



Basic Glossary of Papermaking Terms

ABRASION RESISTANCE

Ability of paper product to withstand abrasion. Measured by determining degree and rate that a sample loses weight under specific rubbing action of an abrading substance, such as an eraser.

ABSORBENCY

Property of pulp, paper, and its constituents and products that permits the entrainment and retention of other materials it contacts, such as liquid, gaseous and solid substances.

ACCEPTS

Stock after it has been subjected to some cleaning processes.

AFTER DRYERS

The bank of dryers positioned after intermediate or sizing rolls.

AGITATOR

(1) Propeller or agitating shaft for stirring the pulp suspension in a chest or tank. (2) A rotating device for mixing fluids and fluid suspension in a tank or chest.

AIR DRY (a.d.)

Weight of moisture-free pulp or paper plus a nominal 10% moisture based on traditional assumption that this amount of moisture exists when they come into equilibrium with the atmosphere.

AIR DRYING

A method of drying the paper web on the paper machine by blowing air along the direction of the web.

ALUM

Papermaking chemical commonly used for precipitating rosin size onto pulp fibres to impart water-resistant properties (when used for water treatment) to the paper. Also, used for pitch control. More correctly called aluminium sulphate.

ANTI-TARNISH PAPER

Term originally applied to higher weight tissues used for wrapping silverware, but now used for all papers so prepared that they will not rust or discolour razor blades, needles, silverware etc.

APPARENT DENSITY

Weight (mass) per unit volume of a sheet of paper obtained by dividing the basis weight (or grammage) by the caliper (thickness).

BACKWATER

Water used in the papermaking process, recycled to reduce the wastage of fresh water, and normally contains residual amounts of fibres and chemicals.

BACKS

The waste paper stock used to make the bottom ply of a sheet of board.

BAFFLE

A device which obstructs the flow of fluid, whether to aid mixing or restrict the flow rate.

BALE

Solid, compressed stack of pulp or paper sheets.

**BASESTOCK**

Paper or board to be further treated in various ways.

BASIS WEIGHT

Weight in pounds of a ream of paper, usually consisting of 480, 500, or 1000 sheets of a specified size, according to grade. In countries using the metric system, more commonly referred to as grammage and expressed as g/m².

BEATER

Large, longitudinally partitioned, oval tub used to mix and mechanically “work” pulp with other ingredients to make paper.

BEATING

Mechanical treatment of fibres to improve fibre bonding. See Refining

BINDERS BOARD

Grey coloured, glazed board often used in the binding of hardcover books.

BIOLOGICAL OXYGEN DEMAND (BOD)

Amount of dissolved oxygen consumed in five days by biological processes breaking down organic matter in mill effluent.

BISULPHITE PULP

Pulp made by the bisulphite cooking process using bisulphite cooking liquor.

BLEACHING

Chemical treatment to whiten, purify and stabilise the pulp normally carried out in several stages.

BLENDING

Blending of different pulps in a chest to determine the quality of the final product.

BOARD

Generic term for stiff paper, often consisting of several plies and with a grammage normally above 150g/m².

BOGUS

Product that has been made from wastepaper or other inferior materials to imitate higher-quality grades.

BOND

Class of printing/writing papers made from bleached chemical woodpulp and cotton fibres.

BONDING STRENGTH

Intralayer binding force in a multi-ply paperboard or laminate. Also refers to the degree of adherence of coating and film on a sheet and to the inter-fibre binding force within a sheet.

BONE DRY (b.d)

(1) Descriptive term for the moisture-free conditions of pulp paper. See Oven Dry (2) Refers to air containing no water vapour.

BOOK PAPER

Paper suitable for printing and other uses in the graphic arts industry.

**BREAKS**

When the paper being made on the paper making machine ruptures while passing through the machine.

BREAKING

Process of returning sheets to liquid form.

BREAST

The point of the machine where the pulp suspension passes onto the paper machine wire.

BRIGHTNESS

Measure of the degree of reflectivity of a sheet of pulp or paper for blue light measure under specified standard conditions. (Also, though incorrectly, called whiteness).

BRISTOLS or BRISTOL BOARDS

Heavy graded papers possessing higher than average quality characteristics. Rigid enough to be used for announcements, invitations, postcards etc.

BROKE

(1) Paper trimmings or damaged paper due to breaks on paper machine and in finishing operations. (2) Paper which has been discarded during any stage in its manufacture; represents loss in time, money and effort.

BROKE PIT

A pit below the machine into which broke is disposed from the machine floor.

BULK

Compactness property of a sheet in relation to its weight (whose value decreases as compactness increases). Bulk is calculated as caliper divided by grammage.

BURSTING STRENGTH

Resistance of paper to rupture when pressure is applied to a side by a specified instrument. Also called burst, mullen and pop strength.

CALENDER / CALENDERS

Piece of processing equipment located at dry end of paper machine, consisting of a set of smooth-faced rolls through which paper sheet is passed for smoothing, levelling, polishing and gloss improvement. The rollers may be of polished metal (hard), or composite material (soft); the hardness of the material affects the degree to which the paper or board is crushed. Furthermore, the equipment could be placed in-line at the end of the paper machine just before reel-up, or done as an off-machine process (see supercalender).

CALENDER FINISHED

Paper and paperboard passed through a calender to improve surface characteristics by application of pressure, friction or moisture.

CALIPER

Thickness of a sheet of paper or paperboard, measured under certain specifically stated conditions, expressed in units of thousandths of an inch (called “mils” when referring to paper, and “points” when referring to paperboard). In regions using metric measurement, usually measured in millionths of a metre (microns or μm). Also called thickness.

**CAMBER**

Greater diameter in the centre of a papermaking roll, compared to the ends; this compensates for roll weight.

