

## A

**A Series** An international ISO range of sizes

**Absorbency** The extent to which a paper will take up and hold a liquid.

**Absorption** The first stage of drying of ink when printed onto a porous material.

**Acid free paper** Paper that does not contain any acid. Good for archival purposes. Precautions are taken during manufacture to eliminate any active acid that might be in the furnish, in order to increase the longevity of the finished paper (sometimes known as 'long life paper').

**Acrobat** A computer software package used for editing PDFs.

**Acrobat Distiller** Used to create PDF files from postscript.

**Acrobat Reader** Software package used to view PDFs. For more information on how to download Acrobat Reader, access the Adobe site on [www.adobe.com](http://www.adobe.com)

**Adhesion** The bond between ink/toner and the material on which it is printed.

**Airmail paper** Paper made in the lightest substance consistent with strength and a good surface, for reasons of postage costs (usually below 40 g/m<sup>2</sup>). Manifolds and lightweight bonds are also often known as airmail papers.

**Ambient conditions** The conditions surrounding a particular piece of equipment, such as temperature and humidity.

**Antique** A quality bulky paper, particularly opaque, with a rough surface finish. It can be made with deckle edges and either laid or wove. A good printing surface is a feature of this grade, which is often used for more expensive books.

**Antique laid** Antique paper embodying faint laid lines that are seen when holding a sample to the light.

**Aqueous (inks)** Aqueous inks or other coatings have formulations based on water, as opposed to organic solvents.

**Archival paper** Paper intended for permanent records and usually subject to a specification covering strength and chemical properties. Often used for legal documents.

**Art paper** A generic term given to woodfree coated papers, which has traditionally referred to papers with a highly polished surface in the upper quality bracket. Today the term is less used because of the introduction of more categories in the sector. However, 'Real Art' is still used for those woodfree coated papers, gloss or matt, which are considered to be of the very highest quality.

**Artwork** Original illustrative copy or typesetting, ready for reproduction.

## B

**B Series** An international ISO range of sizes

**Back up** To print on the reverse side of a printed sheet.

**Bale** Solid, compressed stack of pulp or paper sheets.

**Banding** A defect in the print of a graduated tint.

**Base board** Board intended for coating or laminating.

**Base paper** Name given to the base sheet for off machine coating, or paper intended to be converted, eg by a coating process or by impregnation. The term is sometimes also used for paper to which a layer of other material (aluminium, plastics) is bonded.

**Basis weight** The weight of paper defined in grams per square metre (g/m<sup>2</sup>).

**Binder** The adhesive used to stick the layers of coating together and to the paper or board surface. The most frequently used binder is starch, but synthetic binders are also used to give improved performance.

**Binding** The process of securing the pages of a document together to form a 'book' or set.

**Biodegradable** A substance that will decompose as the result of action by bacteria and other living organisms.

**Biodiversity** Biological diversity in nature. Man influences the biodiversity mechanically through construction, cultivation and raw material supply, and chemically through (for example) municipal waste and

industrial emissions.

**Blackening** Defect associated with calendered paper occurring as unintended local areas of apparently darker or greyer colour due, for example, to the paper being too damp when passed through the calender.

**Blade coated paper** Paper coated by a process in which the freshly applied wet coating is smoothed and the excess removed by a thin, flexible metal blade that bears on the coated surface.

**Bleaching** A chemical treatment used to whiten, brighten and improve the performance of pulp.

**Bleed** The part of a printed image beyond the area to which the finished sheet will be cut.

**Blind embossed** A logo, text or design that has been relief stamped into a sheet of paper, onto which no printing ink has been added.

**Boards** A term applied to paper above an accepted weight. The substance when paper becomes known as board varies a great deal between manufacturers and can vary from as low as 180 g/m<sup>2</sup> to as high as 250 g/m<sup>2</sup>. The lower substance definition usually refers to boards in the graphic sector.

**Book jacket paper** The term applied to the printed dust cover or wrapper used to cover books or similar publications; usually a high quality coated grade in the higher substance range.

**Breaking length** The calculated limiting length of a strip of paper of any uniform width, beyond which, if such a strip were suspended from one end, it would break under its own weight.

**Brightening** Addition of optical brighteners to the stock to make the pulp appear whiter.

**Bulk** A term applied to the substance, thickness and feel of a paper.

**Bulk packed on pallets (BPOP)** A method of packing paper in which the sheets are not wrapped in parcels but stacked on the pallet, tabbed at the required intervals to indicate quantity and over-wrapped.

**Bulky mechanical** A mechanical paper made to a specific caliper as opposed to a fixed grammage. Typical calipers are 102 and 127 microns. This type of paper, used mainly for mass market paperback books, also has several uses when converted, such as cash register rolls.

**Bulky paper** Paper that appears to be thick in relation to its grammage.

## C

**C1S/C2S** One side coated and two side coated papers and boards.

**CB, CF, CFB** see Carbonless copy paper.

**CMYK** Standard process colours used in four colour printing - cyan (C), magenta (M), yellow (Y) and black (K), with the K standing for key colour.

**CoC** see Chain of Custody.

**Calcium carbonate** Chalk pigment used as a filler in some papers, usually neutral sized grades, also used as a white coating mix.

**Calendered** Paper subjected to smoothing and polishing between stacks of highly polished steam heated rollers (calenders), which can form part of the dry end of the papermachine, but there are other forms of calendering performed away from the papermaking machine.

**Calibration** Using a fixed measurement to make certain of the correct operation of a machine.

**Caliper** see Thickness.

**Carbon cycle** After use and recycling, wood based products such as paper decompose, releasing carbon dioxide. New forests established in place of those cut down remove carbon dioxide from the atmosphere.

**Carbon dioxide** One of the basic gases in the atmosphere, produced by animals and needed by plants for assimilation. Cellulose is formed from carbon dioxide and water. The use of fossil fuels raises the amount of carbon dioxide in the atmosphere; carbon dioxide is the biggest contributor to the greenhouse effect and thus to the unwanted rise in atmospheric temperature.

**Carbonless** This consists of two sheets of paper; the underside of the top sheet (designated CB, coated back) is coated with colourless dye in minute gelatine capsules; the underneath sheet (CF, coated front) is coated with a reactive chemical which turns blue or black when mixed with the colourless dye. Pressure from a pen or printer on the top sheet causes the gelatine capsules to break, the dye and chemical then mix and the blue or black copy appears on the bottom sheet. There is also an intermediate paper (CFB, coated front and back), used between

the top and bottom sheets to make multi-part sets. Some types of carbonless paper are not separately coated but incorporate both parts of the dye mechanism within the one sheet. Not all carbonless is suitable for digital, as some of the oils used can damage the internal workings of the printer.

