

**Air-dried pulp**

Pulp is described technically as air-dried when its moisture content is in equilibrium with the ambient atmosphere. Commercially, pulp is usually described as air-dried when the moisture content of the pulp is 10%.

**Annealing**

Process in which metal is heated, retained at a suitable temperature, then cooled rapidly or slowly to reduce internal stress. As a result, the metal becomes softer and more workable, particularly in cold processes.

**APMP/P-RC™**

Alkaline Peroxide Mechanical Pulping is a refining process preceded by multi-stage impregnation with alkaline peroxide bleach liquors. The wood chips are compressed and destructured prior to addition of the bleach liquors. APMP systems can operate without a post bleach plant since bleaching takes place up front in the process. P-RC™ APMP is a technology that distributes chemicals between the impregnation steps and a small inter-stage bleach tower located between the primary and secondary refining stages. "P-RC" stands for Preconditioning-Refiner Chemical.

**BCTMP**

Bleached Chemi-Thermo Mechanical Pulping. The prefix "B" indicates that a post bleach plant, most commonly alkaline peroxide, follows the CTMP pulping step.

**Black liquor**

Mixture of spent cooking chemicals and dissolved wood material remaining after sulphate cooking. Black liquor is recovered during pulp washing, concentrated by evaporation, and burned in the recovery boiler to regenerate the cooking chemicals and also produce energy for the mill.

**Brownstock**

The pulp obtained directly from the cooking process, before intercellular materials and cooking liquors have been removed.

**Cellulose**

The primary constituent of pulp. Chemically, cellulose is a long-chained carbohydrate consisting of repeating chains of a single simple sugar, glucose.

**Chemical pulp**

A generic term which describes pulp produced by chemical (as opposed to mechanical) processes. These chemical processes include kraft (sulphate) and sulphite processes.

**Chemical recovery**

In chemical pulping, the collection, recovery, and regeneration of cooking chemicals so that they can be utilized again in the process.

**Chipping**

A process in a woodroom area in which the debarked logs are converted into chips for pulping or refining processes. Chipping is typically done by horizontally or gravity-fed disc chippers.

**CrescentFormer**

Sheet forming section in a tissue machine, with the pulp suspension jet-out of the headbox flowing between a felt and a wire both moving at the same speed.

**CTMP**

Chemi-Thermo Mechanical Pulping is a pressurized refining process which is preceded by the addition of sulphite in a single impregnation stage. The refining pressure for CTMP is usually lower than for TMP since the sulphite treatment lowers the softening temperature of the wood lignin. By altering the parameters of the process (chemical concentration, temperature, etc.) it is possible to customize the pulp for particular end uses. CTMP may be bleached, in which case it is known as BCTMP.

**Deinking**

A process in which most of the ink, filler, and other extraneous material is removed from printed and/or unprinted recovered paper. The result is a pulp which can be used in the manufacture of new paper, including tissue, printing, writing, and office papers.

**Delignification**

Removal of lignin from wood fibers (cellulose and hemi-cellulose). This is performed primarily in the cooking process and further carried out in the washing and bleaching process. In bleaching, ECF pulp mills use chlorine compounds (chlorine dioxide) for this process, although it can be achieved with oxygen, hydrogen peroxide, or ozone (which do not create organochlorines).

**Digester**

A pressure vessel, typically cylindrical used to treat wood chips or other cellulosic materials with chemicals under elevated pressure and temperature, so as to produce pulp for papermaking.

**DIP**

Deinked Pulp. Pulp produced from deinked wastepaper, like old newsprint and old magazines. Most DIP is used in integrated paper mills, but some is sold on the market, in which case it is usually dried or wet-lapped.

**Dispersion**

A process stage in the treatment of recycled fibers. Several process stages are needed to remove the impurities (e.g. glue, ink) from the fibers. It is impossible, however, to eliminate all impurities. Dispersing reduces these particles to such a small size that they are no longer detrimental to paper quality.

**ECF**

Elemental Chlorine-Free pulp. Pulp bleached without the use of any elemental chlorine. However, chlorine compounds (e.g. chlorine dioxide) may be used in the bleaching process.

**EPC**

Engineer-Procure-Construct. A project delivery where one supplier assumes total responsibility for product and project engineering, equipment and construction procurement, and on-site construction.