CAPSTAN

Machine to wind cable or rope.

CARBONIZING PAPER

Lightweight, uncoated paper made from unbleached chemical and/or mechanical pulps and surface coated with a carbon solvent or wax so that it takes up carbon inks and releases them under pressure, thereby duplicating the inked areas being printed.

CARBONLESS PAPER

Copying paper that is treated or coated so it can be used without needing carbon coating or interleaved carbon paper.

CARLOAD

Quantity of paper shipped from mill in or on a freight car. Must exceed a freight classification zone minimum weight to qualify for carload freight rate.

CAST COATED PAPER

Very high gloss coated paper and paperboard with surface characteristics produced by allowing applied coating to harden while in contact with surface of steam heated, highly polished, chrome plated drum.

CELLULOSE

Chief substance in cell walls of plants used to manufacture pulp.

CELLULOSE WADDING

See Wadding.

CENTRE

A chipboard tube upon which paper or board is wound.

CHEMICAL PULP

Mass of fibres resulting from reduction of wood or other fibrous raw material into component parts during cooking phases with various chemical liquors in processes such as sulphate, sulphite, soda and neutral sulphite semi-chemical process (NSCC).

CHEMICAL PULPING

Process of dissolving and extracting the lignin in wood by chemical means.

CHEMICAL WOODPULP

Pulp prepared from wood by either the kraft or other suitable digestion process.

CHEMITHERMOMECHANICAL PULP (CTMP)

Pulp made by thermomechanical process in which woodchips are pre-treated with a chemical, usually sodium sulphite, either prior to or during pre-steaming, as an aid to subsequent mechanical processing in refiners.

CHEST

Vessel equipped with an agitating device for storing, collecting, mixing and/or chemical treatment of pulp suspension. A large vessel fitted with an agitator for storing pulp stock.



CHINA CLAY

A white mineral which is mined, ground, purified and used as a filler in certain papers to make the sheet bright and opaque, or as a coating to make a paper smooth and to improve print quality.

CHIPBOARD

(1) Inferior quality, low density, solid or lined paperboard made primarily from recycled wastepaper stock and used in low strength applications. (2) Name used for cardboard made from wastepaper, normally consisting of several plies. (3) Colloquial name given to particleboard wood panel material.

CHIPPER

A machine that chips logs after de-barking.

CLARIFIERS

Storage tanks in which suspended solids are allowed to settle and be removed from green and white liquors in the causticising areas of a pulp mill.

COATED

Papers and paperboards that contain a layer of coating material, such as clay or pigment, in combination with an adhesive.

COATING

Process by which paper or board is coated with an agent to improve its brightness and/or printing properties.

COIL

A wound length of paper board in which the diameter is much greater than the width.

COMBINATION BOARD

Multi layered, cylinder made paperboard having outer and inner layers made from different pulp stocks.

COMBINED BOARD

Multi layered board made by uniting a number of boards with proper adhesives.

CONSISTENCY REGULATOR

A device for diluting pulp stuff to a steady, preset solids content.

CONSTRUCTION PAPER

Heavy type of paper used for watercolour and crayon artwork, made in various colours primarily from groundwood pulp.

CONTAINERBOARD

Single and multi-ply, solid and corrugated boards used to make boxes and other containers for shipping materials.

CONTRARIES

(1) Unwanted materials such as wire, paper clips and plastic. (2) Waste materials harmful to paper and the papermaking process.

CONVERSION

Subsequent process that paper or board undergoes after manufacture but before being sold to the customer.

**COOK**

Process of reacting fibre-containing materials, such as wood, rag, straw and bagasse, with suitable chemicals, usually under high temperature and pressure, in order to reduce them into component parts so that acceptable fibres can be separated and made into pulp.

CORD

Pulpwood volume measurement indicating a pile measuring 4ft x 4ft x 8ft, equalling 128ft³ (3.62m³)

CORE

The tube usually made of paperboard, on which a paper roll is wound.

CORRUGATED BOARD

(1) A pasted single or double faced, multi layered board having a fluted bottom or middle layer. (2) The fluted paperboard after it has gone through the corrugating operation and before it is pasted to the flat facing board sheet.

CORRUGATING MEDIUM (CCM)

Paperboard that is to be converted to a corrugated board by passing it through a corrugating machine. (Sometimes abbreviated to CCM – Corrugated Case Medium).

COUCH PIT OR HOG PIT

Tank with an agitator located below the papermaking machine for taking up couch broke. Also known as a hog pit.

COUCH ROLL

The final roll round which the wire passes at the wet end, normally of a larger diameter than a guide roll, of a perforated or wire construction and with a vacuum inside.

COVER PAPER

Paper used as protective covering for books, pamphlets, magazines, catalogues and boxes.

CREPE PAPER

Low basis weight paper made from sulphite, sulphate or mechanical pulp and given a simulated crinkly finish by crowding the web sheet over a roll with a doctor blade.

CREPING

Creping of paper on the paper machine using a large drying cylinder known as a Yankee.

CROSS DIRECTION (CD)

Side to side direction of a paper machine or the paper sheet made on it, as opposed to machine direction, which runs from head to exit end.

CUNIT

Pulpwood measurement equivalent to a volume containing 100ft³ solid of unpeeled wood.

CUTTER

A machine for converting paper from the reel to specific sheet sizes.

CUTTING PIPE

Water jets used to trim the rough edge off the paper while it is being made on the machine (deckle edges).

**COUCH**

The point on a papermaking machine where the wet web leaves the wire before the presses.

CURL

Paper or paperboard deformation caused by non-uniform distribution of strains and stresses throughout the sheet as a result of uneven internal moisture conditioning.

