THREE BOND SINGAPORE PTE LTD
5, JOO KOON CRESCENT
SINGAPORE 629009

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Three Bond 1530
Single-component, Moisture cure type Elastic Adhesive

Three Bond 1530 is a single-component elastic adhesive, which cures in the presence of moisture. The polymer material contains silyl functional group, which will react with the small amount of moisture to cure. This product is different in that 7 minutes after applying (23°C, 50% relative humidity), a strong adhesion is formed, without the use of temporary fixation. As compared to present adhesive,strong adhesion strength can be achieved as soon as the parts are bound together.
This can be used in similar applications as RTV silicone (sealant, potting agent). There will not be low molecular weight cyclosiloxane produced during cure. Hence, it will not affect the electronic contact points.

Features
- Does not contain any solvent, environmentally friendly.
- Low odor.
- Single component, rapid curing.
- Does not require any light or heating equipment.
- Good initial strength, hence, does not require any temporary fixing.
- Elastic material. Hence, good peel strength, together with good impact and vibration resistance. Good adhesion to different adherents.
- Good adhesion with metal, plastic, rubber, wood and inorganic materials.

Applications
Bonding to different materials possible (multi-purpose). Sealing, molding and potting purpose.

Characteristics
Before curing

Items	Units	Results	Testing Method	Remarks
Main Component		Polymer containing silyl functional group		
Appearance		White paste	3TS-201-02	
Viscosity	Pa.s {cP}	100 {1000}	3TS-210-02	
Specific Gravity		1.39	3TS-213-02	
Non-volatile matter	%	98	3TS-217-02	80°C x 2h
Tack-free time	min	7	-	

After curing (23° C x 50%RH x 7 days curing)

Items	Units	Results	Testing Method	Remarks
Tensile strength	MPa {kgf/cm^2}	5.9 {60}	3TS-320-01	
Elongation	%	280	3TS-320-01	
Hardness		A44	3TS-215-01	
Rate of curing shrinkage	%	2.53	3TS-228-01	
Glass Transition Point	°C	-55	3TS-501-04	
Heat conductivity	W·M^{-1}·K^{-1}	0.28	3TS-501-06	
Coefficient of Thermal expansion	K^{-1}	2.18 x 10^{-4}	3TS-501-05	

Note: Dumbbell No 3, 2mm thickness.
Glass transition point was measured on a DMS at 1Hz, the temperature at which the material loses its elasticity. (Speed of heating 3°C/min)

Electrical properties

Items		Units	Results	Testing Method	Remarks
Volume resistivity		Ω·m {Ω·cm}	5.0 x 10^{10} {5.0 10^{12}}	3TS-401-01	
Surface resistivity		Ω	1.2 x 10^{12}	3TS-402-01	
Dielectric Constant	50 Hz		4.40	3TS-405-01	
	60 Hz		4.23		
	1 kHz		4.87		
	1 MHz		3.53		
Dielectric Dissipation factor	50 Hz		0.017	3TS-405-01	
	60 Hz		0.020		
	1 kHz		0.028		
	1 MHz		0.040		

Degree of Moisture Absorption

At 40°C and 95% relative humidity, a 2mm sheet of the cured product will absorb moisture up to 49 g/m^2 in 24 hours. (JIS Z 0208)

Under similar condition, silicone or modified silicone of our products will absorb to 60 ~ 70 g/m^2 in 24 hours.