**Carton** A container, usually made of relatively thin carton or folding board.

**Case bound** The standard hard back book finish.

**Cast coating** A method of drying coated paper by contact of the freshly coated surface with a highly polished chromium plated heated metal surface. Cast coated papers or boards have an extremely high gloss finish for top quality printing. The finish is obtained by the coating mix solidifying while in contact with the polished surface, resulting in the surface of the paper or board possessing the mirror like quality of the surface on which it is dried.

**Cellulose** Complex fibrous substances forming the walls of plant cells; the prime raw material in pulp.

**Chain of Custody** Allows open transparency in tracking and tracing forest products along the supply chain from the forest to the end user. Third party environmental audits are carried out by organisations such as the FSC and PEK to endorse Chain of Custody certificates.

**Chemical pulp** Fibre pulp made by means of chemicals that dissolve the bonding agent - lignin - in the wood. The chemical pulping process produces all the energy it needs through burning the dissolved wood constituents and recovering and regenerating the pulping chemicals.

**Chip board** A cheap board grade usually manufactured from the lower grades of waste paper.

**Chips** Small pieces of wood produced by a chipper; used to produce pulp, fibreboard and particleboard and also as fuel.

**Chlorine** A common element (symbol Cl) which occurs naturally in the environment, and which is vital to all living organisms. One of the most important industrial chemicals, it is used for example to make PVC, to purify water and to bleach pulp.

**Chlorine bleaching** Chlorine gas has been used to bleach pulp for many years, but its use has been greatly reduced in the past few years. The excessive and uncontrolled use of chlorine in old bleaching equipment is known to have led to the formation of harmful polychlorinated organics. Minimising the amount of chlorine gas by chlorine dioxide substitution is an efficient way to avoid this.

**Chlorine dioxide** A compound of chlorine and oxygen (symbol ClO<sub>2</sub>). Chlorine dioxide is the most selective (ie able to remove lignin while preserving cellulose) of all known oxidising bleaching chemicals. Using chlorine for bleaching greatly reduces the organic chlorine compounds created in the process. The occurrence of dioxins and furans can be fully prevented.

**Clean edge** Refers to a very fine perf line that simulates the effect of a guillotine cut edge. (Also known as microperf.)

**Coated paper or board** Material coated on one or both sides with a mixture of china clay, latex and other loadings to fill up surface pits and improve the printing surface. There are a variety of coating methods including roll coating, blade coating, air knife coating and brush coating, or combinations of these types. A very high quality form of off machine coating is cast coating. Some digital technologies require papers to be specially coated before use.

**Coating (mineral)** The application of a layer of minerals applied to one or both sides of paper or board to improve brightness, gloss and printability; the mineral most often used is china clay (hydrated aluminium silicate), but calcium carbonate and titanium dioxide are also used; the coating is held together and stuck to the paper by a binder.

**Coat weight** The amount of coating on a base paper expressed as dry weight on a given area in grams per square metre (g/m<sup>2</sup>).

**Cockle** Local deformation of a sheet of paper due to unequal shrinkage giving it a slightly crumpled appearance.

**Coil binding (spiral binding)** A form of binding whereby spiral 'wires' (made from wire or plastics) are inserted through holes punched in the substrate. Increasingly, these 'wires' are being made from eco friendly materials.

**Colour correction** Method used to improve the reproduction of the colour original.

**Colour management** System used for calibrating machines to ensure accurate colour rendering throughout the workflow.

**Comb binding** A form of binding whereby circular plastic combs are used to create the bind.

**Computer Integrated Manufacturing** A process of using computers to streamline the workflow.

**Conditioned paper** Paper that has been treated, at the mill or at the point of use, to adjust the moisture content to what is considered to be an optimum level for flatness and stability.

**Container boards** These boards, are made to provide a variety of product containers, usually from waste materials. They may, however, be lined with bleached or unbleached kraft, or other papers, depending on end use. Some of these boards may also be treated with plastics to provide special characteristics.

**Continuous Inkjet** ink is forced through a small printing nozzle in the printhead at a steady flow rate. The electrically charged droplets are directed onto a substrate or deflected into a collection system.

**Continuous stationery** A grade widely used on modern high speed accounting and similar machines. The paper is supplied in reel form and along with the printing process many finishing techniques can also be used, such as perforation and special folds. A particular use is for invoices, statements and similar documents, when it is normally fan folded.

**Contrast** The ratio of brightness between the lightest and the darkest parts of an image.

**Converter** A company that specialises in sheeting, re-reeling or changing the format of reels and sheets of paper and board into packaging or finished goods for sale to the trade or public.

**Copier paper** Lightweight grade of good quality, used for copying correspondence and documents. May be glazed or unglazed. Most copier papers are laser compatible and special grades are made for colour copying.

**Core** The tube on which material is wound. Usually cardboard, but may be plastic or metal.

**Corrugated fibreboard Board** consisting of one or more sheets of fluted paper stuck to a flat sheet of paper or between several sheets. The following are the main classifications:

Single face corrugated fibreboard: Board consisting of one sheet of fluted paper stuck to one sheet of facing.

Single wall corrugated fibreboard (also known as double faced): Board consisting of one sheet of fluted paper interposed between, and stuck to, two facings.

Double wall corrugated fibreboard (also known as double-double faced): Board consisting of two sheets of fluted paper interposed between, and stuck to, three facings.

Triple wall corrugated fibreboard: Board consisting of three sheets of fluted paper interposed between, and stuck to, four facings.

**Cover papers and boards** A range of different grades that may be plain, embossed, or coated. These grades may also be made into two ply or three ply papers for special cover work. Many cover papers are characterised by strength, flexibility and durability.

**Crop marks** see Register marks.

**Cross direction** The direction in the plane of the sheet, at right angles to the machine direction, in a sheet or web of paper; the set expansion coefficient of paper is about three times as much in the cross section as in the machine direction.

**Curl** Sheet distortion leading to a tendency to roll up.

**Cut set** A multi-part business form, which is cut to a precisely required size and in an individual set (ie not continuous). (Also known as a unit set; a snap apart set is a particular type of cut set.)

## D

**DAM** see Digital Asset Management.

**DFE** see Digital Front End.

**DMI (Direct Machine Interfaces)** Allows data collection directly from the production device. Delivers data direct to the MIS.

