

Technical Bulletin

Verso Customer Technical Services Group

Glossary of Terms

Basic Fine Paper and Printing Terms for Today

The terms outlined in this glossary are intended as a guide for the Fine Paper and Printing industries and as an adjunct to the Verso Papers Group Technical Bulletins and texts. The guide is not intended to be all-inclusive and terminology and usage will likely evolve with time.

Terms included are those related to PAPERMAKING, PAPER COATING, PAPER PROPERTIES, DEFECTS, AND PRINTING. We have omitted, where possible, terms that have either fallen into disuse or are inherently obvious.

The contents of this glossary are based on the knowledge of individuals and groups experienced in papermaking and/or graphics technology, as well as from the Verso Paper Knowledge Program.

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A Sizes

A series of metric paper sizes based on the ISO 216 standard. A4 (8.25 x 11.7 inches) corresponds to North American 8.5 x 11 (inches).

absolute humidity

The weight of water vapor contained in a volume of air expressed in grams of water vapor per cubic meter.

absorption

(1) In paper, the property that causes it to take up liquids or vapors in contact with it; also, absorbency.

(2) In optics, the diminution of light as it passes through a transparent or translucent material.

acid free See "alkaline sizing."

acid sizing See "alum."

achromatic

Without color or hue (black and white).

additive primary colors See "primary colors."

AFPA

Abbreviation for American Forest and Paper Association, an industry association of forest products and paper manufacturing companies. (In 1993, the former API "became a part of this organization.")

against the grain

Folding or feeding paper at right angles to the grain or fiber direction.

air-dried moisture content

The percentage loss in weight of a paper specimen when dried to a constant weight in controlled lab conditions.

air dryer See "tunnel dryer."

alkaline sizing

Also called neutral or acid-free sizing. Synthetic resins are added to the furnish of the paper machine to impart water resistance to paper. Unlike the acid sizing system, alkaline sizing does not use high concentrations of alum to set the size. Common internal synthetic sizing materials are abbreviated as AKD (for Alkyl Ketene Dimer) or ASA (for Alkenyl

Succinic Anhydride). An advantage of alkaline sizing is better "permanence" (archival properties).

alkyd resin

Synthetic drying oil made by chemical reaction of various organic acids. See "drying oils."

alum

Common name for aluminum sulfate, used for "setting" internal rosin size that imparts water resistance to paper. The alum-rosin size system is "acid" sizing, and the alum is what imparts the acid character to the sheet of paper. Alum can also be used as a release agent on the paper machine to prevent wet webs from sticking to turning rolls or as a minor additive for alkaline sizing, imparting no pH change.

angle bars See "turning bars."

anilox roller

A metering roller engraved with tiny cells that carries and deposits a thin, controlled layer of ink or coating onto a surface. Anilox rollers are commonly used in flexographic presses.

ANSI

Abbreviation for "American National Standards Institute, Inc.," which develops and publishes standards as the U.S. representative to international standards organizations.

anti-offset spray

In sheetfed printing, a material (usually dry starch particles) sprayed on the wet ink film surface to prevent set-off.

antioxidants

Agents which retard the action of oxygen in drying oils (chemical drying), and other substances subject to oxidation.

anti-skinning agents

Materials that retard the "skin" formation on the surface of a drying oil-based printing ink. Analogous to skin formation that can develop when a can of oil-based paint is left open, with a resultant drying on the surface; liquid paint remains below the "skin."

antique finish

A very rough uncoated paper finish, obtained on the paper machine with little wet pressing or machine calendering; can also serve as a prefix to other finishes, implying a rougher than usual finish, such as "antique vellum."

API See "AFPA."

archival See "permanence."

artwork

Original materials, including the illustrations, lettering, charts, color blocks, etc., which are to be reproduced in a printed piece.

ash

The inorganic pigment (mineral) residue after complete combustion (burning off) of the organics (cellulose fiber for example) from a sheet of paper; used as a test to determine the filler content of the paper.

ASTM

Abbreviation for "American Society for Testing and Materials," which develops and publishes consensus test methods in many fields.

automatic density control

An automatic toner control system where the toner layer deposited on the paper is controlled by the copier or printer.

backbone

The bound edge of a book; also called spine.

back cylinder print

An image unintentionally printed on the back side of the paper. In sheetfed offset lithography, a printing malfunction where the ink image is transferred from the blanket to the impression cylinder and then to the back side of the next sheet of paper.

backing up or back printing

Printing the reverse side of a sheet already printed on one side.

back lining

A paper cemented to the backbone of sewn signa-

tures, to bind the signatures and allow space between the backbone of the book and the backbone of the cover.

back pressure

See impression; the squeeze pressure between the blanket cylinder and the impression cylinder, usually measured in 0.001 inch increments.

back printing See "backing up."

backtrap mottle

The blotchy appearance of an otherwise uniform ink film, particularly noticeable in cyan printing, due to non-uniform ink splitting between the printed ink film and subsequent printing units. Also, see "mottle."

baggy roll (of paper)

Refers to a roll with non-uniform draw; the web width does not uniformly support web tension. There are slack and tight sections across the width of the web usually resulting from a ridge, rope or other defect in the machine direction. This condition can result in web tension difficulties in subsequent operations.

bar codes

Machine-readable (often OCR), pre-printed vertical bars used extensively in labeling. Designed for automated material handling, inventory control, and point of sale terminals. A multitude of systems exist, which are not compatible with each other or their respective reading devices.

base paper or stock

Paper made for further converting by coating, laminating, etc.

basic See "alkaline sizing" and "pH."

basic size

The sheet size (dimensions) of a ream of paper (usually 500 sheets) used to determine basis weight; see "basis weight."

basis weight

Weight per a selected unit of area for a grade of paper. The U.S. uses many different basis weight

designations, depending upon the type of paper, including, within the fine paper category, but not limited to:

lbs per 25" x 38"-500 sheets: text, book, offset,

lbs per 17" x 22"-500 sheets: writing, bond, ledger,

lbs per 20" x 26"-500 sheets: cover,

lbs per 24" x 36"-500 sheets: newsprint, tag, tissue, board.

The 500 sheets represent the standard "ream" count and the basic unit for determining area. Basis weight may also be called substance weight, particularly in the bond or business grades of paper.

Baume hydrometer

See "hydrometer," a flotation device used to give the specific gravity or density of a solution, and thus its concentration. Can be expressed in Baume units.

bearers

Rings of steel at the ends of offset printing press plate and blanket cylinders that make rolling contact on impression for meshing of the drive gears and for structural support of wide press cylinders. These rings are raised above the cylinder plane to provide a fixed base for determining packing of the plate and blanket.

beater A large oval tub. See "refining."

beating See "refining."

binder

Material in a coating or ink that holds the coating or ink together and also to the paper surface.

biocide See "slime."

black liquor

Spent cooking liquor from a kraft pulp manufacturing process, containing dissolved organic wood materials and residual alkali compounds.

blade coating

The coating method which uses a blade to smooth and level the coating applied to the surface of a sheet of paper. The primary paper coating process.

blade cut See "blade streak."

blade scratch See "blade streak."

blade streak

Also called blade scratch; a very fine line or indentation in the coated surface, usually less than 1/8" wide but occasionally wider, in the machine direction, and varying in length from a few feet to several hundred feet. Streaks can be visible under low-angle illumination on the surface or appear less opaque than the general coated area when viewed by transmitted light. This defect can sometimes be observed as an actual cut in the sheet, when the streak is deep enough to sever the sheet. The blade streak, scratch or cut is caused by a piece of fiber, dried coating or coating ingredient, or other foreign material being caught under the blade for a period of time, during the blade coating operation.

blanket

A fabric coated with rubber or other synthetic material that is clamped around the blanket cylinder and which transfers the ink from the press plate to the paper.

blanket creep See "creep."

blanket gap See "cylinder gap."

blanket-to-blanket press

An offset lithographic perfecting press that has no impression cylinders. During printing, the blanket for one side acts as the impression cylinder for the other side, and vice versa. Also called perfecting press unit.

blanket smash

A low spot in the blanket equating to a lower caliper area that results in a low pressure printing zone against the paper or plate.

bleach or bleaching

The material or the process used to whiten paper pulp. While cellulose fibers are naturally transparent and appear white in color, wood impurities and staining colorants encountered in the pulping process give the fibers a brownish color (as in grocery bags); the

stained fibers are referred to as unbleached Kraft pulp. Chemical pulps are bleached in multiple-stage processes (3 to 7 stages), with materials like chlorine dioxide, hypochlorites, peroxides or ozone (the last two being oxygen-type bleaching materials).

bleed

(1) An illustration that extends to one or more of the edges of a printed piece; bleed illustrations are usually printed 1/8" beyond the planned trim edge(s).

(2) Term applied to a lithographic ink pigment that dissolves in the fountain solution and causes it to be tinted.

(3) The discoloration of dyed pulp and paper due to the removal of color by liquid, thereby making it likely to stain other materials with which it comes into contact.

blind emboss See "embossing."

blinding

In offset lithography, a condition of the plate where the image has lost its ability to accept and/or transfer ink.

blister

An undesirable result that occurs in paper arising from the rapid expansion of moisture in the interior of a well-sealed sheet when subjected to high drying temperatures; occurs most frequently on a heat-set, web offset printing press. Caused by too rapid or excessively high temperatures during drying, weak internal bond strength of the paper, high moisture content and/or low coating porosity.

blocking

The sticking together of a stack of sheets, or paper in a roll, because of wet ink or coating.

block-out inks

Inks applied to selected areas of some plies of multiple-part business forms, so that any transferred image is unreadable in or on that printed area. The block-out ink is usually the same color as the transferred image or darker, so that any image transferred in or on that

printed area is unreadable. These inks might be used to block out a price that does not need to be known by the recipient of that particular ply.

body

A term referring to the viscosity or flow characteristics of an ink or vehicle; an ink with too much body is stiff or is said to have high consistency.

bold face

Heavy line characters or type used for emphasis, captions, sub-headings, etc.

bond papers

Originally referred to paper used for printing bonds and other certificates, but now a generic term applied to business papers; also called writing or ledger (heavier weight); bond papers generally are less opaque than an equivalent weight book paper and are measured on a 17" X 22" basic size.

bonding strength See "plybond."

book papers

Printing papers that are generally used in the graphic arts (exclusive of newsprint and board); also called text or offset; book papers are usually more opaque than equivalent weight bond papers and are measured on a 25" X 38" basic size. Also see "cover paper."

breaking length See "tensile."

breast roll

The first roll over which a Fourdrinier wire passes as the furnish exits the slice.

brightness

In paper, the amount of light diffusely reflected from a surface, compared to that which would be reflected from a block of bright Magnesium Oxide. Measurement is made with a specific wavelength of light (457 nm - blue), with the surface of an opaque pad of paper being illuminated at a 45-degree angle and the reflection being measured at a 90-degree angle. The human eye sees only reflected light, and brightness influences printed contrast and the amount of illuminating light that is reflected.

bristol

A heavyweight printing paper usually six or more points in thickness. Types of bristols include printing, vellum, postcard, tag, and file folder.

broadside

Any large advertising circular.

broke

The term applied to wastage in the manufacture and finishing of paper in the paper mill. Technically, the wastage that occurs on the paper machine, prior to subsequent finishing operations. Most broke or wastage in the paper mill is returned to the paper machine furnish for reprocessing into saleable paper.

broken carton

A finished carton of paper that has been opened.

brush finish

A paper that is run under stiff brushes after coating to give it a high finish.

bubble jet printer

Inkjet technology in which drop emission is produced on demand by a thin film of boiling ink in a tubular chamber.

buckle fold or folder

A fold or folding device which creates a fold in a sheet or signature. The sheet or signature is fed against a constrained flat stop to create a bend in the sheet, which is completed into a fold by the action of two rollers pinching the sheet at the point of buckle or maximum bend.

buckles

(1) The edge of a roll, usually only part of the diameter, where the paper along that edge is thinner and longer than the balance of the width of the paper on the roll. To compensate for this extra length, it buckles as it is wound.

(2) Wrinkles adjacent to the bound edge of a book that has been assembled with paper below its equilibrium moisture content. This is caused by the paper

picking up moisture and increasing in dimensions, resulting in poor appearance and influencing durability.

buffer

In offset lithography, a material to maintain an acid condition and stable pH in the press fountain solution.

bulk

Measure of the density or the thickness in relation to the basis weight of a sheet of paper; used in the binding of books and measured as pages per inch (ppi). Individual sheet calipers do not necessarily total to ppi, because of how the sheets pack together.

burn

In plate making, a common term used for exposing the plate.

burst

A rupture in a web of paper resulting from stresses caused by too tight of winding on adjacent areas of high and low caliper or simply too tight of winding where the tension exceeds the ultimate strength of the paper.

burster

A business forms handling device for detaching continuous forms at cross perforations.

burst test or strength See "Mullen test."

business form See "form."

butt splice

Formed by trimming the ends of two webs of paper, placing them end-to-end, and pasting a strip over and under to make a continuous web without overlapping; see "splice."

C1S

Paper that has been "coated one side," typically label paper.