Tensile shear strength (MPa {kgf/cm^2}) (3TS-301-13)

Item		Results	Remarks
METAL	Aluminium	6.6 {67}	Cohesion failure
	Steel (SPCC-SB)	5.4 {55}	Cohesion failure
	Stainless steel	4.4 {45}	Cohesion failure
	Brass	4.5 {46}	Cohesion failure
PLASTICS	Acrylic	4.7 {48}	Cohesion failure
	PPO (Poly dimethyl phenylene oxide)	5.0 {51}	Cohesion failure
	ABS	2.9 {30}	Cohesion failure
	6,6 nylon	5.1 {52}	Cohesion failure
	PC (polycarbonate)	5.6 {57}	Cohesion failure
	Polystyrene	3.5 {36}	Adhesion failure
	Hard PVC	3.3 {34}	Cohesion failure
	FRP (Polyester)	4.8 {49}	Cohesion failure
	PET (Polyethylene terephthalate)	2.1 {21}	Adhesion failure
	Phenol	5.3 {54}	Cohesion failure
	PPS (Polyphenylene sulphide)	1.5 {15}	Adhesion failure
	PBT (polybutylene terephthalate)	1.4 {14}	Adhesion failure
	Lauan plywood	4.4 {45}	Cohesion failure
	Glass	5.7 {58}	Cohesion failure

Peel Strength (kN/m {kgf/25mm}) (3TS-304-23)

Item		Results	Remarks
Aluminium		2.5 {6.5}	Cohesion failure
Tent cloth		1.8 {4.5}	Cohesion failure
RUBBER	NBR	1.6 {4.0}	Material failure
	Chloroprene	1.4 {3.4}	Adhesion failure
	SBR	1.4 {3.6}	Material failure
	NR	1.8 {4.5}	Material failure
	EPDM	0.83 {2.1}	Adhesion failure
	Silicone	0.30 {0.77}	Material failure

Note: The adhesive was applied onto both sides, with an open time of 5 minutes (time after applying and before putting the adherents together).

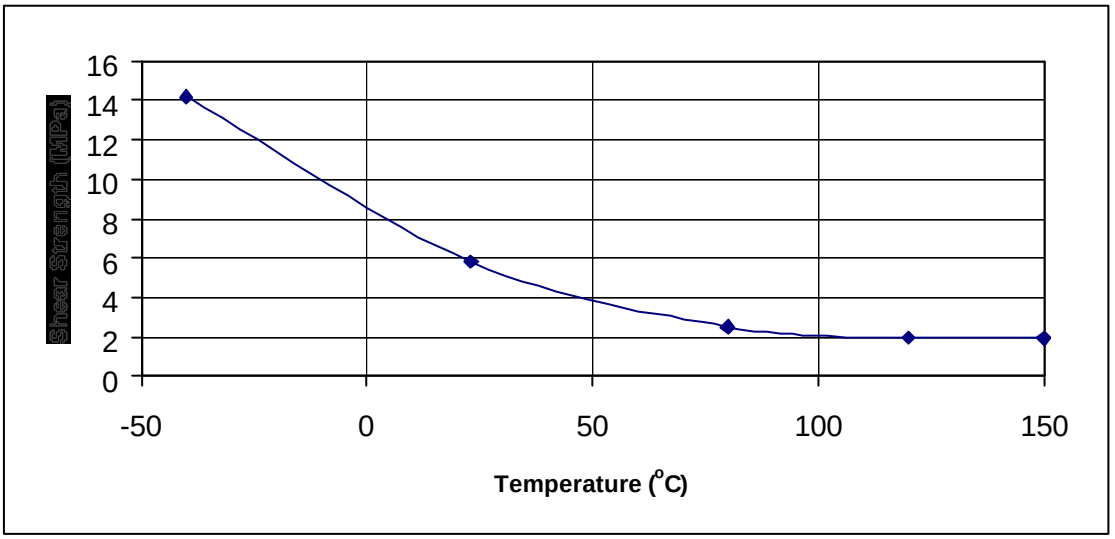
Surface treatment of test piece:

Metal	Wash with xylene
Plastic	Wipe with ethanol
Rubber	Grind with sandpaper, then wash with xylene

※ Cannot bond with polyethylene, polypropylene, polyacetal and Teflon.

