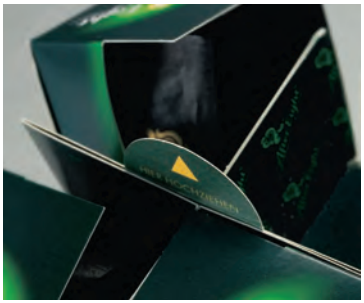
GLOSSARY

9



Adhesives
Adhesives are used to join surfaces together. They are involved with folding cartons in lamination where one of the substrates is cartonboard, carton construction in carton making and during packing where they are used to erect and close cartons. There are several types of adhesives, e.g. starch, polyvinyl acetate (PVA), wax based (hot melts) and plastic based e.g. polyethylene (PE) as used in PE extrusion lamination.

Biodiversity
A term which describes the diversity of species in the natural world. It is important to maintain the large number of species in the natural world and their associated genetic material. Species can be lost when natural habitats and eco-systems are changed.

BIR
Bureau of International Recycling

Bleaching
A process which removes residual lignin from chemical pulp and makes the cellulose fibres, otherwise known as pulp, chemically purer and brighter in appearance.

Brightness
Brightness is the term used to describe the intensity of colour and luminance which relates to the lightness or darkness of an image. Brightness also has a specific meaning for paper, board and pulp where it is defined as the amount light of a specific wavelength, 457 nanometres (nm), reflected from the surface when measured in a specified way - this measurement has virtually no relevance to a printed carton which is normally viewed under the wider range of wavelengths present in the visible spectrum. (see Whiteness)

Cast coating
A mineral pigmented coating mix is applied to the surface of cartonboard, smoothed and cast against a heated chromium plated high gloss cylinder to which it sticks but from which it releases when sufficiently dry, resulting in a high gloss surface finish.

Cellulose
Cellulose is a polymer based on carbon, oxygen and hydrogen. It forms the cell walls of plants and, therefore, the plant fibres. In pure fibrous form cellulose is soft, flexible, chemically pure and odourless.

Though individual fibres are themselves translucent when bulked together the mass is white in appearance.

CEN
European Committee for Standardisation. Standards published by CEN are referenced with “EN” and the appropriate number.

CEPI
The Confederation of European Paper Industries.

Chlorine
Chlorine is a gas at room temperature and has many industrial uses. It used to be used for bleaching pulp but this process has been discontinued because it produced undesirable by-products.

Coating of cartonboard
Mineral pigmented coatings are applied to the surface of cartonboard to make it whiter, smoother and capable of having gloss, satin or matt surface finishes. The mineral component is usually china clay or calcium carbonate. The coating is bound together and to the surface of the cartonboard by a synthetic binder (adhesive). The coating is applied to the surface from an aqueous (water) mix. The excess is removed and the remaining coating smoothed using a blade, air knife or smoothing roll. The coatings are dried and the surface “finished” by buffing or friction glazing.

Compression strength
An important property of cartonboard. It relates to the strength required to prevent cartons collapsing under load when stacked on top of one another.

Crease
A groove made in the surface of cartonboard which facilitates folding. It is made with a thin strip of metal with a smooth, rounded, edge which indents the cartonboard surface and pushes it into an accurately cut groove on the underside of the board. The latter is known as the "make-ready" or matrix. A crease acts like a hinge when adjacent panels of a carton are folded.

Cross direction, CD
See Machine direction (MD). The Cross Direction is the direction at right angles to the MD. Although proportions of fibres orient themselves in all directions it is usual to measure those properties of cartonboard which show directional variations in just two directions, the machine and cross directions respectively.

Cutting
In the context of folding cartons, cutting is a process combined with creasing whereby the profile of the carton is produced from printed cartonboard.

Dimensional stability
Changes in the moisture content of cartonboard can result in dimensional changes in the sheet or carton. The extent of such changes are minimised during manufacture. It is also important that the exposure of cartonboard to variations in temperature and relative humidity (%rh) are minimised by good manufacturing practices in printing, carton making and in the packing operation.

Dry End
That part of the cartonboard manufacturing machine following the wet end, where board is dried, surface sized, surface coated, smoothed and reeled. (See Wet End)

ECMA
European Carton Makers Association

EMAS
The Eco-Management Scheme set up under the European Union. When this is awarded it indicates that the organisation concerned is operating eco-management to the satisfaction of the awarding body. It is site specific, requires external certification and for the results to be published.

