GLANCE

- The INDSIL Group has a key presence in the Ferro chrome and low carbon silicon manganese industries.
  - Both products are important ingredients in Stainless Steel making.
  - INDSIL runs a 75,000 tpy Ferro chrome smelter in the Sultanate of Oman along with captive chrome mine resources.
  - INDSIL's capacity for low-carbon silicon manganese is 45,000 tpy located across 3 smelters within India.
- The group also runs 2 captive power plants viz., a 21 MW hydropower plant in Palakkad, Idukki Dist., Kerala and a 12 MW Coal-fired plant in Raipur, Chhattisgarh

**PRODUCTS****PRODUCTS AND SPECIFICATION**

	CR	MN	SI	AL	C	P	S	SIZE
ULTRA LOW CARBON SILICO MANGANESE	-	60% MIN	28% MIN	-	0.05- 0.06	0.10% MAX	0.02% MAX	10- 50mm (90% MIN)
LOW CARBON SILICO MANGANESE	-	55- 60%	28% MIN	-	0.1% MAX	0.10% MAX	0.02% MAX	10- 50mm (90% MIN)
FERRO SILICON	-	-	70- 72%	1.2% MAX	0.15% MAX	0.05% MAX	0.05% MAX	10- 80mm (90% MIN)
FERRO CHROME	57- 60%	-	4% MAX	-	8% MAX	0.03% MAX	0.05% MAX	10- 100mm (90% MIN)
FERRO CHROME	54- 57%	-	4% MAX	-	8% MAX	0.03% MAX	0.05% MAX	10- 100mm (90% MIN)

**ULTRA LOW CARBON SILICO MANGANESE**

Low-carbon and ultra-low-carbon silico manganese improve productivity in the manufacture of stainless steel and special steel by eliminating decarburization in the final step. The use of low-carbon silico manganese in stainless steels and alloy steels provides a more economical production route where a combination of manganese and silicon is required in a low-carbon steel product

**LOW CARBON SILICO MANGANESE**

Manganese alloys are mostly used in steelmaking and foundry activities. Some 30% of the manganese used today in steelmaking is used to promote the formation of sulphides as a deoxidant. In this last case it combines with sulphur avoiding the formation of iron sulphides. These sulphides are low melting point phases which become liquid at hot rolling temperatures and consequently, generate surface cracking.

The other 70% of the manganese is used purely as an alloying element. Steels usually contain from 0,2% to 2% manganese depending on grades as manganese is the cheapest alloying element among those which enhance some key mechanical properties like strength and toughness. In the specific case of stainless steel it can substitute expensive nickel in some austenitic grades called 200 series.

**FERRO CHROME**

Ferro Chrome will be produced out of a joint venture company in Oman and the chrome smelter would have access to captive chrome ore, making it a highly cost effective chrome smelting complex. Exports to various regions of the globe comprise about 80% of the group's market portfolio.

Over 80% of the world's ferrochrome is utilized in the production of stainless steel. Stainless steel depends on chromium for its appearance and its resistance to corrosion. It is also used when it is desired to add chromium to carbon steel. More commonly used in specialist applications such as engineering steels where a high Cr to Fe ratio and minimum levels of other elements such as sulphur, phosphorus and titanium are important and production of finished metals.

## FERRO SILICON



Ferrosilicon is used as a source of silicon to reduce metals from their oxides and to deoxidize steel and other ferrous alloys. This prevents the loss of carbon from the molten steel (so-called blocking the heat); ferro manganese, spiegeleisen, silicide's of calcium, and many other materials are used for the same purpose. It can be used to make other ferroalloys. Ferrosilicon is also used for the manufacture of silicon, corrosion-resistant and high-temperature resistant ferrous silicon alloys, and silicon steel for electro motors and transformer cores. In the manufacture of cast iron, ferrosilicon is used for inoculation of the iron to accelerate graphitization. In arc welding, ferrosilicon can be found in some electrode coatings.

### OBJECTIVES OF STUDY

- ✓ To study the effectiveness and efficiency of material management in INDSIL
- ✓ To study the effectiveness of inventory management.
- ✓ To find out the remedial measures and suggestions to improve the performance of the company.

### SCOPE OF THE STUDY

In manufacturing concern materials has much importance. 40-60 % of the money earned is expended for the purchase of materials. Effective control over the utilization has much bearing on profit and here is an attempt to study the management of materials.

### METHODOLOGY

NATURE OF DATA: secondary data is used for the purpose of the study.

METHOD OF DATA COLLECTION: Secondary data were obtained from the records (journals and ledgers), Published Annual Reports and financial statements of INDSIL.

### METHOD OF INTERPRETATION

Ratio analysis and tables are used for analysing and interpreting the collected data.