Bonding strength with temperature

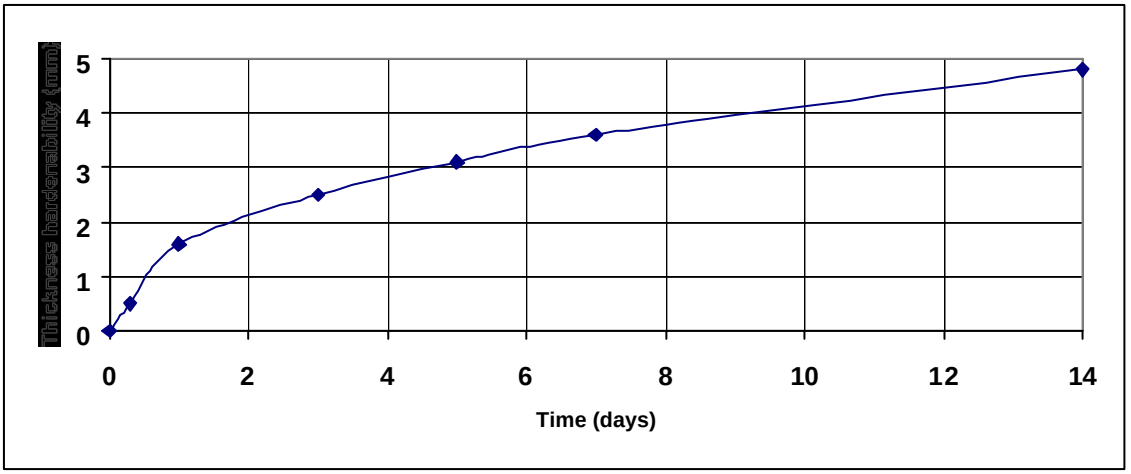
Steel (SPCC, SB) test piece, washed withxylene
Open time 5 minutes, 23°C x 50% RH x 7 days curing



Curability

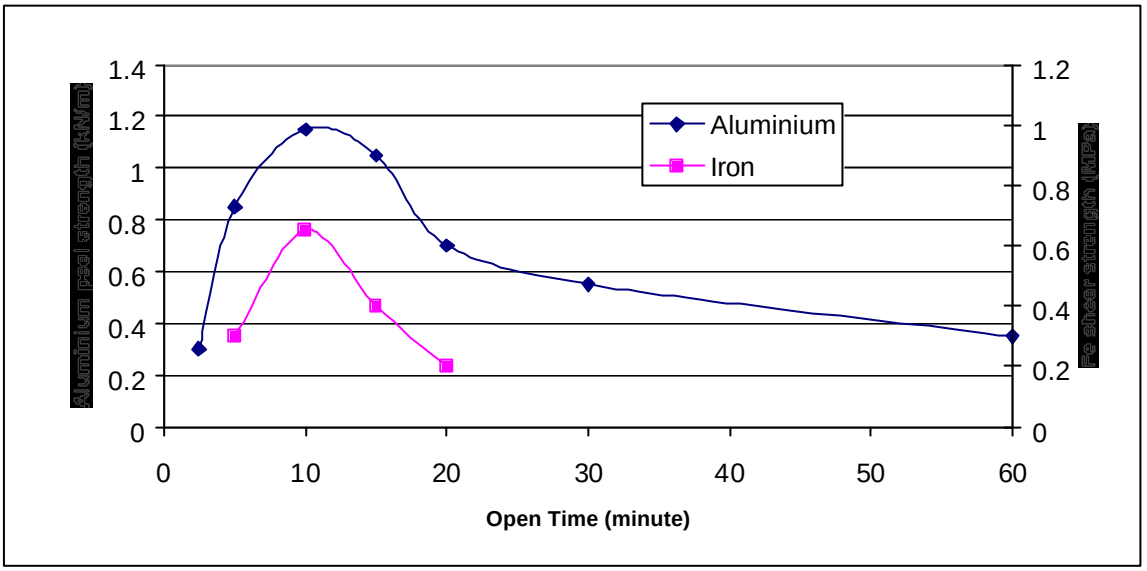
Thickness Hardenability

At 23°C and 50% RH, the speed of curing is represented in the graph below.
De-oxime silicone will cure at 1.5 ~ 3.0 mm/day under the same condition.



