Packaging design: Structures and Materials

Structure and Materials

- Package = product
- Embodies brand's visual identity
- Containment, protection, transportation
- Surface for packaging design

Packaging structure and materials is based on

- The product
- Transportation
- Storage
- Need for protection
- Display
- How and where sold
- Customer
- Competition

- Cost restraints
- Production quantities
- Production timetable
- Can pre-existing structure be reengineered?
- Need for new structure?
- Should the structure be proprietary?

Paperboard

- Virgin wood fiber or recycled paper stock
- Functional, cost-effective and recyclable
- Broad, flat surfaces great for design elements
- Thickness measured by the layer, ply or in thousands of an inch
  - Anything thicker than .01 of an inch
- Weight of paperboard depends on size and function of carton, product's size and weight, marketing objectives, may accommodate secondary package inside

2 kinds of paperboard

- Fourdrinier: 4 plies of mostly virgin fiber
- Cylinder: 7-9 plies, mostly recycled

Variety of weights and finishes

- SBS (solid bleached sulfate): most expensive, food, dairy, cosmetics, medicine and pharmaceuticals

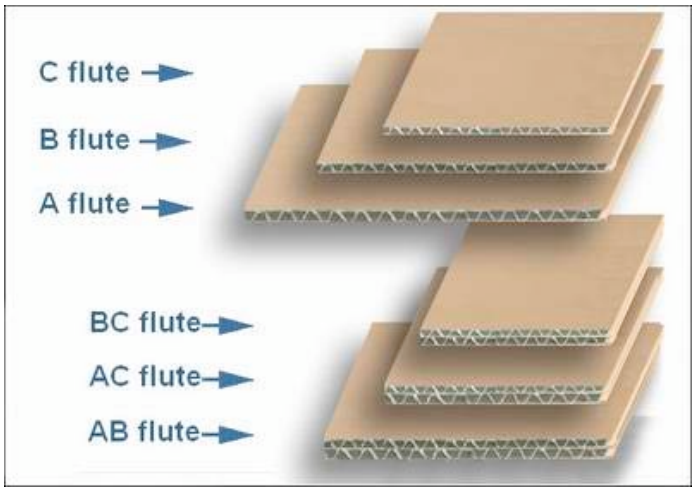
– SUS (solid unbleached sulfate): coated and uncoated, beverage carriers, hardware products, office supplies

– Recycled: coated and uncoated; composite cans, fiber drums, dry food packaging, household goods (paper products, powdered detergents)

– Plain chipboard: wastepaper, grey or tan; set up boxes covered in decorative papers, folding cartons, backing boards for blister packaging, low-end packaging, inner structures

Corrugated paperboard

- Paperboard with fluted medium paper laminated to it
- One sided: single faced x double-faced
- Unlined packaging material for fragile products, product support for inner structural packaging
- Single-, double- and triple walled used for outer packaging such as shipping cartons and containers
- Single-faced with smaller-sized fluting: higher-end packaging materials > textured look
- Printed paperboard can be laminated to corrugated for heavier products: appliances, cookware, electronics, electronics



Folding cartons

- One-piece constructions stamped out of paperboard or corrugated paperboard
- Scored, folded, tabbed and glued to make a structure
- Pattern or die-line of the carbon includes outside contour of its shape and all cut and score lines and all flaps.
- May have inner die-cuts or partial cuts

Folding Carton styles

- Reverse tuck: top and bottom flaps alternate so that the top flap opens from front to back while the bottom flap opens back to the front.
  - The hard edge of the top of the reverse tuck should be at the back.
- Straight tuck: both top and bottom in the same direction. Open back to front.

The two common folding carton closures

- Slit locks: The tucks are slit into the top dust flaps
- Friction lock: Tucks held in place by friction, usually on the side of the flaps

Boxes

Boxes come in a variety of shapes, sizes and materials, depending on the purpose of the package and what it contains.

Laid flat, a carton typically forms the shape of the letter "s."

For the most economical printing, the pattern should be laid head to toe. This allows the maximum use of a single sheet of paper.