C2S

Paper that has been "coated two sides;" coated paper for text, publication, or commercial printing.

calcium carbonate

A white pigment used in the furnish or coating of paper. In the furnish, limited to alkaline or neutral internal sizing systems. Calcium carbonate can be obtained from grinding naturally occurring limestone (ground calcium carbonate or GCC) or manufactured as a precipitated pigment (precipitated calcium carbonate or PCC).

calendering

A finishing process that smooths and densities (controls thickness or caliper) a web of paper. The equipment involved in this process is called a calender; the process involves rotating rolls under pressure, with the web running between the two. On the paper machine, the equipment is called the machine calender, with the rolls being of a steel or metal composition; also see "supercalendering." Collectively, the calender rolls in the equipment that do the calendering are called the calender "stack."

calender crush or blackening

A term describing the darkening of the intended shade of paper caused by excessive calendering or by the calendering of wet paper.

calender cut

A cut in the web of paper, usually at an angle to the machine direction, as a result of wrinkles or excess paper accumulating in a fold at the entrance of a calender nip. When the excess paper suddenly carries through the nip, the force applied in the nip cuts the sheet.

calender marks

Marks imparted by the calender, at a repetitive interval depending on the diameter of the damaged calender roll causing the defect. The defect usually appears as a dull, irregularly shaped area when viewed under low-angle light.

calender scale See "scale."

calender spots

Marks or spots of a non-uniform size and shape, on or impressed into the surface of paper, caused by

foreign material sticking to a calender roll. The defect will repeat, depending upon the diameter of the roll causing the defect; the defect usually appears as a transparentized spot when viewed through the sheet.

calender stack See "calendering."

calender streaks

Relatively high(er) gloss bands in the machine direction, resulting from non-uniform wet pressing, drying, coating, etc. These bands become more apparent after the sheet has been calendered.

caliper

The thickness of a sheet of paper measured under specified conditions, generally expressed as one thousandths of an inch (0.001), "mils" or "points;" measured with an instrument called a micrometer or caliper.

camera-ready copy

Copy (text) to be printed that is ready to be photographed without further alteration.

can

One of the drying cylinders in a paper machine dryer section.

caption

Text describing an illustration placed adjacent to it.

capsules See "microencapsulation."

carbonizing See "carbon paper," "spot carbonizing" and "smudge."

carbonless paper

Originally NCR paper ("No Carbon Required", an invention of the National Cash Register Company), also called chemical carbonless as opposed to mechanical carbonless-see "spot carbonizing." Paper, which when used in multi-ply or multiple copy forms (see manifold form), transfers an image by the action of an impact or writing instrument to the sheets below, by means of mated chemical coatings on the front (CF) and back (CB) of the sheets. Also, see "self-contained paper."

carbon paper

Thin tissue which has been carbonized (carbon coated) with a hot melt application of a waxy base and pigment, usually black or blue. Used between plies of a multi-part business form (see manifold form), where the tissue or carbon paper gives up a part of the carbonizing material upon a localized application of pressure, thus creating an image on the receiving (under) sheet.

case bound

Describes a book with a stiff cover that is made separately, with the sewed body being inserted and fastened (called casing-in); the stiff cover is called the case. Also referred to as hardbound.

casing-in See "case bound."

cast coating

The coating method in which a wet coating on the surface of a web is held or cast against a highly polished, rotating, chromium-plated, heated dryer drum; the result is a high gloss finish.

catching up

A condition where the non-image areas of the plate are beginning to take ink. See "scumming."

cellulose fibers

The primary ingredient or raw material in papermaking; derived primarily from plant sources, mainly wood, but can be obtained from cotton, sugar cane, or other plant sources; the fibrous material remaining after the non-fibrous components of the wood (or other plant) have been removed by the pulping and bleaching operations.

CB paper

Coated back; the coated donor sheet of mated carbonless paper used in multiple part forms; the CB coating contains colorless dyes, microencapsulated with a suitable solvent for controlled release and development of color on the CF receiver sheet; multiple part forms will have the CB coating on the back of all but the last ply of the form.

CF paper

Coated front; the coated receiver sheet of mated carbonless paper used in multiple part forms; contains a color developer in the CF coating: a multi-part form will have the CF coating on the second through the last plies of the form.

CFB paper

Coated front and back: the intermediate or middle plies of mated carbonless paper, used in multiple part forms. CFB paper has both CF and CB coatings: see CF and CB paper. Also see "carbonless paper."

chalking

A condition in a printed image (or coating) in which the pigment is not properly bound to the paper and can easily be rubbed off as a powder (or flushed off with water): usually an indication of improper ink or coating drying, excessive absorbency of the paper, or insufficient binder.

character of fold See "fold quality."

chemical ghosting See "ghosting."

chemical pulp See "pulping."

chest

In the paper industry, a storage tank used especially for stock, pulp, furnish, water, white water, etc.

chill rolls

Rolls located immediately after heated or drying ovens on either papermaking, coating, or printing equipment in order to lower the temperature of the web, and in the case of heatset inks, to "set" inks. Can also be called "cooling rolls" or "sweat rolls."

chopper fold or folder

A fold or folding device that creates a fold in a sheet or signature. The sheet or signature is positioned under a reciprocating chopper blade (non-cutting knife) that then forces it, at the point of contact between folding rollers, to complete the fold. Also called a knife folder.

clay

A pigment (kaolin-type material) used as a filler (for opacity or smoothness) in the making of paper, or in the paper coating.

clothing or machine clothing

Paper machine term for the wire, wet felt or dryer felt.

coated paper

Paper which has been coated with a material to provide printing ink holdout, smoothness, and levelness.

coating lump

Also "color lump;" a lump of dried coating, most commonly from 1/16 to 1/4 inch in diameter, which has been redeposited on the web of paper, usually from some place on the coating equipment; can even be a splash of coating (coating splash) on the sheet during or after the original coating application.

coating scale See "scale."

coating splash See "coating lump."

coating streak

A band of lighter or heavier-than-normal coating material, wider than about 1/8 inch. Streaks are in the machine direction and appear as more or less transparent than the surrounding area when viewed by transmitted light. Streaks are generally caused by a disturbance to the coating during or after application to the paper web. A "drag mark" is actually a coating streak, created by a foreign material dragging against the coated surface (wet or dry) and creating a disturbance in the coating.

cockle or cockling

A surface that has a "puckered" or rippled look, which is intentionally obtained by air drying under minimum tension; cockling simulates handmade, air-dried paper and as such is a desirable effect. Otherwise, cockle is considered a defect when localized surface roughness or puckering occurs.

collating

The interleaving or collecting of flat sheets, signatures, or webs (business forms) in the proper sequence

before binding, crimping, fastening/gluing, or edge padding; also called "gathering" when dealing with signatures.

color

In the paper industry, the term used to refer to the coating mixture, regardless of its actual color. Typically, it consists of the coating pigments, binder and various additives, most often dispersed in water.

color down

Refers to the sequence of applying printing inks to the paper; i.e., the magenta could be the 2nd "color down" in a "four-color process job."

color lump

A hard lump of coating on the surface of a sheet of coated paper; see "coating lump."

color measurement

An instrumental reading of color. One such system is manufactured by Technidyne and can use the "color coordinates" of "L*,a*,b*," "Lab," or others, where "L" signifies a lightness value from black to white, "a" denotes the variation from red to green, and "b" the variation from yellow to blue.

colors See "primary colors."

color scanner

A system and equipment that creates an electronic image, rather than a photograph, of normally flat objects such as prints or film.

color separation

The process of separating full-color originals into the fundamental printing colors; see "three-color and four-color process," can be accomplished either photographically or electronically.

color sequence

The order or sequence in which various colors of inks are printed; also laydown sequence. In multi-color printing, the trapping of each color down depends upon the lower tack of each successive color; i.e., jelly applied to peanut butter, not peanut butter applied to jelly.

colorimeter

An instrument that measures and compares the hue, purity, and brightness of colors in a manner that simulates how people perceive color.

commercial register

Historically, color printing in which misregister allowed is one row of dots. Can also imply any subjectively acceptable registration and is dependent upon the job being run. See "register" and "hairline register."

common impression cylinder (CIC)

A large press cylinder that holds or supports the substrate and has several color stations positioned around it. On some web and sheetfed offset presses, the common impression cylinder is in contact with several blanket cylinders.

conditioning

Refers to the act of bringing paper to moisture equilibrium with its environment. In a laboratory, the temperature and relative humidity are defined by TAPPI. (See "TAPPI.")

coniferous

Cone-bearing trees, like pine and fir, that usually do not shed their leaves seasonally; also known as "softwood." Pulps made from this type of tree give cellulose papermaking fibers that are long, thus "long-fiber" pulp.

contact angle

The angle at which a drop of fluid (like fountain solution or ink) makes contact with a surface (such as paper) after a specified period of time; usually a measure of the surface or internal sizing, or a measure of the absorption characteristic of the surface being tested for the fluid applied. A low contact angle indicates good or high absorption, while a high contact angle (for example, a 90 degree angle of the edge of the droplet with the plane of the paper) indicates resistance to surface wettability or lack of absorption of the fluid by the surface.

continuous forms

Business forms produced in a continuous or web format, which may be cut (see "unit set forms") to

individual length or perforated for easy tearing to individual length at the forms manufacturer, or during or after use. May also be used in the continuous format, in roll or fanfold/accordion form; frequently used on automatic, pin feed units.

continuous tone

A continuous and smooth transition of tones from one tonal value to another, as obtained in photographic prints; see "tonal value."

conversion coated

Paper that is coated on one or two sides after it is off the papermaking machine; see "machine coated."

cooling rolls See "chill rolls."

copy or copier

When used as a single term, refers to a system and equipment that relies upon electrostatic reproduction principles to either generate an offset lithographic plate, or even the copies themselves directly from the electrostatic photoreceptor. Also see "duplicator."

copy

The furnished material (typewritten or line work, pictures, artwork, etc.) to be used in the production of the printed job.

copying

The act of producing an image on paper that is a duplication of the image of another document, such as by a photographic or xerographic process, or with carbon or carbonless papers.

corona

A device used to place a uniform electrical charge on the surface of an electrostatic/xerographic photoreceptor.

corrugating See "fluting."

corrugation See "rope" and/or see "fluting."

cotton fiber paper

Paper made using 20% or more cellulose fiber derived from sources of cotton; i.e., garment clippings, cotton linters (short fibers that adhere

to cotton seeds) or waste, and "rags." The latter being referred to as the "rag content of paper."

couch marks See "shadow marks."

cover paper

A general term applied to heavier basis weight durable printing papers, normally used for outside covers, such as on pamphlets and magazines; measured on a 20" x 26" basic size.

cracked edge

A slight tear in the edge of a web, which under tension, can initiate a web break.

crash sequence

Also called straight or forward sequence; in a multi-ply business form, the usable sequence of the individual plies; the term crash comes from crash numbering or printing, whereby all parts in the form are imaged by impact printing on the top ply of the form, thus printing all the plies in the form. See "reverse sequence."

creep

(1) In offset lithography, the forward movement (or stretch) of a printing blanket during printing. This can result in "doubling." Can also apply to the movement of the packing under the plate or blanket during printing, causing excessive plate wear.

(2) For saddle-stitched products, also known as "shingling," where inner pages extend beyond the boundaries of the outer pages.

cross direction See "grain direction."

crossline screen

Originally in half-tone or tonal photography, a grid pattern with opaque lines crossing each other at right angles, creating transparent squares or apertures through which the dots were produced to form an image giving the illusion of printed tonal values. See "screen."

crown See "roll crown."

crushed core

Core out of round or completely collapsed as a result of excessive squeeze or impact.

CTP

"Computer-to-plate," meaning text, line and halftone content are imaged directly on the plate without the use of any intervening process involving film. The plate is usually, but not always, imaged offline from the press. Other technologies allow a photosensitive "plate cylinder" to be imaged directly from the computer; hence, "computer-to-press."

curl See "simple curl."

cut-line

A caption placed inside the illustration.

cut-off

In web printing, the cut length of paper prior to the delivery. The maximum cut-off length is the circumference of the plate cylinder or plate length.

cut-outs

Printed pieces cut into irregular shapes, or with cut-out holes (such as an envelope window).

cut-size paper

Refers to any lift of paper which is 17" x 22" or less in dimension. Generally, specific to business papers that are usually "cut-to-size" to 8.5" x 11," 8.5" x 14" (legal size), 11" x 17," or A4 size.

cyan See "process colors."

cylinder gap

On a printing press, the gap or space along the plate or blanket cylinder axis, housing the clamping mechanisms for holding the plate or blanket in place; can be called blanket gap or plate gap.

Dahlgren dampening system

A type of dampening unit that utilizes bare-backed rollers and a chrome metering roll; used in both web and sheet-fed printing.

dampeners

The rollers (mechanical devices) that carry the fountain solution from the press fountain to the lithographic plate.

dampening solution See "fountain solution," also called dampening etch (particularly in reference to fountain solution concentrate).

dancer roll

Usually, a weighted roll that rides on a web of paper between two fixed points (for example, between an unwinding roll of paper and an impression or coating nip) to take up slack and maintain a uniform web tension.

dandy roll

On the paper machine, the dandy roll impresses the still-wet web of paper to smooth the formation, reduce foam bubbles, and to impress a pattern if desired; with raised areas on the wire-covered dandy roll, it can give a watermark or laid pattern; with recessed areas, it can also give a watermark-like pattern called a "shadow mark;" the raised or recessed patterns on the dandy roll result in a difference in transparency when viewed in transmitted light.

deciduous

Leaf-bearing trees, such as oak and maple, that shed their leaves with the seasons, also known as "hardwood." Pulps made from this type of tree give cellulose papermaking fibers that are short, thus "short fiber."

deckle

In papermaking, the width of the wet sheet as it comes off the wire.

deckle edge

The untrimmed, feathered edge of the dried paper from the paper machine; see "deckle" and "feather."

de-inking

The mechanical or chemical removal of printing inks and other foreign materials from paper so that the cellulose fibers can be reused or recycled.

delaminate See "plybond."

delivery

The printing press mechanism that handles the paper after it is printed. Printing presses "deliver" the printed product as flat sheets, folded sheets (signatures), finished products or rewound rolls.

densitometer

Instrument used to measure the optical density of an image or color; optical density is the intensity of the color or printed image.

desensitize

(1) In lithographic printing plates, making the non-image area of the metal plate non-receptive to ink. The main desensitizing material, is usually a gum, often gum arabic.