Relation between open time and bonding strength

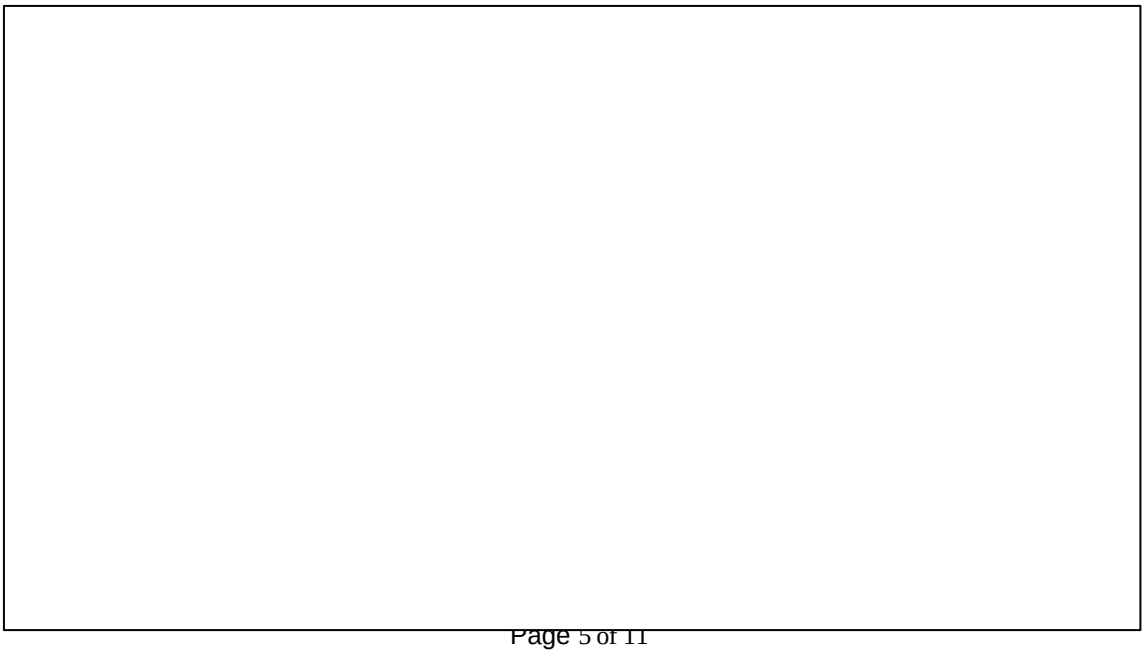
Test piece was applied with the product and left at specific open time before putting the pieces together.



Relation between open time and final adhesion strength

Polycarbonate test pieces were applied with the product before subjecting to the various open time. Following that, they were placed at 23°C x 50% RH for 7 days, before the shear strength was measured.

The open time is not dependent on whether the adhesion is applied on one side or both. When the open time is too long, the surface of the product will harden and the adhesive strength will decrease.