Cube

Gatefold

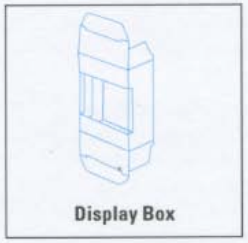
Detached Lid

Self-locking Tray

Small Box

Popcorn Box

Playing Cards



Display Box

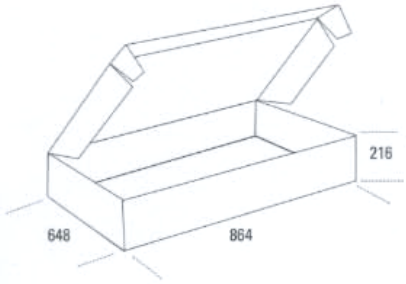
Stacking Box

CD Case

Six-Sided Box

How to Determine Box Size

All boxes are listed with the inside dimensions in points and are shown in the following order: Length x Width x Depth (see diagram). For example, a box listed as 864pts x 648pts x 216pts is 864 points long (left to right), 648 points wide (front to back), and 216 points deep.

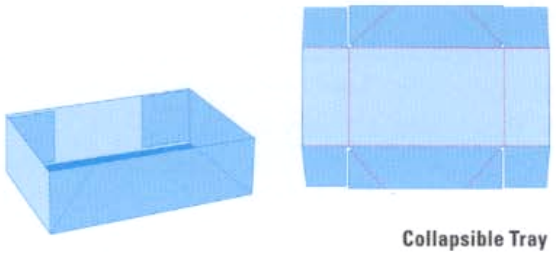


COLLAPSIBLE TRAY: Often found in clothing gift boxes. Also used by printers to hold stationary. Their construction generally calls for a top and bottom, one slightly larger than the other to enclose the box.

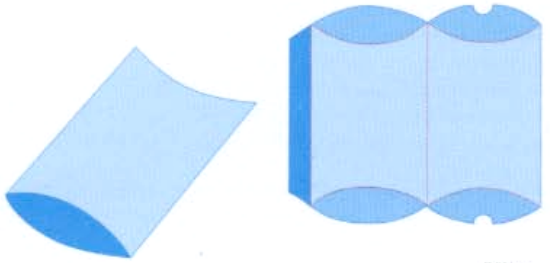
PILLOW PACK WITH TUCK: Functions well for packaging soft items such as clothing or a number of small pieces. This this versatile construction is easily erectable, easily stored in a flat-packed, state and does not require gluing. The package design can be easily modified to include a pull-strip closure for added security.

CUBE: A versatile box used for many packaging and gift boxes. All four sides, plus the top and bottom are of equal size and proportion.

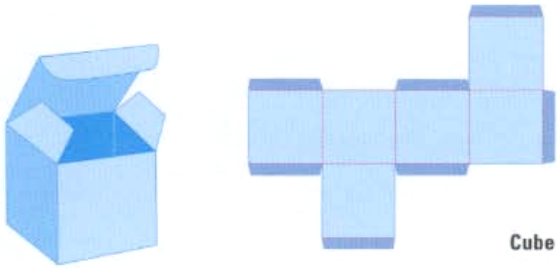
MILK CARTON-STYLE: A recognizable construction designed with a tuck in flap or a twist-off cap can be inserted for easy pouring.



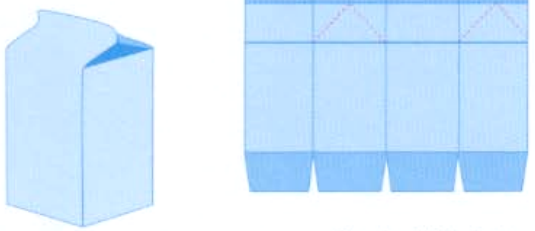
Collapsible Tray



Pillow



Cube



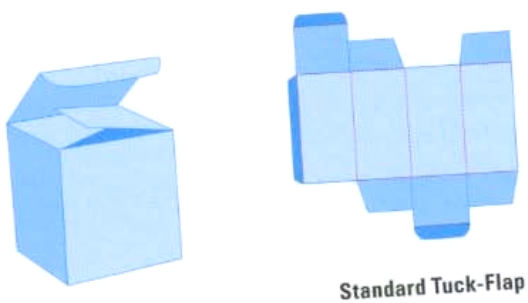
Standard Milk Carton

Basic Closures

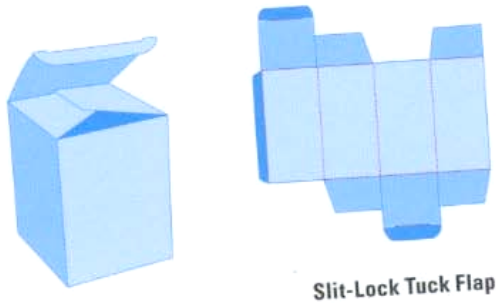
Packaging provides a temporary barrier between the package's contents and the outside. The closure can also contribute to the rigidity of the carton, as we determine or transform the purpose of a carton.

