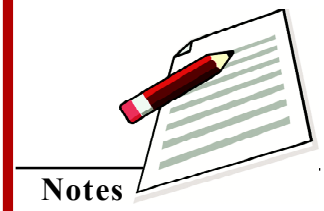
19

CARGO ARRANGEMENT & CONSOLIDATION CHARGE



Cargo consolidation is largely used in international export. It involves the bundling of several smaller shipments from multiple shippers at the point of origin into a single delivery at the same end location. In the process a consolidator combines individual LCL shipments from various shippers into one full container shipment. By doing this consolidation a shipper earns better or preferred rates and helps optimize supply chain logistics by saving time and reducing cost. Consolidated shipping is ideal for someone who might only have a few pallets of freight or smaller shipments they need packaged and shipped in one container.

Warehouse consolidation is a practice that streamlines orders from companies with large order numbers or with multiple logistics or distribution centers. The central task of a consolidation warehouse is to combine loads. Let us learn how this is actually done.

LEARNING OUTCOMES

After reading this lesson the learner-

- explains the principles and rules of cargo arrangement;
- applies these procedures in warehousing, handling of cargo and loading of vehicle;
- emphasises the need of aggregation of cargo;
- develops skill in preparing certificates and estimating costs.

19.1 PACKING LIST IN CARGO ARRANGEMENT

A packing list, also known as packing slip, manifest, delivery docket, delivery list, shipping list, etc. is a document that aids in making international trade easy and seamless.

It provides entire information about your shipment to the exporter, freight forwarder, shipping line, and the consignee. This information includes the details of your shipment, how it has been packed, dimension and weight details, destination details, etc.

Basically, a packing list lets the customers and others involved in the transaction visualize the contents of your shipment; and hence is an important document.

When preparing a packing list, ensure the following details are included:

- Date
- Origin and destination of goods
- Total number of packages in the shipment
- Specific details of each package
- Weight and volume of each package as well as the shipment as a whole
- Commercial invoice number for the shipment
- Shipper contact information
- Consignee contact information

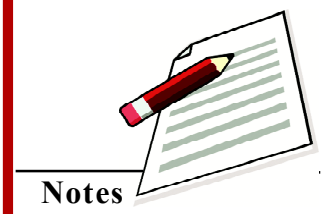
Why is Packing List Necessary?

A packing list safeguards against shipping incorrect cargo across international borders. It specifies all the details of your freight making it clear for all the related parties involved in your shipment. For international trade, there is export packing list and for domestic trade, there is domestic packing list. Export packing list is very important as compared to the domestic one, and needs to meet all the requirements of the related parties in the supply chain.

The freight forwarder or your transporter will use this packing list to prepare a BOL (Bill of Lading).

Having no packing list at all or having an incorrect one can land you into many problems like causing delays in customs process, not getting your cargo delivered on time or not getting properly paid. An export packing list needs to be attached to the exterior of the shipping container in a tamper proof or waterproof casing so that it can be easily accessed by the concerned parties. Here are some of the reasons why a packing list is important for your international shipments:

- It specifies the count of the product shipped in your freight and serves as a guide for the receiver or the buyer.
- It is helpful in creating a booking with international shipping lines and carrier and in obtaining a BOL



- It is a proof of inland BOL
- It provides all the details required by the Electronic Export Information section in the Automated Export System
- It indicates information required for the Certificate of Origin
- In case of dangerous goods, it acts as a proof of Material Safety Sheet
- It aids the customs broker in entering cargo in their country's import data files
- It acts as a supporting document for reimbursement under the Loc (Letter of Credit)

19.2 ARRANGEMENT OF CARGO CONTAINERS

Container ships travel on round-robin routes where at each port of destination containers may be unloaded and additional containers destined for subsequent ports may be loaded. Determining a viable arrangement of containers that facilitates this process in a cost-effective way makes up the container stowage problem.

Stowage planners determine stowage arrangement for a container ship. The planners ascertain the placement of containers so that following constraints are satisfied.

- Restrictions placed upon where and how containers can be stowed and
- Material handling costs i.e. costs associated with loading, unloading and transporting cargo are minimized. The most important aspect is the re-handle. A re-handle is a container movement made in order to permit access to another or to improve the overall stowage arrangement.

In a container ship, a stowage plan is prepared as per the container to be discharged and loaded on a particular port along with the tanks condition i.e. mass carried by the ship other than cargo. This is done to maintain the stability of the ship at all times.