(2) In carbonless paper, the over-printing of the CF (receiving) surface so as to eliminate its ability to develop an image from the CB surface.

digester

The large pressure vessel in which wood is pulped (cooked) to extract the cellulose fibers; can be a continuous or batch process.

dilatant

The property of some inks and coatings to become more viscous when stirred as a result of separation of the vehicle phase from the suspended materials; this dilatancy phenomenon is not always reversible once the separation has occurred; also see "thixotropic."

Dilitho

Direct lithography; see "direct printing."

dimensional stability

Ability to maintain size under conditions of varying moisture or humidity; the property of a sheet of paper that relates to its constancy of dimensions under different relative humidities.

dioxin

An undesirable, toxic, chlorinated contaminant generated when chlorine is used in bleaching wood pulp and in combustion processes.

direct printing

Any printing process where the ink is transferred directly from the plate to the paper. (Most lithographic printing is "offset;" i.e., a blanket is utilized to transfer the ink from the plate to the paper.) Dilitho is the abbreviated term for "direct lithography."

dished roll See "telescoped roll."

disk refining See "refining."

doctor

Usually a steel or plastic blade used on many types of equipment for coating (see "blade coating"), for metering (removing excess ink from a gravure cylinder or plate), or for keeping the surface of a roll clean.

dog ear See "turnover."

dot

The individual printing element or spot in halftone printing.

dot gain

The gain in real ("mechanical") or apparent ("optical") size of the printed dot, as a result of the ink, paper, printing pressure, prepress operation, or any combination of these. Since the dots printed are larger than planned, this can be a defect evidenced by darker tones and/or different hues. "Mechanical gain" refers to the actual physical enlargement of the dot; "optical gain" refers to the apparent increase in dot dimension caused by light reflection and scattering losses in the paper. Optical gain is most often much greater than mechanical gain. Also referred to as "Tone Value Increase" (TVI).

doubling

In printing, the appearance of a latent, second or ghost-like image of the original on the printed piece or the appearance of a "slur" or blurring of the image. Doubling can be the result of "creep," or even a mechanical feeding problem on the press, where the image has moved its position on the blanket (resulting in a misregister from unit to unit). If the cause of the doubling is due to "creep," the latent image will generally disappear as the latent ink image is

removed from the repositioned blanket. Variability (coming and going) of the latent doubling image is usually due to a mechanical press or feeding problem. Paper distortions can also cause doubling.

drag mark See "coating streak."

draw

(1) In guillotine trimming of paper, the displacement of the cut sheets in a clamped stack by the thickness of the knife; can result in inaccurately cut paper.

(2) The tension on a paper web between sections of a piece of equipment, such as a paper machine, coater, or printing press.

drawdown

The application (by a blade or a bar) of a thin film of coating or ink to a piece of paper; used as a test method to evaluate coating or ink characteristics (such as shade, color strength, coating strength, absorption, etc.)

driers See "dryers."

drilling

The piercing of stacks of paper in a precise manner -loose-leaf notebook paper is an example of drilled paper, using a hollow point drill.

dropout

The loss or elimination of very small highlight dots in a halftone print.

dry back

The term applied when the density and/or gloss of the wet, freshly printed ink film decreases after drying, to a greater extent than was anticipated. It is generally related to an overly absorbent paper surface or a poor ink/paper combination.

dry end

That part of the paper machine where the paper is dried; the last sections of the paper machine.

dry trapping

The ability of a dry, printed ink film to accept a wet ink film over it. In most lithographic process color

printing, the ink is not allowed to dry before subsequent ink is applied; hence, it is "wet trapped."

dryers

(1) The pieces of equipment used to dry the paper during manufacture, coating, or printing. Drying equipment consists of large, steam-heated rotary cylinders, hot air dryers, or direct radiant heat impingement.

(2) Various chemical compounds added to ink to promote or speed (catalyze) ink drying by oxidation/polymerization; may also be spelled "driers."

drying of inks

Printing inks dry in a number of different ways, often in a combination of these: absorption, oxidation, polymerization, evaporation, precipitation, solidification (such as cooling of a hot, melted material) and radiation curing. All of these are mechanisms for turning fluid, mobile ink into a relatively immobile image.

drying oils

Oils that possess the property of hardening to a tough film by oxidation and polymerization (like linseed oil).

dry offset

See "letterpress printing;" refers to the use of a letterpress plate or cylinder on an offset press; i.e., transfers the ink from the plate to the paper on an intermediate blanket cylinder. Also called "letterset."

dry trapping See "trapping."

dull finish

See "gloss;" any finish lacking gloss and/or luster; generally refers to an intermediate gloss of coated papers or of printed ink films. "Dull" papers have a 75" TAPPI gloss anywhere between 30-50 gloss units.

dummy

A preliminary layout or presentation to show the style, form, size or shape of a printing job.

duplicator

Early on the term referred to "spirit duplicators," but has now come to mean (generally small) sheetfed

lithographic presses that are often used for relatively short runs.

dust

Loose particles of fibers, filler, or coating materials appearing on the edges of a skid, lift, or roll of paper; this dust can interfere with print quality, particularly if on the sheet or web surface.

dwelt time

The length of time that the paper web takes to go through the press dryer of a heat-set web offset press.

ECF

Abbreviation for "elemental chlorine free."
Refers to the absence of elemental chlorine in the bleaching process.

edge bleed

Undesirable coloration at the edge of sheets caused by the action of the cutting knife; in carbonless papers, the image color development at the edges of the sheet or web from the same cutting action.

edge guide

Also web guide; a guide on web-fed equipment to position the paper sideways for the operation. On sheetfed equipment, this is called a side guide.

edge padding adhesive See "padding compound."

electron beam See "radiation curing" (of inks).

electrostatic assist

The use of an electrostatic or electrical charge to assist in removing the ink from gravure cells or in electrostatic printing or the transfer of the toner from the photoreceptor to the paper surface.

electrostatic copier or printer

Also called xerography or electrophotography; see "photoreceptor." The means by which an electrostatically charged photoreceptor surface is exposed to light in order to create non-image areas or a latent electrostatic image. The light source is generally a lens mechanism in copiers and a laser light in printers. The non-exposed area, which still has a static charge

on the surface of the photoreceptor, defines the image. The electrostatically charged image areas attract a toner (which has an opposite charge), much like a magnet. An electrostatic charge (such as created by an electron beam) can also be applied directly to a desired image area of the plate, to create a latent image without the use of light. The toner defining the image is transferred to the paper and is "set or fixed" to the paper surface either by heat (fuser section) or absorption of the fluid portion of a liquid toner into the paper.

Elmendorf See "tear test."

em

A printer's variable unit of measure, generally considered to be the width of the capital letter "M." Specifically, a square the size of the individual type. Most automatic line and type figures are 1/2 an em in size, or an "en."

embossed

(1) A textured finish imparted to paper by means of raised or depressed engravings on steel rolls, so as to leave a visible surface design on the paper.

(2) A raised image or design in the paper surface created by using male and female dies; an unprinted design created in this manner is referred to as blind embossing.

embossing

(1) The process for creating an embossed finish. Also, see "reverse embossing."

(2) The swelling of a printing press blanket due to absorption of solvents from the ink; blanket embossing.

emulsification

A condition in offset lithography that results from the mixing of excessive fountain solution (water-based) with ink (oil-based) on the press; generally a contamination of the ink by the fountain solution.

en

Half of an em; see "em."

enamel

Originally, this term designated a coated paper with a high gloss finished surface. Enamel has now come to signify any coated paper surface, regardless of gloss.

engraved printing or engraving

A form of recessed printing, where the image to be printed is etched or engraved below the non-image areas of the plate. The ink is applied to the plate and the non-image areas are then scraped or wiped clean. Gravure printing is another form of recessed printing, but the ink body and viscosity are much lower with gravure. Engraved printing normally is characterized by a slightly raised image area and a slightly recessed area on the reverse side of the paper corresponding to the printed image.

EPA

An abbreviation for the "Environmental Protection Agency." EPA regulations can be administered by one or more agencies on the national, state, or local level. Generally, these agencies are responsible for everything in the environment around us.

equivalent weights

Means of comparing the weights of papers which have different basic sizes and basis weights; strictly a mathematical calculation.

etch

In offset lithography, the acidified gum solution used to desensitize the non-image (non-printing) areas of the plate; the "etch" commonly refers to the concentrate used with water to prepare the "fountain solution," also, the buffered acid solution added to the fountain solution. See "fountain solution."

fabric See "wire."

Fadeometer

An instrument used to provide controlled and accelerated fading from simulated sources. A Weatherometer does the same, but also includes the option of simulating high moisture environments.

fan-a-part adhesive or glue

"Padding compound," specifically designed for mated

carbonless papers is used for padding individual unit sets of forms when in the "crash" or straight sequence; carbonless papers and the fan-apart adhesive are designed to allow automatic (sometimes with a light fanning by the fingers) separation into unit sets after the adhesive has dried.

feather

(1) Tendency of an ink image to spread with a fuzzy, "feather like" edge.

(2) Can refer to the untrimmed deckle edge of a web of paper, tapering in thickness, as on the wire.

feed(er)

The printing press mechanism that supplies and controls the paper as it goes into the first printing unit. Printing presses are either sheet "fed" or roll/web "fed," and either designation is adequate.

felt

A fabric used to carry the wet web of paper from the wire on the paper machine through the wet presses and usually through at least a portion or part of the dryer section.

felt mark (or lick)

An imperfection in the web of paper, caused by a worn, filled or damaged felt, so as to disturb the uniform removal of water from the wet web.

felt side

The top side of the web of paper as it is produced on the paper machine; the side of the web of paper opposite to the wire side as produced on a paper machine; historically, the felt side has been the smoother of the two sides.

festoon

(1) A series of moveable rollers that allows an accumulation of enough length of paper so that a zero-speed splice can be made without slowing or stopping the printing press or coater.

(2) An older means of slow air drying (most often with heated air) a web or coating that involves conveying a web through the drying chamber, hung over closely spaced horizontal bars/poles, with the web sagging

near the floor or bottom of the drying chamber, between each bar. Also called loft, pole, or loop drying.

fiber clumps

Small pieces of fiber bundles loosely adhered to the surface of the sheet.

fiber puffing

The tendency of groundwood fibers to "puff up" in the dryer when printing by heatset web offset printing, giving an unwanted "grainy" appearance to the printed piece.

fibrillation

Act of loosening fine threads (fibrils or fibrillae) or roughening the surface of a cellulose fiber by the action of refining. This aids in increasing the surface area for bonding the fibers to make a web of paper.

filled roll See "supercalendering."

filler

The pigments and minerals used in the furnish to fill the spaces between fibers. The use of filler improves the opacity and printability of paper as well as imparting other properties.

fine papers

Types of paper, normally white, used for printing and writing; also called "white papers." This term is usually used in contrast to coarse/industrial and/or packaging papers.

finish

(1) To finish paper is a term used to describe the converting operations in a papermaking or printing plant to prepare the product in a form suitable for the next customer.

(2) The finish of a sheet of paper refers to the condition of its surface; a highly finished surface is one that is hard (low porosity) and smooth, while a low finish is one that is relatively rough and "toothy."

flats

(1) The flat sheets of a printed piece prior to folding.

(2) Sheets of positioned film negatives or positives

that have been prepared to expose lithographic plates during the platemaking process.

flexographic printing

A form of relief printing, formerly called aniline printing. A special kind of letterpress printing, using synthetic or rubber relief plates, special inks, presses, and procedures. Finds wide use and application in the printing of packaging materials, and in decorating sanitary tissue products.

flow See "body," "leveling," "tack," and "viscosity."

fluorescent dyes

Chemical components that function by converting invisible ultraviolet radiation into visible light, thus making the paper surface appear brighter. Can be added to the paper furnish, size press applications, or coatings to increase brightness. Also called optical brighteners.

flush

Highly-pigmented base used in the manufacture of printing inks. Usually reserved for oil-based or energy curing systems. If water-based, then usually referred to as a dispersion.

fluting

Also called heat-set corrugations or waffling; a web distortion that runs parallel to the grain, caused by uneven moisture losses in the image and non-image areas of the print as it passes through the press drying oven.

flying paster or flying splice

A mechanism which allows the lead end of a new roll of paper to be connected (pasted) to the end of an expiring roll web of paper on a paper coater, converter, or printing press without stopping the equipment; both the new incoming roll and the expiring roll are running at line speed.

foam spots

Holes or weak spots in the finished paper caused by foam in the wet end of the paper machine; or surface defects such as spots occurring in a coated paper surface as a result of foam in the coating.

fold(er) See "buckle fold(er)," "chopper fold(er)," "former fold(er)," and "jaw fold(er)."

folding endurance (strength)

A paper test that measures the number of double (back and forth) folds that can be made on a sheet of paper under tension, before it breaks.

folding quality

Also called "character of fold;" refers to the quality of the fold itself and the breaking of the paper surface or the printed ink film across the fold line. This is a visual, comparative, and/or subjective evaluation.

folio

Refers to a sheet of paper, sized 17" X 22" and larger; can also mean the page number of a book.

font

Complete assortment of all the different characters of a particular size and type style.

form

Any document for the recording of variable information, whether in a variable or standardized format. The form itself can be of a single sheet of paper, or multi-ply (for copies) construction. Also see "continuous" and "unit set" forms.

formation

Refers to the uniformity distribution of the cellulose fibers and other ingredients when manufacturing paper on a machine; can be observed by looking through the sheet using transmitted light; good formation is characterized as very uniform or "close," while poor formation is "wild" or "cloudy."

former fold(er)

A fold made by a triangular device (former), slanted at a steep angle from the horizontal, over which a web travels to be folded in half longitudinally. Air jets, rollers, and rounded edges are used on the device to minimize friction as the paper passes over the former. Running the fold through a pair of nipping rollers usually makes the final crease of the former fold.

form rollers

The rollers, either inking or fountain/dampening, that directly contact the printing press plate.

forms bond

Generally a lightweight, dense bond paper used for single or multi-ply output of variable information in a standardized format; a business paper. Measured on the bond basis of a 17" X 22" 500-sheet ream.

fountain

The part of a printing press which contains the ink to be fed to the distributing system ("ink fountain"), and in offset lithography, the part that feeds the fountain solution to the dampening device/system; the latter is also called the "water fountain."

fountain solution

Also called the "dampening solution" or fountain or dampening "etch," or just "the water." Water, buffered acid, gum, and probably wetting agents (alcohol or alcohol substitutes like high molecular weight glycol ethers) used to keep the non-image areas of the plate moist and prevent them from accepting ink in the lithographic printing process.

four-color process

The printing of a full-color picture or drawing by the use of four separate printing inks, the three process colors-yellow, magenta and cyan-and black. Also see "three-color process."

