ThreeBond

Three Bond International, Inc.
Technical Data Sheet

TB1530
ONE COMPONENT, MOISTURE CURING, ELASTOMERIC ADHESIVE

Information
TB1530 is a one-component, non-solvent and moisture curing, elastomeric adhesive. This adhesive cures rapidly upon exposure to moisture in the air forming a tough elastomer over time. TB1530 provides excellent weather resistance, good adhesion to most substrates without the use of a primer. Moreover, TB1530 is an environmentally friendly adhesive: odor-free, solventless, and isocyanate free.

Applications
TB1530 is a multipurpose adhesive for various materials: sealing, casting and potting of metal, plastic, wood, rubber, fiber and inorganic materials. Unlike conventional adhesives, TB1530 has a tacky stage after exposure to moisture for approximately 7 minutes in ambient conditions. During this stage TB1530 can act as a pressure-sensitive adhesive without the aid of jigs for fastening. Due to flexibility of TB1530, it has good peel srength, impact resistance, and high vibration, as well as good adhesion for bonding of dissimilar adherends. TB1530 is free of low-molecular cyclic siloxanes making it more desirable than silicones for electronic applications.

Typical Properties

1. Uncured Material

Property	Units	Value	Method
Main Component	-	Silyl-Ended Special Polymer	-
Appearance	-	White Paste	3TS-201-02
Non-volatile content	%	98 (80°C × 2 hours.)	3TS-217-02
Viscosity	Pa·s (P)	100 (1000)	3TS-210-02
Specific gravity	-	1.39	3TS-213-02
Tack Free Time	Minute	7	-

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2. Cured Material (Condition: 23°C × 50% R.H. × 7 days)

Item	Unit	Value	Method
Tensile Strength	MPa (kgf/cm^2)	5.9 (60)	3TS-320-01
Elongation	%	280	3TS-320-01
Hardness	JIS A	44	3TS-215-01
Curing Shrinkage	%	2.53	3TS-228-01
Glass-Transition	°C	-55	3TS-501-04
Thermal Conductivity	$W \cdot M^{-1} \cdot K^{-1}$	0.28	3TS-501-06
Linear Expansion Coefficient (20°C)	K^{-1}	2.18×10^{-4}	3TS-501-05

3. Electric Property

Properties		Units	Value	Method
Volumetric resistivity		Ω·m (Ω·cm)	5.0×10^{10} (5.0×10^{12})	3TS-401-01
Surface resistivity		Ω	1.2×10^{12}	3TS-402-01
Dielectric constant	50Hz	-	4.40	3TS-405-01
	60Hz	-	4.23	
	1kHz	-	4.87	
	1MHz	-	3.53	
Dielectric loss tangent	50Hz	-	0.017	3TS-405-01
	60Hz	-	0.020	
	1kHz	-	0.028	
	1MHz	-	0.040	

4. Lap Shear Strength (3TS-301-13) (Cure condition: 23°C × 50% R.H. × 7 days)

Substrate	Units	Value	Failure Mode
Aluminum	MPa (kgf/cm^2)	6.6 (67)	CF[1]
Steel (SPCC-SB)		5.4 (55)	CF[1]
Stainless Steel		4.4 (45)	CF[1]
Cupper		4.5 (46)	CF[1]
Acryl		4.7 (48)	CF[1]
PPO		5.0 (51)	CF[1]
ABS		2.9 (30)	CF[1]
Nylon 66		5.1 (52)	CF[1]
PC		5.6 (57)	CF[1]
Polystyrene		3.5 (36)	AF[2]
Hard PVC		3.3 (34)	CF[1]
FRP (Polyester)		4.8 (49)	CF[1]
PET		2.1 (21)	AF[2]
Phenol Resin		5.3 (54)	CF[1]
PPS		1.5 (15)	AF[2]
PBT		1.4 (14)	AF[2]
Plywood		4.4 (45)	CF[1]
Glass		5.7 (58)	CF[1]

1.) CF – Cohesive failure. 2.) AF – Adhesive failure.

