

Master Terms List

A

- *Adiabatic* – The running condition where enough heat is generated from the mechanical work to melt the polymer.
- *Air Entrainment* – air that is between the web and rolls
- *Air Flow Interlock* – on the treater, protects against loss of ozone exhaust and cooling air
- *Air Gap* – distance from the die lip to the laminator nip
- *Annealing Roll* – cooled/heated roll for providing additional processing to the web
- *Applesauce* – term used to describe the appearance of the melt curtain when it appears lumpy.
- *Automatic Die* – ability to adjust the lip gap along the die with thermal bolts, adjustment is based on gauge feedback of layer uniformity
- *Auxiliary Roll Carriage* – movable carriage that moves the lay on roll into the winding roll and moves to make a transfer.

B

- *Back Flow* – polymer flow backwards over the flight
- *Backside Treatment* – treatment on the reverse side of the web that lowers surface treatment on the correct side
- *Barrel* – bimetallic cylinder that houses the feed screw, can withstand high pressures
- *Barrel cooling* – used to help maintain a temperature, cooling is accomplished with either air or water.
- *Barrel heating* – heaters on the barrel that along with the screw and drive, help the polymer to melt.
- *Barrier Screw* – special screw designed with a melting and solids section for more efficient melting
- *Batch Drying* – filling the hopper, drying the resin and removing all material at once. Not a typical drying method
- *Bond* – adhesion of one substrate to another

- *Bow Spreader Roll* – bent shaft construction with many bearings and rubber covering designed to smooth the web or provide slit separation.
- *Breaker Plate* – A perforated plate at the end of the extruder that supports the screen pack
- *Bulk Density* – weight of material in pounds per cubic foot

C

- *Calculated Mode* – runs the chill roll at the calculated speed to achieve the desired polymer thickness
- *Chiller* – Machine for cooling water, may be either water or air cooled.
- *Coefficient of Friction (COF)* – measure of how well one material wants to stick to another
- *Co-extrusion* – process where two or more polymers are extruded through a single die too form a multi-layer coating or film
- *Composite Profile* – measurement by the gauge of the complete structure
- *Concentrates* – type of resin pellet having a high amount of an additive such as color
- *Contact mode* – when the lay on roll stays in contact with the winding roll
- *Contamination gel* – gel formed by foreign particles or resin contamination in the melt curtain
- *Corona Treater* – system designed to increase the surface energy of plastic films, foils and paper so that inks, polymer and adhesives will “wet out” and adhere to the surface of the web.
- *Cross Contamination* – gel formed by two different polymers in the system. These polymers chemically link together and form gels.

D

- *Dancer* – tension control system that uses cylinders and a pivoting arm to maintain good tension control
- *Dehumidification* – process of removing moisture from the air.
- *Density Control* – Winding system for controlling the nip pressure to produce an optimum quality roll
- *Desiccant* – material that will absorb moisture from the air
- *Dewpoint* – temperature where condensation takes place

- *Die* – machined piece that takes the polymer from a small area and stretches it to the proper width sheet
- *Die Gap* – opening of the die lips
- *Die Lines* – line or split in the melt curtain as material comes out from the die.
- *Die Position Lead* – location of die relative to the nip
- *Differential tension* – tension difference between machine sections
- *Disco Purge* – alternately varying extruder rpm from high to low to quickly purge the extruder
- *Dispersive mixing* – deformation of the components resulting in a reduced size.
- *Distributive mixing* – a repetitive rearrangement of components. No deformation of material occurs
- *Drag Flow* – Maximum flow of polymer if everything is ideal
- *Draw Resonance* – term used to describe the edges of the melt curtain as the melt gets wide, narrow, wide, etc.
- *Drawdown* – distance from the die lip to the laminator nip
- *Drooling* – running the extruder at slow speed, generally less than 20 rpm
- *Dry Bond Lamination* – combining two substrates using a dry bond laminating nip
- *Dry Cycling* – running the dryer empty for 24 hours to dry both desiccant beds before use
- *Drying Hoppers* – machine used to remove moisture from pellets by taking the air through desiccant which traps the moisture

E

- *Edge Pinning* – pushing the edges of the melt curtain against the chill roll to cool the edges and reduce neck-in
- *Edge Tear* – refers to the edge bead area of the melt curtain. The edges will start to tear across the curtain
- *Electrode Assembly Position Interlock* – protects against the power supply starting with an electrode assembly pivoted out of the treatment position
- *Electrodes* – generate corona treatment onto the web
- *Emergency Stop* – puts the entire machine in e-stop conditions. All nips open and all drives rapidly decelerate

- *Encapsulation* – phenomenon for when the less viscous polymer will surrounds the more viscous
- *Extrudate* – the molten polymer after it is extruded.
- *Extruder* – machine designed to melt, mix and deliver molten polymer to the process
- *Extrusion Coater Laminator* – machine that combines molten polymer with substrates while quenching
- *Extrusion Coating* – combining an extruded polymer with a substrate
- *Extrusion Lamination* – combining an extruder polymer between two substrates