Fourdrinier

French financiers of the inventor (Louis Robert) of the equipment to produce a continuous web of paper; the term used to describe the most common type of modern papermaking machine; also, the term used to describe the section of the papermaking machine that is a continuous "wire" or belt screen through which the first removal of water occurs, as the result of gravity, suction, and hydraulic forces.

freesheet

A sheet of paper that is "free" of groundwood, though a small percentage (up to 10%) of groundwood is tolerated.

freeness

A term used by papermakers that indicates how quickly water drains from a pulp-containing furnish; freeness is dependent on the degree of refining and is inversely related to the ability of a pulp to lose water.

furnish

The mixture of papermaking ingredients, including cellulose fibers, ready for use on the paper machine to produce a designated grade of paper; usually about 1% solid material with 99% being water and additives.

fuzz

Fibrous projections from the surface of a sheet of paper that are attached. See "lint."

GAA

Abbreviation for "Gravure Association of America." (Also could be "Graphics Arts Association").

gap See "cylinder gap."

GATF

Abbreviation for "Graphic Arts Technical Foundation."

gathering

The assembling of sheets of paper or folded signatures in proper sequence; see "collating."

GCR

Abbreviation for "gray component replacement," also see "UCR." Three-color process can produce gray tonal values, but slight hue shifts can occur (such as can result from dot gain and or non-equal trapping). Adding black (four-color process) for better black prints is common. Gray component replacement is the additional work done in color separation to reduce the amounts of yellow, magenta, and cyan and to replace them with black ink. This can make better/more consistent grays in the printed image (and usually reduces ink consumption and costs).

gear streaks

In printing, streaks appearing perpendicular to the web or sheet direction, at an interval corresponding to the gear teeth of a press cylinder.

ghosting

Ghost images are unwanted images (often faint) that appear in the printed piece. Mechanical ghosting is usually traceable to conditions on the printing press and/or layout of the form. Chemical ghosting (gloss ghosting, dull ghosting, trapping ghosting, fuming, etc.) is usually delayed from the printing operation and evidenced later. Chemical ghosting, usually found only in sheetfed printing with conventional inks, is frequently the result of ink vapors from the first side printed affecting the visual appearance of an image on the second side printed or vice versa.

glassine

Light, dense, translucent paper made from highly refined chemical pulp and possessing a high degree of hydration. Glassine uses include envelope windows and protective packaging for foodstuffs, candy, etc.

glazing/blanket glazing

A glazed appearance or condition on the offset blanket that is the result of excess gum being deposited in the non-image areas; is most likely caused by either excess evaporation of the fountain vehicle (alcohol and water), leaving behind the gum, or as a result of the gum being insoluble or kicked out of the fountain solution.

gloss

The "shininess" ("glare") reflected from a surface; in paper measurement, it is the specular reflection of light, incident and reflected at a 15-degree angle from a surface, as compared to a polished plate of black glass; papers can range in finish from matte to satin or dull to glossy.

GRACol

An acronym for General Requirements for Applications in Commercial Offset Lithography, an emerging set of specifications for the commercial printing market to complement SNAP and SWOP.

grain direction

The direction of orientation/alignment of cellulose fibers in a sheet or web of paper, resulting from the

flow of fibers in a water suspension during the paper-making process; the direction of paper parallel to its forward movement on the paper machine; also called "machine direction," with the orientation perpendicular or at right angles being called "cross direction."

grain long

A sheet of paper where the grain direction is parallel to the long dimension; an 8.5" x 11" sheet of paper is grain long if the grain direction is parallel to the 11" dimension.

grain short

A sheet of paper where the grain direction is parallel to the short dimension; an 11" x 8.5" sheet of paper is grain short if the grain direction is parallel to the 8.5" dimension.

grammage See "basis weight."

graphic arts

In common usage, this includes all components and segments of the printing industry, as well as other industries or media that utilize graphic images.

grater rolls

Rollers on a printing press that guide and support the web—used most often on a web that has just had wet ink applied—in order to prevent tracking; the rollers generally have a rough or textured surface to minimize the possibility of tracking and/or smearing of the freshly printed ink film, and to aid in gripping and guiding the web of paper. Also, see "idler rollers."

gray balance

The values for yellow, magenta and cyan that produce a neutral gray with no dominant hue when printed at a normal density.

gravure printing

A form of recessed printing where the very fluid ink is applied to the plate or plate cylinder and is actually carried in small microscopic cells recessed into the plate; used for long-run printing applications due to plate or cylinder costs. Normally run on rotary presses, hence the name rotogravure. Engraved

printing is based on the same principle, using larger recessed areas (as opposed to microscopic cells) and more viscous inks.

gripper margin/edge

A plain unprinted (and unprintable) margin on the leading edge of the sheet where the grippers that pull the paper through the press hold onto it; usually 0.5 inch or less. Required by sheetfed presses.

groundwood

Wood-derived pulp, obtained by mechanical means, and containing all the tree's lignin-type materials. Carefully cleaned and debarked logs were originally pressed against the face of a rapidly revolving grindstone. The abrasive action tore the fibers from their setting in the wood. Groundwood is one type of mechanical pulp, but the term is often used synonymously with mechanical pulp.

groundwood papers

Term applied to papers containing a substantial proportion (> 10%) of groundwood or mechanical pulp.

guide edge

The edge of a sheet, at right angles to the gripper edge, that travels along a guide to position the sheet on the table and through the sheetfed printing press. The guide edge is the means of control of edge-to-edge register of the images.

guide roll

A roll or roller used on a running web of paper; can be "cocked" to compensate for side to side draw difference variations.

gum

A water soluble resinous material (generally, naturally harvested gum arabic, but can be synthetic materials) used to treat the lithographic printing plate and make the non-image areas of the plate more wettable and receptive to the dampening solution. Also, the dampening solution usually contains a gum to replenish that worn away from the plate during printing.

gusseting

A waviness and, in extreme cases, actual creases at the heads of the inner pages of a closed head press signature.

gutter

The inside margin in a bound piece, between the printed area and the binding; also gutter margin.

hairline register

Multi-color printing on which misregister allowable is 1/2 row of dots; also the joining or butting of two or more colors, with no color overlap. See "register" and "commercial register."

halftone

The process in printing to impart tonal value to a printed piece with a single color of ink; it is created by separating the different tonal value areas into dots of varying size. This term is used to signify any printed area that has been printed with small dots to create a tonal effect.

hard bound See "case bound."

hard sized

Refers to a paper that has been heavily sized to resist moisture penetration; opposite of slack sized.

hard spot See "ridge."

hardwood

Source of "shorter" cellulose fibers for papermaking, as extracted from deciduous or leaf-bearing trees.

headbox

The first section of the paper machine, where the furnish is mixed to provide a uniform suspension to the slice for the formation of a web of paper on the wire.

heatset inks

Inks that use the following as their primary drying mechanisms: (1) the evaporation of solvents and (2) solidification by the reduction in temperature of the thermoplastic resins in the ink vehicle. Usually associated with heatset web offset presses.

hickeys

When foreign material sticks to the printing press blanket or plate in an image area, it interferes with the transfer of ink to or from the blanket surface.

The printed imperfection created can appear as a "hickey" (a white area around a dark center, similar to the appearance of a doughnut); can be caused by dirt on or around the press, dried ink skin, paper or coating particles, etc.

high fidelity color (HiFi color)

Generally referring to color reproduction techniques involving two to three additional "process" colors beyond the basic three. A wider color gamut can thus be obtained. The original image, must be screened with proprietary software in order to take advantage of these techniques.

holdout

(1) In paper, the ability to resist surface liquid penetration.

(2) In printing, the property of the paper or ink that leads to low absorption of the ink. Increasing levels of holdout can result in slow ink setting, which can in turn cause set-off.

humidity See "relative humidity."

hydration

The wetting of fibers, generally to swell them and to increase their susceptibility to refining; any process of altering fibers to increase their ability to absorb water.

hydrometer

See "Baume hydrometer;" a series of flotation type instruments used to measure the specific gravity of liquids, or in turn the concentration of solutions.

hydrophilic

Describes the surface of a material that is easily wet by and compatible with water; "water loving." For the opposite, see "hydrophobic." In offset lithography, the non-image areas of the plate are very water receptive and thus hydrophilic.

hydrophobic

Describes the surface of a material that is not easily wet by and actually repels water; "water hating." For the opposite, see "hydrophilic." In offset lithography, the image areas of the plate repel water and are thus hydrophobic.

hygroexpansivity

The property of a material that causes it to expand or contract when its moisture content is changed, as in paper, when the relative humidity of the surrounding atmosphere is changed.

hygrometer

Instrument for the measurement of the relative humidity of air.

hygroscopic

The property of paper or other substances that makes it prone to absorb moisture.

hysteresis

The characteristic of paper and other materials that accounts for the fact that certain properties are dependent upon the material's history, e.g., the moisture content of paper depends upon its prior exposure to different environmental conditions. (In other words, it's as if paper has a "memory.") For example, two pieces of paper that were last exposed to high and low relative humidities, respectively, will have higher and lower moisture contents when brought into equilibrium at 50% relative humidity; dimensions will also vary accordingly.

idler rollers

Any free turning roller/roll in a web press used to support and guide the web as it travels through the press. Often the roller has a rough or "grated" surface to minimize tracking and smearing of freshly printed surfaces and to aid in gripping and guiding the web of paper.

IGT

A laboratory printing device that uses special fluids or inks for assigning numerical values to the measurement of surface strength; see picking. The I.G.T. abbreviation

is for the Amsterdam Holland manufacturer of the equipment: "Instituut voor Grafische Techniek."

illumination See "standard illumination."

image density

A measurement of the image darkness according to a reflection densitometer or the perception as detected by the eye; see "reflectance."

imposition

The proper placing of pages on a layout for printing, such that the pages will appear in proper sequence in the signature after folding.

impression

The pressure (see "back pressure") between different press elements (such as the plate cylinder and the blanket cylinder). Also refers to the image left on the paper or other substrate.

impression cylinder

The cylinder against which impression is made; it is used as the opposing element to create the pressure required to transfer the image from the blanket (or plate) to the paper surface.

indirect printing See "offset."

ink film thickness

The thickness of ink on the plate, blanket, or paper as expressed in micrometers (μm) or g/m^2 .

ink fountain

The reservoir from which ink is metered to the ink rollers on the printing press.

inkjet printing

Also "jet" printing; pressureless and plateless forms of printing, generally where a variable image is generated from an electronic media or computer. The digitized information generating the image "triggers" the squirting or deflection of a very low viscosity liquid ink through one or more nozzles onto the paper surface.

inkometer See "tack."

ink receptivity See "K & N" ink receptivity.

inks See "printing inks."

ink trapping See "trapping."

intaglio printing See "recessed printing."

interleaving

The placing of flat sheets together in proper order before binding.

internal bond strength See "plybond."

International Organization for Standardization

See ISO.

internal sizing See "sizing."

ISO

Abbreviation for "International Organization for Standardization; ISO" develops and publishes standards for a variety of technical applications, including paper (see "A sizes"), communications, printing, and data processing; also certifies quality control programs (such as ISO 9000).

jaw fold or folder

Also called a tucker fold. One or two folds are created in a web at right angles to the direction of web travel by the use of a two- or three-cylinder device. The lead edge of the web is caught by some means on the first cylinder (commonly by pins which penetrate the paper; the effect can be observed on a newspaper fold) which carries it around the first cylinder. Halfway around, a tucker blade on this cylinder forces the center of the soon-to-be folded web, into the folding jaw on the second cylinder. The jaw closes, thus creating the fold. At the same time or subsequently, a cut-off knife separates the tail of the signature from the web. The signature is carried around the second cylinder and released by the jaw and the cycle continues. The signature can be passed to a third cylinder in a similar manner to make a second parallel jaw fold.

jet printing See "inkjet printing."

jet streak

Some applicators use a jet system to apply coating, hence the name. Jet streaks are caused by something in the orifice of the coating jet blocking the flow of coating. The dry sheet will then typically burn the blade (since there is no coating to lubricate it), so that if coating is restored to this area, it doctors less off in the area that was dry before causing a wet streak in the same spot. See "coating streak."

job lot

Paper that is overrun or which does not meet standard quality specifications and that is sold at a reduced price.

jog

(1) The mechanical or manual operation of producing a smooth-sided pile of paper by shoving and pushing sheets together against a smooth flat surface; to straighten or align sheets of paper in a stack.

