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SNIPPETS

FOR THE PAPER INDUSTRY

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KNOW YOUR "BOARD"

Carton board is all board that is used to make folding cartons (i.e.: folded boxes). It thus means mainly folding box board, but also some solid board, and some other grades that are bending quality. The other important properties of these board grades generally are: Scott ply bond, stiffness, caliper, bulk, and printability, plus adequate barrier properties for the end-use.

The production of cartons essentially involves (in-line, if desired):

- Printing the web. E.g.: by 4 or 6 color flexography.
- Stamping out the blanks with a die cutter.
- Shaping the blanks with a creaser-slitter (scorer-slitter).
- Folding and gluing (folder-gluer) the appropriate flaps.

The carton blanks are shipped flat, and erected when ready to be filled. Erection rates go up to about 250 carton/min. A few corrugated container erecting machines also erect cartons, but at a slower rate (e.g.: 30 carton/min)

SOLID BOARD:

Solid board is made from a single furnish.

Solid Bleached Surfate (SBS): Traditionally the furnish has been bleached chemical pulp, with a minimum of 80% in North America. Recently there has been a trend to add RCF.

There are 2 types:

Uncoated (by pigments) (UZ) – Used mainly for – Food board. Eg.: frozen food cartons, cups (cup stock), plates (plate stock), and oven-able trays (i.e., suitable for a conventional oven); dual oven-able trays are also suitable for a microwave)

Liquid packaging board (LPB) when plastic coated. E.g.: Tetra Pak milk carton, other dairy products and juice carton – sometimes using aseptic packaging.

Coated (GZ) – C1S or C2S. Used for – food board. The first board-based butter tub to be marketed in Europe has been designed for Carrefour by CAN Packaging using Stora Enso's Ensocoat and Ensocup board grades plus Ensobarr coating. The tub can withstand the different temperature and relative humidities in the shop and domestic refrigerators, and its barrier properties are said to surpass those of aluminum foil.

Graphic board. In Europe, there is a trend to double (even treble) on-machine coating. Coating is 10-23 g/m²/side.

Solid un bleached Kraft (SUK). The coated version (coated unbleached Kraft, CUK) was developed at the end of the 1980s. Its strength has made it popular as carrier board for beverage multipack carriers (e.g. Beer), envelopes and food board. Coating is about 30 g/m² (one side).

FOLDING BOX BOARD:

Folding boxboard (FBB, folding carton board; the word boxboard by itself usually means folding boxboard, but could also mean containerboard {i.e.: corrugated box board} or set-up boxboard). Its prime characteristic is a furnish with sufficient long fiber, particularly in the top liner(s), to allow creasing without cracking.

Coated Folding Boxboard

GC1 - Composition is Coated bleached chemical pulp top / mechanical pulp filler / bleached chemical pulp back. It is used for graphic board

(e.g.: postcards), and high quality cartons (e.g.: cosmetics, chocolates, cigarettes). The top side can be coated up to 3 times. ie: 18-25 g/m²/side. Sometimes the back side is coated. ie: 7-12 g/m², but goes up to 25 g/m². It is soft calendared. It consists of a middle layer of CTMP and outer layers of chemical pulp.

GC2 – Composition is – Coated bleached chemical pulp top/ mechanical pulp filler/ mechanical pulp back. It is used for lower quality cartons. E.g.: detergent packs, cereal packages.

GC3 – As for GC2, but with high bulk (1.7 – 2.1 cm³/g)

Uncoated Folding Boxboard. UC. The uncoated furnish analogs of GC1 (ie: UC1) and GC2 (i.e.: UC2). Being uncoated, they are used for end-use requiring lower quality.

Duplex and Triplex Boards:

Duplex Boards: Duplex (D) grades have 2 furnishes. This usually means a base of RCF and atop liner that may contain virgin pulp or be 100% RCF. The commonest duplex board is white-lined chipboard (WLC):

-Coated (GD) – clay coated news, CCN, bending news board.

-Uncoated (UD) – white patent coated news board, which is not coated.

Some duplex boards are not bending quality.

Triplex Boards: Triplex (T) grades have 3 furnishes. This usually means a top liner, filler and bottom liner. The liners for chipboard can be white, brown, Kraft or manila. E.g.: white-lined manila-backed board, which is GT (if coated) or UT (if uncoated). Some triplex boards are not bending quality. Beer mat board has a bulky absorbent mechanical furnish for filler, with brighter outer liners for printability. Grammage 480 – 600 g/m².

ASEPTIC PACKAGING

Aseptic processing and packaging extend the shelf life of food and drink by means of 3 steps:

-Rapid heating of the product (e.g.: food) to kill bacteria, followed by rapid cooling.

-Separate sterilization of the packaging by chemicals or heat. Absolute sterility is not achieved, but micro-organisms are commonly reduced by a factor of 10¹². Medical packaging may be sterilized by hydrogen peroxide and heat. Alternatively irradiation, using either IR or UV, gives essentially complete sterilization.

- Filling under sterile conditions. E.g.: enclosing the operation in a sterile air flow.

BARRIER PROPERTIES:

Although this topic relates to carton board, the same principles apply to other paper and board grades that are given barrier properties.

According to the carton contents (and buyer preference), the appropriate level of barrier properties (against: moisture, water vapor, oxygen in air, other gases, odor, taint, grease, oil, other liquids) is conferred on the board. Barrier chemicals coming into contact with food must meet the appropriate health regulations (e.g.: FDA, BgVV).

In approximate increasing order of barrier resistance, - Hard sizing, by either internal sizing or surface sizing. Starch-based biopolymers are being developed.

