



Adhesive Industry Background

The global adhesives market is approximately \$25 Billion, of which US producers account for approximately \$13 Billion. General-purpose adhesives and sealants account for 54% of the dollar value, followed by binders with 12%, and hot melts and pressure sensitive adhesives, each at 10%. Engineering adhesives and films account for most of the balance at a combined 14%.

The industry supports over 780 adhesive suppliers. Despite major acquisitions in recent years, the business is not very concentrated. Some 19 companies have U.S. sales at \$100 million or more, yet represent only 43% of the domestic total. National Starch ranks as the leading supplier with 6.5%, followed closely by H.B. Fuller with 6.1%. 3M, Henkel, Illinois Tool Works, Sovereign Specialty Chemicals, Morton, DAP (now owned by RPM), Reichhold and Borden round out the top 10.

Although there are hundreds of different varieties of adhesives available from the manufacturers, it is possible to categorize them by chemical type. Two major groups are recognized based on whether the adhesive solidifies by chemical or physical reaction. Chemically reactive adhesives generally are multi-component and provide a stronger bond than physically reactive ones.

The major classifications are described as follows:

Hot Melt Adhesives

Hot melt adhesives are 100% solid adhesives that are heated to temperatures above their melting point and applied to at least one substrate in the molten state. These adhesives can be very rigid materials or soft "tacky" materials depending on the ingredients used which are in turn dictated by the end use of the adhesive. Hot melts are well established in most of the adhesive markets such as packaging, converting, bookbinding, non-woven, footwear, and others, due primarily to the advantage of fast processing. Unlike water-based or solvent-based adhesives, hot melt adhesives do not require drying. Hot melts set up as quickly as they can cool down to their solidification point. This fast solidification is ideal for use on highly automated manufacturing lines that require rapid bond formation.

Water-based adhesives

Water-based adhesives are made up of materials or compounds that can be dissolved or dispersed in water. These adhesives generally develop a bond by losing water through evaporation or penetration into the substrates. At least one substrate must be absorbent or porous in order to form a strong bond. Water-based adhesives come in a variety of chemistries and compositions, and can be categorized as either natural or synthetic polymers.

Reactive Chemistry Adhesives

Reactive systems are high performance adhesives and offer physical properties that include high strength and flexibility, as well as excellent adhesion to a variety of substrates such as wood, plywood, particleboard, paper, metals, fabrics, foam and plastics. Types of adhesives offered include hot melt and liquid moisture curing polyurethanes (sometimes referred to as PURs); two part polyurethanes, one and two-part epoxies; and polysulfide adhesives.



Global Strategy, Inc.

www.globalstrategy.biz ▲ info@globalstrategy.biz

Solvent-based Adhesives

Solvent based adhesives, coatings, and sealants were developed for a variety of applications. These products can be sprayed, brushed, roll coated, gravure coated, curtain coated, or extruded. Solvent based products are noted for their fast bond strength development, versatile adhesion to a wide variety of substrates, good heat resistance, as well their tolerance of a wide range of production conditions, including low temperatures or high humidity. Solvent based contact adhesives offer excellent “auto adhesion” which results in an instant bond, thus allowing assembled components to undergo downstream processing without clamping or fixturing.

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For more information, contact Mark Tomkins, Vice President
1400 E Lake Cook Rd, Suite 150
Buffalo Grove, IL 60089
USA
www.globalstrategy.biz
mark@globalstrategy.biz
Telephone: +1 847 440 8152