(2) The "inching" of the drive mechanism of a piece of machinery, such as a coater or printing press.

junior carton

A carton package of five to ten reams of cut-size paper.

justify

To make a line (or lines) of text copy fit both margins exactly.

K & N ink receptivity

A test (using a special ink or dyed oil provided by K & N Laboratories Inc.) to evaluate the absorption of ink by a paper surface. The paper surface is smeared with an excess of the K & N ink and after a specified time, the unabsorbed ink is wiped off the sheet. The depth of color remaining (absorbed ink) is measured, usually with a reflectance instrument. Other test inks from other manufacturers are also available (Fiint-Croda, Leneta, K&N, Porometrique, etc.)

king roll

The bottom roll in a calender stack, usually the largest diameter in the stack and the only driven roll in the stack.

kiss impression

A very light printing impression with just enough pressure to transfer ink to the paper; a term used to signify ideal impression pressure when printing by the flexographic and lithographic processes, particularly when printing pressure-sensitive carbonless papers.

kaolin

A white clay that, in its beneficiated condition, is used as an opacifier and to promote paper smoothness in the paper machine furnish. Also used as a pigment in coatings.

kraft

Also known as the sulfate process. A process and the product resulting from the pulping of wood using a sodium hydroxide (alkaline) and sodium sulfide solution, under conditions of high temperature and pressure. A "strong" pulp, Kraft is the most widely used chemical pulping process; see "soda" for the less widely used alternative alkaline pulping process. Kraft also refers to the strong brown paper used for packaging, such as brown grocery bags.

L,a,b See "color measurement."

lacquer

Usually a clear overcoat imparting such properties as high gloss, heat sealing, improved surface appearance, etc. Historically, lacquer has been organic solvent-based but can now be water-based. See "varnish."

laid pattern/paper

A watermark pattern in paper resulting in parallel lines to both the machine and cross directions of the paper web.

landscape mode

A printer's (usually driven by a computer) output orientation in which the printed text runs parallel to the direction of movement for the paper text during short-edge feeding; see "portrait mode."

laser

Coherent light; an abbreviation or acronym for "Light Amplification by the Stimulation of Emission of Radiation."

laser cutting

Coherent light, of sufficient intensity to be able to physically cut or burn; used in delicate surgery, for example, as well as in paper perforation.

laser printers

Electrostatic/xerographic printers using a laser as the light source. Activated by an electronic media, rather than by optical means.

latex

Naturally occurring liquid (from rubber trees), but now a generic name for synthetically produced materials; used as an adhesive in the coating of paper.

laydown sequence See "color sequence."

layout

An artist's conception (the master plan or "blueprint") of the finished printed job. Layouts can be very rough, semi-comprehensive, or so comprehensive that nothing is left to the imagination.

LCD Abbreviation for "liquid crystal diode," used in electronic displays, such as on watches, but emitting no light. See "LED."

LED

Abbreviation for "light emitting diode." Used in electronic displays, such as on watches; see "LCD."

ledger paper

A strong, smooth writing paper, originally designed for accounting records and ledgers. Measured on a bond or business papers basic size of 17" x 22."

length

Describes a property of printing ink that is the distance a finger and thumb can be pulled apart while maintaining an unbroken "thread" of ink between the two; as such, inks can be described as "short" or "long." Length is related to both viscosity and tack, as a fluid or body property of ink.

letterpress printing

A form of relief printing where ink is applied on all raised areas on the plate; the non-image or background area is cut away or removed; i.e., "relieved."

Can be likened to a "rubber stamp," though the plate can be made of wood, metal, or other non-flexible material. Dry offset is really letterpress or relief printing where the plate is a flexible synthetic material with relief features, but the plate can also be run on an offset press (using no fountain solution).

letterset See "dry offset."

letter spacing

The placing of a space between each letter of a word.

leveling

The property of a coating or an ink causing it to flow out as would a true liquid. As a corollary, a paint or coating that leaves "brush or roller marks" has poor leveling or flow properties.

lift

A pile of sheeted paper; usually the amount accumulated at the delivery end of a press or placed under the knife of a cutting or trimming (guillotine) machine.

lignin

A part of the naturally occurring "glue" in wood that holds the cellulose fibers together.

line copy

Any copy with no gradations in tone, suitable for reproduction without using a screening technique.

line holes

The holes punched along one or both edges of a continuous form to assist in feeding, by pins or sprockets, of the form through the imaging or functional device.

linen finish

An embossed finish to simulate the pattern originally obtained by pressing wet paper between sheets of linen cloth.

lint

Fibrous materials on the surface of a sheet of paper that are not attached. See "fuzz."

lithographic printing

Originally stone printing, but more commonly referring to printing from metallic or in some cases polyester plates; see "off-set lithography."

localized watermark

Watermarks (created by a dandy roll) arranged to appear at a definite location in a particular size sheet of paper.

loft drying See "festoon."

logo See "logotype."

logotype

A single image that generally contains a symbol, trademark, or identifying name of a business, association, or product.

long ink See "length."

loose core

When the paper at the core is not fastened properly to the core or the paper comes loose, the core can rotate at a different rate than the surrounding paper. This can cause tension and draw control problems in processing the roll.

lubricants

In coatings, chemicals added primarily to improve flow and finishing properties.

M

Abbreviation for a quantity of 1,000; see "M weight."

machine clothing See "clothing."

machine coated

Paper that is coated on one or two sides on the paper machine; see "conversion coated."

machine direction See "grain direction."

machine finish

The finish applied on the paper machine.

magenta See "process colors."

makeready

On a printing press, all work done prior to running; i.e., adjusting grippers and guides, putting ink in the fountain, mounting plates, obtaining proper ink flow through the press to the paper, etc.

making order

Any order that cannot be filled from stock inventory and is to be made according to the purchaser's specifications.

manifold form

A multi-part (multi-ply) business form normally made with carbonless paper or "forms bond" interleaved with carbon paper or tissue. Usually made with light-weight, dense paper for transmitting the imaging energy down through the plies of the form.

master See "paper plates."

matte finish

The non-glossy appearance resulting from being an uncoated sheet of paper, or from coating without supercalendering; the least glossy paper surface available. For the opposite, see "gloss."

mechanical See "pasteup."

mechanical carbonless See "spot carbonizing."

mechanical ghosting See "ghosting."

mechanical pulp See "groundwood," also see "semi-chemical," "thermo-mechanical," and "refiner mechanical pulp" (RMP).

metamerism

The condition where colors appear identical under a given illumination, but different under another.

metric system

A decimal system used by most countries other than the U.S. for solid, liquid and distance measurements; see "basis weight" and "grammage."

MICR

Magnetic Ink Character Recognition/Reading: magnetic inks printed on business documents,

like checks, so as to be easily readable by the data processing machines through which the forms are run.

microencapsulation

The process of producing microcapsules, microscopic-sized "packages," for controlled release. The process was an invention for and is still used in the production of carbonless paper, but has now found widespread application including use in pharmaceuticals, agriculture and cosmetics/perfumes, particularly for promotional applications

microcapsules See "microencapsulation."

micrometer

A device for accurately measuring the thickness (caliper) of paper.

mil See "caliper."

milking

Also called whitening; the gradual buildup of coating or filler material (usually white pigments, thus the names) from the paper on the non-image areas of the blanket. Over time, this can be abrasive to the lithographic plate, and can sensitize the non-image areas of the plate, resulting in scumming. Milking can result from the softening of a coated paper surface by the first printing unit's fountain solution, and only be evidenced in the later or last printing unit. Whitening (dusting) is usually evidenced in the first printing units, as the result of loose pigment coming off or out of the sheet surface. If either milking or whitening is severe enough, a build-up of the white material in the non-image area can be termed "piling."

mimeograph printing

A form of "screen printing," using the porous principle; a stencil is "cut" (usually with an impact typewriter) to create porous image areas in the screen. This allows an ink to be forced through these porous areas onto the sheet of paper brought into contact with the stencil; the paper used has a toothy, absorbent surface.

mineral oil

Petrochemical oil that can be used as a part of the

ink vehicle. Covering a wide range of initial boiling points, "mineral oil" generally refers to those fractions having very high initial boiling points. Lower boiling fractions are generally referred to as solvents, such as the "Magie Oils."

misting

A mist or fog of tiny liquid droplets thrown off a coater (coating) or a printing press (ink) by high-speed rotating parts.

moire pattern

In process color printing, the undesirable patterns (optical interference) that are caused by incurred screen angles of successive colors. Also, see "rosette pattern."

moisture content

The percent by weight of moisture in a sheet of paper; varies according to atmospheric relative humidity conditions because the paper may either absorb or emit moisture in an attempt to reach equilibrium.

moisture welts See "weather wrinkles."

mottle

Refers to either the spotty, uneven or non-uniform appearance of a printed surface (mostly in solid ink coverage areas) or to a non-uniform distribution of fibers in the formation of a sheet of paper. Also see "backtrap mottle."

Mullen test

Also "pop" test; equipment which tests the bursting strength of paper—the force necessary to punch a hole in paper.

multi-color press

A printing press that can print two or more colors on paper in one pass through the press.

M weight

The weight in pounds of 1000 sheets of paper of a given basis weight and size (dimensions); M is the Roman numeral for 1000.

neutral sizing See "alkaline sizing."

newsprint

A generic term used to describe paper of the type used to print newspapers; usually of very high groundwood content.

nip

The point of contact between two rolls, as in a calendering operation.

nominal weight

The weight stated as the basis or substance weight of paper. The accepted trade tolerance-necessary because of variables in manufacturing paper-is plus (+)or minus(-) 3% of nominal weight.

non-drying oils

Those oils used in inks that do not form dry, hard films as the result of oxidation/polymerization.

OCR

Abbreviation for "Optical Character Recognition;" human readable images that are optically scanned (read) by data and word processing machines.

offset

Short for offset lithography. See "offset lithography" and "offset printing."

off-set See "set-off."

offset core

A core that is not evenly aligned with the edge of the roll.

offset lithography

"Offset" printing has become the commonly used name for this type of planographic printing; also called lithographic or stone printing. The method of printing using a plate in a single plane where the non-image area is chemically distinguished from the image area by creating water receptive and non-water receptive areas on the plate. Today, this is generally accomplished on metal surfaces, by either light-sensitive coatings or electronic methods.

offset papers See "book papers." Coated or uncoated papers.

offset printing

Also known as indirect printing. The method by which the printing plate is removed from the point of transfer of the printing ink to the paper to be printed, generally by means of a resilient blanket or roll. The resilient blanket or roll actually makes the impression on the paper, thus it "offsets" the ink. Unless stated otherwise, can also be specific to the "offset lithography" (see "offset lithography") or planographic printing process, using a resilient blanket to minimize wear on the plate typically caused by the paper being printed directly.

offset spray powder

Particulate dust, normally starch, of generally spherical particles that is sprayed over printed sheets to hold them slightly apart until the inks have fully set. This prevents ink offset from one sheet to the other.

offset winding

Also called "staggered winding." Frequent or abrupt off-sets on the end of a roll.

oleophilic

Describes the surface of a material that is easily coated by and is compatible with an organic oil; for the opposite, see "oleophobic." In offset lithography, the image areas of the plate are very oil-receptive or oleophilic.

oleophobic

Describes the surface of a material that is not easily coated by and actually repels an organic, non-polar oil: for the opposite, see "oleophilic." In offset lithography, the non-image areas of the plate have been wet with a water-based fountain solution and do not accept the oil-based ink—these non-image areas are said to be oleophobic.

opacity

The characteristic of paper to block the transmission of light, or the ability to provide (low opacity, like tracing paper) or prevent (high opacity) "show thru" of dark printing. Measurable and expressed as a percentage of the light that cannot pass through the sheet of paper; for example, a 98% opacity means that 98% of the light cannot pass through the sheet and is absorbed or reflected from the incident surface.

opaque ink

An ink that does not allow light to pass through it and "hides" the paper or previous printing under it; normally not used in multi-color process printing where transparent inks are required; see "process inks."

OPAS

An abbreviation for "On/Off Press Application System;" a patented system and materials developed by Verso, which allow printers and converters to produce their own carbonless paper on site, either prior to or during the printing of multiple part or multiple ply business forms.

optical brighteners See "fluorescent dyes."

optical density

The intensity of the color or printed image.

orange peel

A granular or pebble-like textured surface appearance (like an orange peel) that appears as a defect on a coated or printed paper surface.