CUT SIZE

Fine paper cut to specific end use dimensions on a paper trimmer usually of the guillotine or rotary type.

CYLINDER MACHINE

Machine primarily used to make paperboards. The forming cylinders are covered with wire, so that, as they turn within a vat filled with stock solution, fibres are picked up to form a web on the surface with water draining through and passing out at the ends. The wet sheet is then transferred off the cylinder onto a felt for possible combining with other sheets (multiple cylinders on same machine) and subsequent pressing and drying.

DANDY ROLL OR WIRE ROLL

A hollow roll with varied coverings, usually metal, that compacts the fibres and applies finish characteristics e.g. a watermark.

DEBARKING DRUM

A cylindrical hollow tube (drum) through which logs are fed.

DECKLE

The width of the paper being produced on a paper or board making machine.

DEFIBRATION

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

DEFIBERING

Term for pulping processes i.e. separating the fibres of pulp bales, broke or waste paper, in water by mechanical action.

DEINKING

(1) Removal of printing ink and impurities from recovered paper; to produce recycled fibre pulp with maximum whiteness by a floatation or washing process. (2) Removal of ink and other undesirable materials from wastepaper by mechanical disintegration, chemical treatment, washing and bleaching before reusing as a source of papermaking fibre.

DEINKING CELL

Vessel in which glues and inks can be removed from post consumer or recycled waste.

DE-WIRING

Process by which blades are dewired, either by the snapping or cutting of the wires.

DIE CUT

Paper and paperboard products cut by a metallic die to specified dimensions or form.

DIGESTER

Pressure vessel used to chemically treat chips and other cellulosic fibrous materials such as straw, bagasse, rags etc, under elevated temperature and pressure in order to separate fibres and produce pulp.

**DIMENSIONAL STABILITY**

Ability of a sheet to maintain its original machine direction and cross direction dimensions with time and under variable moisture and relative humidity conditions.

DISINTEGRATION

See Defibering.

DOCTOR

A metal or synthetic weighted blade which bears against rolls and cylinders in order to keep their surfaces clean.

DRAINAGE

Formation of a paper or board web on the wire by removing water at the paper machine wet end.

DRAW

The pull or tension which paper undergoes between the parts of the papermaking machine.

DRY END

Portion of a paper machine where sheet moisture is removed by evaporation. Consists of several dryer sections or air dryers, depending on type and size of the machine. The end of the papermaking machine where the wet paper is dried, maybe calendered, and reeled up.

DRYER FABRIC

Fabric woven from high temperature resistant synthetic materials to support and provide contact for the damp paper web with the hot dryer cylinders, at the dry end of the papermaking machine.

DRYERS

(1) The steam heated cylinders on the papermaking machine over which the wet paper passes and is dried. (2) Portion of a paper machine where water is removed from wet paper by passing it over rotating, steam heated, cylindrical, metal drums or by running it through a hot air stream.

DUPLEX

(1) Papers and paperboards with each side having a different colour, finish or surface texture, which is produced on the paper machine or by pasting. (2) General term referring to multi-ply paper and paperboard and to bags made of two separate sheets of paper.

EFFLUENT

Waste backwater and rejects from which fibre is recovered prior to discharge from the mill.

ELECTROSTATIC COPY PAPER

Smooth finished, stable, medium weight bond paper made from chemical pulps. Generally treated with a zinc oxide coating material and used on dry type office copying machines.

ELMENDORF TEST

Test commonly used in paper mill laboratories to determine tear resistant property of paper. Also called tear test

ELONGATION

Physical property of a paper sheet that allows it to experience a certain degree of stretching.

EMBOSSSED

Paper finish obtained by mechanically impressing a design on the dry sheet or web with engraved metallic rolls or plates.

**ENAMEL**

Clay coating on coated paper

ENGLISH FINISH

Medium finish applied to a sheet of paper that is smoother than the finish coming off dryers or calenders, but not as smooth as the finish coming off supercalenders.

FABRIC PRESS

Paper machine wet press that uses a special multiple weave fabric belt sandwiched between the regular felt and the rubber covered roll, increasing the capacity to receive and remove water from the nip between the rolls.

FEEL

Evaluation of paper surface finish by sense of touch.

FELT

Woven belt of wool, cotton or synthetic fibres used to transport web of paper between rolls of press section (wet felt) and against dryer drum (dryer felt) in dry end section of paper machine.

FELT SIDE

Top side of paper sheet as it is formed on wire of wet end of paper machine which later comes in contact with felts during subsequent drying phases.

FIBRE

Examples include woods (softwood, hardwood), bastes (flax, hemp), grasses (straw). Elongated, tapering, thick walled cellular unit that is the structural component of woody plants.

FILLER

(1) Mineral substance added to pulpstock to fill spaces between fibres and enhance printing properties of paper made from it. (2) Inner layers of multi-ply paperboards .

FILLERS AND LOADINGS

Minerals or compounds added to the stock to improve characteristics in the finished paper.

FINES

Small fibres that pass through the wire of the papermaking machine.

FINE PAPERS

High quality printing/writing and cover papers having excellent surface characteristics for pen and ink writing.

FINISH

Surface characteristics of sheet of paper, such as smoothness, appearance and gloss, as determined visually.

FINISHING

Processing of paper after completion of papermaking operations, including supercalendering, slitting, rewinding, trimming, sorting, counting and packaging, prior to shipment from mill.



FLEXOGRAPHIC PRINTING

Rotary letterpress printing process using liquid ink. Solvent-based formulations made of aniline dyes and pigments (mixed with a binder) dry primarily by evaporation due to the solvent vehicle; water-based formulations have now become more common and are force-dried either by heat or irradiation (if the ink contains monomers that can be polymerised by UV-irradiation). Sometimes called aniline printing.