**dpi** see Dots per inch.

**DI** see Direct Imaging.

**Dandy roll** The roll on the wet end of a papermachine, in contact with the upper surface of the forming web, which is covered with a woven wire and usually carries a design to form a watermark.

**Defibration** Separation of wood fibres by mechanical and/or chemical means.

**Deinkability** Suitability of recovered paper for de-inking; depends on paper grade, printing process used, age of paper and other factors. Some forms of inkjet have raised problems with de-inkability.

**Deinked pulp (DIP)** Waste paper pulp produced by de-inking.

**Deinking** The removal of printing ink and mechanical impurities by flotation and/or washing pulped waste paper before it is recycled.

**Densitometer** An instrument for measuring the density of a colour or differences in tone.

**Density** The darkness of a printed image.

**Digital Asset Management** The practice of storing and retrieving digital or electronic files such as images, logos and marketing collateral in a centralised system. Particularly useful for printers who work on catalogue, brochure or corporate production.

**Digital Front End (DIFE)** The device used to drive the data to the print machine.

**Digital paper** Paper specifically designed and optimised for digital printing technology.

**Digital press** A press that receives its image directly from a computer file.

**Digital printing** The printing process where an image is applied to the substrate directly from a digital file rather than using plates or film. Digital printing includes a variety of different technologies including inkjet, electrostatic, thermal transfer, or laser.

**Digital proofing** Proofing directly from digital files instead of using film to create proofs.

**Dimensional stability** Ability of paper to retain its dimensions and its shape (a) despite changes in its moisture content under the influence of, for example, variations in the surrounding atmosphere, or (b) despite variations of the physical and mechanical stresses during printing and converting operations or use.

**Direct Imaging (DI)** The process of directly imaging plates on press.

**Dots per inch (dpi)** Used usually in the context of semitone or process printing, which refers to the frequency of print dots appearing. The greater the dpi, the finer the print.

**Double coating** Coating of paper or board twice on one or both sides.

**Down time** Non-productive time when a printing machine is being maintained or cleaned.

**Drilling** The process of putting holes into the substrate. Drilling is used prior to binding when used with things such as coil and comb binding.

**Dry offset** A method of printing, as in the offset lithographic method, but from a relief plate, and without the use of a fountain solution.

**Dry strength** Mechanical strength of a dry paper sheet (includes tensile strength, tearing resistance and folding endurance).

**Duplex paper and board** Grade made from two different webs combined during the manufacturing process while still moist, without the use of adhesive. This combination may, for example, be two different webs of furnish, colour or substance.

**Duplex printing** Printing on both sides of a sheet.

**Dummy** An unprinted representation of the text pages of a book or magazine made by folding and collating sheets of the intended quality, size and grammage of paper so that an idea may be formed of the general appearance and thickness of the final result.

## E

**ecf (elemental chlorine free)** A common definition for pulp bleached without using elemental chlorine. Originally any of the bleaching techniques for chemical pulp, when no molecular (elemental) chlorine is used.

**ENGO** Environmental non governmental organisation.

**EMAS** Eco-management and audit scheme.

**EMS (Environmental Management System)** Part of the management system of an enterprise. Under an EMS, all functions of a business from design to delivery are planned and controlled from the point of view of a sustainable environment. The primary objective of an EMS is to ensure that environmental matters are taken care of through a documented system and environmental effects are decreased in every function of a business in a way that is stated in its environmental policy.

**EVA (ethylene vinyl acetate)** A glue used for hot melt binding.

**Eco-solvent Inks** A variety of inks that contain less solvents. Not necessarily more environmentally friendly than pure solvent inks, but they do emit less VOCs. These inks are usually more slow to dry, therefore may require heaters to aid with ink drying.

**Ecosystem** All living organisms - the plants, animals and microbes - and their environment in a defined zone, eg the forest ecosystem.

**Electronic Data Interchange (EDI)** The electronic exchange of documents, such as invoices or purchase orders, commonly used between trading partners.

**Embossed paper** Paper on which a raised and or depressed design has been produced by pressure.

**Emissions** The release of impurities from a source such as industry and farming.

**Encapsulation** The process of applying a film (usually up to 250 microns), to both sides of the printed piece, which seals the contents.

**Encoding** Characters that are printed, invariably on cheques, which contain iron, and which can be recognised by MICR automatic readers. MICR stands for Magnetic Ink Character Recognition.

**Environmental audit** An examination of the operations of a company, organisation or authority in relation to the environment, eg emissions, occupational health and safety and the use of resources. It is carried out by independent, trained environmental specialists or auditors.

**Equilibrium moisture content** The moisture content of a paper that has reached a balance with the atmosphere surrounding it, ie in a condition in which it will neither give up nor absorb moisture.

**EU Eco Label** Also known as the EU Flower. The EU Eco label is a certification scheme designed to help end users across Europe distinguish more environmentally friendly products. The label is administered by the European Eco-labelling Board (EUEB) and has the support of the European Commission, member states of the European Union and the European Economic Area.

**Eyelet** The protective metal ring used over a drilled hole to provide strength and protection to that hole.

## F

**FTP (File Transfer Protocol)** The program used to transfer files through the Internet from one computer to another.

**FSC** see Forest Stewardship Council.

**Fanfold** A web of paper folded into connected sheets by alternate folds across the web.

**Fan out** Widening of the paper web on the press due to dampening or printing pressure.

**Fastness** Resistance of colour to fading.

**Feathering** A fault with ink spreading into non-printed areas, causing blurred images.

**Felt** A fabric that presses the paper web against the drying cylinder on the papermachine.

**Felt mark** Imprint left on the paper by one or more of the felts used in making paper. Special effects can be introduced in this way.

**Fibre** Wood cell whose properties vary from one tree species to another; the main raw material for papermaking.

**Filler** A material, generally white mineral matter such as china clay or calcium carbonate, which is added to the paper furnish to increase opacity, improve flatness and allow a smoother finish to be obtained.

**Filling in** The spreading of the printed image on a sheet.

**Fine paper** Fibre based paper usually containing less than 10% mechanical pulp, eg quality printing and writing paper.

**Finish** The surface characteristics imparted to paper by mechanical means.

**Flame resistant paper** Paper that has been given a treatment designed to give it a certain degree of non-flammability and/or of incombustibility.

**Flexographic printing** A method of relief letterpress printing using flexible rubber or photopolymer plates on web fed rotary presses.

**Flocked paper** Paper with velvet like smooth unglazed surface.

**Fluorescent paper** A white base paper or board coated with a mixture of fluorescent pigment and binder, the

latter being used to key the former to the surface. The coating is activated by ultraviolet light, either by exposure to an ultraviolet lamp or to natural daylight.