OSHA

An abbreviation for "Occupational Safety and Health Administration;" an agency responsible for establishing and enforcing business health and safety standards.

out-of-square

Sheet paper which is cut or trimmed with other than 90-degree corners, or paper that is cut non-parallel or not at right angles to the grain of the paper (cut on the bias).

out-turns

Samples which represent the paper made on different runs of the paper machine; they are kept by the mill and may be sent to the customer.

oven-dried moisture content

The percentage loss in weight of a paper specimen when dried to constant weight in an oven maintained at the temperature of 105± 2° C.

overcoating See "varnish."

over-print See "desensitize" (of CF carbonless papers).

overprint

Often meaning an "overprint varnish," but more generally referring to the application of some ink or varnish to a previously printed piece.

overrun

A quantity of paper made in excess of the amount ordered; trade practices permit a certain tolerance for overruns and underruns, with the percentage usually dependent upon the size of the order. Also, in printing, copies printed in excess of the quantity ordered.

packing

In printing presses, paper or other sheet materials used to underlay the plate and/or blanket (between the cylinder and plate or blanket), to bring the surface of the plate or blanket to the desired height in order to obtain proper squeeze for printing. Packing can also be adjusted to compensate for minor dimensional changes in the paper in multipass/multicolor printing jobs, but only around the circumference of the cylinder (the print length).

padding compound

Also called edge padding glue or adhesive. A liquid adhesive mixture which, when brushed or sprayed onto the side of a pile of paper, adheres sheets of paper together along one edge, thus forming a pad.

paper

A relatively homogeneous matting of primarily cellulose fibers which are formed, usually from a water suspension on the paper machine wire, bound together by entanglement of the fibers and by bonding agents, and subsequently dried.

paper machine

The machine upon which paper is produced from a suspension of cellulose fibers and other components in water (the furnish) by forming, pressing, drying, surface sizing (in some cases), calendaring, and winding on a reel.

paper master See "paper plates."

paper plates

A plate for an offset duplicating printing press (offset

lithography) made of paper; can also be called a "paper master" or "master."

papeterie

A wide variety of writing papers, that fold well, feature good sizing for pen and ink, have high opacity and stiffness. Typically used for personal correspondence and greeting cards.

parchment

Originally a writing substrate made from animal skins; today, parchment is made from cellulose fiber paper by dipping the unsized stock into sulfuric acid to simulate the appearance and feel of genuine parchment. Called "vegetable parchment" when made from cellulose fiber paper.

paste dryer or drier

In ink making, a type of chemical compound (typically a metallic soap) necessary to cure certain types of inks. See "dryers."

paster See "splice."

pasteup

The various art, display and text copy of a printing job assembled on one page of photographing. Also known as "mechanical."

perfect binding

A process of holding pages of a book together with glue (like padding), using no stitching or sewing. The backbones of the books are usually roughened, then adhesive is applied, and the binding is finished with a wrap around cover.

perfect or perfecting press

These terms apply to printing both sides of the paper in the same pass on the printing press. Also applies to printing on the back of a sheet already printed on one side. Printing can be on opposite sides, either blanket-to-blanket or sequentially through a multiple unit press.

perforate

Punching a series of holes or slits in a line in the paper to weaken it so tearing will occur easily along that line.

Also the making of slits in paper during folding, at the fold, to prevent wrinkles and to allow air to escape.

perfs

The actual holes or slits created during perforating.

permanence

The resistance of paper to the destructive effects of age; also the "archival" properties of the paper or printed job. A lack of permanence is indicated by a significant loss in paper strength or a fading of the color of the paper or printed image. The permanence of paper is chiefly dependent upon the purity of the cellulose fiber used to make the paper, the acidity (see pH) in the paper as a result of manufacturing or later contact, and the storage of the paper away from heat, light, and moisture.

pH

Technically, the negative logarithm of the hydrogen ion activity (concentration) on a scientific scale from 0 to 14, 0 being extremely acidic, 14 extremely alkaline. Measured by instruments, pH defines the strength of an acid or alkaline (basic) liquid. From 0 to 7 is acid and from 7 to 14 is alkaline, while 7 is considered "neutral" (neither acid nor alkaline.)

phloroglucinol

A chemical used to identify the presence of ground-wood pulp in a paper.

photoconductor See "photoreceptor."

photoreceptor See "electrostatic copier/printer;" the surface or plate in an electrostatic/xerographic copier or printer where the image and non-image areas are distinguished. The characteristic of a photoreceptor material is that it holds an electrostatic charge on its surface in the dark until the charge is dissipated or erased by exposure to light (either conventional or laser). When a material has this property with respect to electrostatic charges and light, it is known as a photoconductor.

pica See "point," (2).

picking

The lifting of any material off of or out of the paper surface during the printing impression; sometimes due to surface contamination, inadequate surface sizing, inadequate surface strength, or to the ink being too tacky. Generally, the pick will adhere to the blanket and interfere with future impressions; can appear to be hickeys in the printed surface. For measurement of picking, see "IGT" and "wax pick."

pigment

(1) Minerals and other materials used in the manufacture and coating of paper to provide desired properties.

(2) Minerals and other materials, including colorants, used in the manufacture of printing inks; finely divided solid materials.

piling

The collecting of ink and/or paper particles on rollers, blankets and/or plates. Causes include the inability of an ink vehicle to hold the ink pigment in suspension, a microscopic pick, and/or a removal of pigment from the surface of the paper by the ink. The unwanted material can accumulate either on the blanket, the plate or in the ink roller train, often evidenced in the trailing edge of the image areas on the press blanket. If "milk-ing" or "whitening" is severe enough, an accumulation of foreign material can occur in the non-image areas, also creating an extra thickness there; this is also called non-image area "piling."

pin holes

Imperfections in paper which appear as minute holes through the sheet; accentuated by lower basis weights.

PIRA

Formerly the UK-based Printing Industry Research Association, now an international consultancy for the graphic arts.

planographic printing See "offset lithography."

plate

The object used to carry the image and non-image areas.

plate cylinder

The cylinder on the printing press around which the plate is mounted.

plate gap See "cylinder gap."

plybond

Internal bond strength; a measure of the resistance of a sheet of paper to delaminating or blistering due to stresses created during printing and drying.

PMS® color

An abbreviation for Pantone Matching System; an ink color system containing about 500 color swatches, each of which is identified by a color number and a formula for the ink.

points

(1) See caliper; refers to the thickness of a sheet of paper in one-thousandths of an inch.

(2) A unit of printing type measurement; 0.0138 of an inch-{12 points to the pica}-each pica being about 1/6th of an inch or 72 points to the inch.

poor splice See "splice."

poor start

Also called bad start; when there is an obvious difference in the mechanical appearance between paper near the core and the remainder of the side of the roll.

"pop" test See "Mullen test;" slang term for burst test; originating from the popping sound made when the paper bursts.

porosity

A measurement defining how open or tight the sheet of paper is with respect to the passage of air through the sheet.

porous printing See "screen printing" and "mimeograph printing."

portrait mode

A printer output orientation (usually driven by a computer) in which the printed lines run perpendicular to the direction of movement of paper; see "landscape mode."

pre-collated See "collated;" sheet papers purchased in a predetermined sequence, generally for the sheet printing of business forms.

press run

The quantity specified for any given printing job. Also, the number of impressions made from a printing plate.

press section See "wet press."

primary colors

The additive primary colors are the three major wavelengths of light in the visible spectrum-red, green and blue-and are used in applications such as the cathode ray tube of a color television set. The subtractive primary colors-yellow, magenta, and cyan-are used when dealing with reflected light, such as from a full-color process-printed piece. In papermaking, red, yellow, and blue are the primary colors in the dyeing of paper, any two of which can be mixed together to obtain secondary colors and hues.

print contrast

A differential measurement of light reflectance between the image and background areas.

printing

The act of producing an image on a page from a machine designed for that purpose, such as a printing press or a computer printer such as laser or inkjet.

printing inks

Pigmented coatings applied over specific areas of the paper surface by means of a printing press to create images and/or text.

printback

A term used to identify the printed defect encountered when an inked spot of limited size appears in the non-image area.

process inks/colors

Transparent inks used in three-color and four-color printing of full-color pictures or drawings; subtractive primary ink colors are yellow, magenta, and cyan; see "three- and four-color process."

process printing

Printing from two or more halftone plates to produce intermediate shades, hues, and tonal values; see "three- and four-color process."

proofs

Samples of copy and/or layout provided at various stages of production for a printing job.

psychrometer

An instrument for determining the relative humidity of an atmosphere.

puffing See "fiber puffing."

pulping

The act of processing wood (or other plants) to obtain the primary raw material for making paper, usually cellulose fiber. Wood is the most widely used source of fibers for the papermaking process. Chemical pulping is generally by the "kraft" or sulfate process; the soda process or the sulfite process is also used—see each. Wood pulp can also be obtained for papermaking by purely mechanical means ("groundwood") or in combination with chemicals or at elevated temperatures (see "semi-chemical and thermo-mechanical" pulps); also see "refiner mechanical pulp (RMP)."

queen roll

The second roll from the bottom in a calender stack, usually smaller in diameter than the "king roll," but larger than the rest of the rolls above it.

queue

(1) Waiting in line, or the order by which tasks will be carried out.

(2) A set of tasks stored in computer memory for use by a device or machine in a specified order.

radiation curing

Inks have been developed to eliminate solvents (VOCs) when printing by web or sheet offset; these inks have the ability to becoming a hardened image with 100% of the ink composition becoming hardened into the dried ink film. Generally, the hardening

reaction is triggered by either exposure to ultraviolet radiation (UV) or to an electron beam (EB).

rag content paper See "cotton fiber paper."

ragged

Can be "ragged left" or "ragged right;" line and type that has been "justified" to the right or left only, with the opposite side being left uneven or "ragged."

rattle

The crisp, crackling sound produced by shaking or crumpling a sheet of paper to indicate its rigidity or stiffness.

ream

Sheet count of paper (500 sheets for most fine papers); see "basis weight."

ream weight

The amount that one ream of a particular paper weighs.

recessed printing See "gravure printing" and "engraving."

recycle

To reuse or to use over and over; also see "de-inking."

reducers

Materials that are added to inks to reduce either ink tack or viscosity.

reel

A roll of paper.

refiner mechanical pulp (RMP)

See "groundwood;" mechanical pulp obtained by first chipping the wood, then separating the cellulose fibers by mechanical rotary refiners.

refining

The process of preparing cellulose fibers for the making of paper, whereby the individual fibers are separated from each other, flattened, and roughened (see "fibrillation") to various degrees. The flattening action was formerly referred to as "beating" the fibers and was accomplished in equipment called "beaters" in a batch process. Today, most refining is continuous,

by means of rotating close clearance steel bars (plates) also known as disk refiners. Also see "cellulose fibers" and "furnish."

reflectance

The percent of incident light reflected from an image area, where zero percent reflectance is black, and 100 percent is white; see "image density."

refraction

Ability to bend light from a straight course. Materials differ in refractivity, which is measured as "refractive index." The refractive index of materials used in the furnish to make paper will, to a great extent, determine the differences in opacity of various types of paper at equivalent basis weights.

register

(1) In paper, a type of bond paper for multi-ply form use; i.e., register bond.

(2) In printing, when a design or form is printed in parts or steps, as in multiple colors, it is essential that all parts or inks down match exactly. When they do, they are "in register" or in registration; otherwise, they are "out of register." See "hairline" and "commercial" register.

register marks

Fine lines crossing at right angles and placed on original copy before color separation. Used for positioning images, registering colors, accurate cutting, etc.

relative humidity (RH)

Percentage of moisture in the air, relative to the amount of moisture it can hold without precipitation at any given temperature; measured with a psychrometer. Humidity or absolute humidity is a measure of the grains of moisture per unit volume of air.

relief printing

See "letterpress" and "flexographic" printing.

reprography

Copying and duplicating.

retention aids

Materials added to the furnish of a paper machine to help in keeping the fine particles of the furnish within the formed wet mat of paper on the wire. The fine particles are valued for the properties they can impart to the finished sheet of paper.

reverse embossing

A printing defect in which the stresses created in the separation of the paper from the blanket, stretch the paper and actually raise the printed surface in the image areas (and generally create a depression on the back), sufficient to distort the sheet of paper and even prevent its lying flat.

reverse sequence

In a multi-ply business form that is to be run once through the printing press or offset duplicator, the sequence (order) of the plies will normally be reversed -what was on top is now on the bottom, so that after printing the desired sequence is obtained (as contrasted with crash or straight sequence; see "crash sequence").

rewinder

A machine that takes rolls from the reel of the paper machine, coater, or other winder, which slits and/or rewinds into smaller rolls.

RH See "relative humidity."

ridge

A ring around the circumference of a roll or an area in a skid of paper in the machine direction that is harder or higher than an adjacent area; also called hard spot.

RMP See "refiner mechanical pulp."

roll crown

The surface curvature shape or diameter profile of wide-width rolls under high pressure (pli) to compensate for deflection and to obtain a level nip or pressure across the full width.

roll curl

Also called wrap curl; see "simple curl."

roll stand

Frame and mechanism for supporting a roll of paper as it unwinds and feeds into a coater, printing press, or other converting equipment.

rope

Also called "corrugation;" bands of relatively uniform width, which occur in the machine direction around the roll of paper with uniform diagonal marks present in the band. These bands are due to wide areas of caliper differences in the cross direction, resulting in a roll attempting to wind to two different diameters. If tightness of wind is great enough or the caliper differences are accentuated as in large roll diameters, the rope or corrugation can become "set" and be evidenced in the subsequent pile of sheeted paper.

rosette pattern

When preparing conventional color separations for printing, the screen angles are rotated for each process color ink. A symmetrical (but non-objectionable) "rosette" dot pattern can result, which the eye can merge into smooth color gradations. However, incorrect screening angles or the shifting of the paper during printing can result in objectionable patterns. (See "moire patterns").

rosin

A natural resin obtained from pine trees. When suitably modified, it is used as an internal sizing agent to impart waterproofness to paper. Also used in acid sizing of paper. (See "alum").

rotary press

A printing press that carries curved plates on a cylinder (or the plate is the surface of the cylinder), as opposed to an older style flatbed press using flat plates and type. All elements of the press are cylindrical in shape.

rotogravure

See "gravure printing." Web gravure printing utilizes rotary equipment, hence "rotogravure."

rub-off

The degree to which an ink can be removed from the printed surface by rubbing.

runnability

Paper properties that effect the ability of the paper to run on coating, converting, or printing equipment.

saddle stitching/wire

In binding, staples (formed from a continuous wire) driven through the back fold of a booklet, clinched in the middle, enabling the booklet to open out flat. The same type of binding can be accomplished with a stapler, using preformed staples.

safety paper

A treated paper designed to leave a noticeable smudge or discoloration when writing or printing on the paper is altered. This type of paper might be used for making checks or other documents to discourage such alterations.

sales book

Set of forms bound into a book, usually for ease of writing.

satin finish

See "gloss." A finish lacking gloss, generally intermediate to a matte finish and a dull finish.

save-all

A device on the paper machine which screens paper fibers from water to save pulp which might otherwise be lost to the sewer.