FLOW BOX

An open trough with an adjustable slit along the length at the bottom (slice) and an inlet pipe of manifold. Used to distribute the pulp suspension across the width of the papermaking machine.

FLUFF PULP

Thick sheet or batt of wood pulp fibres manufactured in roll or bale form suitable for dry disintegration into individual fibres.

FLUORESCENT PAPER

White paper made with synthetic dyes that produce a brighter appearance when irradiation by some light. Primarily these materials absorb radiation in the UV region and re-emit in the visible, tending to give the paper a bluish tinge. Alternatively, this describes paper that is surface coated with coloured, light emitting dyestuff materials (which reflect white light as colour).

FORMATION

The manner in which paper fibres are mixed in a sheet of paper. Physical distribution and orientation of fibres and other solid constituents in the structure of a sheet of paper that affects its appearance and other physical properties.

FOURDRINIER

The name of the brothers who developed the first process for making paper on a continuous wire belt. Paper machines incorporating this principle are Fourdrinier machines, and are still the most common form of paper machine in use today.

FOURDRINIER WIRE

Continuously travelling, endless, woven, metallic or plastic screen belt located in wet end section of fourdrinier paper machine. Pulpstock is fed onto wire so that water is drained from it as fibres oriented to form a continuous web.

FREENESS

Ability of pulp and water mixture to release or retain water on drainage.

FREE SHEET

Sheet of paper containing no mechanical pulp fibres or made of pulp subjected to minimal refining or hydration, which allows water to drain quickly when sheet is formed on fourdrinier wire. Also called woodfree

FURNISH

(1) Various pulps, dyes, additives and other chemicals blended together in stock preparation area of paper mill and fed to wet end of paper machine to make paper or paperboard. Also called stock. (2) The raw materials for papermaking in liquid form also known as Stock, Stuff or Porridge. (3) The pulp, waste paper, broke and chemicals used in making a specific type of paper.

FORMING FABRIC

Finely woven fabric fitted at the wet end of the papermaking machine to support and provide drainage for the pulp suspension as it becomes a paper web.

**GLASSINE**

Light, dense, translucent paper made from highly refined chemical pulp and possessing a high degree of hydration. Used as envelope windows and in protective packaging for foodstuffs, candy, tobacco products, chemicals and metallic items.

GLAZING

First calendering, in which paper is passed through a roll nip to give it a smoother surface.

GLOSS

Property of paper sheet surface that produces a shiny, highly reflective appearance when light is reflected from it.

GRAIN

(1) Directional alignment of fibres in a paper sheet structure. (2) The running direction on a roll or sheet of paper as it comes off the machine.

GRAMMAGE / BASIS WEIGHT

Weight in grams of one square metre of paper or board. See substance or basis weight.

GRAVURE PRINTING

Intaglio printing process employing minute engraved “wells” and a liquid ink. Generally, deeply etched wells carry more ink than a raised surface, hence they print darker values. Shallow wells are used to print light values. A doctor blade wipes excess ink from the cylindrical printing surface. Rotogravure employs etched cylinders and web fed stock. Sheet fed gravure, as its name implies, involves individual sheet feeding.

GRINDER

A machine in which logs are defibered (or defibrated) against a revolving grindstone:

GROUNDWOOD PAPER

Paper that is made from a furnish containing a large percentage of groundwood pulp.

GROUNDWOOD PULP

Slurry produced by mechanically abrading fibres from debarked logs through forced contact with the surface of revolving grindstone. Used extensively to make newsprint and publication grades.

GUILLOTINE

A device for cutting or trimming piles of sheets of paper to the required size and with smooth edges.

HARD SIZED

Paper and-paperboard made resistant to water and ink penetration by exposure to high degree of sizing treatments.

HARDWOOD

Pulpwood from broad leafed dioctyledonous deciduous trees.

HEAD BOX

Device for applying and distributing stock onto the wire that keeps fibres from clogging together so that a consistent formulation can be achieved. Also known as a breast box or flow box.

HEMICELLULOSE

Alkali soluble, non-cellulosic polysaccharide portion of wood cell wall.

**HOLDOUT**

Ability of paper or board to resist surface liquid penetration.

HOG-PIT

The pit under the machine wire at the couch roll into which the sheet falls during a break. This pit is fitted with an agitator and is also known as the couch pit.

HOOD

A hood covering the paper machine drying section and designed for moist air removal.

HOTMELTS

Plastic or wax coating materials in a molten state applied to paper or paperboard sheet to produce fluid resistant surface with high gloss.

HYDRAPULPER

A metal tank fitted with an agitator rotor for disintegrating pulp and broke in water.

INDUSTRIAL PAPERS

Paper made for purposes such as industrial packaging, tissues, wrappings, impregnating, insulating etc.

INTEGRATED MILL

Mill manufacturing complex in which all pulp and papermaking operations are conducted at one site.

INTERNAL BONDING STRENGTH

See bonding strength.

JOB LOT

Out of specification, defective or discontinued types of paper made in small quantities for special orders and sometimes sold at lower than standard prices.

JUMBO ROLL

(1) Larger than normal roll of paper as it is slit and rewound. (2) Roll of paper usually greater than 12in. in diameter and used for converting into user products. (3) Large roll of paper coming off the paper machine before cutting.

KRAFT

German word meaning strong that is used to denote paper or pulp made by a particular wood digestion process - the sulphate process. Papers made from Kraft pulp are very strong.