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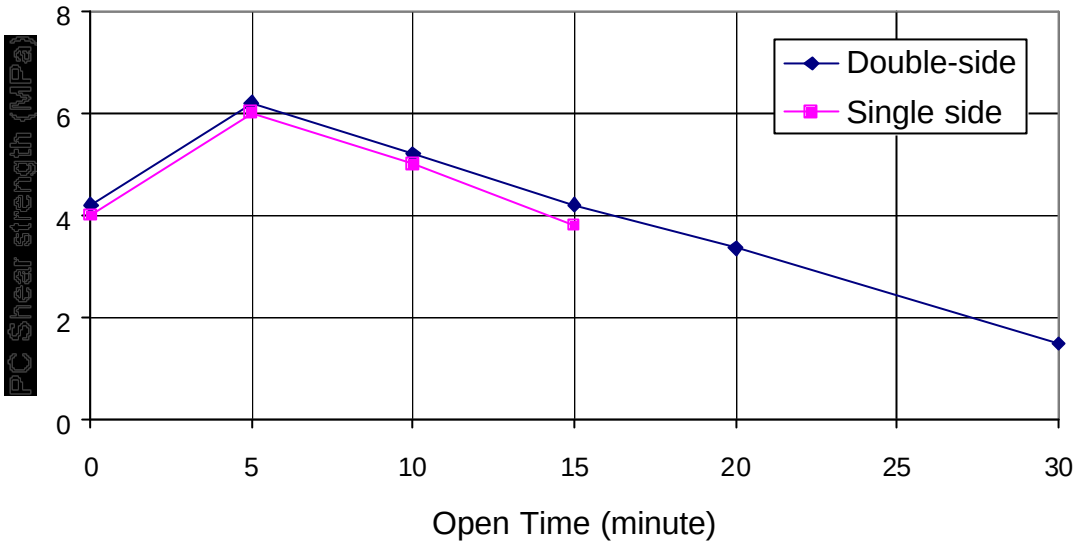
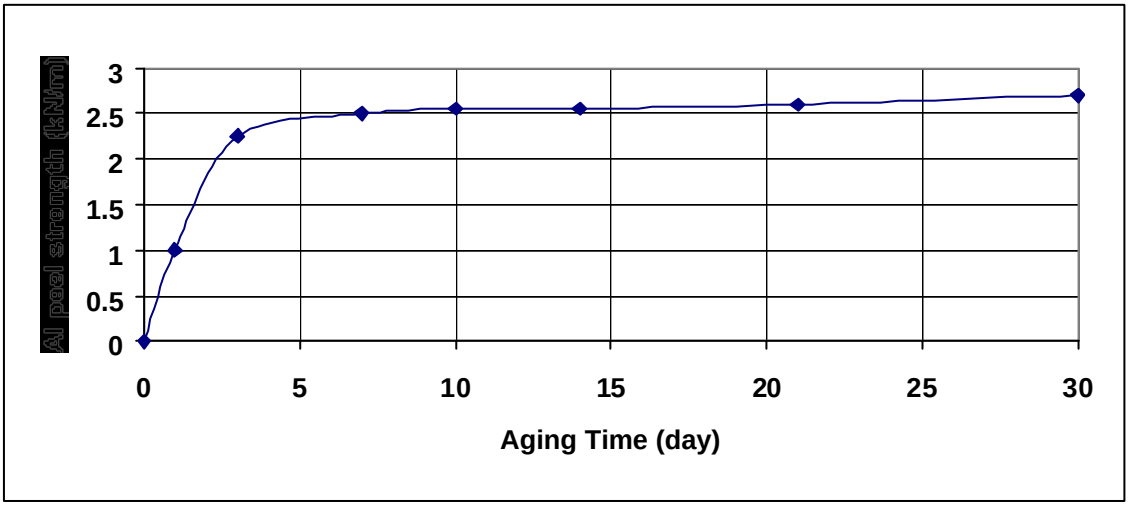
TECHNICAL DATA