Objectives when cargo is stowed in the ship,

- To protect the ship.
- To protect the cargo.
- To obtain the maximum use of the available capacity of the ship.
- To provide for rapid and systematic discharging and loading.
- To provide for the safety of crew and shore men at all times.

Key issues to be considered when loading cargo container on ships,

- Over stowage should be avoided and cargo planning to be done as per the latest cargo, i.e. cargo for a later port should not be placed over that of an earlier port.
- Loading conditions must be calculated for intact stability, shearing force, bending moment, torsion moment, trim and draft etc. Torsion moment, bending moment and shear force values must not exceed 100% at any time.
- The IMO visibility line should be taken care of when planning the stowage of containers on deck.
- The stowage of IMDG containers to be done as per ships Document of compliance with the special requirements for ships carrying dangerous goods
- The GM value or Stability of the ship is affected (increases/decreases) by means of stowing light containers on top of heavy containers respectively and vice-versa. GM is the Metacentric height which is the distance between the centre of gravity (G) of the ship and its metacentre (M).
- However, usually the GM values for ship are high and stowing light containers on top of heavy ones will only increase GM leading to a "stiff" ship with short rolling periods, which increases the stresses on the lashing.
- In this situation, it is preferable for the heavy containers to be loaded on top but with due regard to lashing stresses and staking weight.

INTEXT QUESTIONS 19.1

1. What is the need for a packing list?
2. What points to be kept in mind while loading containers on a ship?
3. What details are given in a packing list?

19.3 OPERATION AT WAREHOUSES

The **first-in first-out (FIFO)** method is a widely used inventory valuation method in warehouses. It assumes that the goods are sold (by merchandising companies) or materials are issued to production department (by manufacturing companies) in the order in which they are purchased. In other words, the costs to acquire merchandise or materials are charged against revenues in the order in which they are incurred.

When using this method of warehouse management, the oldest stock of inventory is shipped out first. The newest inventory stays until the oldest is shipped out to stores or directly to consumers.

The FIFO procedure for distribution is a solid strategy to choose if the products in your warehouse have a shelf life. Items like batteries, beauty products, fashion and apparel, nutritional supplements all need to move quickly. In simple terms, FIFO warehousing compares to the method you might use to keep your refrigerator at home organized. When you're running low on milk, you likely buy a new packet and place it behind the almost empty packet. You wait until the old milk is consumed before moving the new milk to the front and using it in your tea or coffee.

Under first-in first-out method, the ending balance of inventory represents the most recent costs incurred to purchase merchandise or materials.

FEFO: FEFO stands for First Expiring, First Out. Like FIFO, it is as simple as it sounds. When using this method of warehouse management, the stock that expires first is shipped out first. The inventory that expires first is sent out to stores or directly to consumers first. FEFO might be the strategy for you if your products expire quickly. Many certified food grade warehouses rely on FEFO procedures to keep inventory fresh (meats & dairy). Fast-moving consumer goods are good candidates for FEFO warehousing methods. Warehouses storing pharmaceutical products and medicines might take advantage of a FEFO procedure to quickly distribute inventory purchased.

LIFO: LIFO stands for Last In, First Out. In this case, the products that are moved into the warehouse most recently are shipped out first. This means the new stock takes precedence over the old stock.

If your warehouse stocks products that don't expire, LIFO can be a worthwhile approach if your costs of manufacturing the product are on the rise. Bricks, sand and coal might all be warehoused with LIFO procedures.

Which is better-FIFO vs FEFO vs LIFO: In many cases, the warehousing procedure you choose depends on the product you are warehousing. With products that have a lifespan, FIFO might be the best option. Products move quickly through the warehouse and inventory costs are reduced. FEFO is a good method for expiring products. LIFO only applies to stable goods that don't apply to any timeline. Selecting a method for warehousing depends on the products you'll be storing.

INTEXT QUESTIONS 19.2

1. Give a comparison between FIFO, LIFO and FEFO
2. What is LIFO?
3. Explain FEFO?

19.4 ADVANTAGES AND DISADVANTAGES OF USING FIFO

Logistics and warehousing are all about getting the right product to the right place at the right time. A FIFO procedure in your warehouse can help you do this.

There are many benefits of choosing a FIFO procedure for your warehouse. **Five benefits** of FIFO include:

1. **Reduce spoiled and expired products:** When you ship out the oldest stock first, you increase the chance that the item will sell before it reaches its expiration date. This can help businesses reduce the quantity of inventory that remains unsold, helping them improve profits.