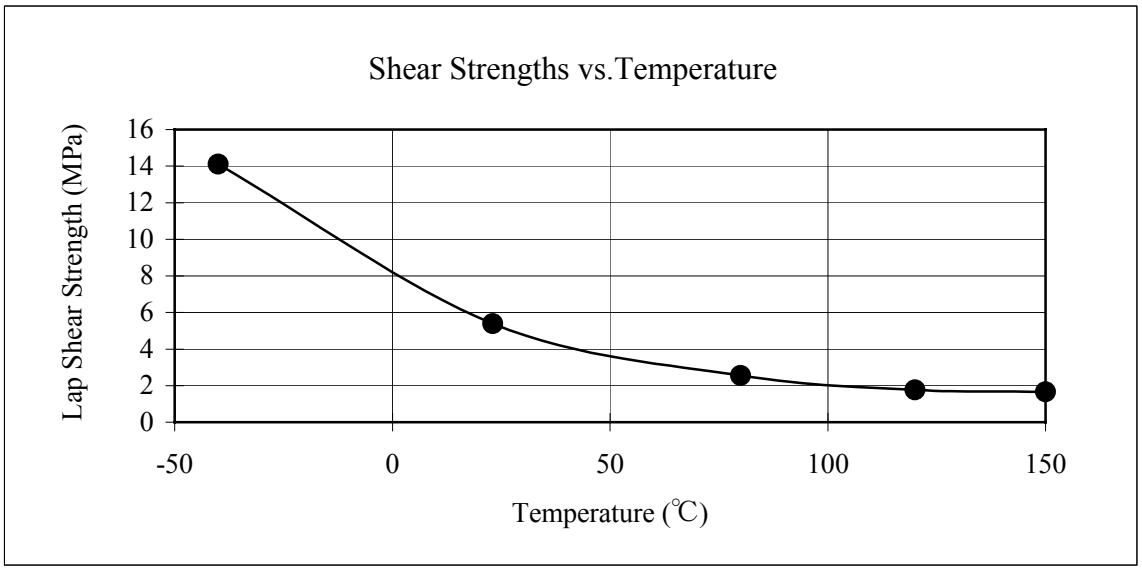
5. T - Peel Strength (3TS-304-23)

(Cure condition: 23°C × 50% R.H. × 7 days, open time 5 minutes)

Substrate	Units	Value	Failure Mode
Aluminum	kN/m (kgf/25mm)	2.5 (6.5)	CF[1]
Canvas		1.8 (4.5)	CF[1]
NBR		1.6 (4.0)	CF[1]
CR		1.4 (3.4)	AF[2]
SBR		1.4 (3.6)	CF[1]
NR		1.8 (4.5)	CF[1]
EPDM		0.83 (2.1)	AF[2]
Silicone Rubber		0.30 (0.77)	CF[1]

1.) CF – Cohesive failure. 2.) AF – Adhesive failure.

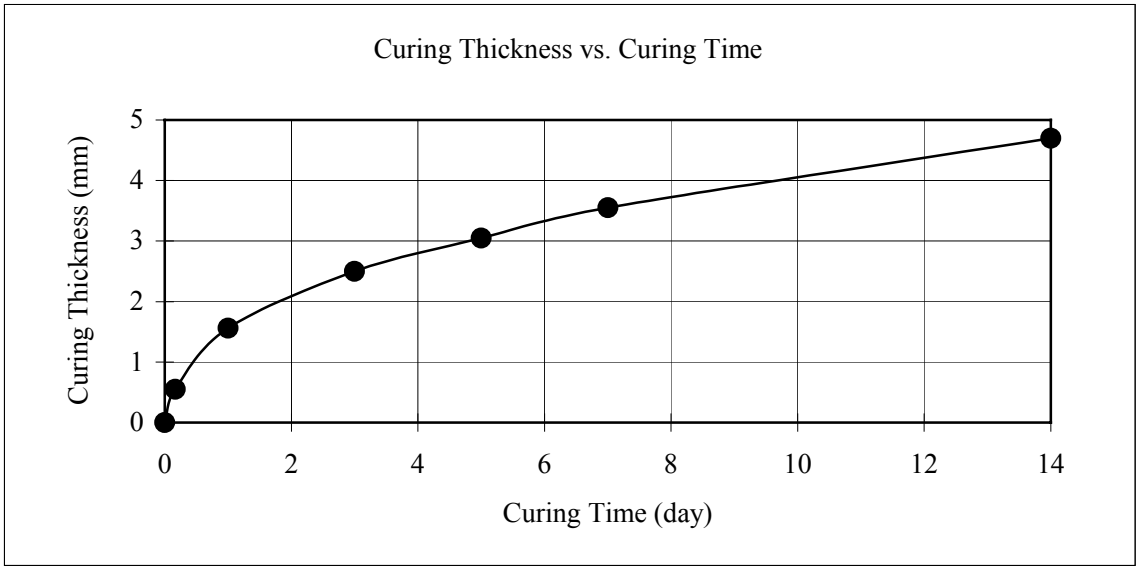
6. Shear Strength at different temperatures



Steel (SPCC, SB) test coupons were cleaned with xylene, open time for 5 minutes, cured for 7 days at 23◦C, 50% RH.

7. Curing Property

Curing condition is 23◦C and 50% RH. Reference curing rate of Three Bond deoxime type silicones are 1.5 - 3.0 mm/day.