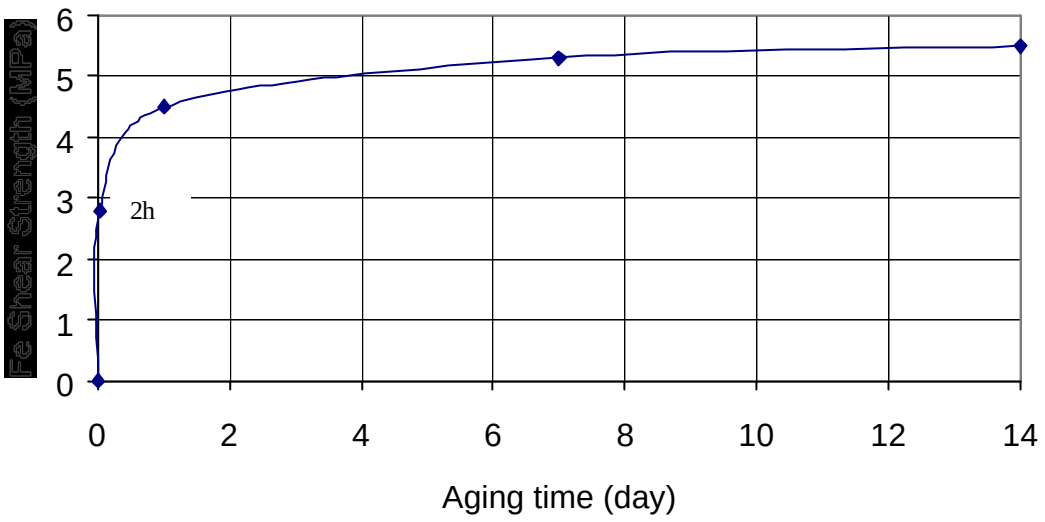
Aging time vs Peel strength

Aluminium test piece, washed with xylene.
Open time 5 minutes, 23°C x 50% RH x 0 ~ 30 days curing



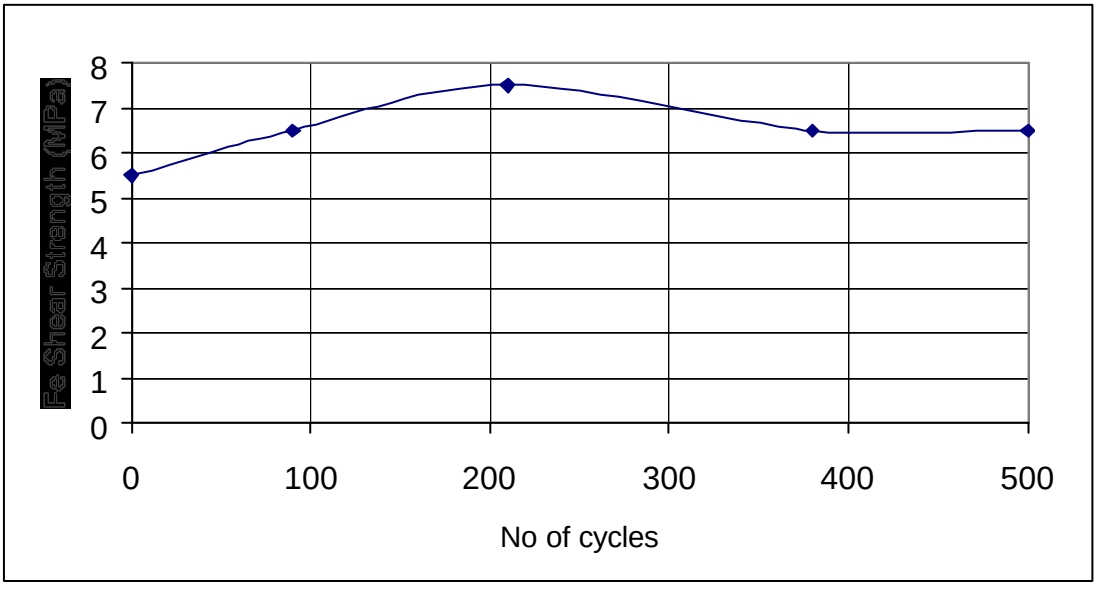
Aging time vs Shear strength

Steel (SPCC, SB) test piece, washed with xylene
Open time 5 minutes, 23°C x 50% RH x 0 ~ 14 days curing