2. **Reduce obsolete inventory:** Obsolete inventory refers to products that are outdated and no longer useful to consumers. When products are moving in and out of the warehouse quickly, you can reduce the chances of an item becoming obsolete before it is ultimately sold to a consumer.

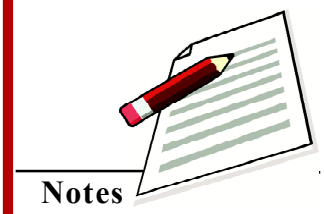
3. **Make quality control easy:** Another benefit of using FIFO is that quality control becomes simple. Shipping products in the order you get them makes it easy to track deliveries. If a product is bad, you know what supplier brought it in and when it was received.

4. **Minimize the impact of inflation:** Inflation refers to the increase in prices over time. FIFO can reduce the impact of inflation on suppliers, retailers and ecommerce businesses. Because the old product is the first sold, it might have cost less to make than newer inventory. This keeps prices accurate and helps retailers and ecommerce businesses manage inventory and profits.

5. **Keep current inventory value:** Using FIFO procedures in your warehouse can help suppliers, retailers and ecommerce businesses keep current with inventory value. As items purchased are pulled from shelves, the inventory system includes the most recently purchased inventory. This helps make sure that the inventory value and cost of goods sold is reflective of current market prices.

Even though there are many benefits of choosing a FIFO system to manage your warehouse, you might find **a few disadvantages depending** on your situation. These might include:

- **Reworking your warehouse space:** When implementing FIFO procedures, you'll need to make the oldest products most accessible,



while reducing materials handling to make the system most efficient. This might require reworking the physical space in your warehouse.

Some products, like food and pharmaceuticals, might expire very quickly and require FEFO warehousing. Other products that don't expire, like bricks or building materials, might benefit from LIFO procedures to help you make the most of your space.

- **FIFO requires tracking your inventory:** Taking advantage of FIFO procedures means keeping careful track of your inventory and using better systems for compliance. The amount of products entering and exiting the warehouse, along with the accessibility of stock and the layout are necessary. Thousands of SKUs at different locations can mean constant updates to your numbers. The larger your inventory, the more difficult tracking can be.

19.5 USING FIFO PROCEDURES

A FIFO system can be ideal in a number of warehousing situations. In fact, many warehouses rely on FIFO procedures for inventory management. Taking advantage of FIFO procedures can help you boost efficiency and throughput in your warehouse. FIFO procedures in your warehouse, provides the following:

1. Increased Customer Satisfaction
2. Reduced Errors
3. Make Warranties Accessible
4. Keep Inventory Fresh
5. Minimizing the Impact of Rising Prices
6. It is economical as it can help minimize the impact of rising prices.

Reasons Not To Use Fifo Procedures: Along with the pros and cons of using FIFO procedures in your warehouse, you might find a number of reasons why it won't work for you. There are a few situations as –

1. **Priority Orders: -** If you're shipping out high priority orders, you might have to bypass the FIFO process.
2. **Discrepancies in Storage Costs: -** If warehousing costs change or additional space is suddenly required, an ecommerce business or retailer might need to adopt a LIFO strategy to clear the space to save on costs.

3. **Overstated Profits: -** From an accounting standpoint, FIFO could unintentionally overstate the gross margin a business earns. This can happen most easily during periods of high inflation in the financial sector can bring on higher income taxes. This is something that will need an eye kept on it.

4. **Shipping Order: -** FIFO might not work if the products in your warehouse need to be shipped out in a certain order. For example, if the production sequence of the products in your warehouse suggests that the items that arrived most recently need to be shipped out first, you might break FIFO.

5. **Space Constraints: -** You might need to break FIFO when you simply don't have room in your warehouse facility for proper materials handling. If there isn't enough space on the shop floor, you might need to stop the FIFO lane. Different parallel segments can help manage flow in this scenario.

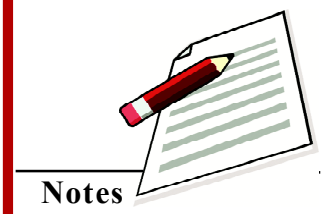
19.6 HOW TO IMPLEMENT FIFO

A FIFO warehouse management system involves specific procedures during the put away and picking process. Implementing FIFO procedures in your warehouse can be a smart business move.