**Fluorescent whitening agent/fluorescent dye** A dyestuff that is capable of converting ultraviolet light into the visible spectrum and improving the brightness of the paper in which it is incorporated. Sometimes known as an optical bleaching agent (OBA).

**Flush** To trim both covers and sections at the same time in binding,

**Fluting** Fluting is a paper that has been pressed into a continuous series of upright and inverted arches to give it the properties of rigidity and cushioning. Usually made of hardwood semi-chemical pulp or waste paper, it is employed in the manufacture of corrugated fibreboard. Various degrees of structure are produced, depending, on end use, ranging from the coarsest A flute (between 105 and 125 flutes per metre) to F flute (more than 320 flutes per metre).

**Fly sheet** A web of paper, frequently unprinted but not necessarily so, to which a form is attached for processing through continuous output printers.

**Foil blocking/foil stamping** The process by which extremely fine leaves of foil are impressed onto a paper, usually logos or company names.

**Folding boxboard** Although boxboards can vary in quality from grey board to premium board, the term is usually taken to mean white lined boards. They are made on multi-layer machines, and the outer layers may be of a different furnish to the centre layer.

**Forest land** Land with the capacity to produce at least 1m<sup>3</sup>/ha of wood a year during one rotation.

**Forest Stewardship Council** A neutral organisation that promotes responsible forestry and sustainability. It has defined principles for good forest management and allows the tracking of wooden goods and its sources all the way down the supply chain. The system of certification provides an assurance of sound environmental management practices.

**Formation** The fibre distribution throughout a sheet of paper. The two extremes are described as 'wild' and 'even'.

**Fourdrinier machine** The most common form of papermaking machine. It forms a web in a continuous sheet on a horizontal, or near horizontal, forming surface. It is named after the Fourdrinier brothers who financed the first operational machine at the Frogmore Mill, Hertfordshire, UK in 1803.

**Fully bleached pulp** Pulp that has been bleached to the highest brightness attainable (>90 ISO).

**Furnish** The mixture of various materials blended in the stock or raw material from which paper and board is made. The chief constituents are wood or other pulps, sizing material, fillers, dyes and other additives.

**Fuser** Part of a non-impact printing system that fuses toner or powder on to paper.

## G

**g/m<sup>2</sup> (gsm)** Both stand for grams per square metre, g/m<sup>2</sup> is the correct definition by paper makers but gsm is used much more frequently by printers. This is the primary measurement of the weight of paper.

**Gamma** Measure of how compressed or expanded the dark and light shades become in an image.

**Ghosting** There are two types of ghosting: a) An image that appears as a lighter area on a subsequent print, due to local blanket depressions from previous image areas. b) Spoiling of a print by an image on it or work on the reverse side that has interfered with its drying, so that differences in the trapping of some colours or variations in gloss are apparent.

**Glassine** A hard semi-transparent paper.

**Gloss** Gloss can refer to the reflectivity of paper itself or to the printed result on it. Gloss of paper is measured by using a Gardner gloss meter, which measures reflected light at an angle of 75°, and is expressed in Gardner gloss units - the higher the number, the glossier the paper surface.

**Graduated screen** A 'screen' is a series of ink 'dots', printed on to a paper, which gives the appearance of a solid colour. The depth of screen colour can be deepened by increasing the dot frequency (see dpi), or the converse. A graduated screen is one where the dpi is varied across the screen so that you get a fading/deepening effect across the printing.

**Grammage** Another expression of gsm or g/m<sup>2</sup>, used to express the weight of paper or board (see g/m<sup>2</sup>).

**Graphic papers** Papers for printing and writing.

**Gravure printing** Process in which recesses on a printing cylinder are filled with ink and the surplus removed by a blade. The paper contacts the cylinder and 'lifts' the ink from the recesses before depositing it on the paper. Generally used for long run printing, eg magazines and catalogues, because of the high cost of the cylinders.

**Greaseproof paper** Paper that has a high resistance to penetration by grease or fats from foodstuffs. The paper is produced by prolonged beating in the pulp stage.

**Greenhouse effect** The natural greenhouse effect is necessary for all living species. An excessive greenhouse effect due to human activities is causing unwanted warming of the lower atmosphere. Certain gases in the atmosphere, such as water vapour and carbon dioxide, do not prevent short wave solar radiation from reaching the earth; but they do hinder the escape of the wave reflective radiation from the atmosphere. The latter thus heats the atmosphere, resulting in a greenhouse effect.

**Green paper** Immature paper that has not been conditioned or had the opportunity to mature naturally.

**Greyscale** The 'greyscale' is literally a strip of paper showing tones from white to black. 'Greyscale' refers to a range of neutral colours - an 8 bit file can have 256 levels of grey (including black and white). A colour monitor uses 8 bits for each pixel, displaying 2 to the 8th power (256) different colours or shades of grey.

**Grey board** A board made entirely from waste paper. It can be lined or unlined and is used for a variety of packaging purposes.

**Gripper** A device on a printing machine for holding the sheet during the printing or finishing process.

## H

**HTML (Hypertext Mark-up Language)** The most common formatting code added to text documents turning them into hypertext documents.

**HWC** High weight coated. A printing paper grade.

**Halftone** The representation of tonal gradation by an image composed of dots of varying sizes, the centres of which are equidistant.

**Hard pulp** Chemical pulp with high lignin content. Hard sized Paper with a high degree of sizing.

**Hardwood pulp** Pulp obtained from the wood of hardwood trees by various processes. The fibres are generally shorter than those of softwood pulp.

**Hickey** A spot on a printed sheet caused by dust, lint or ink imperfections; particularly noticeable on solids and halftones,

**Hologram** A device created by recording the wave patterns and diffraction of light. Used mainly for security purposes.

**Hood** A hood covering the papermachine drying section and designed for moist air removal. It also helps to reduce the level of sound in the paper mill.

**Hydrapulper** Large circular metal tank in which dry pulp is mixed with water and other ingredients in the first stage of the papermaking process.

**Hydrogen peroxide bleaching** A method in which pulp is bleached in an alkaline environment with hydrogen peroxide, sometimes using oxygen reinforcement. The method considerably reduces the need for chlorine containing chemicals in the final bleaching of chemical pulps.

## I

**ICC (international Color Consortium)** An organisation set up to promote the use of vendor neutral, cross platform colour management systems. The ICC specification is widely used.