### ANALYSIS AND INTERPRETATION OF DATA

#### (A)

### PROCEDURE FOR PROCUREMENT OF MATERIAL (PURCHASE MANAGEMENT)

Purchasing is the cornerstone of Material Management. The purchase function involves, Obtaining the right material, In the right quantities, Within the right delivery time, From the right source And finally, at the right price.

Purchase Management plan an important role in an organization because purchasing has its effects on vital factors like manufacture, quality and cost-efficient production of the required quantity depending on market demand. On average, manufacturing firms spend about 50% to 60% of their sales on the purchase of raw materials components.

### FUNCTIONS OF PURCHASE AND STORES DEPARTMENT OF INDSIL PALLATHERI UNIT

The purchase and stores department functions under the charge of a Manager (Purchase) and is assisted by clerks in their day-to-day activities. The main function of this department is to purchase the materials required for production. The purchase of all raw materials, necessary for production is carried out through the head office purchase department and issuance is carried out through stores. The purchase mainly consists of the basic raw materials used in the production i.e. quartz, ore, dolomite, coal, carbon paste etc. high-quality ore is imported.

Purchase activities of INDSIL include the following activities

Material requisition planning (MRP) is the first among the purchase procedure. It includes:

1. Preparation of annual production plan based on the projected annual sales budget , prepared by the marketing department.
2. Prepares material requirement plan based on annual production plan.
3. Plan monthly production based on accepted contractors previous production and release weekly schedule to production.
4. Amend the production plan/weekly schedule MRP if required based on changes in sales target/production shortcomings.
5. Receive materials from stores and issue to production as per schedule.
6. Specify the special customers requirement if any in the schedule.

In the purchase department there is a purchase committee to look after all details regarding purchases. This committee consists of General Manager , Purchase Manager and Finance Manager. The Manager will approve the quotations and select desirable supplier and purchase order binds both the parties to the terms of the contract.

Before placing the order they consider an important factor namely the price. In normal case the lowest price quoted in the price quotation are selected without affecting the quality of the product. But they consider the landed cost for selecting the desirable supplier. Besides this they always make purchases from manufacturers and not from dealers. This is to ensure better price and quality.

After selecting the desirable supplier purchase order is placed. The purchase order clearly states the terms and conditions of the purchases.

Once the purchase order is placed, follow up measures to take place. These are made through fax, telephone, e-mail etc. Follow up measures help the company to collect the goods within the stipulated date. Once the goods are received it is sent for inspection of the materials which is done by the quality control department. INDSIL maintains a good Quality Control Department which is controlled by a Manager assisted by Charge Head and Chemists. They are mainly in inspection of in-process and incoming materials. The inspection work of quality control department is generally for three stages:

1. For incoming raw materials
2. For in-process.
3. For outgoing goods

## STORES AND ISSUE OF MATERIALS

Stores play a vital role in the operations of a company. The most important purpose served by the stores is to provide uninterrupted services to the manufacturing division. The problem of storage is of great concern to a company, because normally a substantial amount of a company's working capital is invested in stores. To strengthen the material control, purchase control must be matched by equally effective store control to avoid losses from misappropriation, damage, deterioration, evaporation and carelessness. Material to become cash on the sale of the finished products represents an equivalent amount of cash, so it is desirable to have an efficient and well-equipped store department to exercise effective material control. INDSIL stores are also under the control of the Production Manager.

### ORGANISATION OF STORES IN INDSIL

Stores or storage is the function of receiving, storing and issuing materials required for production department. The whole process of storing begins with the receipt of goods at the gates. Usually the receiving section varieties that goods delivered are in accordance with purchase order. Goods received note should be prepared which forms the basis of entries of bin card. But in INDSIL there is no separate receiving section and that is why this function is performed by the stores in the store's control function include the function of keeping the store item in the stores in good condition still they are used or issued.

In INDSIL, stores include the following

- Raw material- materials which are required for production.
- Fuel items like coal used for the production process
- Packing items used for covering finished goods. E.g: gunny bags, HDPE bags ➤ Other items include furniture stationary etc used for administration purposes

## (B)

### DETAILED ANALYSIS OF MATERIAL MANAGEMENT IN INDSIL

Financial statements are prepared primarily for decision-making. They play a dominant role in setting up the framework for managerial decisions. The information provided in the financial statement is of immense use in making decisions through analysis and interpretation of financial statements.

#### MATERIAL TURNOVER RATIOS

Material or inventory turnover ratio is one method of exercising material control. This ratio denotes the number of times the material is turned over during the period. A higher turnover ratio denotes less accumulation and high movement of materials. In other words, it indicates brisk sales. A low turnover ratio results in the blocking of funds in inventory which may ultimately result in heavy losses due to inventory becoming obsolete or deteriorating in quality.

