

COMMONLY USED TERMS OF THE EPOXY ADHESIVE INDUSTRY

When discussing an epoxy adhesive with your production line staff or your supplier, you may not be sure of what terms to use. **Fielco Adhesives** assembled this helpful glossary of terms to enhance your knowledge and communication about epoxy adhesives.

For assistance with your epoxy adhesive needs, be sure to contact us.



FIELD
ADHESIVES

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ACCELERATOR — A material, when mixed with a curing agent, which increases the reactivity of epoxy adhesives, resulting in shorter cure times.

ADHESIVE ASSEMBLY — An adhesive and parts, materials, or components being bonded together; such as in the manufacture of aircraft and automotive components, electronic circuitry, medical devices, furniture and many other structures or goods.

ADHESIVE STRENGTH — The strength with which two surfaces are held together with an adhesive, also known as the bond strength. Quantitative tests are available for measuring the adhesive strength under various environmental conditions. Adhesive strength is measured in units such as psi, pli, or N/mm²

ASSEMBLY TIME — The time period between applying an adhesive and the application of pressure, heat, or both to the assembly. For assemblies involving multiple bonding steps or parts, the assembly process begins with applying the adhesive on the first substrate.

BOND STRENGTH — The force required to break an adhesive bond. Forces are applied in various modes depending on the end application such as but not limited to; tension, compression, flexure, peel, impact, cleavage, or shear. Adhesive failure must occur near or within the adhesive bond line. The terms adherence and adhesive strength are frequently used in place of bond strength.

CLOSED ASSEMBLY TIME — The time from assembling the parts being bonded and the application of pressure, heat, or both, to the assembly.

CURING — A chemical reaction between a curing agent or catalyst with an epoxy molecule resulting in a change of physical properties. It frequently involves a physical change from the liquid to the solid state, often called hardening or setting. Fully cured materials exhibit maximum physical, thermal and chemical properties in use.

DRY STRENGTH — The strength of an adhesive joint determined immediately after drying caused by the removal of a solvent or water under specified conditions or after a period of conditioning in a standard laboratory atmosphere.

ENCAPSULATED ADHESIVE — An adhesive that utilizes the microencapsulation of the curing agent or catalyst in a protective coating. This causes a decrease in reactivity until the capsule is destroyed by heat, pressure, or other means

EPOXY RESIN — A most versatile group of thermosetting polymers for adhesive, sealant, coating, potting/encapsulation, and impregnation uses. This can be two component room temperature or elevated temperature curing as well as one component heat or Ultraviolet Light cured compositions. They feature a unique combination of high physical strengths, bond to a wide range of materials, show superior resistance to solvents and chemicals and/or environmental damage combined with excellent dimensional stability. Epoxies are widely employed for structural adhesive applications and as electrical insulation materials. Special formulations are available which feature high electrical and/or thermal conductivity. They offer remarkably wide service temperature range.

EXOTHERMIC — Chemical reactions which release heat such as wood burning; the opposite of endothermic reactions which require heat to proceed.

FILLER — An inorganic or organic solid material added to an adhesive to modify its strength, hardness, permanence, working properties, or other qualities, or to lower cost.

GAP-FILLING ADHESIVE — An adhesive capable of filling a void between surfaces that are not close-fitting and creating a stronger bond when cured. Gaps can range from a few thousands of an inch in the electronic industry to a ½ of an inch in photovoltaic cell processing. Some adhesives will bond by bridging without completely filling the gap, others by filling the gap completely.

HEAT RESISTANCE — The ability of an adhesive to withstand exposure to elevated temperatures for a specified amount of time.

HOT-SETTING ADHESIVE — A thermoplastic hot-melt adhesive that is applied in a molten state and forms a bond upon cooling to a solid state.

OPEN ASSEMBLY TIME — Time interval between applying adhesive on the substrates being bonded and final assembly.

OUTGASSING — The emission of occluded gasses from a material by vacuum or heat. As applied to epoxy adhesives dissolved gas in the resin or entrapped air from compounding can cause outgassing. In applications where this needs to be reduced or eliminated adhesive formations are compounded under a vacuum. Outgassing of unreacted curing agents and external modifiers is also possible. The need for reduced or no outgassing must be taken into consideration when formulating adhesives.

QUALIFICATION TEST — A series of tests conducted by the end user to determine performance of an adhesive to the required design specifications or materials system.

SHEAR — In an adhesively-bonded joint, stress or strain resulting from applied forces that cause adhesive deformation or failure as the internal parallel planes move in opposite directions.

ULTRAVIOLET LIGHT CURING (UV) — A UV cured adhesive is typically 100% solids (no water or solvent). It does not require heat or particularly complex equipment to be cured. All that is required is exposure to UV light waves of a specific frequency. Curing times range from as little as fraction of a second up to several minutes.

VISCOSITY — The resistance of a fluid to flow.

WET STRENGTH — Term commonly used to report bond strength after immersion in water for a prescribed time period at a specific temperature and pressure. In certain circumstances other liquids such as petroleum distillates or other chemicals are used in lieu of water.

WETTING — The coating and or absorbance of a solid surface with an adhesive.

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