ADHESIVES & SEALANTS

SELECTING THE RIGHT ADHESIVE

In selecting the correct adhesive for a given application, it should first be acknowledged that there is no one adhesive that works every time on every material in all environments. Also, final adhesive characteristics may have to be compromised to meet application requirements. As examples, cure speed may be compromised for ultimate strength, or chemical resistance may be sacrificed for flexibility and so on.

The types of available adhesives and chemistries probably number in the hundreds, and possible requirement combinations are limitless. Listed here are key criteria to consider in selecting the adhesive. Only after specifying the criteria, can a match-up with an appropriate adhesive type be made.

- **MATERIAL TO BE BONDED:**
  - Similar or dissimilar
  - Porous or not
  - Rigid or flexible
  - Maximum gaps to fill, etc.

- **SURFACE CONDITIONS:**
  - Finish
  - Cleanliness
  - Compatibility with adhesive
  - Coatings
  - Surface irregularities

- **ENVIRONMENT:**
  - Temperature range
  - Fluids present
  - Temperature cycles
  - Pressure levels
  - Vibration and shock levels

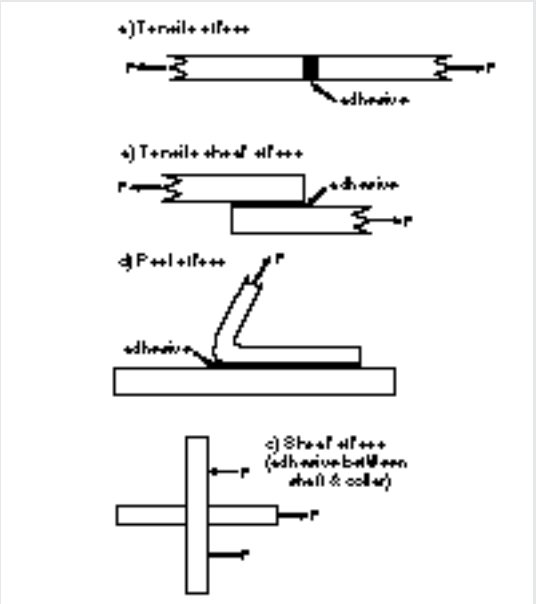
- **ADHESIVE CURE REQUIREMENTS:**
  - Working time
  - Fixture (handling strength) time
  - Full cure time

- **APPLICATION REQUIREMENTS:**
  - Spot or blanket coverage
  - Maintenance or production use
  - Manual or automatic dispensing

- **STRENGTH REQUIREMENTS:**
  - Short term
  - Long term
  - Disassembly concerns

- **CURING CATALYSTS:**
  - Heat
  - Mixing
  - Humidity
  - Absence of air
  - Primer, etc.

- **TYPES OF STRESS THE BOND EXPERIENCES:** very important as some adhesives are excellent under one type, but poor under another.



SELECTING THE RIGHT SEALANT

As with adhesives, there are many different types of sealants available, each with its own set of strengths and weaknesses. To make the proper choice for a given application, define the following parameters and compare to specific sealant capabilities.

- **SURFACES TO BE SEALED:**
  - Compatibility with sealant
  - Porosity level
  - Cleanliness

- **CURING CATALYSTS ;**
  - Heat
  - Mixing
  - Humidity
  - Absence of air
  - Primer, etc.