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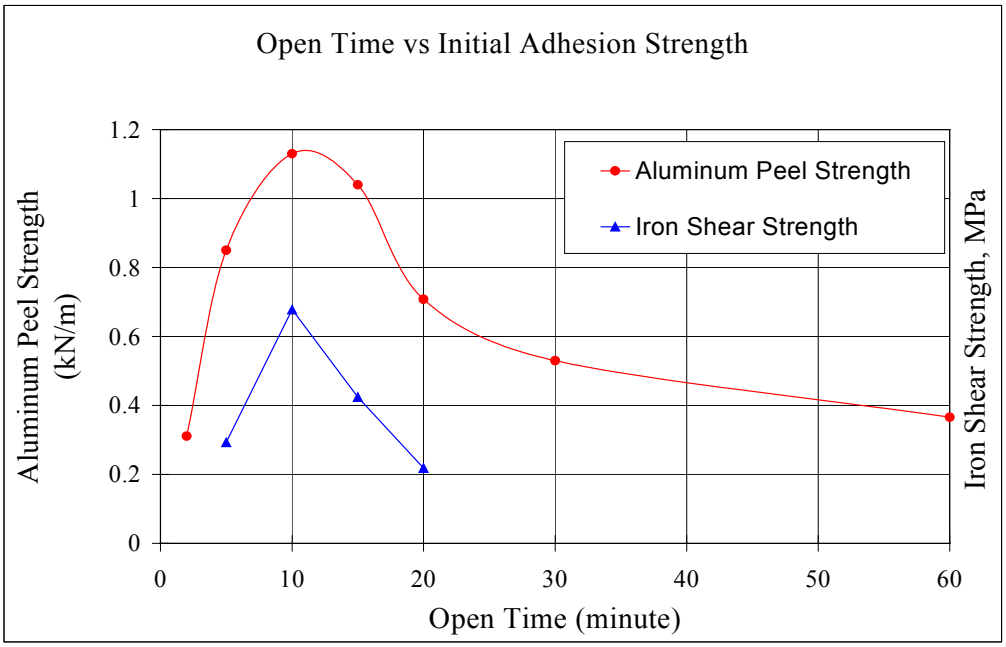
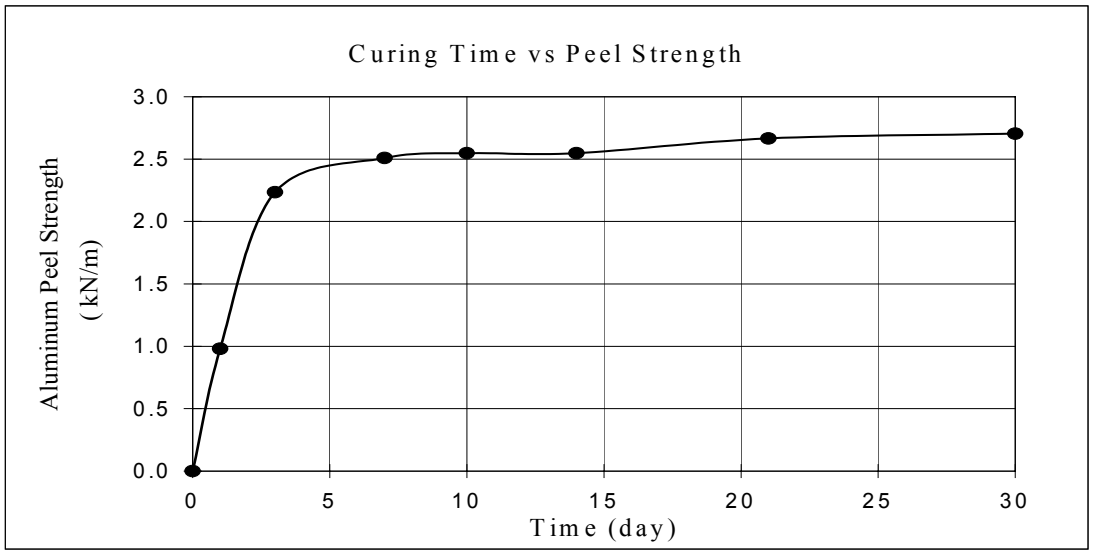
8. Open time versus initial adhesion strength

Apply the adhesive to test pieces. After a specified open time, adhere them together and then measure the shear strength and peel strength immediately.



9. Curing Time versus Peel strength

Aluminum test coupons were cleaned with xylene, open time for 5 minutes, cured for 7 days at 23°C, 50% RH.



