MATERIAL HANDLING

DEFINITION OF HANDLING

Handling operations and stock of materials in a warehouse

Receiving materials, handling the materials inside the warehouse and stock of finished products
HANDLING SYSTEMS

• Lift equipments

• Passenger lift

• Cranes
HANDLING SYSTEMS

• Continuous handling equipment (belts, rollers…)

• Air transport

HANDLING SYSTEMS

• Powered industrial trucks.

• Air handling
• Moving ground …
Handling is related to product and material storage

New concept of storage

Using handling techniques for storage gave rise to different methods that allowed both actions at the same time: pallets and containers

PALLETs

Transport device that allows moving several products at the same time so that the product is treated as a load unit

The pallet has a certain height that allows the powered industrial truck to introduce the forks and lift it.
Material Handling

PALLETS

Materials:

- Metal
- Wood
- Rubber
- Plastic

- Cheap
- Easily worn out
- Flammable

Flammable
**PALLETS**

**Size:**

- Height 5 in. (127 mm) (not specified)
- Depth x width

- Most popular in EEUU: 48 x 40 in. (1220 x 1016 mm approx)
- European standard (Euro-pallet): 1200 x 800 mm

---

**CONTAINERS**

**Metallic vase of international standard dimensions with devices that provide an easy handling**

**Features:**

- Long usage, resistant for several usage.
- Designed to provide transport of materials, without needing to separate the load, in one or several transport modes.
- Provided with devices that allow an easy handling of it, especially when changing from one mode to another.
- Easy to fill in and empty it.
- Volume not less than 1m³.
Material Handling

CONTAINERS

Standard exterior dimensions:

• Length: 20 ft. or 40 ft.  6m or 12m aprox
• Width: 8 ft.  2,4m aprox
• Height: 8,5 or 9,5 ft.  2,55m or 2,85m aprox

Standard interior dimensions:

• Length: -8 in.  -203mm aprox
• Width: -5 in.  -127mm aprox
• Height: -9,5 in.  -241,3mm aprox
Material Handling

**HANDLING DURING MANUFACTURING**

Basic operations during manufacturing process:

- Input of material for the working place.
- Machine loading.
- Mechanical operation (mechanize, assemble, etc.).
- Unloading of the machine.

Related with transport

**HANDLING TYPES**

External handling:

Materials moving (raw materials, products nearly finished or finished) between production units or between these and the stores.

Internal handling:

Moving materials that are being ‘created’ or that need to change position or to be moved to another work place.
EXTERNAL HANDLING

Easily applied to automatic devices

Types:

- Belt conveyors
- Cranes
- Powered industrial trucks
- Hand transport

Belt conveyor

- Material is transported between two specific points.
- Material is moved along a fixed path.
- High flux volume.
### Material Handling

#### EXTERNAL HANDLING

**Cranes**

- Material is transported (vertical and horizontal) along variable paths inside a restricted area.
- Have more flexibility than belt conveyors.
- Less flexibility than powered industrial trucks.
- Loads can vary in shape and load much more than loads handled by belt conveyors.

![Cranes Image]

**Powered industrial trucks**

- Material is transported horizontally along variable paths without area restrictions.
- They allow vertical lifts of materials if provided with the needed devices.
- Variable flux of materials.
- More flexibility than belts or cranes.
- They are not allowed to ride on public roads.

![Powered Industrial Trucks Image]
EXTERNAL HANDLING

Powered industrial trucks
Powered industrial trucks: AGV’s (Automatic Guided Vehicle)

• No operator is required
• Used when:
  – Special conditions (paint)
  – Hazaourdous situations
  – High operation costs
• Used in operations for handling materials with medium-low volume and medium-low
• Types:
  – Fixed path
  – Variable path
INTERNAL HANDLING