Embossing
A process which imparts a relief design, either raised or impressed, in the surface of cartonboard. It can be applied in register with text, or other printed image, or may be applied all over the surface, where it can provide, for example, a linen or sand pattern. Embossing is often combined with hot foil stamping.

EUROPEN
An industry body dealing with packaging and environmental issues.

FAO
United Nations Food and Agricultural Organisation.

Flatness
See dimensional stability.

FMCG
Fast Moving Consumer Goods.

Folding
Folding occurs when a cartonboard panel is rotated around another panel separated by a crease, which acts as a hinge. Folding is necessary during carton manufacture and during the packing operation.

Fourdrinier
One of the most common ways of forming a sheet or web of fibre on a cartonboard machine is by flowing the suspension of fibre in water onto a moving wire mesh. The name is derived from the Fourdrinier brothers who patented the process. Some machines have several wires, each forming a layer of pulp. The various layers are then combined. Alternatively, pulp is deposited in several layers on a single moving Fourdrinier wire mesh, building up the layers of the cartonboard. As each layer is formed it passes under a smaller wire mesh which extracts water vertically. This method is known as Inverform.

FSC
Forest Stewardship Council.

Gloss
Gloss relates to the amount of light reflected from a surface compared with the amount of incident light. It can be measured in a defined way based on defined angles of incidence and reflectance. Highly reflective surfaces are said to have high gloss levels, lower levels are described as satin, silk, semi-gloss and matt. The way mineral pigment coatings are treated can result in various levels of gloss. Gloss can be also be achieved with inks and varnishes.

Gluing
See Adhesives.

Grammage
This is the weight per unit area measured in Europe in grammes per square metre (g/m^2). Most cartonboard packaging has a grammage in the range 200 to 600 g/m^2.

Hot foil stamping
Plain or printed cartonboard can be covered with a reflective metallic foil using a heated metal die. This technique is frequently combined with embossing.

INCPEN
Industry Council for Packaging and the Environment.

ISO
International Standardisation Organisation.

Lamination
A process whereby cartonboard is combined by means of a suitable adhesive with another sheet of either paper, eg. coated MG Kraft, greaseproof, glassine or vegetable parchment, another sheet of cartonboard, or a plastic film such as oriented polypropylene, cellulose acetate, polyvinyl acetate or aluminium foil.

LCA
Life Cycle Analysis.

Light fastness
A measure of the resistance to fading caused by exposure to light. In practice the light concerned is sunlight and a commercially acceptable degree of light fastness of print and the whiteness of a cartonboard surface can be defined. Fading can be accelerated and measured in a fadeometer.

Machine direction (MD)
When cartonboard is manufactured the fibres at the wet end tend to line up in the direction of motion along the machine. This is known as the Machine Direction (MD).

Nicks
These are uncut parts of a die knife cut which hold the sheet together after die cutting and creasing so that the sheet does not break up prematurely.

Opacity
High opacity is important when both sides of a sheet of cartonboard is printed. High opacity means that only a small amount of incident light is transmitted through the cartonboard. Opacity depends on the ability of the cartonboard to absorb and scatter incident light.

OPP
Oriented polypropylene film.

Pasting
When reels of several layers of paper or cartonboard are laminated with one or more additional layers of paper or cartonboard the process is known as “pasting”.

PE
Polyethylene, used in plastic extrusion coating.

PEFC
Programme for the Endorsement of Forest Certification.

Perforation
A row of short cuts made with a special design of knife. They are used for easy opening features, they facilitate the removal of coupons or reply cards and in carton manufacture, on 45° creases which are folded back on themselves to form crash lock bottoms and in other constructions.

PET
Polyester (polyethylene terephthalate), plastic used in extrusion coating.

pH value
A measure of the acidity or alkalinity of a solution. This is a scale where a value of 7 is neutral, values below 7 are increasingly acidic and values above 7 up to 14 are increasingly alkaline. For cartonboard, the pH of an aqueous extract is measured. It is relevant for direct contact with metal objects and in the lamination of cartonboard with aluminium foil.

Pigment coating
A mineral pigment coating is based on either china clay or calcium carbonate. (See Coating of cartonboard).

