



PACKAGING TECHNOLOGY FOR NUTMEG





- ▶ **PACKAGING PLAYS A VITAL ROLE FOR**
 - ▶ **FOOD PRESERVATION.**
 - ▶ **PROTECTION DURING STORAGE, HANDLING, TRANSPORTATION AND DISTRIBUTION.**
 - ▶ **A SYMBOL OF VALUE ADDITION.**
 - ▶ **A CONVEYOR OF CONVENIENCE TO CUSTOMER.**
 - ▶ **REDUCES WASTE DUE TO MISHANDLING, IMPROPER STORAGE AND TRANSPORTATION**
 - ▶ **ASSURED ABOUT RIGHT QUANTITATIVE AND QUALITATIVE FOODS**



PACKAGING ATTRIBUTES

MUST ATTRACT ATTENTION

MUST TELL THE PRODUCT STORY

MUST BUILD CONFIDENCE

MUST LOOK CLEAN AND SANITARY

MUST BE CONVENIENT TO HANDLE, TO CARRY AND TO USE



PACKAGING REQUIREMENT OF WHOLE NUTMEG & MACE

- ▶ **Adequate Mechanical Strength.**
- ▶ **Amenable to respiration facility.**
- ▶ **Moisture barrier**
- ▶ **Oxygen barrier**
- ▶ **Handling Mechanisms.**





PLASTIC CONTAINERS

- ▶ Polyethylene terephthalate (PET) bottles are effective packaging materials.
- ▶ unbreakable, colorless, lightweight, transparent polymer
- ▶ bottles completely safe for on-the-go distribution & in supply chain
- ▶ Less weight packaging material (a bottle weighs around 20 -30 grams)
- ▶ can be economically recycled





FLEXIBLE PACKAGING MATERIALS & POUCHES

- ▶ REGENERATED CELLULOSE OR CELLOPHANE
- ▶ COLORED TRANSPARENT CELLOPHANE(CT)
- ▶ MOISTURE PROOF SEALABLE COLORED TRANSPARENT CELLOPHANE(MSCT)
- ▶ MOISTURE PROOF SEALABLE ANCHORED TRANSPARENT CELLOPHANE(MSAT)
- ▶ MOISTURE PROOF SARAN COATED CELLOPHANE(MXXT)





ATTRIBUTES OF FLEXIBLE PACKAGING



- ▶ Flexible packaging has more preferable environmental attributes for carbon impact, fossil fuel usage.
- ▶ Has high product to package ratio.
- ▶ Facilitates better and easy transportation of final products
- ▶ Strength, seal ability, high-barrier properties and printability are advantageous factors of multi-layer flexible pouches.



MAJOR CHALLENGES IN PACKING NUTMEG RIND PRODUCTS

- ▶ Moisture absorption – in nutmeg, mace and its powders
- ▶ Microbial contamination - in nutmeg, mace and its powders, pickles
- ▶ Leaching of flavors and aroma – whole nutmeg, mace and its powders
- ▶ Oil spillage – pickles





SUITABLE PACKAGING FOR NUTMEG RIND PRODUCTS



Kraft Stand up pouches



LDPE Pouches



Glass bottles



सत्यमेव जयते

GLASS CONTAINERS

- ▶ Chemically inert & non-permeable to gas, moisture, light and odour.
- ▶ Transparent & Moldable.
- ▶ Compatible with majority of Food products
- ▶ 100 % Recycling and hence, environment friendly.
- ▶ Can be made in any Shape, Size as desired.
- ▶ Ideal for high speed filled /Capping/ Labelling Machines.
- ▶ High Impact Strength & unlimited Supply.