Closures come in forms other than the standard tuck-lid box. The disc and string closure, used in mainly envelope closing, consists of a disc on one side with string attached and another on the opposite side to wrap the string around allowing for a secure, quickly accessible opening and closing.

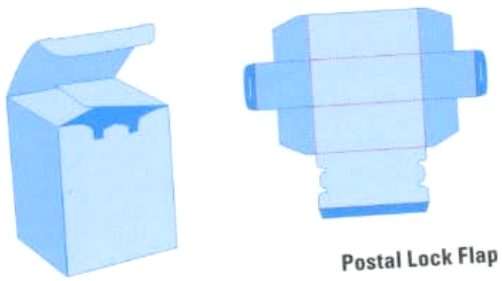
The disc and string closer, used in magnets, Velcro, press studs, and elastic, have gained popularity in recent years.



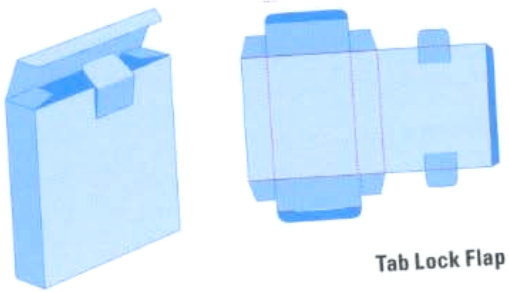
Standard Tuck-Flap



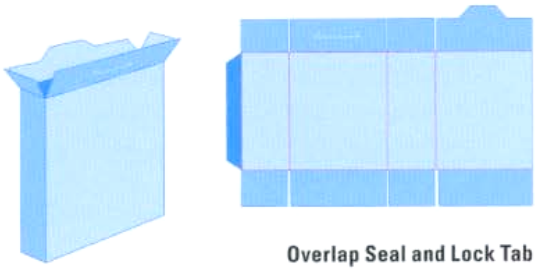
Slit-Lock Tuck Flap



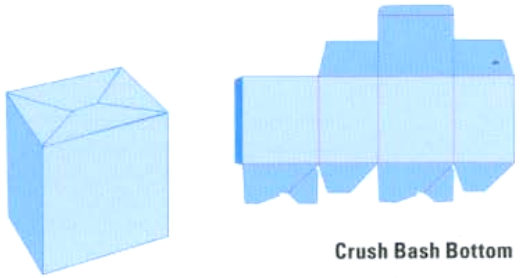
Postal Lock Flap



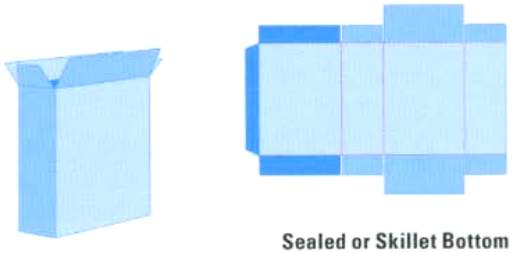
Tab Lock Flap



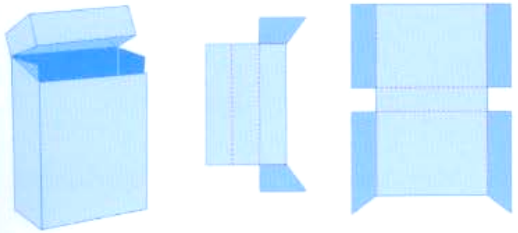
Overlap Seal and Lock Tab



Crush Bash Bottom



Sealed or Skillet Bottom



Flip-Top

STANDARD TUCK-FLAP CARTON: Appropriate for individually wrapped items such as bandages or products in squeezable tubes. Also a good choice as a container for food items such as tea and sugar packets where reusability is important. May require a seal or outer wrapping to ensure contents will remain intact prior to purchase.

SLIT-LOCK TUCK CARTON: Application is similar to standard tuck-flap carton, except slits provide a more secure seal. For tamper resistance, add a seal or a protective outer wrapping.

POSTAL-LOCK: Although not reusable, this completely tamper-proof option has an arrowhead tab that tears on opening, providing proof of entry.

TAB-LOCK: Slits and tab provide additional protection against tampering and lid being forced open by inside pressure from the contents.