Plastic extrusion coating/lamination
Plastics such as polyethylene (PE), polypropylene (PP) and polyethylene terephthalate (PET) can be applied in the molten state to the surface of cartonboard by extrusion coating. PE can also be used as an adhesive as, for example, when cartonboard is extrusion laminated with aluminium foil.

Platen die
This the name given to the tooling used to cut and crease the profile of a carton. It comprises a steel frame (forme) in which cutting and creasing rules are secured for the particular carton profile. A sheet of cartonboard is cut and creased when it is momentarily clamped between this forme and a flat bedplate.

Plies
The layers of pulp forming a multiple layer paperboard.

Ply bonding
Adhesion between layers in a multiply paperboard.

PP
Polypropylene, used in extrusion coating.

Printing
Using ink to apply text, illustrations and other graphical images to cartonboard.

There are several printing processes used to produce cartons - offset lithography, gravure, flexography, letterpress together with digital printing for some specialised applications.

Pro Carton
Association of European Cartonboard and Carton Manufacturers.

PVC
Polyvinyl chloride film.

Relative humidity, % rh
The amount of water present in the atmosphere expressed as a percentage of the amount required to saturate the atmosphere at the same temperature.

Recovered fibre
Fibre recovered from paper and paperboard which has been collected after its original use has been completed, also known as recycled fibre and secondary fibre.

Retail ready packaging
Secondary transit packaging, containing a number of primary packs, which is designed for convenience in merchandising at the point of sale. Also known as “shelf ready packaging”.

RFID
Radio frequency identification device.

Rotary die
The surface of a cylinder can be machined to create knives and creasing rules. The rotary system is used to make cartons from a reel of printed cartonboard, often printed on the same machine. Due to the high cost and longevity of such dies they only become commercially viable for high volume production. Narrow web machines using dies produced by more recently developed techniques have altered the commercial position in some applications.

SETAC
Society of Environmental Toxicology and Chemistry.

Scoring
When a knife is used to partially cut through cartonboard, the resulting score can be folded.

Stiffness
Stiffness is a measure of the resistance of cartonboard to bending. It is usually defined as the force which must be applied to deflect a piece of cartonboard through a specified distance or angle. Stiffness is the most important strength property of cartonboard.

Surface smoothness
This property has an aesthetic significance and is also important in printing and varnishing. In the gravure printing process for example, a rough surface will not reproduce the printed image correctly - some dots will not transfer properly and result in “dot skip”.

Tear strength
Force required to promulgate an existing cut in a sheet of cartonboard.

Thickness of cartonboard
The distance between the two surfaces of the carton measured in thousandths of a millimetre (µm). Because cartonboard is compressible thickness is measured in a special way at specified compression force per unit area. Most carton packaging has a thickness in the range 350 to 800 (µm).Thickness is also referred to as caliper, a term derived from the instrument which was used to measure thickness at one time.

Varnish
Varnishes are used to develop the required print finish. Usually this means enhancing the gloss level. It is also used to protect print from abrasion. There are several methods of applying varnish and several types of varnish.

Vat
Multilayer cartonboard is also produced on a machine where the pulp for each layer is circulated in a vessel known as a vat. A cylinder covered with wire mesh rotates in the vat and a layer of pulp is deposited on the wire mesh. A blanket passes over the tops of several vats collecting layers of pulp from each to build the layers or plies of the cartonboard.

Virgin fibre
Fibre derived directly from wood, also known as primary fibre.

Wet End
Comprises the forming and pressing sections of a cartonboard machine. After forming water is removed by drainage, vacuum and pressure.

Whiteness
Whiteness, and colour in general, is a perceived sensation of the eye and brain. It depends on several factors - the illuminating light source, and the ability of the illuminated surface to absorb, reflect and scatter that illumination. Carton makers have studied the type of whiteness which is preferred by the market and have developed surfaces by means of mineral pigmented coatings and other additives to meet specified levels of whiteness. Whiteness, and other colours, can be measured in a spectrophotometer.

WWF
World Wide Fund for Nature.

Pro Carton, the European Association of Cartonboard and Carton Manufacturers, would like to thank Alexir Packaging, Chesapeake Corporation, The Holmen Group, Graphic Packaging International Sweden, Korsnas Frovi, Mayr-Melnhof Karton, M-real and Stora Enso for supplying photographs and helping with editing the text.

Printed on Era Silk donated by M-real
Designed and produced by **Carr Kamasa** Design
Printed by Spin Offset