TYPES OF GLASS

- ▶ **The quality of Glass is expressed in terms of its resistance to acid or alkali attack. Universally accepted Standards are:**
 - ❑ **TYPE– III : All Soda-lime Glasses.**
 - ❑ **TYPE – II : Same as Type –III but Coated with Sulphur inside the bottle**
 - ❑ **TYPE – I : Borosilicate Glass (Natural Glass), Hard and more expensive, mainly used for pharmaceuticals.**



LIMITATION OF USING GLASS

- ▶ **WEIGHT OF GLASS BOTTLE IS HEAVIER AS COMPARED TO PLASTIC BOTTLE**
- ▶ **FRAGILE IN NATURE**





SEMI-RIGID MATERIALS

- ▶ COMPOSITE CONTAINERS.
- ▶ ALUMINUM COLLAPSIBLE TUBE.
- ▶ MULTILAYERED PLASTIC COLLAPSIBLE TUBE.
- ▶ DUPLEX BOARD CARTONS





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COATED CONTAINERS

- ▶ BY SPRAYING OR ELECTRO STATIC METHOD.
- ▶ GIVES COLOUR COATING AND SHADES.
- ▶ ENHANCE PRODUCT APPEAL.
- ▶ NEON COLORED SPRAYS- INCREASES THE VALUE ADDITION.
- ▶ USE OF COLOUR CHANGE INKS (BY THERMO CHROMIC INK) PROVIDES FURTHER DECORATIVE OPTIONS.



KRAFT PACKAGING

- ▶ Currently very popular material in food packaging.
- ▶ Made by sulphate pulping process.
- ▶ Poly amide or polyamine resin is used to coat or laminate to improve barrier properties.
- ▶ Has good strength, printability and appearance.
- ▶ Other advantages are its low cost, wide availability and low weight.





SUITABLE PACKAGING FOR BULK PACKING

- ▶ METAL DRUMS & BARRELS
- ▶ PLASTIC DRUMS & BARRELS.
- ▶ CORRUGATED FIBER BOARD BOXES.
- ▶ WOODEN BOXES.
- ▶ PLYWOOD BOXES.
- ▶ RIGID INTERMEDIATE BULK CONTAINERS.





PACKAGING MACHINERIES

- ▶ Several packaging technologies and machineries are adopted in industries
- ▶ It helps in time saving and less labor intensive functioning of the small scale units
- ▶ Accurate filling and sealing is enabled
- ▶ Vacuum assisted packaging results in improved shelf life of nutmeg and mace
- ▶ Use of induction capping helps to avoid oil spillage from nutmeg pickle.
- ▶ MAP assisted packaging could also be used for premium products.



Vacuum packaging machine

DOUBLE CHAMBER VACUUM GAS FLUSHING PACKAGING

MACHINE(SS) with nitrogen flushing

Specification:-

- ❑ Voltage: AC 380V / 50 hz , 3 phase
- ❑ Motor power: 1800W
- ❑ Sealing power :600W
- ❑ Ultimate vacuum pressure :1KPa
- ❑ Sealing width :10mm or 2x3mm
- ❑ Cost: 1,70,200/-





FORM FILL AND SEAL MACHINE

Voltage	230V
Capacity	500-1000 pouch per hour
Automation	Automatic
Grade	
Speed	1800-2400 pkts / hr
Surface treatment	Polished
Power consumption	1 kw
Cost	4 lakh





ADVANTAGES & DISADVANTAGES OF FORM FILLING MACHINES

ADVANTAGES

- ▶ Completely automated
- ▶ Speeds up bagging process
- ▶ Increase overall sealing precision
- ▶ Delivers high quality packaging at low cost
- ▶ Require less labors

