ITW P.S.N.A. CONTACT ADHESIVE DEFINITIONS

Artificial Aging The exposure of an adhesive assembly to conditions that accelerate the effects of time. The conditions can include heat, cold, flexing, UV light, humidity, etc.

Adhere To cause two surfaces to be held together by adhesion.

Adherence The unit load (ex: psi, lbf.) applied to tension, compression, peel, cleavage, or shear required to break an adhesive assembly with failure occurring in or near the plane of the bond. Same as *Bond Strength*.

Adhesion The state in which two surfaces are held together by interfacial forces.

Adhesive A substance capable of holding materials together by surface attachment.

Adhesive Assembly A group of materials or substrates, including adhesive, that are placed together for bonding or that have been bonded together.

Adhesive Failure Rupture of an adhesive bond such that the separation appears to be at the adhesive-substrate interface. Same as *Adhesion Failure*.

Adhesive Strength The strength of the bond between an adhesive and substrate.

Application Depositing the adhesive onto the substrate. Contact adhesives can be sprayed, brushed, or rolled onto the substrates.

ASTM American Society of Testing Methods. This group publishes standard testing methods.

Block Copolymer An essentially linear copolymer consisting of a small number of repeated sequences of polymeric segments of different chemical structure (ex: SBS - Styrene Butadiene Styrene, or SIS – Styrene Isoprene Styrene). Block copolymers are widely used in contact adhesives. They have rapid bond strength, but usually limited (<200ºF) heat resistance.

Blushing The condensation of atmospheric moisture at the bond line interface.

Bond The union of materials by adhesives. To unite materials by means of an adhesive.

Bond Line The layer of adhesive that attaches two substrates.

Bond Strength The unit load (ex: psi, lbf) applied to tension, compression, peel, cleavage, or shear required to break an adhesive assembly with failure occurring in or near the plane of the bond. Bond strength of a contact adhesive is dependent on point-to-point contact and the correct amount of adhesive in a uniform film. Same as *Adherence*.

Cleavage Pulling apart two stiff substrates, "cleaving", bonded together with adhesive.

Cohesion The state in which the particles of the adhesive are held together. It is the ability of the adhesive in an adhesive assembly to resist splitting under an applied load.

Cohesive Failure Rupture of an adhesive bond, such that the separation appears to be within the adhesive.

Cohesive Strength Intrinsic strength of an adhesive.

Condition The preliminary exposure (usually 1 –2 days) of a laminate or substrate to environmental conditions before assembly. Usually placing inside the assembly shop in winter to heat to about 65ºF.

Contact Adhesive An adhesive that is apparently dry to the touch and that will adhere to itself instantaneously upon contact. Bond strength is dependent on point-to-point contact and the correct amount of adhesive in a uniform film. Synonym for *contact bond adhesive* and *dry bond adhesive*.

Contaminant A foreign substance present in an adhesive assembly that affects one or more properties of the adhesive, particularly adhesion.

Cross Linking With thermosetting (and some thermoplastic) polymers, the curing of chemical links between the molecular chains.

Cure To change the physical properties of an adhesive into a fixed or hardened state. Same as *Set.*

Delamination The separation of layers in an adhesive assembly because of failure of the adhesive, either in the adhesive itself (cohesive) or at the interface between the adhesive and the substrate (adhesive).

Dry To change the physical state of an adhesive on a substrate by the loss of solvent by evaporation.

Drying Time The period of time between when the contact adhesive is applied and the solvent has evaporated to the point where the adhesive will not transfer to a finger when touched.