**ISO 9001** An international quality standard for industry defining the structure of an organisation, its obligations and authorisations, the structure of production and its ability to manufacture products or to produce services at a continuous quality level in conformity with the standard.

**ISO 14001** An international environmental standard that provides a framework for the development of an environmental management system.

**ISO brightness** The brightness of paper and board measured at a wavelength of 457 nanometres under standard conditions. Image colour enhancement Permits a wide range of colours to be printed beyond the four colour process.

**Imitation parchment** A tough greaseproof paper.

**Imposition** Arranging individual pages on a printed sheet so that they will be in correct sequence when folded.

**Impressed watermark** Semi-genuine watermark made in the papermachine press section using engraved rolls while the web is still wet.

**Inkjet** Process where ink dots are projected onto the substrate to form an image. Most common are thermal, which heats ink in the printhead to boiling point, and piezoelectric, which sends an electric charge to a piezo-crystal, which then changes its shape and thus forces out ink through the printhead nozzles. (See also Piezoelectric inkjet and Thermal inkjet).

**Inkjet printing** A printer that sprays drops of ink onto the substrate to form an image. Drop on-demand inkjet shoots out single drops of ink, while continuous inkjet sprays a constant stream of small droplets. (See also Continuous inkjet and Drop on-demand inkjet).

**Ink fade** Variation in ink density or uneven ink film.

**Ink rub** A defect, often associated with matt coated papers, in which parts of a dried ink film are removed by pressure or friction from another surface.

**Integrated mill** A mill that starts with logs or wood chips and produces wood pulp, which it then processes to make paper or board without intermediate drying. In an integrated pulp and paper mill, pulp is piped direct to the paper mill.

**Intermittent board machine** A machine for producing sheets of thick boards by winding the web from a Fourdrinier wire or cylinder mould(s) around a making roll to form a sheet consisting of several layers. When the thickness is sufficient the layers are cut, so forming a sheet which is removed from the machine for drying and any further processing.

**Internal sizing** The addition of materials such as rosin and alum to stock, generally in order to increase the resistance of the finished paper to the penetration and spreading of aqueous liquids, eg ink. Frequently described as engine sizing.

**Ivory Board** High quality board with a bright, clear appearance, particularly used for high class printed work. Original Ivory board was, and still is, made in Holland (Dutch ivory board), although the grade is now made in many countries.

## J

**JDF (Job Definition Format)** An XML based file format. JDF is designed to allow an open exchange of data between different machines and applications, from various manufacturers, including pre-press, press and finishing, thus providing a streamlined flow of information from job inception to completion.

**JMF (Job Messaging Format)** The messaging element within IDE

**JPEG (Joint Photographic Experts Group)** A format for image files.

**Job ticket** Specifies the print job and gives all pre-press requirements, technical information, finishing required and administrative data.

**Jumbo reel (or roll)** The first reel of paper produced after the papermaking process, prior to transfer to a different part of the mill for further coating, processing or finishing.

**Just in time printing** Documents can be stored digitally and then produced at a given time. This type of process allows for only the number of copies needed to be printed.

## K

**Kaolin** A fine clay used in papermaking.

**Keyline** A line drawn on artwork that indicates an area for tint laying, positioning of halftones etc, where this must be done at a later stage. May be printing or non-printing.

**Knocking up** Aligning the edges of a pile of paper.

**Kraft paper** Paper made from a particular type of chemical wood pulp, ie kraft pulp. It may be bleached or unbleached and is a strong paper that is largely used for wrapping and packaging; the term comes from the German word for strong. Affectionately known as 'brown paper'.

**Kraft pulp** Chemical wood pulp produced by digesting wood by the sulphate process. Originally a strong,

unbleached coniferous pulp for packaging papers, kraft pulp has now spread into the realms of bleached pulps from both coniferous and deciduous woods for printing papers.

**Kraftliner** Facing board used, for example, as an outer ply in corrugated board.

## L

**lpi** see Lines per inch.

**LWC** lightweight coated paper with a grammage below 60 g/m<sup>2</sup>.

**L\*A\*b\*** Colour based on values of light (L), red/green (a) and yellow/blue (b).

**Label papers** A large variety of body papers that are made to be gummed, or for application of a self-adhesive material.

**Laid lines** A continuous watermark consisting of very close parallel lines, generally associated with spaced lines called chain lines at right angles to them.

**Laid paper** Usually printing or writing paper with a ribbed appearance caused by the use of a wire roll or dandy roll at the wet end of the papermachine

**Laminate** A converted product made by combining together suitable paper or board either with other paper or board or with other materials such as plastics or metal foil, generally by means of an adhesive, to form a product with particular qualities.

**Laminating** A surface coating applied after the printing process.

**Laser printing** Images are produced through electronic impulses using an intense focused beam of light. (Laser: Light Amplification by Stimulated Emission of Radiation).

**Lay** The position of print on a sheet of paper.

**Layboy** A stacking device on a paper cutter.

**Layout** An overall term to describe the design of the print or artwork.

**Lean manufacturing** Identifying and eliminating wasteful resources within an organisation - whether that is raw materials, man hours, power etc. Manufacturing then becomes most cost efficient, clean and efficient. Lean encompasses good organisation with optimised workflow and value for customers, whilst often providing a better environment for employees. It can also help to make a company more environmentally friendly. Its implementation is centred on getting the right elements to the right place at the right time in the right quantity to achieve perfect workflow, while minimising waste and being flexible.

**Letterpress** Printing from images with a raised surface, which are inked and impressed directly onto the surface of the material.

**Lick coating** A light form of mineral coating, achieved by supplying the surface sizing press of the papermachine with coating material instead of normal surface sizing solution.

**Life cycle** All stages in the lifetime of a product from raw materials through to use and disposal. It includes production of raw materials, the production, processing, storage, transport of materials and disposal.

**Light fast** Inks that will not fade to any significant extent even after prolonged exposure to light are termed light fast.

**Lightweight coating** Coating applied at 7 to 10 g/m<sup>2</sup> on one or both sides of the paper.

**Lightweight printing paper** Printing paper with high bulk and a grammage under 40 g/m<sup>2</sup>, used in telephone directories, sales catalogues and airmail projects.

**Lignin** A substance in wood that binds its fibres together and reinforces its structure. Lignin is removed in the manufacture of chemical pulp.

**Lines per inch (lpi)** A gauge of resolution quality.

**Line work** A printing term used to describe printing in which lines of ink, or solid blocks of ink, appear.

**Lint** Surface fibres released from paper during printing.

**Listing paper** A form of continuous stationery used for computer listings, punched with sprocket holes at the edges and traditionally printed with light green horizontal lines set to the same pitch as the printing device.