### COST OF GOODS SOLD/ AVERAGE INVENTORY

TABLE SHOWING THE MATERIAL TURNOVER RATIO

(Source: annual report)

(Rs in lakhs)

Year	COGS	AVERAGE INVENTORY	RATIO
2017-18	8582	1858	4.61
2018-19	7365	2275	3.23
2019-20	4128	2526	1.63
2020-21	9042	2797	3.23
2021-22	9758	2952	3.30

### INTERPRETATION:

The inventory turnover ratio of INDSIL shows a decreasing trend from the financial year 2017 to 2019. The ratio started increasing from 2020-21 and shows a slight increase in the year 2021-22 compared to the previous year.

### INVENTORY CONVERSION PERIOD

This is calculated to see the average time taken for clearing the stock. This period is calculated by dividing the number of days on a year by the inventory turnover ratio. The formulae are:

$365/\text{INVENTORY TURNOVER RATIO}$

TABLE SHOWING INVENTORY CONVERSION PERIOD

(Source : annual reports)

(Rs in lakhs)

Year	Inventory turnover ratio	Conversion period
2017-18	4.61	79
2018-19	3.23	113
2019-20	1.63	223
2020-21	3.23	113
2021-22	3.30	110

**INTERPRETATION :**

The financial year 2017-18 shows a conversion period of 79 days, which means that it took only 79 days for clearing the stock but it gradually increases in subsequent years.

**RATIO OF INVENTORY TO SALES**

This shows the relationship between inventories to sales. higher inventory as a percentage of sales indicates the inefficient management of inventory. A lower ratio indicates better efficiency of the firm towards the business in terms of sales with less amount of inventory. This situation provides a direct bearing on profitability for the concerned firm. The ratio of inventory to sales can be determined as :

CLOSING INVENTORY/SALES \*100

**TABLE SHOWING THE RATIO OF INVENTORY TO SALES**

(Source : Annual Reports )

(Rs . in lakhs )

Year	Closing stock	Sales	Ratio
2017-18	2205	10626	20
2018-19	2344	9161	25
2019-20	2707	5686	47
2020-21	2886	9761	29
2021-22	3018	11633	25

**INTERPRETATION**

The ratio shows an increasing trend from the financial year 2017 to 2020. but it decreased to 29 in 2020-21 and to 25 in the year 2021-22, in the beginning, it shows an increasing trend and after that, the ratio started decreasing gradually.

**EXPENDITURE ON MATERIALS/TURNOVER****TABLE SHOWING THE RATIO OF MATERIAL CONSUMPTION TO TURNOVER**

(Source : annual reports)

(Rs . in lakhs)

Year	Expenditure on materials	Inventory turnover ration	Ratio of material consumption to turnover
2017-18	4323	4.61	937.7
2018-19	5053	3.23	1564.3
2019-20	2994	1.63	1836.8
2020-21	4356	3.23	1348.6
2021-22	5320	3.30	1612.12

**INTERPRETATION :**

The ratio of material consumption to sales increases from the financial year 2017- 2019. After that in the financial year 2020-21 it shows a decreasing trend. Then the next year it has increased gradually. The trend here is fluctuating. The fluctuation in ratio shows that the company needs more control over the firms.

**RATIO OF MATERIAL CONSUMPTION TO PRODUCTION**

This ratio shows the expenditure on materials incurred for production undertaken. Lower ratio of materials consumption to production denotes that it is favourable to the concern. This ratio is calculated as follows :

EXPENDITURE ON MATERIALS/PRODUCTION

**TABLE SHOWING THE RATIO OF MATERIALS CONSUMPTION TO PRODUCTION**

(Source : Annual reports )

(Rs . in lakhs )

Year	Expenditure on materials	Production	Ratio of material consumed to production
2017-18	4323	12496	.34
2018-19	5053	11498	.43
2019-20	2994	6826	.43
2020-21	4356	10429	.41
2021-22	5320	122640	.42

**INTERPRETATION:**

The production has decreased in the beginning and increased marginally during the subsequent years. Here expenditure on materials is mainly determined as per the specification of order received from the customers. The ratio shows a fluctuating trend.

**CONCLUSION**

Purchase Department is the back bone of any industry. A Well Organized Purchase department is very much an essential department. Inventory Management is very important in any organization. Proper attention and care is utmost important as the cash loss will be huge if it is not properly managed. There are losses which are direct and indirect which needs to be taken care of. This is one of the area where proper checks and controls are very much required from preparing an order for a purchase till the material is arrived and consumed.

he effective materials management plan builds from and enhances an institutional master plan by filling in the gaps and producing an environmentally responsible and efficient outcome. An institutional campus, office, or housing complex can expect a myriad of benefits from an effective materials management plan. For starters, there are long-term cost savings, as consolidating, reconfiguring, and better managing a campus' core infrastructure reduces annual operating costs. An institutional campus, office, or housing complex will also get the highest and best use out of campus real estate.

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