1. **Aging Your Product:** One step in implementing FIFO procedures in your warehouse is aging your product. There are several ways you can do this. Consider the following when aging the product in your warehouse:

   - **Expiry dates:** Looking at the expiration dates on your products is one way you can age your warehouse product. Using the dates marked on the products can make it easy to see which products entered the warehouse first and should leave first. Learn more abiut expiring product fulfillment.
   - **Lot control:** Grouping products that arrive at the same time together in your warehouse is a form of lot control that makes it easy to determine the dates on which it arrived. You can further simplify lot control by using dated lot labels. Lot control can work even if the product is not stored on pallets.
   - **Sequential pallet licensing:** You can also implement FIFO procedures by using sequential pallet licensing. Sequential pallet licensing involves using sequentially dated plates to identify pallets. Older pallets would be marked with lower pallet numbers, making the warehouse FIFO procedures simple and straightforward.

2. **Label items efficiently:** Using a clear labeling process like sequential pallet licensing can help you identify the oldest items in the warehouse so you know



what to ship out first.

3. **Make older items most accessible:** When implementing FIFO procedures, it is important that the older items are the most accessible in the warehouse. Make considerations in the put-away process to store product to make material handling easy.

4. **Stack the pallets appropriately:** When organizing the warehouse, it is important that new pallets are not stacked on old pallets. Should older pallets be stored under new pallets, more material movement is required for FIFO procedures. Stacking pallets appropriately makes the fulfillment process easier.

INTEXT QUESTIONS 19.3

1. Give the advantages of FIFO system.
2. What steps are necessary to implement FIFO system?
3. How is FIFO useful in warehouses?

19.7 ILLUSTRATION FOR PRACTICAL UNDERSTANDING OF THE CONCEPT

The Fine Electronics company uses perpetual inventory system to account for acquisition and sale of inventory and first-in, first-out (FIFO) method to compute cost of goods sold and for the valuation of ending inventory. The company has made the following purchases and sales during the month of January 2016.

- Jan. 01: Inventory at the beginning of the month; 24 units @₹.1,000 per unit.
- Jan. 04: Sales: 16 units.
- Jan. 07: Purchases; 12 units @ Rs.1,020 per unit.
- Jan. 10: Purchases; 10 units @ Rs.1,050 per unit.
- Jan. 14: Sales; 16 units.
- Jan. 23: Sales; 12 units.
- Jan. 24: Purchases; 12 units @ Rs.1,060 per unit.
- Jan. 27: Purchases; 4 units @ Rs.1,080 per unit.
- Jan. 29: Sales; 6 units.

During the month, all sales have been made @ Rs.1600 per unit.

Required

1. Prepare journal entries to record the above transactions under perpetual inventory system.
2. Prepare a FIFO perpetual inventory card.
3. Compute the cost of goods sold and the cost of inventory in hand at the end of the month of January 2012.

Solution

(1) Journal entries

January 4: The Fine electronics company has sold 16 units for Rs.25,600 (16 units × Rs.1,600) on January 4, 2016. On this date, 24 units in the beginning inventory are the only units available for sale. The cost of goods sold is, therefore, Rs.16,000 (16 × Rs.1,000). Since the company uses perpetual inventory system, two journal entries would be made for the sale of inventory – one to reduce the inventory account by the cost of 16 units and one to record the sale of 16 units. These two journal entries are given below:

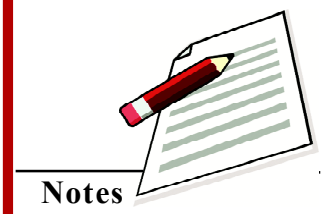
Date	Account Name	Debit	Credit
Jan. 04	Accounts receivable Sales	25.600	25.600
"	Cost of goods sold Inventory	16,000	16,000

January7: The following entry would be made to record the purchase of 12 units @ Rs.1,020 per unit on January 7:

Date	Account Name	Debit	Credit
Jan. 07	Inventory	12.240	
	Accounts payable		12,240

January10: The following entry would be made to record the purchase of 10 units @ Rs.1,060 per unit on January 10:

Date	Account Name	Debit	Credit
Jan. 10	Inventory	10.500	
	Accounts payable		10,500



January14: According to FIFO assumption, first costs incurred are first costs expensed, the cost of 16 units sold on 14 January would, therefore, be computed as follows:

Date	Account Name	Debit	Credit
Jan. 14	Accounts receivable Sales	25.600	
	Sales		25,600
"	Cost of goods sold	19,160	
	Inventory		16,160

Cost of 8 units (from beginning inventory): 8 units × Rs.1,000 = Rs.8,000

Cost of 8 units (from units purchased on January 7): 8 units × Rs.1,020 = Rs.8,160

Total cost of 16 units sold on January 14: Rs.8,000 + Rs.8,160 = Rs.16,160

The journal entries for the above sales would be made as follows:

January23: According to first-in, first-out (FIFO) method, the cost of 12 units sold on 23 January is computed below:

Date	Account Name	Debit	Credit
Jan. 23	Accounts receivable Sales	19.200	
	Sales		19,200
"	Cost of goods sold	12,480	
	Inventory		12,480

Cost of 4 units (from units purchased on January 7): 4 units × Rs.1,020 = Rs.4,080

Cost of 8 units (from units purchased on January 10): 8 units × Rs.1,050 = Rs.8,400

Total cost of 12 units sold on 23 January: Rs.4,080 + Rs.8,400 = Rs.12,480

The journal entries for the above sales would be made as follows:

January24: On January 24, the following entry would be made to record the purchase of 12 units @ Rs.1,060 per unit.

Date	Account Name	Debit	Credit
Jan. 24	Inventory	12.720	
	Accounts payable		12,720

January27: On January 27, the following entry would be made to record the purchase of 4 units @ Rs.1,080 per unit.

Date	Account Name	Debit	Credit
Jan. 27	Inventory	4,.320	
	Accounts payable		4,320

January29: According to first-in, first-out (FIFO) method, the cost of 6 units sold on 29 January is computed below:

Date	Account Name	Debit	Credit
Jan. 29	Accounts receivable	9,600	
	Sales		9,600
"	Cost of goods sold	6,340	
	Inventory		6,340

Cost of 2 units (from units purchased on January 10): 2 units × Rs.1,050 = Rs.2,100

Cost of 4 units (from units purchased on January 29): 4 units × Rs.1,060 = Rs.4,240

Total cost of 6 units sold on 29 January: Rs.2,100 + Rs.4,240 = Rs.6,340

The journal entries for the above sales would be made as follows:

(2) FIFO perpetual inventory card: Companies using perpetual inventory system prepare an inventory card to continuously track the quantity and dollar amount of inventory purchased, sold and in hand. This card is known as ***perpetual inventory card***. A separate perpetual inventory card is prepared for each inventory item. This card has separate columns to record purchases, sales and balance of inventory in both units and dollars. The quantity and dollar information in these columns are updated in real time i.e., after each purchase and each sale. At any point in time, the perpetual inventory card can, therefore, provide information about purchases, cost of sales and the balance in inventory to date.

The perpetual inventory card of Fine Electronics company is prepared below using FIFO method.

Date	Purchases	Sales	Balance
Jan. 01	Beginning balance		16U×₹1,000=₹24,000
Jan. 04		16U×₹1,000=₹16,000	8U×₹1,000=₹8,000
Jan. 07	12U×₹1,020=₹12,240		8U×₹1,000=₹8,000 12U×₹1,020=₹12,240

Jan. 10	10U×₹1,050=₹10,500		8U×₹1,000=₹8,000 12U×₹1,020=₹12,240 10U×₹1,050=₹10,500
Jan. 14		8U×₹1,000=₹8,000 8U×₹1,020=₹8,160	4U×₹1,020=₹4,080 10U×₹1,050=₹10,500
Jan. 23		4U×₹1,020=₹4,080 8U×₹1,050=₹8,400	2U×₹1,050=₹2,100
Jan. 24	12U×₹1,060=₹12,720		2U×₹1,050=₹2,100 12U×₹1,060=₹12,720
Jan. 27	4U×₹1,080=₹4,320		2U×₹1,050=₹2,100 12U×₹1,060=₹12,720 4U×₹1,080=₹4,320
Jan. 29		2U×₹1,050=₹2,100 4U×₹1,060=₹4,240	8U×₹1,060=₹8,480 4U×₹1,080=₹4,320
Total	₹39,780	₹50,980	₹12,800

(3) Cost of goods sold (COGS) and ending inventory: With the help of the above inventory card, we can easily compute the cost of goods sold and ending inventory.