**Lithographic printing** A planographic (ie flat surface) printing process in which the non-image areas of the printing plate are made 'wetable' and the image areas are made to repel water whilst attracting the printing medium (ink).

**Long grain** The fibres in paper naturally take up an alignment roughly parallel to the direction of travel of the web on the paper machine; this becomes the grain direction. When cut, the paper's grain direction may be parallel either to the long edge of the finished sheet (when it is called long grain) or the short edge (short grain). Papers are normally stocked in long grain form, short grain being supplied to special order. The grain direction affects the stiffness in a particular dimension and must be taken into account when planning a job that needs to be folded, as paper usually folds easier with the grain.

## M

**MIS** see Management Information Systems.

**Machine direction** The direction in a sheet of paper corresponding to the direction of travel of the forming surface; the majority of the fibres in the sheet position themselves with their lengths parallel to this direction.

**Machine fill** The width of the paper machine taken up by a making of paper. For reasons of economy it should approach as far as possible the maximum width of the machine. Also known as deckle fill.

**Make up** Preparing and collecting all elements of a page

**Machine glazed (MG)** Paper that has had one side made smooth and glossy by pressing and drying in contact with a very large, heated, polished metal cylinder which forms part of the drying section of the machine (see Yankee dryer). The other side of the paper remains relatively rough.

**Make ready** Time spent preparing a machine to run a specific job.

**Magnetic Ink Character Recognition paper (MICR)** Usually a high quality bond paper with good surface characteristics and dimensional stability for printing with magnetic inks for computer sorting.

**Management Information System (MIS)** Computerised modules designed to streamline workflow by providing relevant real time information as a job is going through the press.

**Manila** Originally paper made from pulp produced partly or entirely of manila hemp, but now mostly composed of softwood Kraft pulp. Most frequently employed in industrial uses including the printing industry, especially envelopes.

**Matt paper** A coated paper with a dull smooth finish.

**Mechanical paper** A paper that contains a proportion of mechanically produced wood pulp. These papers enjoy good opacity and caliper, but will yellow with age and tend to be very weak. Newspapers are printed on mechanical papers.

**Mill conditioned paper** Paper that has undergone conditioning at the mill to regulate the moisture content and prevent it warping and curling when exposed to the air.

**Misregister** The appearance of a printed image out of its correct position.

**Moisture content** The amount of moisture in paper, expressed as a percentage of its weight. A moisture content of around 7 to 8% is recommended for printing papers.

**Mottle** The appearance of irregular spots or blotches in a printed area that should be even in colour.

**Mould made** Originally, paper made by hand by the tradition method of paper moulds, usually from rag pulp. Today, mould made papers are high quality grades made on a cylinder mould machine, as opposed to a Fourdrinier or other type of machine, and may be made with or without deckle edges.

**Multipart** Refers to a business form that contains more than one leaf of paper.

## N

**NBHK** Northern bleached hardwood kraft. An important variety of market pulp, produced chiefly from birch trees; it is brighter than NBSK but not as strong.

**NBSK** Northern bleached softwood kraft. One of the chief varieties of market pulp, produced mainly from spruce trees from Scandinavia, Canada and north eastern USA, It consists of long (hence stronger) fibres than NBHK.

**NCR** No carbon required. This expression, which was introduced by the National Cash Register Company (which formerly owned the patents), has now been superseded by the term carbonless.

**Newsprint** The relatively low grade paper intended for the printing of newspapers; it is mainly produced from mechanical softwood pulp and recycled fibres.

**Nip** The pressure point between two rollers.

**Non-renewable** resources Oil, coal, natural gas and other sources of energy which occur naturally and cannot be replaced.

**Nordic Swan** The Nordic Swan is an eco label where a joint Scandinavian co-ordination team has determined the criteria for various branches of industry and applications are dealt with by a national committee.

**Nozzle** Minute hole in the printhead from which ink is expelled. Printheads can incorporate many nozzles.

## O

**OMR** Stands for Optical Mark Recognition, and is the process via which the typed or written position of a 'mark' (ie, a simple tick or shaded out area) on a piece of paper denotes an instruction to an electronic forms' processing device.

**Offset letterpress** see Dry offset.

**On machine coating** The process of covering the surface(s) of a paper with one or more layers of coating slip or other materials in fluid form, without recourse to a separate operation, the necessary equipment being an integral part of the papermachine.

**On press proof** Sample print in a small run length to show the final printed result. Often used with the digital process.

**Opacity** The extent to which a paper is capable of obscuring matter printed on the other side or on an underlying page or other surface lying underneath.

**Open Architecture** Allows users to add to or upgrade their systems with new components - even using new software from third parties. (As opposed to Closed Architecture, in which the manufacturer chooses the components and they are not generally upgradeable).

**Out work** Operations put out to another company or individual for reasons of specialism or capacity.

**Over run** Sheets or copies produced in excess of the required number.

## P

**PDF (Portable Document Format)** Electronic file format for pages including fonts, graphics and text.

**PEFC** see Programme for the Endorsement of Forest Certification schemes.

**PUR (polurethane reactive)** A glue used for adhesive binding suitable for heavier or difficult to bind substrates It is very strong, durable, but also flexible. it also has excellent lay flat qualities.

**PVA (polyvinyl acetate)** Cold melt glue used in binding.

**Pass** The travel of a printhead assembly over a substrate is called a pass. Printers can be either single pass or multi-pass. Single pass printing is usually faster than multi-pass.

**Pantone colour** Also known as the PMS, ie Pantone Matching System. This is an ink system where eight primary colours are mixed in defined ratios to achieve a specific colour, ie if asked for PMS 357

- this is a reference for a specific colour, achieved by mixing three or four of the Pantone primary colours to achieve a particular shade.

**Paperboard** A term sometimes used for lightweight boards (below 300 g/m<sup>2</sup>).

**Perfect binding** Means of binding books or magazines using adhesive.

**Personalised printing** The ability of a digital press or printer to individually personalise each sheet within a run. This can take the form of changing text, graphics or images, altering colours or typeface, and personalising the content through variable data printing.

**pH value** A number on a logarithmic scale extending from 0.3 to 14.5 which indicates the active acidity or alkalinity of an aqueous liquid. Neutrality is represented by pH 7.07; figures below this reading indicate increasing amounts of acidity, and those above, alkalinity.

**Picking** The rupture of the surface of paper during manufacture or printing, which occurs when an external tensile force applied to the surface (eg from an ink that is too tacky) is greater than the cohesion of the paper.

