

## More about adhesives

There are a large number of adhesive types for various applications. They may be classified in a variety of ways depending on:

- their chemistries (e.g. epoxies, polyurethanes, polyimides),
- their form (e.g. paste, liquid, film, pellets, tape),
- their type (e.g. hot melt, reactive hot melt, thermosetting, pressure sensitive, contact, etc.), or
- their load carrying capability.

Moreover, they may be applied in a variety of ways: they may be spread on a surface manually or may be dispensed using a variety of sophisticated nozzles and robotic equipment that is currently available. The strongest adhesives solidify by a chemical reaction while weaker varieties harden by some physical change.

Type	Use	Advantages	Disadvantages
<b>Synthetic resin glue and PVA</b> (Polyvinyl acetate glue)	Joining wood. It is a powder that is mixed with water to form a thin paste. It is stronger than PVA, which is a white liquid sold in various sizes of containers.	1. Stronger than PVA 2. Heat and water resistant 3. Economical 4. Durable 5. Non-staining	1. Takes 4-6 hours to set 2. Hard on tools  1. Not waterproof
<b>Contact adhesive</b>	Joining different types of materials. Each surface is coated with the adhesive and left for 10-15 minutes until touch dry. The surfaces are then lined up before being pressed together.	1. Clean 2. Quick 3. Economical	1. Little or no time for repositioning 2. Good ventilation required
<b>Epoxy resin</b>	Araldite is the main example of this adhesive. It is used to form a rigid bond with most dissimilar materials with the exception of silicon rubber, polythene or thermoplastic. The resin and hardener are mixed and spread over surfaces and left to set for 24 hours.	1. Good water resistance 2. Insulation and gap filling properties	1. Expensive: it needs to be spread over a large area to be permanent 2. High cost prevents large-scale work
<b>Acrylics</b>	Structural acrylic adhesives <b>cure</b> by mixing two separate parts, a resin and an activator. Once the two components are mixed, a room-temperature chemical reaction occurs, delivering a very strong bond to metals, plastics and composites.	1. High strength and toughness 2. Bond well to a wide range of materials 3. Require little surface preparation	1. Not for wood and rubber
<b>Polyurethane</b>	Chemically reactive formulations that may be one or two-part systems and are usually fast curing. They are useful for bonding glass fibre reinforced plastics.	1. Strong resilient joint 2. Impact resistant 3. Better low temperature strength than any other adhesive	1. The fast cure usually necessitates applying the adhesives by machine
<b>Silicones</b>	They are available in single or two-part forms. The latter functions like epoxies, the former like polyurethanes. The single-part adhesives liberate either alcohol or acetic acid (the familiar smell of vinegar).	1. Flexibility 2. High temperature resistance 3. Excellent sealant 4. Excellent durability	1. Not very strong adhesive  <b>to cure: <i>indurire</i> to stain: <i>macchiare</i></b>

### 1 Match the terms to the given definitions.

chemistry • container • durable • equipment • nozzle • permanent • powder • resilient • vinegar • waterproof

1. A dry substance made up of very tiny pieces of something.
2. The structure and properties of a substance, i.e. the study of the way a substance changes and reacts with other substances.
3. Lasting or continuing for a very long time or forever, not temporary or changing.
4. Able to exist for a long time without significant deterioration in quality or value.
5. A sour liquid that is used to flavour or preserve foods or to clean things.
6. Able to return to its original shape after being pulled, stretched, pressed, bent, etc.
7. A short tube that is put on the end of a hose or pipe to control the way a liquid or gas flows out.
8. Designed to prevent water from entering or passing through.
9. An object, such as a box or can, that can hold something.
10. Supplies or tools needed for a special purpose.

### 2 Decide if the sentences are true or false, then correct the false ones.

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| <ol style="list-style-type: none"> <li>1. Synthetic resin glue takes more time to set than PVA. <span style="float: right;">T F<br/><input type="checkbox"/> <input type="checkbox"/></span></li> <li>2. Adhesives can be applied in one way only. <span style="float: right;">T F<br/><input type="checkbox"/> <input type="checkbox"/></span></li> <li>3. The strongest adhesives are those that harden by some physical change. <span style="float: right;">T F<br/><input type="checkbox"/> <input type="checkbox"/></span></li> <li>4. Epoxy resin has insulation and gap filling properties. <span style="float: right;">T F<br/><input type="checkbox"/> <input type="checkbox"/></span></li> </ol> | <ol style="list-style-type: none"> <li>5. Acrylics bond well to wood and rubber. <span style="float: right;">T F<br/><input type="checkbox"/> <input type="checkbox"/></span></li> <li>6. A smell of vinegar is given off when using single-part silicone. <span style="float: right;">T F<br/><input type="checkbox"/> <input type="checkbox"/></span></li> <li>7. Contact adhesive requires good ventilation. <span style="float: right;">T F<br/><input type="checkbox"/> <input type="checkbox"/></span></li> <li>8. Acrylic adhesives cure by mixing two separate parts, a resin and a coating. <span style="float: right;">T F<br/><input type="checkbox"/> <input type="checkbox"/></span></li> </ol> |
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### 3 Translate the sentences into Italian.

1. A huge variety of adhesives used for manufacturing purposes are currently available on the market.
2. Polyimide (*poliimmide: materia plastica*) adhesives are based on synthetic organic chains. They are available as liquids or films, but are expensive and difficult to handle.
3. Epoxy adhesives can be used to join most materials. These adhesives have good strength, low shrinkage and do not produce volatiles.
4. Silicones are often used as bath and shower sealants.
5. Cyanoacrylate adhesives are suited to small plastic parts and to rubber. They are a special type of acrylic resin.
6. Phenolics (*resina fenolica*) were the first adhesives for metals and have a long history of successful use for joining metal to metal and metal to wood. They require heat and pressure for the curing process.
7. Anaerobic adhesives cure when in contact with metal, and the air is excluded, e.g. when a bolt is home in a thread. They are often known as "locking compounds" (*frenafiletto*), being used to secure, seal and retain turned threaded, or similar fitting parts. They are based on synthetic acrylic resins.
8. Cyanoacrylate adhesives cure through reaction with moisture held on the surface to be bonded. They are suited to small plastic parts and to rubber. They are a special type of acrylic resin that usually solidifies in seconds.