

Glossary

Analog (as in analog signal)

A signal that varies in amplitude or voltage over a given range.

Analog Follower Control

A control that accepts a voltage or current of varying amplitude and produces an identical, but stronger, signal at the output, suitable for driving a brake.

Butt Splice

A splice in which two webs are placed end to end without overlapping, and adhered together by a piece of adhesive placed over both. Most common with paperboard.

Controlled Stop

Stopping of the roll and web while maintaining tension at the prescribed level.

Core

The hollow center (usually made of heavy paperboard) on which the roll of material is wound.

Core Diameter

The smallest diameter of an unwind roll.

Cutter/Creaser

A machine used in the production of folding cartons. It uses sharp knives to cut through the board and dull knives to crease the board along a fold line.

Dancer

A movable, often pivoted, roll placed in a loop of the web, which is weighted or loaded to add tautness or tension to the web. Often used as part of a feedback loop to control brake operation.

Die Cutter

A machine which cuts or stamps paper or board to a specified size or shape with a steel die. The die is part of an impression cylinder in a rotary die cutter.

Duplex

Paper or paperboard that has a different color, texture or finish on either side. Also sometimes applied to any multi-ply paperboard.

Electro-Pneumatic Modulator

A device that modulates, or controls, an air brake in response to a set of control parameters.

Emergency Stop (E-Stop)

General term to describe immediate stop of a converting or printing machine due to a malfunction or unsafe condition. Normally done in fastest time possible.

Equipment Sizing or Sized

A method of tensioning a web at the in-feed that is sometimes used in printing operations. An equipment sized in-feed roller is slightly smaller than the printing impression cylinder. This creates a back tension in the web since each rotation of the printing impression cylinder pulls more web than is being fed by each rotation of the in-feed roller. Not as common as a variable sized in-feed since it requires changing the in-feed roller along with the impression cylinder.

Festoon

A reserve area consisting of several loops of stored web. This reserve is drawn down to feed the converting process while roll feed is interrupted for splicing.

Force Transducer

A device that senses the magnitude of a load upon it (such as a tension load) and sends a corresponding signal out. Also called a load cell.

Grabiness

"Stick-slip," or lack of smoothness during slip operation of a braking system.

Heat Dissipation (in a brake)

The ability of a brake to release heat generated by friction. Dissipation usually increases with RPM. Dissipation can also be increased by forced cooling, e.g., by a fan.

Inertia Stop

An emergency stop where the prime objective is to get the unwind roll and machine to a rapid stop, disregarding any control of the web condition. The inertia of the roll is the largest factor in determining speed of stop, for a given machine braking system.

Lap Splice

A splice in which the ends of two webs are overlapped and adhered together by a piece of adhesive placed on the contact side of one.

Load Cell

See Force Transducer.

Nip Rolls

A pair of driven, rotating rollers which act to pull the web into or through the converting process.

Pivot Point

The central point of rotation, as in a dancer arm.

Pivot Point Sensor

A sensor mounted at the pivot point of the dancer arm, which determines which direction the dancer is moving, and where it is in its arc of travel.

Register

The exact, corresponding placement of successively printed images on the web of material.

Sheeter

A machine that cuts a web of material into individual sheets.

Slip

The relative motion, or sliding, between the two members of a braking system. In tensioning, the smoothness of slip is critical to maintaining tension.

Slitter-Rewinder

A machine that unwinds the wide rolls of material, slits them to narrow widths, and rewinds them into narrow rolls.

Splice

The joining of the ends of two webs to make one continuous web.

Splicer

A machine with two (or more) unwind rolls of material. As one roll expires, the other is “spliced” to the end of the first, to provide a continuous web of material to the process. Splicers are referred to as “zero-speed” if the splice occurs when the new roll is stopped, with paper feeding from a festoon storage system. A “flying splicer” is one where the new roll is accelerated to line speed before splicing the roll, and roll feed is continuous.

Taper Tension

Constantly decreasing tension on winders to help eliminate telescoping and core crushing.

Tensile Strength

The force, parallel to the plane of the specimen, required to break a given length and width of material.

Tension

The tautness in a web of paper or material. The press or process produces a “pull-through” effect, which is countered by the unwind brake. Each material has an optimum tautness, or tension, and it is the job of the tension system to maintain this tension.

Torque

The braking force which holds the unwind roll from unwinding. Usually referred to in pound-feet or pound-inches of torque produced by the brake.

Transducer

A device that changes one type of signal into another. In tensioning, the most common types are electric-to-pneumatic transducers, and force transducers. See Force Transducer.

Web

A continuous strand of material coming from the roll in its full width. It remains in web form until “terminated” by a sheeter, die-cutter or other device.

Web Break Detectors

Sensing devices that monitor the web and signal a shutdown or E-stop if a web break occurs. This is a good photoelectric application.

Web Draw

Tension or tautness induced in the web by the pulling action of the printing press or process, resulting in web movement in that direction.

Wrap Angle

Refers to the wrap of the web around a roller, especially a dancer roller. Expressed as “degrees of contact” with the roller.

Conversion Factors

Millimeters x 0.03937 = inches

Inches x 25.4 = millimeters

Centimeters x 0.3937 = inches

Inches x 2.54 = centimeters

Meters/minute x 3.280 = feet/minute

Feet/minute x 0.3048 = meters/minute

Kilograms x 2.205 = pounds

Pounds x 0.4536 = kilograms

Newtons x 0.22482 = pounds

Pounds x 4.448 = Newtons

Watts x 0.001341 = horsepower

Horsepower x 746 = watts

Kilogram-meter² x 23.753 = pound-feet²

Pound-feet² x 0.0421 = kilogram-meter²

Newton-meter x 0.722 = pound-feet

Pound-feet x 1.385 = Newton-meter

Grams/meter² x 0.613495 = pounds (basis weight)

Pounds (basis weight) x 1.630 = grams/meter²

$$\text{Lineal feet} = \frac{36,000 \times \text{roll weight}}{\text{roll width} \times \text{basis weight}}$$

$$\text{Approximate roll unwind time} = \frac{\text{lineal feet}}{\text{linear speed}}$$

Effective cylinder force at a given air pressure

$$F_{\text{CYL (lbs.)}} = P_{\text{PSI}} \times \frac{(\text{cylinder piston diameter in (in)})^2 \times \pi}{4}$$

Example: PSI = 30

CYL dia. = 2 in.

$$F = 30 \times \left(\frac{2^2 \times \pi}{4} \right) = 94.2 \text{ lbs.}$$