OVERLAP SEAL AND LOCK TAB: Partial overlap sealed end with lock tab and lock slot. This option is used for items that contain a moisture-proof bag such as cereal, cookies, or crackers. Initially the top is glued shut, the tab and slot as a reusable closure after the carton is opened.

SNAP-LOCK BOTTOM: The strongest and simplest constructed box. The box is pre-glued and folded flat for fast and easy assembly and storage.

SKILLET OR SEALED END: A good choice when strength is a concern. The construction gives the bottom greater strength and needs to be secured with adhesive.

FLIP-TOP: A hinge-lid box having a box part and a lid on the rear wall of the box. A collar is anchored in the box part and has a collar front wall to allow to fold down and enclose the box like a crayon box.

Set up boxes

- Rigid preassembled structures with top and bottom
- Heavyweight paperboard or chipboard
- Laminated with decorative papers, materials and other finishes
- Cosmetics, candy, jewelry, high-end products
- After-product reuse
- Now cartons can be produced cheaply to imitate

Canisters

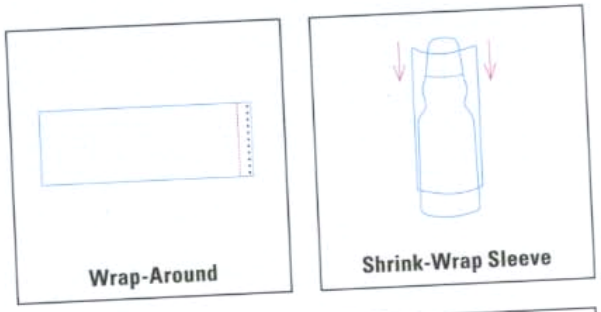
- Spiral-would in a cylinder
- Varying weight and lengths
- Inner cylinder of toilet paper
- Cosmetics, lingerie, fashion accessories, luxury products
- Multiple layers with protective plastic, metal film or foil barrier layers
- Snacks, oatmeal, frozen juice concentrates, refrigerated dough
- Ovals and asymmetrical forms, die cuts and finishes

Other paper structures

- Trays, sleeves, bags
- Sleeves: die cut in contours and shapes
- Embossing, foil-stamping, foil laminates, matte and gloss varnishes, pearlescent coatings

Labels

Labels have multiple purposes. They identify products, encourage the purchase of the product, and contain information intended to protect and inform the consumer. Information such as; warning labels, recycling, product descriptions and other information needed to communicate to the consumer.



WRAP-AROUND: Simple and widely used label for food and beverage containers.

SHRINK-WRAP SLEEVE: Plastic sleeve that fit around a bottle and heated to form the shape of the bottle.

FOOD: Specific die-cut for a particular brand, showing not all labels have to be exactly the same.

BOTTLE: One example of label used for many products.

ROUND CHEESE: Used to seal wrapper on round cheese.

CONDIMENT: Specific die-cut for a particular brand, showing not all labels have to be exactly the same.

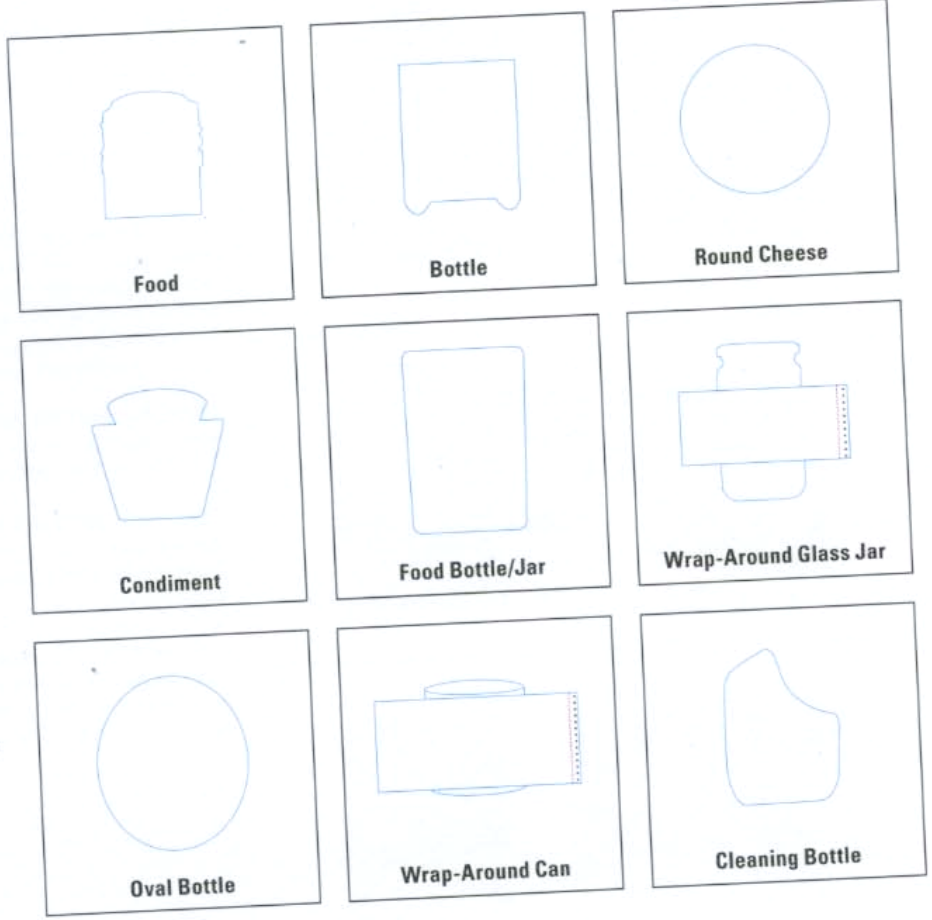
FOOD BOTTLE/JAR: Commonly used vertical label found on bottles and jars.