KRAFT PAPER

High strength paper made from sulphate pulp, usually with a naturally brown colour from unbleached pulp. Also called sulphate paper

KRAFT PULP

Fibrous materials used in pulp, paper and paperboard manufacturing, produced by chemically reducing woodchips into their component parts by cooking in a vessel under pressure using an alkaline cooking liquor. Also called sulphate pulp.

KROFTA

Name of equipment used for recovering fibre excess from backwater on an air flotation principle.

**LACQUER**

Organic solution with volatile solvents used for coating paper to give high surface gloss, grease resistance, heat sealing and improved surface appearance.

LAMINATED PAPER

Multi-ply paper and paperboard consisting of firmly united, superposed layers, which may be bonded with resin or adhesive.

LAYBOY

Device at the end of a cutting machine for jogging sheets into a neat pile.

LEAD OR CARRYING ROLL

Roll that helps lead the paper from the wire to the first felt and onto subsequent felts.

LEDGER PAPER

Strong, highly sized paper made from bleached chemical pulp. Used to make accounting and record books; also used with accounting machines.

LETTERPRESS PRINTING

Printing process in which ink is applied to paper, paperboard or film from raised portions of printing plates or type.

LIGNIN

Natural 'adhesive' which binds wood fibres together. Brown organic substance that acts as an interfibre bond in woody materials.

LINERBOARD

Kraft paperboard, generally unbleached, used to line or face corrugated core board (on both sides) to form shipping boxes and various other containers.

LINER

A term in board-making used to denote the top ply, usually of better quality, in a sheet of cardboard.

MACHINE COATED

Paper and paperboard that have surface coating of adhesives and minerals applied while being made on the paper machine, as an integral part of the papermaking operation.

MACHINE DIRECTION (MD)

Direction from the wet end to the dry end of a paper machine or to a paper sheet parallel to its forward movement on a paper machine.

MACHINE FINISH (MF)

Surface finish produced on an uncoated sheet of paper as it is being made on the paper machine, and usually accomplished with limited calendering on the machine calender stacks.

MACHINE FINISHED OR MF

Smooth paper calendered on the machine.

MACHINE GLAZED OR MG

Paper with a glossy finish to one side produced on the paper machine by a large MG or Yankee cylinder.

**MACHINE GLAZED (MG)**

High gloss surface finish produced on the wire side of a sheet by passing it over a large diameter, highly polished, steam-heated roll as used on Yankee type paper machine dryers.

MANIFOLD PAPER

Very thin regular bond paper with glazed or unglazed finish used to make carbon copies of letters.

MATTE

Paper and surface finishes with very low gloss or lustre.

MEASURING UNIT OR SCANNER

Cross machine unit using ionising radiation source to gauge web characteristics such as weight.

MECHANICAL PULP

Pulp produced by reducing pulpwood logs and chips into their fibre components by the use of mechanical energy, via grinding stones, refiners etc.

MECHANICAL PULPING

Grinding and screening of chips to separate the fibres without removal of lignin.

MECHANICAL WOODPULP

Pulp made by grinding coniferous logs, which have had the bark removed.

MEDIUM

See corrugating medium

MG CYLINDER

Similar to a Yankee cylinder, usually larger in diameter, 23 feet, with a lower steam pressure. Gives a smooth or glazed finish to one side of the sheet while leaving the other quite rough.

MIDDLES

Stock pulp usually of waste paper, used to make the middle plies of a sheet of board.

MOISTURE CONTENT (MC)

Percent of water by its weight in paper, pulp, paperboard, chips etc., which will vary according to atmospheric conditions because of the ability of these types of materials to absorb or emit moisture.

MOISTURE PROOF

Ability of paper and paperboard to resist the penetration of water vapour.

MOISTURE VAPOUR TRANSMISSION RATE (MVTR)

Ease or rate of water vapour permeation through a sheet of paper.

MOTTLE

(1) Random non-uniformity in printed gloss, or the visual density or colour of a printed area caused by uneven absorption of ink by paper. (2) A surface effect produced by the addition of heavily dyed fibres of a different colour in the stock furnish.

MOULD

A cylinder covered with fine wire mesh which rotates in a vat of pulp stock and forms a continuous wet ply of board.

**MULLEN**

See bursting strength.

MULTI-PLY

Paper or paperboard sheet made up of two or more layers.

NEWSPRINT

Grade of paper, combining high percentages of groundwood pulp, made especially for use in the printing of newspapers.

NINEPOINT

Paperboards with a thickness of 9 mils (0.009 in.) used as the fluted component in the manufacture of multi-ply combined board or wrapping. See corrugating medium.

NIP

The 'nip' of two rolls in a calender or press is the point of contact between the two rollers or rolls.

NONWOVEN FABRIC

Sheet of cloth-like material made from long natural or synthetic fibres and formed from a slurry on a wire screen, such as a wet end of a paper machine, or by laying on a fine mesh screen from an air suspension.

OFF MACHINE COATING

Process of applying coating material to a web of paper or paperboard in a location that is away from the machine on which it is made.

OFFSET PRINTING

Process of indirect printing in which an impression of type or a design on a flat plate or cylinder is transferred to a rubber blanketed cylinder from which it is impressed ("offset") upon the surface to be printed.

ONIONSKIN

A thin, lightweight, transparent paper made especially for producing typewritten copies of correspondence.

OPACITY

Ability of substances such as paper, flue gases (smoke) and liquids to resist transmission of both diffuse and non-diffuse light through them. Prevents show through of dark printing in contact with backside sheet of paper.

OVENDRY (o.d.)

Moisture free conditions of pulp and paper. Usually determined' by drying a known sample to a constant weight in a completely dry atmosphere at a temperature of 100°C to 105°C. Also called bone dry.

PACKAGING PAPER

Collective term for papers of different pulp composition and properties, sharing only the application.