**Extrusion**

A continuous process in which animal feed components are cooked under pressure in a combination of frictional and steam heat in order to expand the resulting product and convert it into feed granulate. This process is very common in production of pet food, fish feed, and cereals.

**Fiberline**

The machines and process systems involved in converting wood chips into pulp. Process steps can include cooking, washing, screening, knot separation, refining, and, if required, bleaching.

**Grade**

A class or level of quality of pulp or paper which is distinguished from other pulps or paper on the basis of its use, appearance, quality, manufacturing history, raw materials, or a combination of these factors.

**Green liquor**

Aqueous solution of the smelt resulting from the burning of thickened waste liquor in the recovery boiler. Mainly consists of sodium carbonate and sodium sulphide.

**GSM**

Grams per Square Meter, or g/m<sup>2</sup>. A measure of the basis weight of paper and board, or its grammage.

**Hammermill**

Machine used for pulverizing raw materials for various applications including animal feed and preconditioning for refining applications; the raw materials are hammered by a series of steel hammers. The pulverized material exits through a screen plate with apertures. The size of the apertures and hammers, including the number of hammers, can be changed to achieve desired results.

**HC**

High Consistency. Pulp suspension with a consistency of 18–40%.

**Headbox**

Located at the wet end of a paper machine, the headbox delivers a uniform jet of paper slurry (furnish or stock) having essentially the same width as the paper web to be produced. The word is derived from earlier days when the hydrostatic head within the box was sufficient to deliver a jet velocity matching the speed of the forming fabric. Today, the pressure within a modern headbox is maintained by pumps and controls.

**Hexenuronic acid**

Acid formed during chemical pulping that reacts with several bleaching chemicals, thus increasing their consumption. The elimination of hexenuronic acid reduces the need for bleaching chemicals and lowers the production costs of bleached pulp. It also helps to keep the pulp's brightness longer.

**Kraft pulp**

The Kraft process is the world's predominant chemical pulping process because of the strength of pulp it produces. The process involves cooking (digesting) wood chips in an alkaline solution, where the active cooking agent is a mixture of sodium hydroxide and sodium sulphide. The dis-

solved lignin is later removed, leaving behind the cellulose fibers. The term "kraft" is interchangeable with "sulphate" and is derived from a German word which means "strong."

### LC

Low Consistency. Pulp suspension with a consistency of 1–6%.

### Lignin

One of the three main constituents of wood, along with cellulose and hemi-cellulose. Lignin acts as the cementing agent in wood, binding the cellulose fibers together.

### Lime kiln

A long, slowly rotating kiln used to reburn lime mud (calcium carbonate) to form calcium oxide, which can be re-used in causticization.

### LMD-Filter™

The LMD-Filter™ is a lime mud precoat filter designed to achieve optimum dry solids with excellent washing efficiency for lime mud. The filter ensures efficient lime kiln operation at low heat consumption. "LMD" stands for "Lime Mud Drying."

### LMD lime kiln

A rotary kiln with an external dryer for lime mud. LMD stands for "Lime Mud Drying."

### Market pulp

Pulp produced from wood, and sold on the open market, as opposed to that which is produced for internal consumption by an integrated paper mill or affiliated mill.

### MC

Medium Consistency. Pulp suspension with a consistency of 6–18%.

### MDF

Medium Density Fiberboard. Board made of mechanical pulp from the refiner process.

### Mechanical pulp

A generic term describing pulps produced by a mechanical (as opposed to a chemical) process. Also known as "high-yield" pulp as the processes utilize a higher proportion of the wood raw material than the chemical processes. There are a large number of mechanical pulping processes including GWD, PGW, RMP, TMP, CTMP, APMP, CMP, etc. Mechanical pulps are produced using either grinders or refiners. Mechanical pulps are used prin-

cipally in the production of newsprint, magazine papers, printing papers, specialty papers, tissue, toweling, paperboard, and wallboard.

### NBSK

Northern Bleached Softwood Kraft. The industry's benchmark grade of pulp for pricing and inventory data. Produced primarily in Canada and the Nordic countries. Some NBSK is also produced in the Northwestern USA and Russia.