Dry Tack	The property of adhesives to adhere on contact to themselves at a stage in the evaporation of solvents, even though they seem dry to the touch. Synonym for *aggressive tack.*
Edge lift	The pulling apart (cleaving), of HPL from the substrate along the exposed edges of the assembly.
Flat Work	HPL adhesive assemblies that do not require bending of the substrates.
Foot Pounds	The unit of force required to impart an acceleration of one foot per second per second to a mass of one pound. Abbreviated as *lbf*. Metric equivalent is the Newton.
Force	An influence (as a push or pull) that causes motion.
Green Strength	The initial strength of an adhesive assembly that, even though cure is not complete, allows sawing, routering, or machining without assembly failure.
Heat Resistance	The temperature at which delamination occurs under static loading in shear.
HPL	High Pressure Laminates. Paper and plastic layers laminated molded and cured at high temperatures (>300ºF) and high pressure (>1 ksi).
Hot Cleavage	Pulling apart two stiff substrates, "cleaving", bonded together with adhesive. Testing is performed at 400ºF.
Humidity	Water vapor in the air. High humidity conditions can affect (extend) drying time of contact adhesives.
Laminate	To unite layers of material with adhesive.
Legging	The drawing of filaments or strings when adhesive bonded substrates are separated.
Legs	The filaments that are seen between the substrates
Neoprene	The DuPont trade name for polychloroprene. Neoprene is the widely used synthetic polymer in contact adhesives. It combines rapid bond strength, good tack, and resistance to heat, water, and sunlight.
Nitrile	Nitrile rubbers are synthetic copolymers. Nitriles are not widely used in contact adhesives. They have rapid bond strength, but usually limited (<200ºF) heat resistance.
Open Time	This is the interval between the time when the solvent has evaporated (dry time) and that time when the adhesive has no affinity for itself. The adhesive and cohesive strengths of an adhesive normally will increase;

	reach a maximum and decline to zero during the bonding-range period. Also called “Open Tack Time”, “Bonding-Range Period”, Tack Time”
Oxidation	A chemical reaction within the adhesive in which electrons are transferred causing weakening and ultimately failure of the bond line.
Peel Strength	The average load per unit width of bond line (lbf/in) required to progressively separate one substrate from another over the adhered surfaces at a 180º angle at a set separation rate.
Plasticizer	A material incorporated in an adhesive or substrate (typically vinyl’s) to increase its flexibility, workability.
Postforming	The forming, bending, or shaping of an HPL assembly that has been heated to >325ºF to make it flexible. Upon cooling, the formed laminate retains the shape that it was formed to.
Pressure Sensitive	A pressure-sensitive adhesive remains permanently tacky when all the solvent evaporates. These will adhere instantaneously with very slight pressure.
Rupture	A break resulting from physical stress.
Set	To change the physical properties of an adhesive into a fixed or hardened state. Same as *Cure.*
Shear	An action or stress resulting from applied forces that causes two parts of an adhesive assembly to slide parallel to the substrates.
Shear Strength	The maximum shear strength (tensile stresses parallel to the substrates) that an adhesive assembly is capable of sustaining before failure. This is measured in pounds per square inch (psi).
Shelf Life	The period of time during which a packaged adhesive can be stored under room temperature conditions and remain suitable for use.
Solids Content	The percentage by weight of nonvolatile (will not evaporate) matter in an adhesive.
Solvent Adhesive	An adhesive having a volatile organic liquid as a vehicle. This term excludes water-borne adhesives.
Starved Area	An area of a substrate that has an insufficient amount of adhesive to product a satisfactory bond.
Stress	The internal force per unit area that resists a change in size or shape of a body.

Substrate	The material which an adhesive is applied to bond to another material. Contact adhesives are applied to both surfaces to be bonded.
Tack	The property of an adhesive that enables it to form a bond immediately after adhesive and substrate are brought into contact.
Telegraphing	A condition where irregularities, imperfections, or patterns of the adhesive are visible on the laminate surface.
Tensile Strength	The pulling stress required to break an adhesive assembly.
Thermoplastic	An adhesive that is capable of being repeatedly softened when heated and hardened when cooled. Contact adhesives are thermoplastic.
Thermoset	An adhesive that has undergone a chemical reaction by UV, heat, catalyst, etc., that will not soften when heated.
Volatiles	Materials, such as water and solvents, that are capable of being driven off (evaporated).