- *Cost of goods sold: Rs.16,000 + Rs.8,000 + Rs.8,160 + Rs.4,080 + Rs.8,400 + Rs.2,100 + Rs.4,240 = Rs.50,980
- **Ending inventory: Rs.8,480 + Rs.4,320 = Rs.12,800

* The total of sales column of perpetual inventory card.

** The balance at 29 January – at the end of balance column.

WHAT YOU HAVE LEARNT

	FIFO	LIFO
Meaning	First in , first out	Last in, first out
Unsold inventory	Unsold invetory comprises the most	Unsold inventory comprises the earliest
Effect on Gross and	If costs increase, the items acquired first were cheaper.	If costs increase recently acquired items are more

net profit	This lowers the cost of goods sold (COGS) under FIRST IN FIRST OUT and increases profit. Income tax is higher. The value of unsold inventory is also higher.	expensive. This increases the cost of goods sold (COGS) under LIFO and decreases net profit. Income tax is smaller.
Effect on inventory valuation	If costs increase, the items acquired first were cheaper. The value of unsold inventory is also higher.	If costs increase, recently qcquired items are more expensive. This increases the cost of goods sold (COGS) under LIFO. The value of unsold inventory is less.
Effects on perishable goods	With FIRST IN FIRST OUT, the oldest products are sold first, rendering the expiration of goods in the ware house unlikeely.	With LIFO, the oldest products are kept in inventory and there fore, the number of expired products in the ware house will be high, afecting the gross profit.
Effects on obsolescence	With FRIST IN FIRST OUT it is very unlikely that unsold products become obsolete or be stocked beyond the warranty period.	With LIFO, you risk an unsold product becoming obsolete and stocked products losing their waranty.

TERMINAL EXERCISE

1. Bring out a step by step method of making a packing list.
2. What is the need for planning schedule for loading cargo on a ship?
3. Write a detailed note on the FIFO system in a warehouse management.

ANSWERS TO INTEXT QUESTIONS

19.1

A1. Packing list is important for it has all the details of the cargo – date of manufacture, contents, type, fragile, loading details – also labels to show such details

A2. While loading containers or cargo on a ship it is necessary to make a loading schedule – look into the GM, stability and loading/unloading at various ports of call to minimize delays.

A3. When preparing a packing list, ensure the following details are included:

- Date
- Origin and destination of goods
- Total number of packages in the shipment
- Specific details of each package
- Weight and volume of each package as well as the shipment as a whole
- Commercial invoice number for the shipment
- Shipper contact information
- Consignee contact information

19.2

A1. FIFO- first in First out – the oldest stock of inventory is shipped out first. The newest inventory stays until the oldest is shipped out to stores or directly to consumers - if the products in your warehouse have a shelf life.

LIFO-Last in First out – when products don't expire.

FEFO- First Expiring, First Out - the stock that expires first is shipped out first.

A2. LIFO stands for Last In, First Out. In this case, the products that are moved into the warehouse most recently are shipped out first. This means the new stock takes precedence over the old stock.

If your warehouse products that don't expire, LIFO can be a worthwhile approach if your costs of manufacturing the product are on the rise. Bricks, sand and coal might all be warehoused with LIFO procedures

A3. FEFO stands for First Expiring, First Out. Like FIFO, it is as simple as it sounds. When using this method of warehouse management, the stock that expires first is shipped out first. The inventory that expires first is sent out to stores or directly to consumers first. FEFO might be the strategy for you if your products expire quickly. Many certified food grade warehouses rely on FEFO procedures to keep inventory fresh (meats & dairy). Fast-moving consumer goods are good

candidates for FEFO warehousing methods. Warehouses storing pharmaceutical products and medicines might take advantage of a FEFO procedure to quickly distribute inventory purchased.

19.3

A1. Five benefits of FIFO include:

1. Reduce spoiled and expired products
2. Reduce obsolete inventory
3. Make quality control easy
4. Minimize the impact of inflation
5. Keep current inventory value

A2. A FIFO warehouse management system involves specific procedures during the put away and picking process. Implementing FIFO procedures in your warehouse can be a savvy business move.

- Aging Your Product
- Expiry dates
- Lot control
- Sequential pallet licensing
- Label items efficiently
- Make older items most accessible
- Stack the pallets appropriately

A3. FIFO procedures in your warehouse, provides the following:

- Increased Customer Satisfaction
- Reduced Errors
- Make Warranties Accessible
- Keep Inventory Fresh
- Minimizing the Impact of Rising Prices
- It is economical as it can help minimize the impact of rising prices.