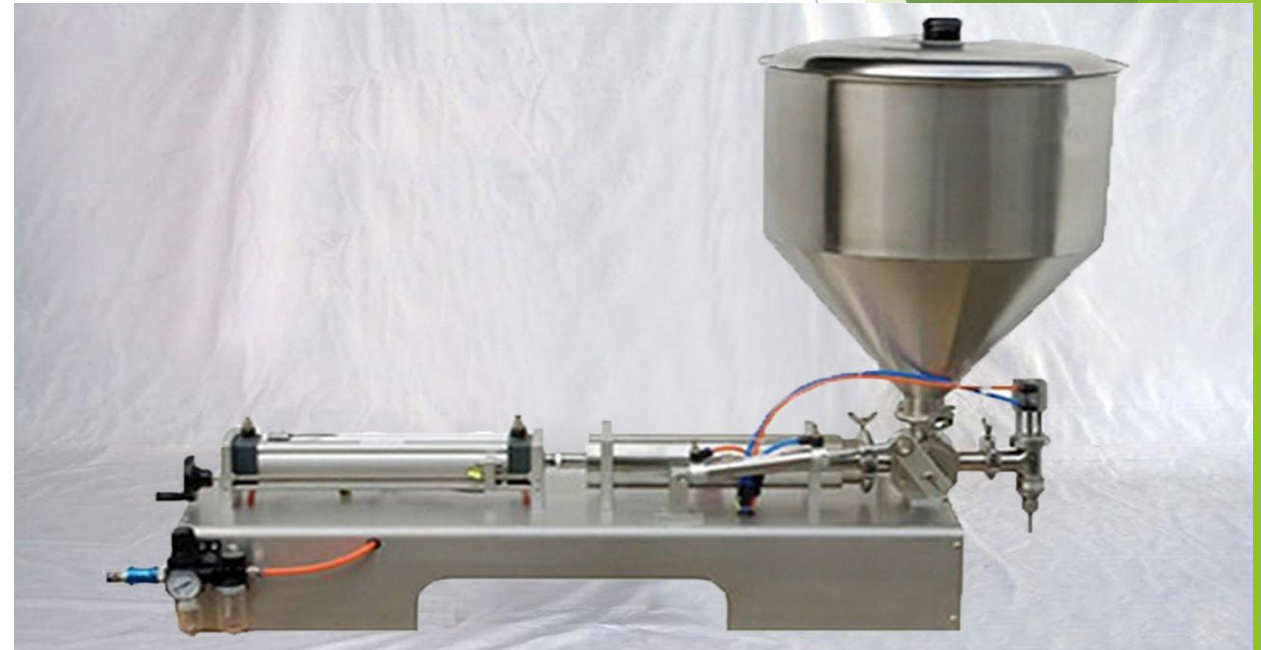
DISADVANTAGES

- ▶ Only suitable for pillow style pouch
- ▶ Trained person is required



VOLUMETRIC FILLERS

Machine Type	Semi-Automatic
Packaging Type	Bottle
Material	SS 304
Brand	Amishi Engineering
Driven Type	Electric
Voltage	220V
Cost	70,000/-





ADVANTAGES & DISADVANTAGES OF VOLUMETRIC FILLERS

ADVANTAGES

- ▶ Recommended for free flowing products
- ▶ Speeds up bagging process (hundreds of fills per minute)
- ▶ Simple design
- ▶ Relatively inexpensive when compared to others filling machines
- ▶ Require less labors

DISADVANTAGES

- ▶ Cannot pack fine powders
- ▶ Very limited fill range without change parts (less than 2:1)
- ▶ Does not run irregular shapes or densities



INDUCTION CAP SEALER

- It is a non-contact method of heating an inner seal to hermetically seal the top of plastic and glass containers.
- This sealing process takes place after the container has been filled and capped.

Cost: 12,000/-





LABELLING MACHINES



- It automatically apply pressure sensitive labels onto round containers.
- It is an ideal machine for contract packagers and manufacturers serving the nutraceutical, food, cosmetic, personal care, and household product markets.



HOT MELT GLUE LABELING MACHINE

Capacity	30-60
Usage/Application	Labeling
Bottle Type	PET
Material	ss 304
Speed	30-60 BPM





CODING PRINTING & MARKING SYSTEMS

- It is used for marking, coding and printing lot codes, barcodes, 2D codes, serial numbers, and contents in the form of labels or direct printing on manufactured products.
- It is used in a packaging / final box / pallet labeling to identify a shipment





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