

TERMS & DEFINITIONS

Every profession, job, sport or science has its own unique set of words. Call it slang, jargon or techno-speak, but even packaging with shrink film has its own list of “key words.” By using these key words, customers, distributors and manufacturers can clearly communicate needs and characterize film operations.

Please contact your Clysar Regional Sales Manager for more information.

Air Evacuation – A hole or series of holes placed in the film to allow the excess air in the bag to escape during shrinkage.

Angel Hair – Thin strands of film that appear between the sealed package and the seal mechanism. Angel hair can be caused by too hot a temperature for polyethylene films or too cold a temperature for polypropylene films.

Anti-Fog Film – A film containing a wetting agent which reduces the surface tension on the film to allow water to wet the surface rather than to form water droplets, which can cause a cloudy appearance.

Ballooning – The lifting action of the film away from the product caused by the pressurizing of the excess air in the bag and the *slight* expansion of that air from heat during the shrink process. This phenomenon keeps the film away from any heat sinks (mainly the product) that could cause erratic or undesirable shrinkage.

Bead Seal – The resultant weld caused by the simultaneous sealing and cutting of two, three or more pieces of film.

Biaxial Orientation – A film that has been stretched under certain temperature conditions equally in both the machine and transverse directions.

Blocking – A condition where layers of flat film cannot be separated.

Blown Film – Film produced by extruding resin into a tube that is expanded by air pressure.

Bubble – The inflated tube of film in the blown film extrusion process.

Burn Through – A weakening of the film where the heat of the tunnel exceeded the heat resistance of the film. Typically, it will appear as a hole or a very cloudy area.

Centerfold – A device used to produce centerfolded film from flat film.

Centerfolded Film – Film folded in half which is a function of surface gloss and internal haze.

Clarity – The transparency of the film which is a function of surface gloss and internal haze.

Coefficient of Friction (COF) – A comparative value indicating the ability of the film surface to move against itself or another surface. The higher the coefficient of friction, the more difficult to slip or move (tackier). The lower the coefficient of friction, the easier to slip or move (slipperier). COF can be targeted at two points in the packaging process:

- *Cold Slip* – This is a measure of the COF when the film is “cold” or at room temperature. Cold slip is the COF the film inherently has on the roll, through the sealer, prior to the tunnel.
- *Hot Slip* – This is a measure of the COF when the film is “hot” or immediately exiting the tunnel. The hot slip of the film will tend to be tackier than the cold slip.

Coextrusion – Two or more different materials simultaneously extruded into a composite film.

Copolymer – A resin polymerized from two or more monomers.

Core – A paper tube used as a base for forming a roll of film.

Cross-Linked – Film that has been irradiated to bond one polymer chain to another, providing consistent sealing and shrink at a broader range of temperatures; plus greater strength with less burn-through.

Crow’s Feet – The residual wrinkles that can be left in a poorly shrunk package. They are normally associated with the excess film on the corners of the pouch.

Dancer Bar – A mechanical device used to control the tension of the film between the film unwind and the film sealing area.

Density – Weight per unit volume. Films with a low density offer more coverage per weight of film.

Dog-Ears – The excessive film extending away from the corners of the pouch formed by placing a three-dimensional item in a flat pouch. Excessive “dog-ears” normally indicates poor shrink technique.

Efficiency Pack – Rolls of film placed on skids without boxes and held in place with plastic cores and spacers.

Electronic Hole Burner – A device that uses an electrical spark to burn a hole in the film for air evacuation during shrinkage.

Electrostatic Seal – An electrostatic discharge is applied to the overlap of two ends of the film. This keeps the edges aligned until the film blocks together in the shrink tunnel.

Elmendorf Tear Resistance – A measure of the resistance to tear after the film has been cut.

Elongation – The percentage a film will deform or stretch prior to breaking.

Extrusion – A technique for producing film by melting a resin and forcing it through a die.

Fin Seal – A seal formed when heated wheels thermally tack together two layers of film and the excess is folded underneath the product. Similar to a candy wrapper.

Fin Trim Seal – A seal formed when two layers of film are thermally sealed and the excess trim is cut and then removed as scrap either by vacuum or a scrap winder. The result is a clean bead seal on the bottom of the package.

Fish Eyes – The circular or oval patterns that remain on a package which has been poorly shrunk. They are normally associated with the absence of adequate heat or air velocity.

Fogging – A buildup of water droplets on the surface of a film.