**Post consumer** waste Waste paper that comes from the end user such as that collected from businesses and homes.

**Poster paper** A grade with a quick drying surface used for out door poster work. The rough underside lends itself to rapid pasting.

**Pre consumer waste** Waste paper that has left the mill, but not reached the end user. This consists of printers' and converters' off cuts and rejects, as well as some damaged paper. It does not include mill broke.

**Preflight checking** Software that allows inspection of a file to ensure that all information included is correct (ie fonts, image resolution, imposition).

**Pre-press** All the functions that take place before a job is printed such as artwork, proofing, or make up.

**Printhead** The part of an inkjet printer through which ink is jetted onto a substrate. It includes the ink feed, a thermal or Piezo transducer and many nozzles.

**Printings** A general term used to describe a wide variety of papers and boards to which print is intended to be applied in one form or another.

**Print on-demand** The ability to print the exact number of documents necessary at any required time.

**Programme for the Endorsement of Forest Certification(PEFC)** A neutral organisation that promotes good forestry management and practices. The organisation has developed a set of strict environmental criteria to which forest owners and managers must work. A certification system means that PEFC products have the highest environmental standards.

**Proof** A pre-production print, made for the purpose of checking the accuracy of layout, type matter, tone and colour reproduction.

**Pulp** The generic term for the cellulose fibre material used in papermaking.

## Q/R

**Quire** A traditional term for one twentieth of a ream. The traditional ream was 480 sheets so the quire was 24 sheets.

**RFID** see Radio Frequency Identification.

**RGB** The colours, red, green and blue, that make up an additive form of CMYK.

**Radio Frequency Identification (RIFID)** Allows chips, or printed circuits, to be inserted in products as a track and trace technology. Gaining an increasing use in packaging.

**Raster Image Processor (RIP)** A device or program that interprets a page description language containing a file's instructions for printing. The RIP converts instructions to dot patterns, so that the printer or press can create a document.

**Real Art** A generic term given to woodfree coated papers, which has traditionally referred to papers with a highly polished surface in the upper quality bracket. Today, the term is less used because of the introduction of more categories in the sector. However, Real Art is still used for those woodfree coated papers, gloss or matt, which are considered to be of the very highest quality.

**Ream** Five hundred (500) sheets of paper of the same quality, size, and grammage.

**Recyclability** The only obstacles to the recyclability of fine paper are certain finishes such as UV lacquering, laminating, plastic coating, pulp dyeing, self-adhesive glues, scratch finishes, plastic windows in envelopes, flexographic printing, and some forms of inkjet.

**Recycled paper** Paper made all or in part from recycled pulp.

**Recycled pulp/fibre** pulp made from waste paper and board and reused to make paper. The quality of the fibres deteriorates with recycling, so paper cannot be recycled endlessly and some virgin fibre must be introduced to the materials stream.

**Reel** A continuous length of paper wound on a core, irrespective of diameter, width or weight. Reels may thus be rewound into smaller reels or slit into coils.

**Reel to reel** A machine on which the material is supplied in reel form, and comes off again in reel form.

**Register** The accurate positioning of images on a sheet relative to one another.

**Register marks** A set of fine line crosses or other suitable devices added to original artwork to provide reference points for accurate subsequent multi-colour printing or finishing processes.

**Relative humidity (RH)** Quotient of the amount of moisture in air and the amount that would saturate it at the same temperature and pressure, expressed as a percentage. Optimum printing press conditions are 20°C and 55 to 65% RH.

**Relief** Printing method using a raised image, eg letterpress.

**Remote proofing** Allows print companies to send electronic files to a calibrated printer at a customer site, which are then printed as proofs.

**Renewable resources** Forests, solar, wind and water and bio energy.

**Repro** Pre-press camera work, scanning and make up, whether film or electronic files.

**Resolution** Number of dots or pixels per unit length. Usually expressed as units per centimetre or inch. Reversed out printing Text is normally printed directly onto paper. The process of 'reversing out' is to print a solid block of colour while leaving the text to be read as unprinted areas on the paper, ie 'white' text being read on a background of solid colour - seen often in titles.

**Reverse side printing** Printing on the underside of a leaf of paper.

**Rigidity** The rigidity of a paper or board is measured using a Taber stiffness tester. This operates by measuring the force required to bend a strip of the material to an angle of 15°. The greater the force required, the more rigid the material and the higher the value.

**Run length** The number of copies to be printed.

**Runnability** The ability of a paper or board to perform on a printing press or on converting machinery without problems.

## S

**Saddlestitching** Means of binding using wire for stitching.

**Screen** A screen is actually a fine film on to which is printed a very fine matrix. The matrix is then laid on to a photograph that is to be printed, and the combination of photograph and overlaid screen is then photographed again by a professional printing camera, producing a photograph of 'dots'. These dots are then ultimately the position of printing ink, which reproduces a photographic effect. Screens are also used to print 'apparent' solid colours on forms but which are in fact a series of print dots that simulate solid colours. Screen matrices can vary in fineness, and are referred to as dpi - dots per inch. The finer the screen, the better quality print production. Photographs in newspapers are examples of coarse screens - say 85 dpi. Good quality magazines will use 150 to 200 dpi and can go up to 400 dpi.

**Screen ruling** The number of lines per inch (or centimetre) on a halftone or tint screen, equal to the number of dot say 85 dpi. Good quality magazines will use 150 to 200 dpi and can go up to 400 dpi.

**Self-adhesive paper** Used essentially for labelling purposes, this grade has a self-adhesive coating on one side and a surface suitable for printing on the other. The adhesive is protected by a laminate that enables the sheet to be fed through printing machines, the laminate subsequently being stripped when the label is applied.

**Self cover** Used when the cover of a document is made from the same paper as its text pages.

**Sewing** The method of binding whereby the document is held together through stitching thread.

**Sheeter** Machine that cuts reels of paper into sheets.

**Sheetfed** Those presses or printers that run cut sheet paper rather than paper from a roll or web. Some sheetfed machines can be converted to run webs with the aid of in line roll feeding equipment, which cuts the webs as it feeds.

**Show through** Due to the low opacity of some papers, copy can be seen on the other side to which it was printed.

**Shrink wrap** Plastic film wrapping.

**Signature** A print sheet that when folded and cut forms a group of pages. Also used to define a mark on the first and last pages of a document when producing book blocks.

**Silk** see Smoothness.

**Simplex** Single side printing.

**Slitting** Dividing a web of paper in the length wise direction into two or more narrower webs, an operation often carried out by converters.