PAPER

Homogeneous sheet of felted cellulose fibres, bound together by overlapping and by self-bonding ("hydrogen bonding") or by the use of bonding agents, and made in a variety of types.

**PAPER STOCK**

Water slurry of various pulp fibres, dyes, additives and chemicals that is pumped to the paper machine for forming into a sheet.

PAPETERIE

Chemical pulp and cotton fibre content paper, made especially for conversion to a class of writing types, usually correspondence stationery.

PATENT COATED

Type of paperboard that is made and lined with white or coloured fibres on a multi cylinder machine, possessing a high surface finish suitable for use in making cartons.

PICK

(1) Phenomenon or pulp or fibres pulling away and sticking to paper machine parts, such as rolls, in the wet and dry sections. (2) Paper mill control test to determine surface adhesion properties of paper. (3) Small particles of paper that loosen from the surface of paper, especially during printing.

PICK UP ROLL

Roll, which lifts the wet paper or board off the wire before the drying section.

PIGMENT

An insoluble mineral or organic powder used as a dye to colour paper and as an additive to impart specific properties, such as bulk, porosity and opacity to the sheet.

PLY

Layer that makes up a multi-layered, pasted or multi-cylinder formed paperboard.

POINT

Measurement of thickness of a sheet of paper or board (0.001in.)

POROSITY

(1) Ability of fluids to pass into paper and paperboard, related to size, shape and distribution orientation or the pores in a sheet and the compactness of the fibres. (2) A measure of the void volume (non-solid portion) of a sheet or web.

PRESS

A wringer device situated in the machine after the wire and couch consisting of a loaded top and bottom roll, through which the paper and felt passes. Water is squeezed out of the paper into the felt.

PRESS FELT

Endless or seamed fabric woven from synthetic materials which support the wet paper during manufacture through the press section.

PRESS ROLLS

Close set of rolls that consolidates paper as it passes through. Lower roll is usually cast iron or steel and the upper a hard composition.

PRESSURE SENSITIVE PAPER

Good strength paper coated with a pressure sensitive type or adhesive and converted to tapes and labels.

PRIMARY FIBRE

See Virgin Fibre

**PRINTABILITY**

Ease with which paper can be printed to high quality standards with the least amount of spoilage.

PROFILE

(1) Visual display showing variations in grammage, moisture content and other characteristics from target value. (2) Cross machine visual display on the computer control system showing the actual variations from target value.

PULP

Fibrous material produced by mechanically or chemically reducing plants into their component parts from which pulp, paper and paperboard sheets are formed after proper slushing treatment. Also used for dissolving purposes (dissolving pulp or chemical cellulose) to make rayon (or viscose) and other synthetic products.

PULPER

Machine that disintegrates fibrous raw material using water and mechanical agitation.

PULPING

Separation of the fibres in the raw material that permits individual cellulose fibres to form a free suspension in water.

RAG CONTENT

Paper containing from 25% to 75% cotton or rag fibres, including bond, ledger and speciality papers.

RAGGER ROPE

A rope used for removing contraries from the pulper.

REAM

Stack or package of paper containing a number of sheets (usually 480, 500 or 520) designated as standard for that grade.

RECOVERED PAPER

Paper recovered for recycling into new paper products.

RECYCLED FIBRE

Fibre obtained from recovered paper; also called secondary fibre, or Paper for Recycling (PfR).

REEL

A term given to a wound length of paper or board in which the diameter is approximately equal to the width.

REELER

A machine for rewinding reels or webs, slitting them to narrower width or widths and trimming off the deckle edges.

REEL UP

The part of the dry end of a paper machine which winds up the paper web into a reel.

REFINER

(1) A machine that modifies the fibre to the degree required by the final product. A series of metal blades rotate from a central shaft against static blades built inside the outer casing of a cone or disc. (2) A machine for defibering pulp and bearing the fibres in a pulp suspension to a certain fibre length and properties, continuously.



REFINER MECHANICAL PULP (RMP)

Pulp made by processing untreated woodchips in mechanical atmospheric refiners.

REFINING

Pulp and paper mill operations conducted of fibre suspensions to rub, brush, crush, fray or cut fibres as desired. Imparts such characteristics as increased capacity to absorb water and improved sheet formation.

REGISTER PAPER

Lightweight writing grade made from chemical pulp and possessing good tensile and tearing strength. Comes in rolls especially for automatic register machines and in flat, folded, snip apart packages for computer printouts and other copying purposes.

REJECTS

(1) Material removed and discarded during the cleaning of pulp or stock. (2) Stock which has been discarded by a cleaning process.

RELATIVE HUMIDITY

Actual amount of water vapour present in the air as compared with the maximum amount of water vapour the air could hold at that temperature (expressed at a percentage).

RELEASE PAPER

Type of paper made especially for easy removal from sticky surfaces. The paper is treated with low surface energy chemicals giving it a repellent or 'non-stick' quality.

REVERSE ROLLS

Press rolls where the paper is fed through in the reverse direction from the normal flow of paper through the machine so that both sides of the paper have the same characteristics.

RIDING ROLL

Roll mounted so that it rests under its own gravitational weight on the paper to control the tension, usually used during reeling operations.

ROLL

A term given to a wound length of paper in which the width greatly exceeds the diameter.

ROSIN

Material exuded by certain pine trees, that when reacted with alkali and made up in the form of a suspension, is reacted with alum and precipitated onto the surface of fibres and used for internal sizing of paper and paperboard. Due to the use of alum this method of sizing takes place in an acidic environment. (Note – sizing with rosin-alum is now rare; reactive sizing agents such as Alkylketene Dimer (AKD) or alkyl succinic anhydride (ASA), that work under neutral or alkaline conditions, are far more common, especially in the West).