WRAP-AROUND GLASS JAR: Wraps all around the entire jar.

OVAL: Used for a wide variety of products such as; wine, food or beverage.

WRAP-AROUND CAN: Wraps around a can of food, coffee or other item contained within a can.

CLEANING LABEL: Typical label for cleaning supplies bottles.



Label Adhesives

Labels are made of paper, plastic, laminate, cloth, acrylic, plastic, just to name a few. A label can also be printed directly on the package.

Pressure sensitive label adhesives are commonly made from water-based acrylic adhesives, with a smaller volume made using solvent-based and hot melt adhesives. The most common adhesive types are:

PERMANENT: Normally cannot be removed without tearing the label and damaging the surface.

PEELABLE: Otherwise known as removable, this label is easily removed without damaging the label or the surface.

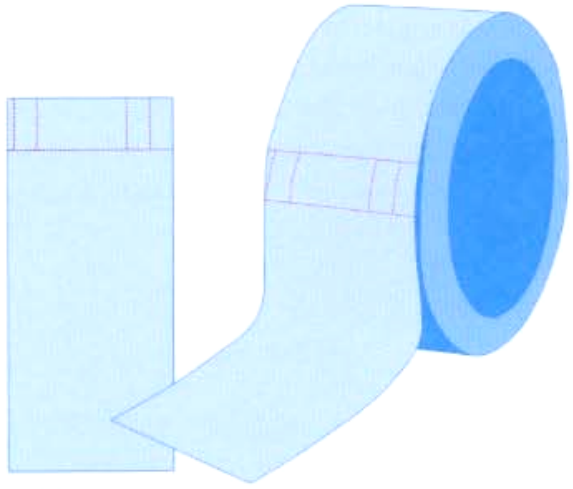
ULTRA-PEELABLE: Ability to remove without leaving any kind of residue and no damage to the surface.

FREEZER OR FROST FIX: Permanent label with the ability to handle -40 degrees Celsius temperatures.

HIGH TACK: A permanent adhesive adheres to difficult surfaces, such as textured or dirty surfaces.

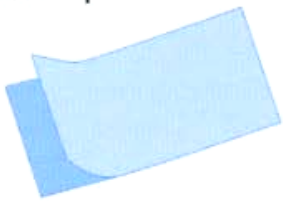
STATIC CLING: No adhesive is used, instead the material has a static quality allowing it to cling flat and smooth on surfaces such as glass.

SHRINK WRAP: A plastic sleeve placed over the container and sent through a heat tunnel to adhere the label to the container, taking the shape of the container.

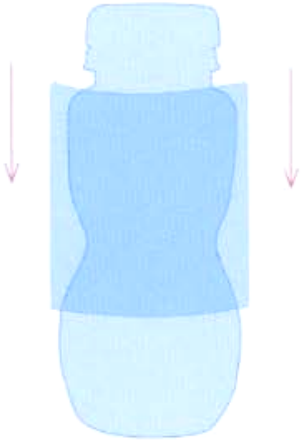


Label Roll

3-Ply Shrink Wrap



2-Ply Shrink Wrap



Shrink Wrap