### NCG

Non-Condensable Gas. Odorous discharges from mill processes that in previous years were vented to the atmosphere. Today, NCGs are collected and disposed of to meet environmental regulations and to stop the nuisance role these gases play with surrounding communities.

### NO<sub>x</sub>

Nitrogen Oxide. A major component of gaseous emissions from a boiler or lime kiln.

### Norscan

A term describing the group of five countries which have historically been the world's principal producers of market pulp – Canada, USA, Sweden, Finland, and Norway.

### Pickling

Process for chemical treatment of oxidized steel, applied to obtain a clean metallic surface. Here, the steel is dipped into a hot bath of diluted sulphuric or hydrochloric acid.

### PrimeLine™

The PrimeLine™ tissue machine system is fully modularized for the production of customized tissue grades. It includes the PrimeFlow™ headbox, PrimeForm™ former, the PrimePress™ or TissueFlex™ shoe press, PrimeDry™ T-rib Yankee, EquiDry™ Yankee hood, PrimeReel™, and PrimeControl™ automation system. Each PrimeLine™ component is selected for specific quality requirements from standard tissue grades to super-soft tissue products.

### Recausticizing

A process by which green liquor from sulphate pulping is converted to white liquor, thus allowing the cooking chemicals to be re-used. In causticization, sodium carbonate of green liquor is converted to sodium hydroxide by using calcium oxide. Lime mud, which is formed in causticization reactions, is reburnt in the lime kiln.

**Recovery boiler**

In kraft pulping, a special boiler where the black liquor from the cooking process is burned, after concentrating it in an evaporation process. The residual carbon is burned and the inorganic sodium salts are melted and recovered.

**Recycled fiber**

Fiber derived from wastepaper which has been recycled.

**Recycled paper**

Paper which has been made partly or wholly from recycled fiber.

**Refiner**

Machine used to grind pulp between two discs. Refiners can operate at low consistency or at higher consistencies. At low consistencies the material is fed to the refiner using a pump. At higher consistency levels conveying devices are used. Other refiner types are used for breaking down wood chips into fibers.

**Rolling mill**

Plant in which steel strip is formed between two rolls rotating at the same speed in opposite directions.

**RTS™**

Retention time, Temperature, Speed refining. A TMP process, which produces better quality mechanical pulp at lower energy consumption. Improved fiber properties are obtained by rapid heat treatment of the fibers at higher temperatures, while optical properties are preserved due to the low retention time. The process is operated at higher refiner disc speeds, most commonly 2,300 rpm.

**Sludge**

Waste created during the biological process of treating effluent from a manufacturing or municipal wastewater process.

**Stock pump**

Special centrifugal pump for water and fiber suspensions.

**TAD**

Through-Air Drying. Process for tissue drying with the paper web running over a perforated drum where hot air is blown through the web.

**TCF**

Totally Chlorine Free. Pulp bleached without the use of chlorine or chlorinated chemical compounds.

**Tissue**

A general term indicating a class of papers which include grades such as toilet, facial, napkin, towels, wipes, and special sanitary papers. Desirable characteristics in these types of tissue papers are softness, strength, and freedom from lint. Tissue papers are divided into three major categories: At-Home (or Consumer), Away-from-Home (or Commercial & Industrial), and Specialty.

**TMP**

Thermo-Mechanical Pulping is a refining process in which wood chips are refined in a pressurized refiner. The process can involve from one to three refining stages in the mainline; however, two stages are most common. The higher temperatures help soften the chips, which results in higher pulp strength compared to atmospherically refined pulps (RMP). TMP relies on mechanical energy rather than chemicals to convert wood into pulp. TMP pulps are most commonly used in newsprint and magazine papers.

**Virgin fibers**

The raw material for making paper, produced either chemically or mechanically by removing the cellulose fibers from the structure of the wood or from other materials, such as used/recycled rags, bagasse, and straw.

**Wet end**

Section at the beginning of a paper or pulp dewatering machine. At the wet end, the pulp enters the machine and the bulk of the water is removed by dewatering, suction, and press rolls in order to obtain a paper web that can be fed through a drying section.

**White liquor**

A strongly alkaline solution used in the cooking (digesting) process. Mainly consists of sodium hydroxide and sodium sulphide.