E

- *Feed Block* – combines 2 or 3 polymer layers into one multilayer structure
- *Feed Pipe* – bored out cylinder for conveying molten polymer to the die (process)
- *Feed screw* – an auger like device that starts with a solid pellet and melts, mixes and delivers molten polymer to the process
- *Feed Section* – transports resin to the next section of the screw
- *Feed Throat* – water cooled, casting where pellets are put into the extruder
- *Feedpipe* – heavy wall pipe used to convey the melted polymer to the die
- *Film Casting* – extruding and forming a flat free film product
- *Flex Pack Nip* – on the laminator, used for general extrusion coating and laminating with low (up to 150 pli) pressure loading
- *Flex Spreader Roll* – roll that has a spiral groove cut into a soft rubber covering. The spiral starts at the center of the roll and angles to the edges. This roll will flatten the web
- *Frost Line* – place on the sheet where the molten polymer is solidified

G

- *Gap mode* – when the lay on roll maintains a preset gap with the winding roll
- *Gauge Bands* – Thick or thin sheet that is about the width of the spacing between die bolts (about 1")
- *Gauge Mode* – runs the line in a calculated thickness mode where the chill roll is trimmed by a feedback signal from the gauge system

- *Gauge Trend* - minimum, average and maximum scan values over a defined number of scans
- *Gel* – melt curtain imperfections or defects developed during forming due to disturbances in polymer flow
- *Gravimetric Feed* – resin additives and recycle are weighed before being put into the extruder.

H

- *Head Pressure* – pressure at the end of the screw
- *Heat Sealability* – ability of the polymer to easily stick to itself or another polymer
- *Historical Trending* – within the supervisory control computer. This function can look up and plot process settings for a specified amount of time, used for troubleshooting and data collection
- *History Log Files* – System stores running data into these files
- *Hold to Run Button* – releasing this type of button stops the specified function
- *Hopper* – storage container for pellets
- *Hopper load cell* – device that sits on the extruder to weigh the loss in weight as the extruder uses material
- *Hot Air System* – heats or cools the web before the chill roll with either hot or cold air
- *Humidity* – water vapor (moisture) in the air
- *Hydraulic Screen Changer* – designed to provide melt filtration

I

- *Interactive Purge* – using bursts of high speed to purge the extruder
- *Interleaf Unwind* – set of two single position unwinds used to introduce laminate or dry bond material to the process

L

- *Lay On Roll* – Rubber covered roll on the roll changer that can nip against the winding roll to wind a tighter roll
- *Line Speed* – how fast the web travels in the machine (usually in FPM, feet per minute)
- *Line Stop* – Normal means of stopping the line. All drives decelerate under a controlled rate
- *Load cells* – tension measurement device that uses strain gauges to measure web tension. The load cell sends signals to the drive to regulate tension.
- *Loading* – term used for filling dryers or hoppers with resin

M

- *Magnet (drawer)* – set of five magnets located near the throat of the extruder. These magnets remove scrap and small pieces of metal from the incoming resin to prevent damage to the extrusion system.
- *Manual Mode* – runs the line at a preset speed, independent of the extruders
- *Melt* – the molten polymer after it is extruded.
- *Melt Curtain* – description for the polymer as it leaves the die
- *Melt Index (MI)* – A measure of polymer viscosity. Low MI means thick (oil) and high MI means thin (water)
- *Melt Temperature* – polymer processing temperature
- *Melt thermocouple* – temperature measurement device for measuring the melt temperature of the polymer
- *Melting Point* – Temperature where the polymer melts into a liquid
- *Metering Section* – delivers melted polymer to the rest of the system
- *Mixing Section* – homogenizes the melt (makes even)

N

- *Neck-In* – shrinking of the extruded film at the edges
- *Nip Impression* – distance that the rubber on the nip roll contacts the steel roll when nipped
- *Nip Roll* – rubber cover roll that presses the web against another roll, either for tension isolation or combining webs.

O

- *Oscillating Base* – winder/roll changer is mounted to a steel base that is on linear bearings and slides. These allow the winder/roll changer to sidelay +/- 1" to randomize gauge bands.
- *Output Rate* – amount of resin being extruded, usually measured in pounds per hour (lb/hr or pph)
- *Oxidation* – when the polymer surface absorbs oxygen as it leaves the die

P

- *Paster Roll* – rubber covered roll used to iron in the new splice
- *Pellet* – Extrusion polymer, refers to the basic shape of the resin
- *Pinholes* – small holes in the extrudate layer
- *Plate Out* – build up of volatiles on the surface of the chill roll
- *Plate Out Assembly* – aids in the removal of plate out deposits from the chill roll surface
- *Pneumatic Pinner* – edge pinner that use air to pin the web
- *Polymer Interface* – the place where two polymers meet each other
- *Polymer Packing* – polymer shrinkage as cooling occurs and draws into feed pipes
- *PPE* – personal protective equipment – items such as gloves, safety glasses and clothing designed to protect the operator near the machine
- *Primary Chill Roll* – main roll for cooling the extruded material
- *Proportional Speed Control* – varies the power with respect to line speed
- *PSD* – Presence Sensing Device – Items such as light curtains or safety mats used to control entry into potentially dangerous areas of the machine.
- *Purging* – flushing one polymer in the system with another polymer. Purging can occur for resin changes or machine shut downs.