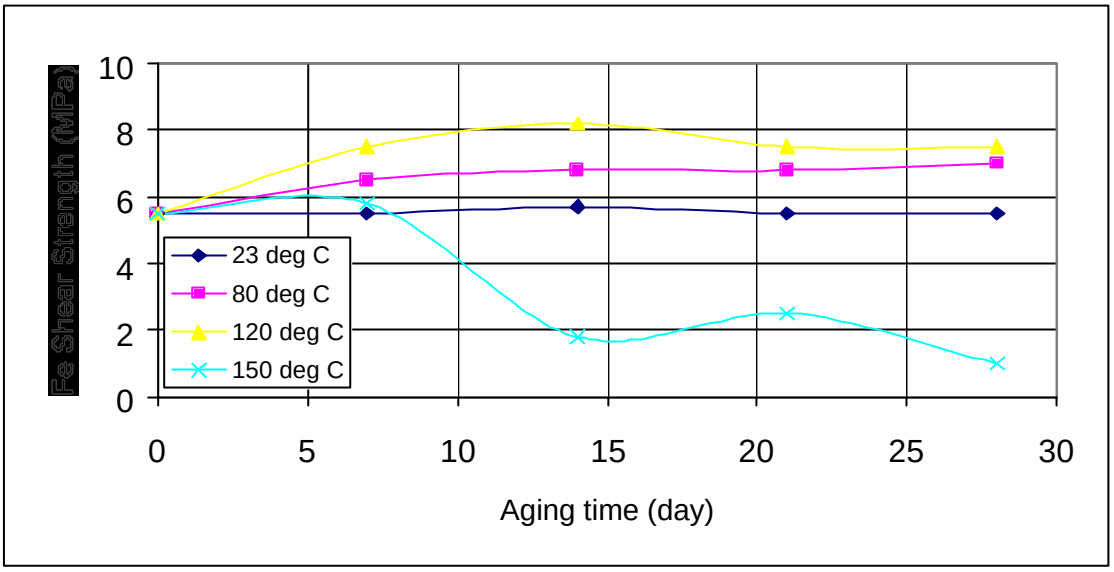
Heat cycle resistance

Steel (SPCC, SB) test piece, washed with xylene
Open time 5 minutes, 23°C x 50% RH x 7 days curing
Heat cycle: -40°C x 1h, 120°C x 1h constitutes one cycle



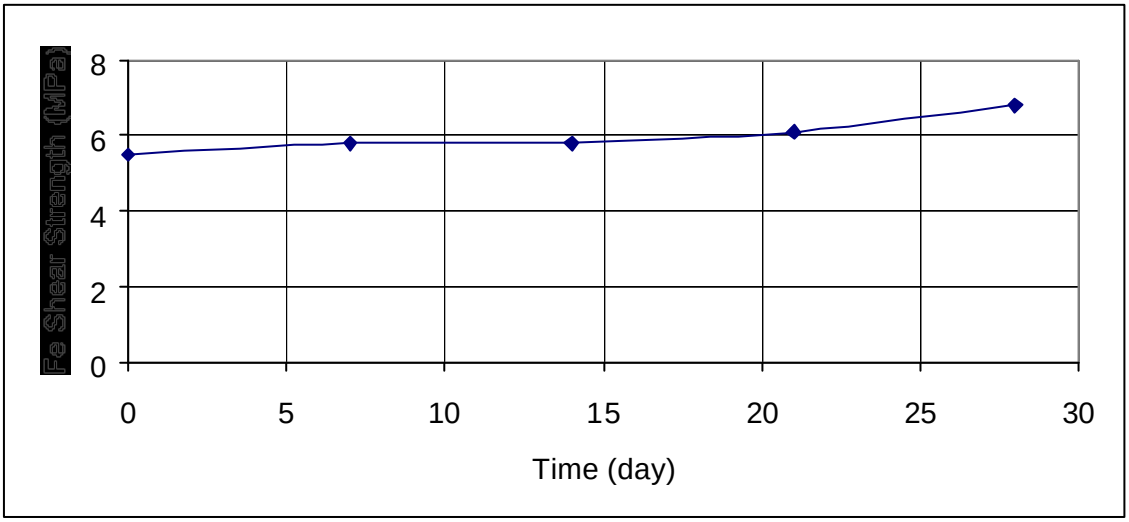
Heat resistance

Steel (SPCC, SB) test piece, washed with xylene
Open time 5 minutes, 23°C x 50% RH x 7 days curing