**Smoothness** The surface smoothness of paper is measured by the Bendtsen smoothness test. The test measures the amount of air escaping between an annular ring and the material surface, and results are measured in ml/min. Papers having a value higher than 50 are usually referred to as matt, below 50 as silk (sometimes called satin or velvet).

**Soft proof** A proof that, rather than being printed onto a substrate, is transmitted to a customer's calibrated

monitor and shown on a computer screen.

**Special furnish** Papers made from special mixtures of pulps.

**Spectrophotometer** Measurement device that determines colour values.

**Splice** Joint in a web of paper in or approximately in the cross direction, made by an adhesive or an adhesive strip, either in order to obtain a reel of the desired length or to permit, (for example on a converting machine) a continuous operation between the end of one reel and the beginning of the next.

**Spooler** Computer memory or hard disk space where data files sit before they are sent to a printer/press.

**Spot colour** Used to enable colours to be included in the print without mixing the primary colours.

**Spot varnishing** Specific areas on the printed piece picked out with a varnish addition.

**Strike through** The effect seen on the back of a sheet of paper due to excess penetration of printing ink.

**Stock** An aqueous suspension of papermaking raw materials from the stage of disintegration of the pulp to the formation of the web or sheet.

**Substance** The weight of paper or board, shown by scales, taken from a sample. The weight is defined by grammage per square metre of a single sheet ( $\text{g/m}^2$ ).

**Supercalendered (SC)** A surface finish on paper that may vary from relatively dull but smooth to highly glazed, produced by passing damp paper through a supercalender stack. This is broadly similar to a machine calender stack except that it is separate from the papermachine and some of the rolls are made of compressed fibre (see also Calendered).

**Sustainable development** Keeping the overall environmental impact from operations within different areas of society within the limits of what man, society and nature can sustain in the long term.

**Swan Label** see Nordic Swan.

## T

**tcf (totally chlorine free)** Pulp produced without any chlorine or chlorinated chemical compounds whatsoever.

**Tack** The property that renders a film of printing ink sticky to the touch. It is governed by viscosity and adhesion.

**Thermal Inkjet** Process where ink is heated to boiling point, which then causes the ejection of the ink onto the media. Thermal printheads are usually cheaper than Piezo technology, but they need to be replaced more often.

**Thermal paper** The base paper used for thermal papers is first pre-coated and then treated with a special emulsion containing heat sensitive modifiers, co-reactants, pigments and colour formers. The heat from a thermal head (eg in a fax machine) melts the modifier, which in turn dissolves the co-reactant that allows the colour formers and pigments to mix, producing a high contrast image on the paper.

**Thermographic printing** Relief effect created by dusting a special powder onto a printed image while still wet and then passing the sheet through a heating device.

**Thickness** The distance between one surface of a paper and the other. Also known as caliper.

**Tie** The small link of paper that remains between each individual perforation cut, which links the paper together

**Toner** Chemical liquid or powder used to create an image in photocopying and laser printing. Toner sticks to charged areas and is then transferred to the paper and fused by heat.

**Tooth** A rough paper surface.

**Trapping** Trapping is a word used in connection with printing sequence of colours, one upon another.

**Twin wire** A two ply paper or board made on a papermachine with duplicated wire parts. In this way two sheets of the same composition are formed and combined, wire side to wire side, so that the finished sheet has two identical printing surfaces.

**Two sidedness** An unintended difference of varying degree in surface texture or shade between the two faces of a paper or board, which is inherent in the method of manufacture.

## V

**VOC** Volatile Organic Compound. In printing VOCs come from chemicals used in the printing process and from some inks; they evaporate into the pressroom and are considered toxic.

**Variable data printing** The ability in digital printing to change each document in a run to include different text or images, so that each is personalised/individualised (see also personalised printing).

**Vellum paper** Often used for certificates, vellum paper is strong, tough and of high class appearance. It is made to imitate the fine smooth finish of a parchment made from animal skin.

**Virgin fibre** Paper or board pulp fibre being used for the first time (as opposed to recycled or secondary fibre).

**Volume basis** An expression used to denote the theoretical thickness in millimetres of 100 sheets of the given paper in 100 g/m<sup>2</sup>. It thus gives an indication of the bulk of the paper.

**Void hickey** A spot appearing as an inkless hole in a printed image. See Hickey.

## W

**Waffling** Deformation of a sheet caused by excessive tack.

**Waterless printing** Waterless printing eliminates the water or dampening system. Using silicone rubber coated printing plates, special inks, and temperature control, the process is more environmentally friendly than other technologies as it saves on water, chemicals and paper. DI presses are generally waterless.

**Watermark** A deliberate design or pattern in paper that is visible when viewed by transmitted light or against a contrasting background, made by a dandy roll at the wet end of the papermachine.

**Web** The term given to the reel of printing paper intended for use on a web, ie not sheetfed, printing press. Also used in paper making for the continuous piece of paper that passes through all the processes of a papermachine before being wound onto the jumbo reel.

**Web presses** Those presses/printers that run paper from a roll or web rather than sheets.

**Web to print** An automated online system that controls all administration, print management and production files for a print job and allows customers to process their print requirements over the Internet.

**Wet end** The first stages of a papermachine, before the drying process, where much of the high percentage of water in the stock is eliminated by drainage, suction and pressure. A web of paper is left, which then passes to the drying cylinders.

**Wet strength paper** Paper treated to decrease its loss in strength on wetting.

**Wiro binding** A form of binding where wire loops are inserted through punched holes. There are many methods of wiro binding such as standard binding, Full Canadian (square backed with hidden binding); Half Canadian (half cover bind partially hiding the binding), or cased in.

**Wood containing** Paper that is part mechanical in furnish.

**Woodfree** A pulp or paper that contains no mechanical wood pulp. In commercial practise, a small percentage of mechanical fibre is usually acceptable. It does not denote a paper or pulp made from materials other than wood, neither it is a paper made without wood fibres.

**Wove paper** Paper first made as early as 1754 by forming it on a mould with a cover made from woven wire cloth, hence the name. The paper has an even opacity and is a type in common use today. The term is usually applied to stationery grades that are usually either 'wove' or 'laid'.

**Workflow** The printing process from production and pre-press, through to press and finishing.

**Wrinkles** Creases in paper that are caused by uneven moisture absorption.

## X/Y/Z

**XML (eXtensible Markup Language)** A set of rules for designing text formats in easily readable configuration. The next step beyond HTML.

**Xerography** Electrostatic copying process in which toner adheres to electrostatically charged paper to produce an image.