R

- *Razor slitters* – razor blade type knives for cutting the web before wind up
- *Recipe Function* – within the integrator. This function can store, download and upload machine setpoints for products
- *Regeneration* – heating desiccant to a high enough temperature to remove the moisture
- *Relative Humidity* – amount of water vapor in the air compared to the amount that it could hold
- *Residual Risk* – non-evident danger or danger remaining after all safety measures have been applied.
- *Resin Blenders* – measure, weigh and blend different resins and/or additives in the correct percentage needed.
- *Resin Conveying System* – machinery to get the resin from its storage location to dryers or extruders
- *Reverse Crown Spreader Roll* – negative crown roll (smaller diameter in the center) to spread the web
- *Roll Changer* – machine designed to make roll changes of a finished product to a newly prepared core without stopping the process or breaking the web.
- *Rupture Disk* – pressure relief device for the extruder

S

- *Safety Chucks* – hold the shaft, core and roll in the winder or unwind
- *Safety Reset* – resets light curtains, pull cords or safety mats
- *Scanner* – part of the gauge that measures material thickness
- *Score slitters* – circular blades that are loaded against a hardened roll. Material is cut by crushing
- *Screen* – generally mesh, used for filtration of the extrudate, a low number is course, high is tight weave
- *Screen Pack* – A series of metal screens that strain the polymer solids and are often used to build pressure. 40 mesh is a big open screen, 200 mesh is a tight screen
- *Screw Cooling* – Most screws are drilled so water can be used to cool the first few flights of the screw to help feeding

- *Shear mixer* – mixing device on screw that mixes both temperature and particles by causing the melt to go over a flight (creating shear)
- *Shim* – term used to describe cleaning the die lips on the outside and along the inside
- *Slitters* – knives to cut the edges from the web. They are also used to make multiple rolls out of one roll.
- *Smoke Hood* – removes polymer smoke from the extruder area with a fan
- *Softening Point* – temperature where the polymer starts becoming soft
- *Solid Bed Breakup* – melting phenomenon where the melted polymer surrounds the unmelted solid. This causes non-uniform melting, surging and non uniform mixing.
- *Spindle* – Part of the winder or unwind where rolls are loaded or unloaded.
- *Splice* – term for the transfer of a finished roll to a new roll
- *Spreader Roll* – roll designed to smooth the web out
- *Static Mixer* – device in feedpipe used to homogenize the melt temperature by cutting the redistributing the melt
- *Static Pinner* – edge pinner that use static to pin the web
- *Steel Nip* – on the laminator, used for extrusion coating and laminating for more than 12 mil thick products under higher pressure
- *Supervisory Control Computer* – HMI (human/machine interface) for the line. Almost all line controls are accessed within this computer
- *Surging* – rpm of the extruder from high to low to high, etc. Pressure will vary up and down too.

I

- *Taper Tension* – Winding setting that allows the winding roll tension to be gradually reduced as the roll winds.
- *Tension* – amount of force used to keep the web running straight without wrinkles
- *Thermal Conductivity* – ability of a material to conduct heat through itself. A material with poor conductivity is said to be a good insulator
- *Thermal Degradation* – burning or discoloration of polymers that are run either too hot, with too much shear and/or are in the system too long.
- *Thermocouple* – A device made of two dissimilar metals that detect temperature changes
- *Transition Section* – compresses and melts the polymer

U

- *Un-melt or un-mix* – piece of pellet that is not completely melted

V

- *Vacuum Box* – suction at the chill roll to promote uniform film lay down and even cooling of the film against the chill roll
- *Voids* – holes in the melt curtain

W

- *Water Purge* – using a small amount of water to purge the extruder
- *Water Recirculation System* – system of pump loops and tank that provide cooling water for the rolls on the machine
- *Watt Density Speed Control* – compares the speed running to the power output setting and gives constant power at any speed
- *Web Handling* – process of conveying the web through the line
- *Winder* – machine designed to continuously wind webs of material

Z

- *Zero Speed Interlock* – prevents treater electrodes from turning on before the treater roll is turning at a preset speed (about 25 fpm)
- *Zip Knife* – electro mechanical knife (mounted to the belt) on the roll changer that cuts the web