- Extended refining plus chemicals, as used for glassine and

INDUSTRY NEWS

M/s Yash Pakka is among Top 50 in Best Workplaces in Manufacturing 2023.

W&F Wires & Fabriks has launched new packaging solution with **ULTRA FL** brand for customer quality need.

W&F takes necessary fumigation and safety measures in packing of fabric and screens before movement, this ensures safety at consumption end.

greaseproof.

- Wax impregnation or coating (eg: by curtain coater). The wax may migrate and the surface may be slippery. E.g.: disposable drinking cups, bread wrap, linerboard.

- Sulfuric acid bath, as used for vegetable parchment.
- Silicones.

- Whey protein has been investigated in the laboratory at the Univ. of California, Davis, because it is both biodegradable and edible.

A native isolate and a heat denatured isolate coating on board were found to have similar barrier properties (against grease) to fluoro chemicals and polyvinyl alcohol (both below) plus good barrier properties against oxygen. Their gloss was at least as good as these 2 alternatives, but not as high as kaolin coated board. However, the coating of both isolates showed cracking after 2 months storage and the native isolate also showed some yellowing.

- Fluoro chemicals.

- Polyvinyl alcohol.

- Water-based latex emulsions of synthetic polymers.

- Co-extrusion or lamination with other materials. (e.g.: EVAL, PE, PET, PMP, PP, PVDC) or aluminum foil.

Controlled gas porosity, in combination with resistance to liquids, can be achieved by the micro-perforation of materials - since surface tension prevents the liquid from passing through micro-pores. Such micro-pores can be configured either in lines, uniformly over the surface, or in zoned arrangements. They measure 2-70 µm diameters, and pore density can go up to 300 pores/cm² in zoned areas. Macro-perforation gives pores in the 50-500 µm diameter range. Electrostatic micro-perforation and laser macro-perforation are used for papers, nonwovens and plastic film. Both gas and liquid porosity can be measured and controlled in-line for web widths up to 2 m.

Vegetables and fruit continue to live and respire after harvesting, by taking in O₂ and giving out CO₂. Modified atmosphere packaging (MAP) extends the shelf life of food (including meat) by modifying the storage atmosphere and thus slowing down the ageing process (senescence). Some common constituents of modified atmospheres are

-CO₂ – Present in the atmosphere at 0.03% concentration. Used at 20% to inhibit bacteria and fungus growth to extend shelf life, and also keep the product moist.

-N₂ – Making up 78% of the normal atmosphere, its inert character suppresses aerobic micro-organism reproduction and so extends shelf life. It also prevents the product from sticking together or forming lumps. Used particularly for dry products.

-O₂ – Used above the 21% normally present, and reportedly up to 80% to retain the red color of meat (myoglobin).

-Noble gases.

Such packages are made by 2 processes:

- Evacuating the package and introducing the gas(es). i.e.: thermoform - fill - seal packs, trays, and side-seal pouches.

- Gas-flushing, i.e.: pillow-type form - fill - seal bags/trays/pouches.

Packaging barrier transmission rates of O₂, CO₂ and ethylene must be high enough to match product respiration rates. Packages must also be transparent and puncture resistant. Two properties relating to film sealing performance during and after manufacture are:

- Hot tack measures the force to peel a seal immediately after it has been made (and is still hot)

- Heat seal measures the force to peel a seal after it has cured for 24 hr.

Measurement of barrier effectiveness can include (depending on the penetrant and substrate)

- Water vapor transmission rate (WVTR), moisture vapor transmission rate (MVTR). TAPPI Test methods includes (test result unit is g. water/ m²/24 hr)

- T 448, which measures the mass of water vapor transmitted by a sheet (at 23°C) having 0% RH on one side and 50% RH on the other side.

- T 464, which is similar to T 448, but the temperature is now 37.8°C (100°F) and the % RH are 0% and 90%.

- T 523, which uses a constant chosen temperature. This method is dynamic, in that it measures the increase in % RH in a dry chamber (which starts the test at 5% RH) as moisture passes through the sheet from the high-humidity chamber (at 90% RH) on the other side. The results correlate well with the other 2 tests.

- Water absorption tests. E.g.: Cobb test.

QUOTABLE QUOTE	"There is nothing is noting IMPOSSIBLE to they who will TRY " - ALEXANDER THE GREAT	
SCRABBLE email answers by 25 th March' 23	Form a word : DONI HAS COMES CAR First correct answer will win a gift from Wires & Fabriks (S.A.) Ltd. (Maximum two prizes for one person in a year)	
WINNER FEB. 2023	No Correct Answer Answer : SPENT LIQUOUR	
?QUIZ email answers by 25 th March' 23	QUIZ: The primary screen rejects could be as high as 50%, the primary screen rejects are often sent to a secondary screen to recover usable _____. (a) Ink (b) Lignin (c) Pulp (d) Fiber	
WINNER FEB. 2023	Quiz: : The _____ process of Repap enterprises using 50% ethanol and 50% water at 195 degree celcius for nearly 1 hour has been demonstrated at 15 t/d . (a) Copper cell (b) Megnesium cell (c) Aluminium cell (d) Strontium cell	
 Prizes	No Correct Answer. Answer : (c) Aluminium cell Best / first correct answer received will win one-year subscription to IPPTA Journal (Maximum one prize for one person in a year).	
 Teaser	<i>Teacher:</i> Can you tell me TWO pronouns? <i>Student:</i> Who? Me? <i>Teacher:</i> Correct! Very Good. <i>Student:</i>\$&#@	
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