SC-A

Uncoated groundwood supercalendered paper containing from 22%-30% fillers.

SC-B

Uncoated groundwood supercalendered paper containing from 8%-20% fillers.

se-c

Uncoated groundwood supercalendered paper containing small amounts of filler or no fillers at all.

scab

A defective lump in paper such as a stock lump or a lump of foreign material that is attached to the web during formation.

scale

Foreign materials from the papermaking or converting operations deposited on the web after it is formed.

Can be starch or coating materials broken loose from the sheet and redeposited. Scale in the printing operation can adhere to the blanket and transfer to the plate causing defects in the printed piece. The terms calendar scale and coating scale are often used in relation to this defect, implying where, in the papermaking process, the scale was deposited on the sheet.

scanning

In printing plate preparation, an electronic method based on point-by-point scanning of color separations and tonal gradations under computer control.

skip coating

Irregularly shaped areas, devoid of coating or non-uniformly coated areas.

score

The line mechanically impressed into a heavy sheet of paper or board to pre-stress the fold line and facilitate folding or improve the appearance of the fold. Most effectively done with the grain of the paper and is absolutely necessary with heavier basis weight paper.

scrap in roll

Trim or scrap paper wound into the roll of paper. The scrap may or may not be protruding from the ends of the roll.

screen

The ruling (usually expressed as lines per inch; i.e., 120 lpi, 133 lpi, 150 lpi) used to determine the dots per unit area in developing tonal values in the printed piece. Up to the point of "dot gain," the higher the screen, the finer the lines per inch, and the greater the fineness of detail in the printed piece. Also, see "stochastic screening."

screen angles

In color reproduction, the half-tone screens are rotated with relation to one another to avoid undesirable moire patterns. The angles typically used are black 45 degrees, magenta 75 degrees, yellow 90 degrees, and cyan 105 degrees.

screen printing

A form of porous printing. The process by which the image area is created by forcing ink into a "screen" or mesh created by blocking off all areas in the "screen" where no image is to be formed; an example would be silk screen printing of T-shirts. Mimeograph printing is also another form of porous (screen) printing.

screen rulings See "screen." The number of lines or dots per inch on a halftone screen.

scuffing

The disrupted appearance of an ink film as a result of abrasion to either the wet or dry ink film.

scumming

A term describing the condition resulting when any non-image area of the plate becomes ink receptive (any cause); when this starts to occur in offset lithography, it is said that the plate is "catching up," sometimes called "toning," although this term is usually reserved for the phenomenon of ink particles becoming dispersed in the fountain solution.

secondary fiber

A term used for wastepaper recycled into the paper-making process.

seam mark

A defect in the web, normally running at approximate right angles to the machine direction and observed as a light streak when viewed by transmitted light. Point of origin is usually an article of machine clothing, a wire or a felt that is seamed. The distance from one defect to the other is a clue as to the origin of the mark.

self-contained paper

A carbonless paper where the colorless dyes and color developers are contained in the coating on one side of the sheet only, and the color is developed *in situ* (not a transfer of chemicals as in a mated system) by the action of an impact or writing instrument to release the colorless dyes.

semi-chemical

A pulping process not widely used in Fine Papers that uses chemicals to assist in the mechanical

pulping process which results in a pulp similar to chemical pulp.

sequence See "color sequence."

separation

The act of separating (dividing) the colors of an original into its component colors (yellow, magenta, cyan, black, and any spot colors); each record or negative is used for the production of a single color printing plate.

set

Inks are said to be "set" when the ink film on a printed piece is immobile, though not fully dry, and can be handled without smudging/smearing.

set-off

Also called off-set; the transfer of ink from a printed sheet to another sheet in contact with it at the delivery end of a printing press and/or during subsequent bindery operations.

sewed

The actual sewing through all the pages of a book which is to be case bound.

shadow marks

(1) Also couch marks; defects which appear as a regular pattern—clearly visible in transmitted light and sometimes visible in direct light. Cause is usually some nonuniform water removal from the sheet of paper in the wet end of the paper machine. Shadow marks take the pattern of the equipment removing the water (such as a drilled hole suction couch roll).

(2) Can also refer to intentional watermark patterning, created using the dandy roll; see "dandy roll."

sheetfed printing

A printing process in which the paper is processed as sheets as opposed to processing from a web (roll/ribbon). Ink drying mechanisms can differ between the sheetfed and web-fed offset lithography printing processes.

shives

Uncooked wood particles which show up in the

finished sheet; in groundwood pulps, bundles of fibers resulting from less than ideal mechanical separation.

short ink See "length."

show-through

See "opacity;" also called strike-through. The undesirable condition where the printing on the reverse side can be seen through the sheet under normal lighting.

shrunken edges See "tight edges."

side guide

A guide on sheetfed equipment to position the sheet sideways for the operation. On web-fed equipment, this is called an edge guide.

signature

A folded sheet of printed paper; usually a section of a book, magazine or newspaper, ordinarily obtained by the folding of a single sheet into 4, 8, 16, or more pages. The term "signature" can also be applied to a printed flat sheet that is to be later folded into a multi-page document.

silk screen printing

See "screen printing;" a form of porous printing.

Originally, the porous material for making the screen was a silk fabric, thus the name.

simple curl

(1) Structural curl is the bending of a sheet of paper around the grain direction and is generally caused by differential moisture changes (cellulose fiber diameter changes) from one side of the sheet versus the other.

(2) Wrap curl is the result of the sheet becoming "set" when wrapped around a core. It is always curling or bending perpendicular to the grain.

size

A water-resisting material which is added to paper; see "sizing."

size press

See "surface sizing;" the part of the paper machine that applies a surface size or treatment to the web of paper.

sizing

A treatment to improve the resistance to a liquid (particularly water) or vapor; surface or internal sizing; see "size press," "acid sizing" or "alkaline sizing." Sizing or waterproofness is generally measured as the time required for a water-based fluid or ink to penetrate from one surface of paper to the other through the sheet.

skinning

The formation of a dried layer on the surface of a fluid such as an ink or coating after a period of standing.

slack sized

Paper having very little or no sizing; designed to resist moisture penetration. Opposite of hard sized.

slice

The opening in the headbox of the paper machine where the furnish is uniformly forced out onto the wire for the web of paper to be formed.

slime

Bacterial microorganisms growing in the wet end of the paper machine system. If left uncontrolled, slime can break loose and become a part of the paper web—a "slime hole" usually results. Slime is normally controlled by slimicides or biocides added to the wet end of the paper machine.

slimicides See "slime."

slip

High-concentration slurry (even semi-solid) of paper-making or coating pigment in water.

slipped roll

Unevenly wound roll, which is usually the result of loose winding. See "telescoped roll."

slitter

A sharp knife (generally a sharp disc) which cuts paper into predetermined widths; if not properly set or maintained, can give a poor, non-uniform, or dusty cut.

slitter dust

The accumulation of dust, primarily filler, fibers, or coating thrown off during the slitting operation and remaining on or in the roll.

slush pulp

Cellulose fibers mixed with water so they can be pumped.

smashed blanket

An area of a blanket that is no longer firm and resilient and gives a light impression in the center of a well-printed area. Usually caused by physical damage of the blanket.

smear

The spreading of ink, usually due to abrasion or rubbing of freshly (not yet set) printed ink to adjacent areas of the paper surface.

smoothness

The texture of the surface of paper; also called "finish." Generally determined with an instrument which measures the flow of air along the surface of a paper sample under standardized loading and air pressure conditions. The greater or faster the flow/escape of air, the less smooth the surface.

smudge

(1) The transfer of ink, usually due to abrasion or rubbing of a printed ink film, to an adjacent sheet or area (see "smear") of the paper; occasionally is referred to as "carbonizing."

(2) In carbonless paper, the premature development of color (intended for producing the image), usually due to abrasion or pressure and the breakage of microcapsules.

SNAP

Abbreviation for "Specifications for Non-heatset Advertising Printing." A color proofing system to assure press-to-press and run-to-run color constancy.

snow-flaking

Small, unprinted areas that appear in the type and solids in offset printing if the ink contains excessive amounts of water.

soda

The product resulting from the pulping of wood using a sodium hydroxide (lye) solution under conditions of

high temperature and pressure; also refers to this particular process. See "kraft" for the more widely used alkaline pulping process.

softwood

Source of "longer" cellulose fibers as extracted from coniferous or cone-bearing trees for papermaking.

soy oil

An agricultural product and renewable resource sometimes used in the manufacture of printing inks as a replacement for a portion of the petrochemical-based solvents and oils. Soy oils, have many of the characteristics of petroleum-based oils but are not as easily evaporated as the lower molecular-weight solvents. Soy oils are also more compatible with water (with implications for fountain solution interactions).

spectrophotometer

An optical instrument to measure color or color differences from a standard.

spectrum

The complete range of rainbow-like colors (continuous), generally in the visible range of wavelengths, from short/blue to long/red.

specular reflection

Light reflected from a surface at exactly the same angle as the incident angle of the light; as a mirror reflects an image.

spine See "backbone."

splice

Also called "paster;" the connection of a continuous web so that subsequent converting and printing operations can be performed satisfactorily. A splice is usually placed in the web during the winding process, when defective paper is removed or when material is added to complete a roll diameter or length. A web break, misregister on the printing press, and damaged blankets due to excessive thickness are just three examples of possible results of a "poor" splice. Also see "butt splice."

spot carbonizing

The printing of only certain portions on the reverse side of the plies in a business form; achieved with a hot melt composition of wax and pigment (originally carbon black). Requires a special coated or uncoated paper, free of pin holes, that would prevent unsatisfactory, unsightly points of carbonizing material to come through to the face (top side) of the sheet. The product resulting from carbonizing or spot carbonizing is also called a mechanical carbonless paper.

spot color

Premixed, semi-opaque or fully opaque printing inks used for exact color match as in a corporate logo (examples: Coca Cola® red or John Deere® green). Used instead of trying to match exact colors by the combination of three- or four-process colors. Can also add visual impact and reduce the process ink costs.

spray powder See "offset spray powder."

squirt

The high pressure water jet used on the wet end of a paper machine to cut the wet web to the correct width. One jet can also be adjusted to cut a leader sheet or tail on the wet web as it is fed from the wire to the wet presses and expands the web width once it is fed through the machine.

staggered winding See "offset winding."

standard illumination

The perceived color of paper and the color of the printed piece are greatly influenced by the illuminating light. For all visual color matching in the graphic arts, the suggested/standard illuminating light is identified as a D50 light source.

starred end (roll)

A "star" pattern radiating from the core to the outer wraps of a roll; cause can be a soft end on the roll, tightly wound paper above paper that is loosely wound, or just from a severe impact to the roll.

start(s)

In the collation of signatures for a book, magazine or other publication, individual signatures may vary in

moisture content. After trimming, the signatures may give an uneven appearance to the edge of the printed matter upon coming to equilibrium with the surrounding environment. This is always after time. This nonuniform edge, with some signature or group of pages protruding more than an adjacent signature, is called a start.

stiffness

Ability of paper to resist bending.

stochastic screening

Conventional screening provides fixed spacing (screen ruling) and variable sized dots for tonal value printing. Stochastic screening can provide tonal values with both variable dot size/area and/or variably spaced dots. This is achieved by electronic media (computers) using digital imaging and laser exposure to achieve renderings approaching continuous tonal value photography, and no dot pattern. With no dot pattern, this eliminates undesirable "rosette" and "moire" effects.

stone printing See "offset lithography."

straight sequence See "crash sequence."

stream feeder

A type of sheet feeding unit that allows several sheets of paper to lap each other in order to minimize the sudden acceleration or deceleration (start and stop) at the feed or delivery end of sheetfed equipment, such as printing presses and sheeters.

strength

The strength of a sheet of paper depends primarily on the nature and amount of fiber used to make the paper; the test used to measure strength depends on the characteristic to be measured and can include such properties or measurements as surface strength, burst, tear, and tensile.

stretch

Describes the "give" to a sheet of paper when it is subjected to tensile pull.

strike-through See "show-through."

stripping

(1) In preparing lithographic plate making films, the placing of the negatives/positives in the proper place on the page.

(2) As a defect in lithographic printing, stripping describes the condition when the ink rollers take water preferentially to the ink (the ink roller surface changes from oleophilic to hydrophilic). This usually occurs on metal ink rollers, but can also occur in synthetic composition covered rollers.

structural curl See "simple curl."

stuck web

Occurs when water, adhesive, coating or some other tacky material gets in between layers or wraps of a roll, causing them to adhere to each other.

substance weight

Synonymous with "basis weight." Generally used with business papers measured on a 17" x 22" basic size. Usually seen abbreviated as, for example, Sub. 24#.

subtractive primary colors See "primary colors."

sulfate

See "kraft;" an alkaline process of cooking wood.

sulfite/sulphite

The product resulting from the pulping of wood using acid (as opposed to the alkaline pulping processes; see "kraft" and "soda"). Also refers to the acid-based pulping process.

supercalendering

See "calendering." The calendering method using alternate steel/metal and resilient (filled) rolls, generally to obtain various levels of gloss.

surface sizing

The surface application of material (in papermaking, generally a starch solution) to change the surface's resistance to fluids. For example, a cotton shirt or blouse may be surface sized from the laundry; i.e., it may have a starch application to give it "crispness" and resistance to moisture.

sweat rolls See "chill rolls."