ROTOGRAVURE PRINTING

See gravure printing.

RUNNABILITY

How smoothly paper runs through the paper machine. (1) In the paper mill, how well pulp stock furnish to the paper machine forms a sheet on the wire and passes through the drying and finishing operations. (2) Used by customers in reference to how well the paper performs in their converting operations, such as on printing presses.



SCREENS & STRAINERS

A variety of devices for removing contraries from a pulp suspension by a filtering process, usually either pressure or vibratory.

SCREENINGS

Rejected materials, such as knots, shives and large back particles from the screening operations of pulp suspensions in a pulp mill.

SECONDARY FIBRE

Any type of paper and paperboard made from fibre obtained from waste papers and other used, reclaimable fibre sources.

SEMICHEMICAL PULP

Lower quality pulp made by cooking fibrous materials in a neutral sodium sulphite / sodium carbonate cooking liquor followed by a final separation of the fibre using unpressurised mechanical means.

SETT

A number of units or bales picked up at the same time by crane or truck.

SHAKE

Device for shaking the wire at the flow box end from side to side, used to improve formation.

SHEAHAN ROPE

Rope feed device for threading a tail or ribbon of paper through a machine when starting up.

SHEET

Flat piece of any type of pulp, paper and paperboard having a variety of characteristics, sizes and finishes.

SHEETER

Machine for cutting the paper web into sheets.

SHELL

A spindle and cylinder upon which machine-made paper is wound.

SHIVE

Coarse bundle of fibres in paper or pulp.

SILVICHEMICAL

Chemical by-products of the wood pulping process and other chemicals derived from wood.

SIZE

(1) Substance such as rosin, gelatines, glues, starch or waxes added to paper stock furnish or to the surface of a sheet in order to give water resistant properties. (2) Additive used in papermaking to reduce the rate of at which a sheet of paper will absorb water.

SIZE PRESS

Paper mill processing unit consisting of two usually rubber covered rolls located between two dry end sections of the paper machine. Applies size solution to the surface of the paper sheet.

SIZING AGENT

Additive used to improve water resistance and strength.

**SLICE**

Outlet from the head box through which a dilute fibre suspension flows onto a moving wire, that produces paper or board.

SLURRY

Liquid mixture consisting of suspended fibres, fillers, coating pigments and other solid material in water or adhesive, used in the papermaking process.

SLUSH

Pulp stock water suspension thin enough to flow or to pump through a pipeline, usually running about 1% to 6% consistency.

SODA PULP

Pulp made by the cooking of woodchips from deciduous or broad leaf trees in a sodium hydroxide or caustic soda solution.

SOFTWOOD

Wood obtained from evergreen, cone bearing species of trees, such as pines, spruces, hemlocks, etc., which are characterised by having needles.

SOLID BOARD

Single-ply, homogeneous types of paperboards, made from the same stock throughout the sheet structure.

SPENT LIQUOUR

Used cooking liquor in a chemical pulp mill that is separated from the pulp after the cooking process. Contains lignins, resins, carbohydrates and other substances extracted from the material being cooked.

SPLICE

Joint made in a continuous web of paper with glue or adhesive tape when a break occurs during winding or rewinding into a roll.

SPEED

The rate at which a machine produces paper or board, expressed in metres per minute.

STANDARD CONDITIONS

Unless otherwise specified, 23°C and 50% relative humidity.

STARCH

Type of carbohydrate adhesive and sizing material obtained primarily from corn, wheat, rice, tapioca, maize and potatoes. Produces a higher degree of rigidity in a sheet and improves the finish by causing the fibres to lie flat.

STIFFNESS

The ability of paper or paperboard to withstand bending or crushing forces.

STOCK

(1) Fibrous mixture that is made into paper. May consist of one or more types of beaten or refined pulps, with or without suitable fillers, dyes, additives and other chemicals. Also called furnish. (2) Paper suitable for a particular use, such as coating raw stock, milk bottle stock, tag stock etc. (3) The diluted pulp suspension immediately before being introduced to the paper or board machine.



STRETCH OR GUIDE ROLLS

Devices used to take up the slack in the felt.

SUBSTANCE

The weight of a unit area expressed in grammes per square metre (g/m²) or pounds per 10,000 square feet. See also grammage and basis weight.

SULPHATE PROCESS

An alkaline pulp manufacturing process in which the active components of the liquor used to cook chips in a pressurised vessel are primarily sodium sulphide and sodium hydroxide, with sodium sulphate and lime being used to replenish these chemicals in recovery operations. Also called kraft process.

SULPHITE PROCESS

An acid pulp manufacturing process in which chips are reduced to their component parts by cooking in a pressurised vessel using a liquor composed of calcium, sodium, magnesium, or ammonia salts of sulphurous acid.

SUPERCALENDER

Auxiliary piece of papermaking equipment used on some paper machines, to obtain a denser paper with a higher finish than paper obtained on a calender.

SUPERCALENDERED OR SC

Paper treated in a supercalender, usually separate from the paper machine to improve smoothness and gloss to give SC paper.

SURFACE COATED

Any paper or paperboard sheet that has a coating material applied to one or both surfaces.

SURFACE SIZED

Paper whose surface is treated with a sizing material after the sheet is formed on a paper machine, or in a separate off-machine operation, occasionally after it has been internally sized

SYNTHETIC FIBRES

Short filaments that are extruded or spun from synthetic resin materials and used in manufacture of synthetic paper.

TACK

Sticky property of paper and paperboard adhesive and glue coating materials.

TAIL

Narrow strip of the web used to feed the web through the machine.