Moisture resistance

Steel (SPCC, SB) test piece, washed with xylene
Open time 5 minutes, 23°C x 50% RH x 7 days curing.
The test pieces were subjected to 85°C x 85% RH for the respective time.



Chemical resistance (Dumbbell test piece, immersed at 40°C x 7 days)

Dumbbell test piece (No 3) was immersed into the respective chemical. It was wiped dry before checking the values.

Chemical	Rate of volume change (%)	Change in tensile strength (%)	Change in elongation (%)	Change in hardness (%)
KOH, 10%	-2.5	-25	+3.6	-23
H_2SO_4, 10%	-1.4	-37	-32	-9.1

Handling Method

(a) Double-side application

① Please remove rust, grease or dust from the surface. This can be done using sandpaper and/or alcohol.

② Apply a thin layer onto each of the adhering side.

③ After binding the parts, leave at 23°C, 50% RH for up to 7 minutes and above and practical strength can be observed. There is no need for temporary fixation to secure the parts. The maintenance time of strong cohesiveness is 7 ~ 20 minutes. Strong adhesion strength will not be obtained when the parts are left for more than 20 minutes, and reapplying is required.

(b) Single-side application

① Please remove rust, grease or dust from the surface. This can be done using sandpaper and/or alcohol.

② Apply a thin layer onto each of the adhering side.

③ Practical strength will be reached in 5 minutes. There is no need for temporary fixation to achieve bonding. If cohesive effect is not achieved, then there is a need for temporary fixation.

※ It is possible to move the parts after 1 ~ 2 hours. Final strength is obtained in 1 day.

※ If the bonding layer is thick, the initial strength can only be reached later.

※ Good adhesion will depend on the application, binding and structure of the bonding parts (size of bonding area).

※ The initial strength may occur at later time, depending on the temperature and humidity of the environment. Please confirm before use.

Handling Precautions

1. Please cap the tube after use.
2. Keep away from children.
3. Harmful. Do not contact or inhale the vapour.

4. If the product comes into contact with the eyes. Wash under running water for about 15 minutes. Consult a physician immediately.
5. In case of contact with skin, wipe with a dry cloth and wash affected area with soap and warm water.
6. Please read direction and brochure carefully before use.
7. Please use suitable mechanical ventilation when using the product, in compliance with local regulation on permissible exposure level.
8. Avoid storing in high temperature, high humidity area, and away from sunlight and other heat source.
9. Use in compliance with local laws and regulation.
10. For other information, please refer to the MSDS, which is attached.

Storage

Store in dark area away from direct sunlight and low humidity at 10 ~ 25°C. Ensure that the container is capped tightly to prevent contaminants.

Shelf Life

Three Bond 1530 12 months when stored at 10 ~ 25°C, unopened.

Packaging

150 g laminated tube
460 g cartridge

Disclaimer

For Industrial Use Only

(Do not use for household purposes)

- The data contained in this report are obtained from experimental results, based on our test methods. We cannot assume absolute responsibility for accuracy and safety. Before using this product, use your own judgement to determine whether or not this product meets the requirements of the application and objectives. This includes the burden of responsibility and hazardous danger. The extent of the guarantee provides replacement for products, which are clearly unsatisfactory.

- We assume responsibility for neither injury nor property damages resulting from the misuse of this product.
- We do not assume responsibility without written notice or contract.