- **SEALANT CURING TIME & WORKING TIME**

- **APPLICATION REQUIREMENTS:**
  - Manual or automatic
  - Strip, spot or blanket coverage
  - Spray, dip, brush or caulk

- **ENVIRONMENT:**
  - Temperature range
  - Fluids present
  - Temperature cycles
  - Pressure levels
  - Vibration and shock levels
  - Maximum gaps to be filled
  - Flexibility requirements
  - Inside or out

ADHESIVE & SEALANT CHARACTERISTICS

	ACRYLIC	BUTYL	SILICONE	URETHANE	PANEL	LUMBER
TYPE	SEALANT	SEALANT	SEALANT / ADHESIVE	SEALANT / ADHESIVE	ADHESIVE	ADHESIVE
TYPE OF CURE	AIR	AIR	ACETOXY	MOISTURE	AIR	AIR
APPLICATION RANGE	45-115°F	40°-100°F	40°- 100°F	40° TO 100° F	0°-120° F	0°-120° F
SERVICE TEMP. RANGE	-20° + 65° F	-20° + 180°F	-50° + 400°F	-40° + 180 °F	0°-120° F	-10°±120° F
SKIN TIME	20-40 MINUTES	2 HOURS	5-15 MINUTES	8-24 HOURS	30 MINUTES	30 MINUTES
FINAL CURE TIME	5 DAYS	10 DAYS +	30 DAYS	7-30 DAYS	10 DAYS	20-30 DAYS
ELONGATION	UP TO 200%	UP TO 150%	400%	1000%	-	-
TENSILE STRENGTH	UP TO 20 PSI	NA	UP TO 300 PSI	UP TO 400 PSI	UP TO 29 PSI	UP TO 37 PSI
PEEL STRENGTH	UP TO 10 PSI	NA	UP TO 40 PPI	20-50 PSI	-	-
COST INDEX	LOW	LOW	HIGH	MODERATE	LOW	LOW
LIFE EXPECTANCY	30-50 YRS INDOORS	10 YEARS	20 YEARS	20 YEARS	30-50 YRS INDOORS	APP. 20 YEARS
PRO	All purpose indoor sealant. Accepts paint readily.	Bonds to almost any surface. Accepts paint readily.	Extremely durable and flexible in all weather conditions	Extraodinary adhesion and flexibility in all weather conditions.	Water resistant Excellent for polystyrene foam, Ceramic, Tile, Wall-board, Cork	Water resistant Can be used on wet pressure treated lumber. Bonds to almost any surface.
CON	Not recommended where tempertature will fall below freez-ing for extended periods of time. Do not use outdoors when rain is imminent.	Do not apply paint until it is fully cured.	Not for use below grade or continuous water im-mersion. Does not readliy accept paint.	Not for use in submerged joints or horizontal traffic-bearing deck joints	Do not use outdoors Do not use on pres-sure treated lumber.	Do not use on polystrene.
SPECS	ASTM C834-76	TT-S-00-1657-Type I	TT-S-00-1543 TT-S-0023C ASTM C920-79 Type S, Grade NS, Class 25, Use T,G,A and D,. Exceeds MIL-A-46106A Type I FDA No. 21 USDA Rating P1	TT-S-CO23C, Type II Class A ASTM C-920, Type S, Grade NS, Class 25, Use NT, Mand A. USDA Approved.	ASTM C557-73	BOCA Approved 80-67-AFG-01

TYPE OF CURE - The manner in which the material cures. AIR by solvent or moisture loss. ACETOXY - loss of acetic acid. MOISTURE - by absorbing moisture in the air to complete the chemical reaction.
APPLICATION RANGE - The temperature at which the sealant or adhesive may be applied.
SERVICE TEMPERATURE RANGE - The temperature at which the sealant or adhesive will perform it's purpose without failure.
SKIN TIME - The time it takes for the material to be dry to the touch.
FINAL CURE TIME - Total amount time necessary to fully cure and develop full performance characteristics.
ELONGATION - The percentage of movement by volume that the material will stretch and return to it's original size.
TENSILE STRENGTH - The force necessary to fail the material in tension.
PEEL STRENGTH - The force necessary to remove the material from that which it is adhering to.
LIFE EXPECTANCY - The expected usable life under the normal conditions for which the product was designed. Not ideal conditions.
SPECS - As there are many quality levels for each type the better the product the more likely it will meet ASTM specifications and can be considered architectural quality.