SWOP

An abbreviation of "Specifications for Web Offset Publications;" a color-proofing system to assure press-to-press and run-to-run color constancy.

sword (hygroscope)

Sword-shaped hygrometer that may be inserted into a pile of paper to determine its equilibrium moisture content and for comparison with the surrounding air.

tab forms

Continuous forms.

tablet papers

A grade of paper (usually 16 pound on a 17" x 22"-500 count basis) manufactured for writing tablets.

tack

Refers to the internal "stickiness" (cohesion) of an ink; a measurement of the resistance to splitting of an ink film between two separating surfaces. Tack is necessary in lithographic inks to ensure adequate film splitting at the thin ink film thicknesses necessary for this planographic process. High tack does stress the paper surface as the ink film is split from the blanket to the paper surface. If that film splitting stress is sufficient, the paper surface can be disrupted, with pick resulting. Tack is an ink characteristic that can be measured by instrumentation (such as with an inkometer); other ink fluid characteristics are described by "viscosity" and "length."

TAGA

Technical Association of the Graphic Arts, a global technical association for scientists and technologists working in all areas of the graphic arts.

tail end hook or curl

Downward curl at the delivery end of a sheetfed offset press; a distortion created by the inked paper clinging to the blanket and the stresses of pulling the paper away from the press blanket. It is noticeable only at the trailing edge of the sheet.

TAPPI

Abbreviation for "Technical Association of the Pulp and Paper Industry." TAPPI standard conditions (see "conditioning") refer to standard conditions of temperature and humidity for most paper tests.

tear test

Also tear strength; a test that determines the tearing resistance of paper. Elmendorf was an original manufacturer of the test equipment and thus became a generic name for the test.

telescoped roll

Progressive roll edge misalignment-concave on one side, and convex on the other; also called "dished" roll for the concave side.

tensile

Strength property measured as the force required to "pull" a paper sheet of specified dimensions to failure; can also be expressed as "breaking length"-usually meters of length required for a web to be hung and broke as a result of its own weight (gravity).

text paper See "book papers."

thermomechanical pulp

Also "TMP;" a pulping process that involves the hot, pressurized refining of wood chips to facilitate the mechanical pulping process.

themography

Also known as "raised printing" or by the trade named unit "Virkotype;" this process is used in conjunction with a printing unit (letterpress or offset lithography) that has slow drying inks. Immediately after printing, the paper is dusted with a powdered compound and the excess, which does not adhere to the wet ink film, is removed. The ink and powder are then fused and swollen above the level of the paper by elevated temperature/heaters. This imparts an embossed or engraved appearance and feel.

thickness See "caliper."

thixotropic

The property of some inks and coatings becoming

more fluid (less viscous) when worked or stirred, and settling to a less viscous or semi-solid state when at rest. See "dilatant."

three-color process

The printing of a full-color picture or drawing using only three colors: yellow, magenta, and cyan. These are also known as process yellow, process red, and process blue. Also see "four-color process."

throw length

In the forms printing business, line holes to guide a form on automated equipment. These holes must line up over a specified length of the continuous form and from side to side.

tight edges

Also known as shrunken edges; these are the result of the sheet having lost moisture at the edges and shrinking to a smaller size. For this to happen, the sheets must be in a pile that prevents loss of moisture in the center of the sheet; thus, the center remains the same size. The sheets will usually be dished with the corners raised. This is caused by a low relative humidity of the air to which the paper is exposed.

titanium dioxide

Also written in the chemical symbols TiO_2 ; a mineral pigment that can be used in the furnish on a paper machine or in paper coatings, TiO_2 is of small particle size and imparts the greatest opacifying and brightening properties of all the pigments used in producing and coating paper.

tone value increase (TVI)

A newer name for dot gain being proposed to reflect that computer-generated halftones may not be composed of the classic dots associated with conventional screening technologies. See also "dot gain."

tonal value

Gradations of image density.

(1) In printing, tonal value is created with a single color of ink by separating the different tonal_value areas into dots of varying size. This can create a full range from less than 5% to 100% ink coverage of the area to be printed, depending upon the size of

the dots of ink. Also, see "halftone."

(2) In photography, tonal value is created on a continuous basis based upon the chemistry and optics of the photographic process.

toner

The "ink" of electrostatic copying/printing processes that defines the image area; usually consists of a magnetic ingredient attracted to the charged area on the photoreceptor, a colorant material (black, etc.), and possibly an adhesive that can be melted (or "fused") to hold the composite "ink" on the surface of the paper being printed or receiving the copy.

toning See "scumming."

tooth

A term which implies a rough finish to the surface of a sheet of paper.

tracking

The carrying of wet ink from the printed paper through the printing press and depositing at least a portion of the ink on parts in the press, with some then being redeposited (tracked) on subsequent paper being processed.

translucent

The property of transmitting light without being transparent.

transparent ink See "process inks."

trapping

The term used to describe the acceptance or transfer of an ink by the surface being printed. Wet trapping refers to the acceptance of an ink film by a previously printed wet ink surface; dry trapping is the acceptance by the dry paper or printed ink film surface; see also "color sequence" and "tack."

trim

(1) Indicates the maximum width of finished paper which can be made on a particular machine.

(2) To remove excess or unneeded paper from the edges of a sheet or roll.

(3) The excess of paper allowed around a printed piece for bleed and/or handling and later trimming.

trim marks

In printing, marks placed on the copy to indicate the edge of the finished page or sheet and where to "cut" or trim.

trimmed size

The final size of a printed piece after all bleeds and folds have been cut off.

tub size

See "surface sizing." In the days of making paper by hand, the sheet of paper was surface sized by dipping the sheet in a "tub" or vat of starch or glue solution.

tucker blade See "jaw fold or folder."

tunnel dryer

Also "air dryer." A well insulated tunnel or large box through which paper is passed for the purpose of drying the paper, the coating on the paper, or the printing on the paper.

turning bars

Metal bars or rollers at a 45-degree angle from the running direction of the web handling equipment (printing press, coater, etc.). Used to turn the web at right angles when feeding from the side or when used in multiples, to actually turn the web over. Often the bars are filled with air and perforated to reduce friction of the web travel. Also called "angle bars."

turnover

A slight tear in the edge of a web or sheet which is folded over during manufacture, converting, or printing; when sticking out of a pile of paper, this is often called a "dog ear."

turn-up

The completion of a roll of paper from a paper machine or coater and the beginning of a new roll.

TVI See "tone value increase."

twin wire

A Fourdrinier papermaking machine with two wires

instead of one (not necessarily twins of each other in size or length), to dewater the furnish and produce a sheet with less two-sidedness.

two-sidedness

In paper, the property denoting differences in appearance properties and possibly printability between the top (felt) and bottom (wire) sides.

type face

A design of alphabetical letters of the alphabet intended to be used in combination.

ucr

Abbreviation for "undercolor removal;" also see "gcr." Three-color process printing (CMY) does not produce a good black. Adding black (four-color process) causes other problems such as excess ink on the page. "Undercolor removal" is the additional work done in color separation to reduce the amounts of yellow, magenta, and cyan to compensate for the addition of black ink in the four-color process.

ultraviolet radiation

Also "UV;" see "radiation curing" (of inks).

underruns

A quantity of paper made, which is less than the quantity specified in the order; for the opposite, see "overruns."

unit perfecting press

See "blanket-to-blanket press;" also see "perfect or perfecting press."

unitized press

A press composed of a series of independent printing stations, each station printing only one image on one side of the paper. The press may be either sheet or web fed in design. Most often found in the forms business.

unit set forms

See "continuous forms." Generally a single form in a multi-ply business forms format. May be printed or converted by sheet or web printing methods.

UV

Abbreviation for ultraviolet radiation; see "radiation curing."

uvinks

See "radiation curing." Special inks composed of materials that set and dry by being exposed to ultraviolet radiation.

varnish

(1) An oil, usually vegetable-based, which has been bodied by heat chemicals or by the addition of gums, resins, or other materials. Used as the vehicle in printing inks.

(2) A thin coating applied to a finished printed job for protection or appearance. A "lacquer" or other "over-coating" material such as an acrylic type emulsion can be used for the same function of providing appearance or protection to the printed piece.

vehicle

The fluid or liquid portion that serves as a carrier for the pigment and additives of the coating or ink formulation, which also determines the flow properties of the ink or coating.

vellum finish

A full, toothy, relatively rough surface finish of uncoated text or book papers; generally intermediate in smoothness to an antique (very rough) finish and a regular or smooth finish.

viscosity

A broad term encompassing the properties or resistance of flow, as of an ink or coating; viscosity is measured on an instrument called a viscometer. Other ink characteristics would include "tack" and "length."

VOC

An abbreviation for "volatile organic compounds." Since these are OSHA and EPA regulated materials, they have become of concern in both inks (evaporative solvents that might be used in heatset web offset inks) and fountain solutions (alcohol).

waffling See "fluting."

water fountain See "fountain."

water jet See "squirt."

waterless offset printing

Refers to lithographic printing, where no fountain solution is used. The non-image areas of the plate are composed of a material that serves the same function as the fountain solution and does not "accept" the lithographic ink.

watermark See "dandy roll."

wavy edges

A warping "wave-like" effect in paper, which is the result of the edges of the sheet having picked up moisture and expanded to a larger size. For this to occur, the sheets must be in a pile that prevents the center of the sheets from picking up the same amount of moisture as the edges. This is caused by higher relative humidity of the air to which the paper edges are exposed. The waviness is usually more pronounced on the "across" grain edge (the edge perpendicular to the paper grain).

wax pick

A laboratory test, using a series of tack-graded wax sticks (by Dennison) that, when applied hot to a paper surface and lifted after cooling, provides an indication of surface strength. On a scale of 2 to 25, high wax pick numbers (over 10) are considered strong surfaces and low numbers are weaker surfaces. Wax pick is used as a test on both coated and uncoated paper surfaces, but is considered a better measurement on uncoated paper. Misleading results can be obtained on coated papers where the coating contains certain types of synthetic binders. See "picking."

weather wrinkles

Also called moisture welts or expansion wrinkles; narrow raised welts or soft wrinkles around the outer diameter of a roll of paper. The phenomenon usually occurs when a roll of paper absorbs moisture from the surrounding atmosphere with a resultant increase in the paper fiber diameters, in the across grain direction. The extra dimensions (usually beginning 6 to 8

inches from the edge of the roll where there is room for the extra dimensions to expand outward) give these raised areas. Weather wrinkles usually do not go more than two or three wraps down into the roll.

web

A continuous ribbon of paper as from an unwinding roll.

web offset

A lithographic printing press in which the paper is fed from a roll or a web (continuous ribbon) as opposed to sheets. Paper requirements and ink drying mechanisms may differ between the two offset printing processes (web vs. sheets).

web press

A printing press that runs webs or rolls regardless of printing method.

web tension

The amount of pull or tightness of pull applied to the paper in the direction of travel of a web.

wet end

The beginning of the paper machine comprising the head box, wire, and wet presses; the first sections of the paper machine where the paper web is formed from water and the solid furnish components.

wet felt

See "felt." Continuous fabric belts used to support the wet paper web through the wet press section and to carry away the water removed during the squeezing and wringing action of the wet press rolls.

wet press

The second section of the paper machine where water is "squeezed" from the still very wet, still forming web of paper. If the press has two bare wringer rolls, it is called a smoothing or smoother press.

wet rub

Resistance of a wet paper surface to scuffing and linting; also a test for the moisture resistance of a paper surface.

wet strength

Strength imparted by synthetic resins to paper when

that manufactured paper is subsequently exposed to extremes of water; wet strength paper is classified as such if its ratio of wet-to-dry strength is 15% or more.

wet trapping See "trapping."

white light

The combination of all of the wave lengths of visible light. See "spectrum."

whitening See "milking."

white paper See "fine paper."

white water

Paper mill waters which have a white, cloudy appearance due to a fine dispersion of fibers and other papermaking ingredients.

wind

To separate sheets of paper, printed or unprinted, so that they will be ventilated by air. The purpose is to provide for easy separation in the next sheet-feeding operation or to allow volatile gases formed during ink drying to escape and/or be replaced with fresh air; also called airing.

wire

The continuous open mesh material (originally, a bronze or copper woven wire screen), used on the paper machine to initiate the water removal process; the wire is the traveling surface and primary forming mechanism of the paper web. When the wire is made of synthetics/plastics, it can also be called the fabric.

wire mark

The impression left in the paper surface by the wire on the paper machine; if observable, it is usually the pattern of the mesh or coarse weave of the wire.

wire side

The bottom side of the web of paper as it is produced on the paper machine that is in direct contact with the wire. Historically, this has been the rougher of the two sides. See "Fourdrinier."

work and roll See "work and tumble."

work and tumble

Also called work and roll; printing the second side of a sheet of paper by turning the sheet over from gripper or lead edge to back or trailing edge, using the same edge of the paper as the guide side.

work and turn

Printing the second side of a sheet of paper by turning it over from left to right or right to left and using the same edge of the paper as the gripper or lead edge.

wove

Absence of a laid pattern.

wrap curl

Also called roll curl; see "simple curl."

wrinkles

Creases or folds in the sheet, usually running at slight angles to the machine direction. They result from excessive localized paper being forced through a nip; their appearance will generally aid in identifying where the defect is occurring in the papermaking, converting, or printing process. When printing, the wrinkles will occur in a direction at an angle to the sheet or web travel.

xerography See electrostatic copying/printing.

ASTMD1968-02 Standard Terminology Relating to Paper and Paper Products

Glossary of Printing & Papermaking Terms - 1996

On-Demand & Digital Printing Primer - 1998

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