TAIL FEED EQUIPMENT

Variety of equipment used to feed the tail of the web through the machine and includes rope systems, air trays, air tubes, conveyors and ropeless systems.

TALL OIL

By product made from the resins, fatty acids and soap removed during the evaporation of sulphate black liquor.

TARNISHPROOF PAPER

See anti tarnish paper

**TEAR STRENGTH**

Resistance of a paper sheet to tearing, usually measured by the force required to tear a strip under standardised conditions. (See Elmendorf test).

TENSILE STRENGTH

Resistant property of a sheet to pull or stress produced by tension. Expressed as the force per unit width of a sample that is tested to the point of rupture.

TEST LINERBOARD

Types of paperboard that meet specific tests (Rule 41) adopted by the packaging industry to qualify for use as the outer facing layer for corrugated board, from which shipping containers are made.

TEXT PAPER

Good quality, laid or woven book paper with a medium vellum-like finish.

THERMOMECHANICAL PULP (TMP)

Pulp made by pre-steaming chips then reducing them into their fibre components during an initial mechanical treatment in refiners under elevated temperature and pressure. Subsequent refining is done at atmospheric pressure.

THICKNESS

See caliper.

THROUGH AIR DRYING OR TAD

A method for increasing bulk or softness of tissue. Dries a web by forcing high temperature air through it without pressing.

TISSUE PAPER

Collective term for papers normally of a grammage less than 30gsm that differ in application and composition but have the common feature of being thin and lightweight.

TRANSPARENCY

Ability of paper to allow light rays to pass through it in such a manner that objects behind it can be clearly seen.

TRIM

(1) Dimension of the widest sheet of paper that can be made on a paper machine, not including the edges (which are normally cut off). (2) Part of the web trimmed off with the rough deckle edge on a reeler.

TURBINE

Rotative device for converting boilerhouse high pressure steam to kinetic energy, and coupled to a generator, produces electricity.

TWIN WIRE OR INVERFORM MACHINE

Paper or board machine in which the web is formed and partially dewatered between two wires.

TWIN WIRE FORMER

Type of multi-ply paperboard machine having two wires (or fabrics) between which the sheet is formed.

TWO SIDEDNESS

Visual difference between the top or felt side of a sheet of paper and the bottom or wire side.

**UNDERLINER**

Stock pulp used to make ply between the liner and middles in a sheet of board.

UNIT

A number of bales held together with wires or straps.

VACUUM BOX

Device situated under a forming fabric for drawing water out of a wet web situated on top of the fabric.

VALVE

A device for restricting the flow of a liquid through a pipe.

VEGETABLE PARCHMENT

Hard, dense sheet of grease resistant paper, having a very high wet strength property. Formed by passing a base paper through a parchmentizing process involving either strong sulphuric acid or a bath containing a strong solution of certain alkali metal salts, which cause the cellulose in the base paper to gelatinise.

VELLUM FINISH

Smooth, dull finish applied to book and stationery paper surfaces to simulate sheets originally made from young calves' skin.

VIRGIN FIBRE

Pre consumer waste, also known as white waste, broke or primary fibre.

WAD

Large piece of broke, often wedged in the drying section.

WADDING

Single or multi-ply, loosely matted fibre sheet made from chemical pulp and used in packaging, thermal and acoustical applications and as a cushioning medium. Also called cellulose wadding.

WASTE PAPER

All types of used paper that provide a source of fibre for the manufacture of some papers, paperboards and chipboards. More correctly called Paper for Recycling (PFR) or Secondary Fibre.

WEB

(1) Continuous sheet of paper produced and rolled up at full width on the paper machine. (2) A large reel of paper which is rolled at the reel up of the papermaking machine on a shell.

WET END

(1) Section of the head end of a paper machine, which includes the head box, wire and wet press sections. Where the sheet is formed from the stock furnish and where most of the water is removed before entering the dryer section. Also called wire end. (2) The first part of the paper machine up to the drying section.

WET MACHINE

Paper machine consisting essentially of a wire covered cylinder rotating in a vat of pulpstock on which a mat of varying thickness is formed by drainage. These mats are removed either intermittently in thick sheets called laps, or continuously.

**WET STRENGTH PAPER**

Paper in which the fibre constituents and/or the sheet are chemically treated to enhance resistance to tear, rupture or disintegration after becoming saturated with liquids.

WET TENSILE STRENGTH

Resistance of paper sheet to pull or stress produced by applied tension after it has become saturated with liquids.

WHITE PAPER

(1) Any paper made from pulpstock whose natural colour has been corrected by the addition of blue, yellow and red dyestuff. (2) To a printer, any paper sheet that is devoid of printing material.

WINDER

Another name for a reeler.

WARP

The thread running parallel to the length of a woven textile or wire fabric.

WEFT

The thread running across the width of a woven textile or wire fabric.

WIRE OR FORMING FABRIC

Horizontally moving metal or plastic mesh belt on which a paper web is formed.

WIRE

See fourdrinier wire.

WIRE MARKS

Small impressions produced on the bottom surface of a sheet of paper, caused by the mesh of the wire screen on which the wet web is formed in the wet end of a paper machine.

WIRE SIDE

Bottom side of a sheet of paper that comes in contact with the wire as the web is being formed in the wet end of a paper machine.

WOOD FREE

See free sheet

WRAP

Broke wrapped around a cylinder.

YANKEE CYLINDER

Cast iron cylinder, 8-18 feet in diameter and designed to handle steam pressures of up to 160 psi. Functions as a press roll and surface for creping.

YANKEE DRYER

Type of steam heated paper dryer consisting of a large, revolving drum equipped with a felt to hold the sheet in contact with its highly polished surface. Commonly used for drying tissue type papers.