

ADHESIVE SELECTION

There is no universal adhesive, which is suitable for all possible applications.

Correct selection of an adhesive is determined by optimal combinations of various factors:

- Substrate material (Adhesives for metals, Adhesives for ceramics, Adhesives for plastics, Adhesives for rubber, Adhesives for wood, Adhesives for paper, Adhesives for glass)
- Required bonding strength;
- Required elasticity of the adhesive joint;
- Environmental conditions (water, temperature range, chemicals);
- Service temperature;
- Type (design) of Adhesive joints;
- Curing conditions;
- Biodegradability;
- Cost effectiveness.

Characteristics of some adhesives

Adhesives for different materials:

- Adhesives for metals**
- Adhesives for ceramics**
- Adhesives for plastics**
- Adhesives for rubber**
- Adhesives for wood**
- Adhesives for paper**
- Adhesives for glass**

Characteristics of some adhesives

- Epoxy** (Single component high strength epoxy adhesive, Two component fast curing epoxy adhesive, Two component toughened epoxy adhesive)
 - Very good resistance to chemicals (acids, alkalis);
 - Very good resistance to Solvents and oils;
 - Good resistance to water;
 - Very good thermal resistance;
 - Strong durable bonding;
 - Low shrinkage;

- ☐ Ability to fill wide gaps;
- ☐ Brittleness (poor elasticity);
- ☐ Poor peel strength.

☐ **Urethane**

- ☐ Good peel strength;
- ☐ Good elasticity;
- ☐ Moderate resistance to water;
- ☐ Moderate resistance to chemicals;
- ☐ Moderate resistance to Solvents and oils;

☐ **Acrylic**

- ☐ Good resistance to acids;
- ☐ Moderate resistance to alkalis;
- ☐ Very good resistance to mineral oils;
- ☐ Poor resistance to Solvents and vegetable oils;
- ☐ Good thermal resistance;
- ☐ Fast cure;
- ☐ Good elasticity at low temperatures;
- ☐ Characteristic odor (non-toxic).

☐ **Cyanoacrylate** (General purpose cyanoacrylate adhesive, Fast curing cyanoacrylate adhesive, Maximum gap cyanoacrylate adhesive)

- ☐ The best adhesive for bonding small parts;
- ☐ Fast cure;
- ☐ High adhesion strength;
- ☐ High cohesion of thin bonding layers;
- ☐ Poor peel strength;
- ☐ Brittleness (poor elasticity);
- ☐ Low biodegradability.

☐ **Silicone**

- ☐ Very good thermal resistance;
- ☐ Good resistance to chemicals (acids, alkalis);
- ☐ Good resistance to Solvents and oils;
- ☐ Good resistance to water;
- ☐ Suitable for outdoor applications;
- ☐ Good wettability;

☐ **Polyvinyl acetate (PVA)**

- ☐ High degree of instant stickiness (tack);

- Good resistance to chemicals (acids, alkalis);
- Moderate resistance to Solvents;
- Moderate resistance to water;
- Suitable for indoor applications;
- Used with porous substrates;
- Unable to fill wide gaps.
- Polyvinyl acetate adhesive
- Formaldehydes (Phenol Formaldehyde, Urea Formaldehyde, Melamine Formaldehyde)**
 - Good thermal resistance;
 - Compatibility with most Polymers;
 - Moderate resistance to water;
 - Release toxic fumes;
 - Used with porous substrates;
 - Cost effective.

Adhesives for metals

- Epoxy
- Polyurethane
- Acrylic
- Silicone

Adhesives for ceramics

- Polyurethane
- Acrylic
- Epoxy
- Silicone

Adhesives for plastics

- Cyanoacrylate
- Polyurethane
- Epoxy
- Acrylic

Adhesives for rubber

- Silicone
- Epoxy
- Polyurethane

- ☐ Cyanoacrylate

Adhesives for wood

- ☐ Formaldehydes (Phenol Formaldehyde, Thermoset Urea Formaldehyde (UF), Thermoset Melamine Formaldehyde (MF))
- ☐ Polyvinyl acetate (PVA, White Glue)
- ☐ Aliphatic resin (Yellow Glue)
- ☐ Polyurethane

Adhesives for paper

- ☐ Polyvinyl acetate (PVA, White Glue)
- ☐ Epoxy
- ☐ Polyurethane
- ☐ Thermoset Melamine Formaldehyde (MF)

Adhesives for glass

- ☐ Acrylic
- ☐ Epoxy
- ☐ Cyanoacrylate

Source : http://www.substech.com/dokuwiki/doku.php?id=adhesive_selection