Forming Head (Plow) – A mechanical device used to shape flat wound film into the desired bag shape needed for a particular package.

Gas Transmission Rate (GTR) – A measure of the rate a gas will permeate through a film.

Gauge – The average thickness of a film.

Gloss – A measure of the reflected light from the film surface.

Haze – A measure of the cloudiness of the film.

Hole Burner – A device that uses a hot wire formed in a circular shape to burn a hole in the film for air evacuation during shrinkage.

Hole Punch – A device to punch a hole in the film for air evacuation during shrinkage.

Impact Resistance – The resistance to impact of a film based on Spencer Impact testing methods.

Impulse Seal – A seal produced by an intermittent electric pulse which heats a round wire or ribbon to cut and seal film.

Inverting Head – A mechanical device used to separate and invert centerfold film 90° as the film is transferred into the sealing device of the wrapper.

Irradiation – A process that uses high-energy electrons to cross-link a film.

Lap Seal – A seal produced by overlapping film and then binding it together either thermally or electrostatically.

Low Temperature Flexibility – The lowest temperatures at which a film can withstand a flexing test without cracking.

L-Sealer – The most common means of sealing film for heat-shrinkable applications. An L-shape sealer produces two seals simultaneously on folded film.

Machine Direction (MD) – The direction the film was manufactured and also comes off the roll.

Matting – Condition where two layers of folded film cannot be separated.

Mill Roll – The large roll produced directly off the extrusion lines. This roll will be charted and divided into many custom rolls.

Modulus – A measure of film stiffness.

Moisture Vapor Transmission Rate (MVTR) – The rate moisture vapor will pass through the film.

Monomer – A simple compound which can react at high temperature and pressure to form a polymer.

Orientation – The stretching technique used to obtain molecular alignment in a film during manufacture, which increases tensile strength and stiffness and decreases tear strength.

Oxygen Transmission Rate (OTR) – A measure of the permeability of a packaging film to oxygen.

Pinholes – Small holes formed in the seal by tension on the film during sealing or wrinkles in the seal area. Pinholes can make it difficult to get consistent shrink performance since it affects air evacuation.

Plasticizer – A substance blended into plastics such as PVC to improve flexibility and softness.

Polyethylene – A resin made from ethylene gas that produces tough transparent film.

Polymer – A high-molecular-weight, long-chain compound formed from one or more simple molecules.

Polyolefin Film – Polyolefin is the largest class of thermoplastic films. These films feature very high resistance to tear and wear and, at the same time, are soft, glossy and flexible. Because of their softness and flexibility, polyolefin films never get brittle. Clysar[®] films fall into the polyolefin family.

Polypropylene – A resin made from propylene gas which produces lightweight, highly transparent, stiff film.

Polyvinyl Chloride (PVC) – A resin produced from vinyl chloride. It is generally compounded with plasticizers and other additives to improve flexibility.

Sealing Wire – A nichrome wire that is heated by its resistance to electrical current. It is used for sealing and cutting shrink film.

Shrinkage/Percent Shrink – The decrease in dimension of a film when it is subjected to heat.

Shrink Film – A plastic film that has been produced under special orientation conditions that allow the film to shrink when heat is applied. Available shrinkage is usually 50% or greater.

Shrink Force – The force exerted on the product by the film during the shrink process.

Single Wound Film – Flat film wound on a core.

Slip Agents – Lubricants added to films to improve slip and reduce friction.

Static – An electric charge generated by film moving across itself (unwinding from the roll) or any other surface.

Suspend Pack – A method of packaging rolls with particleboard end caps and no boxes. This is usually used for double-length rolls for added protection because of the heavier weights. Rolls are stacked on top of each other and then placed on skids and stretch wrapped.

Tear Strength – The ability of the film to resist tearing. Highly oriented films generally have reduced tear resistance.

Tensile Strength – The force required to break a film.

Tension – A force exerted on the film from external sources.

Tracking – The ability of a roll of film to be unwound and transferred to the seal area in a smooth and uniform way.

Transverse Direction (TD) – The direction at right angles to the film movement during its manufacture. It is usually the same as the width of the film.

Trim – The edges of film which are cut from a package formed on an L-sealer or side sealer when the seal is made.

Uniaxially Orientated Film (Preferential Shrink Film) – A film that will shrink in only one direction.

Wrinkles – Loose, unshrunk film found along the edges of the package caused by incorrect bag size or improper air evacuation.

Yield – Coverage of a film per unit weight (usually sq in/lb) rolls.