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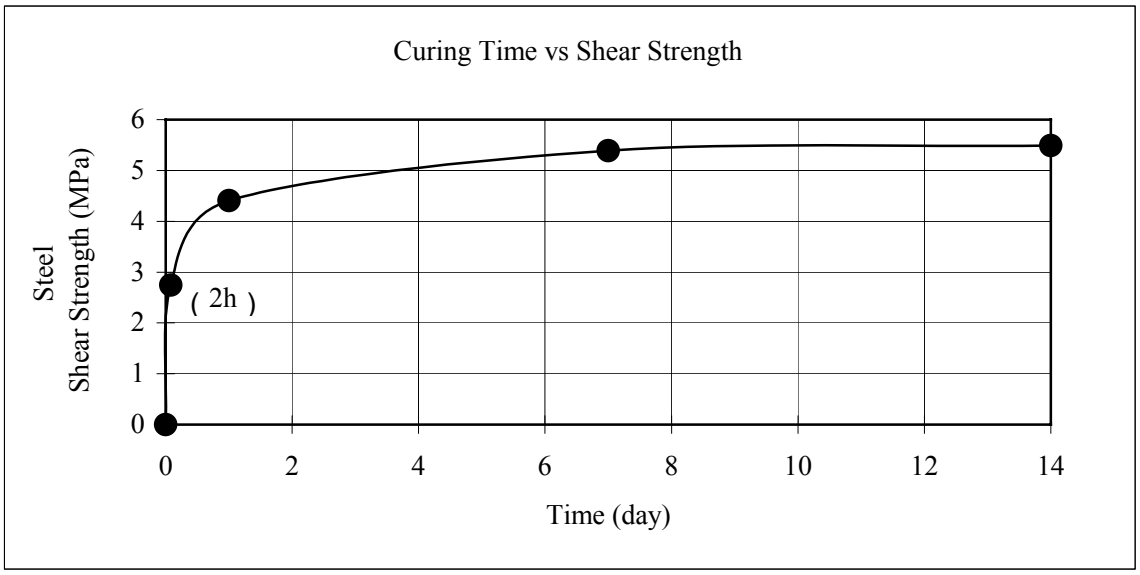
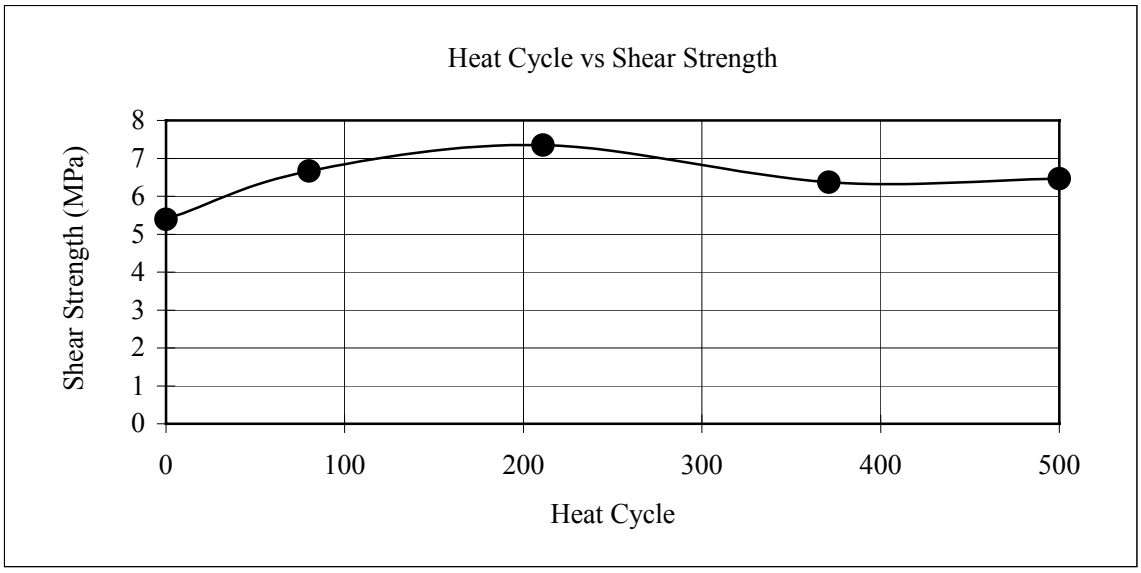
10. Curing Time versus Shear strength

Steel (SPCC, SB) test coupons were cleaned with xylene, open time for 5 minutes, cured at 23°C, 50% RH.



11. Heat cycle aging

Heat cycle: one cycle consiting of –40°C for 1 hour, and 120°C for 1hour. Steel (SPCC, SB) test coupons were cleaned with xylene, open time for 5 minutes, cured for 7 days at 23°C, 50% RH.



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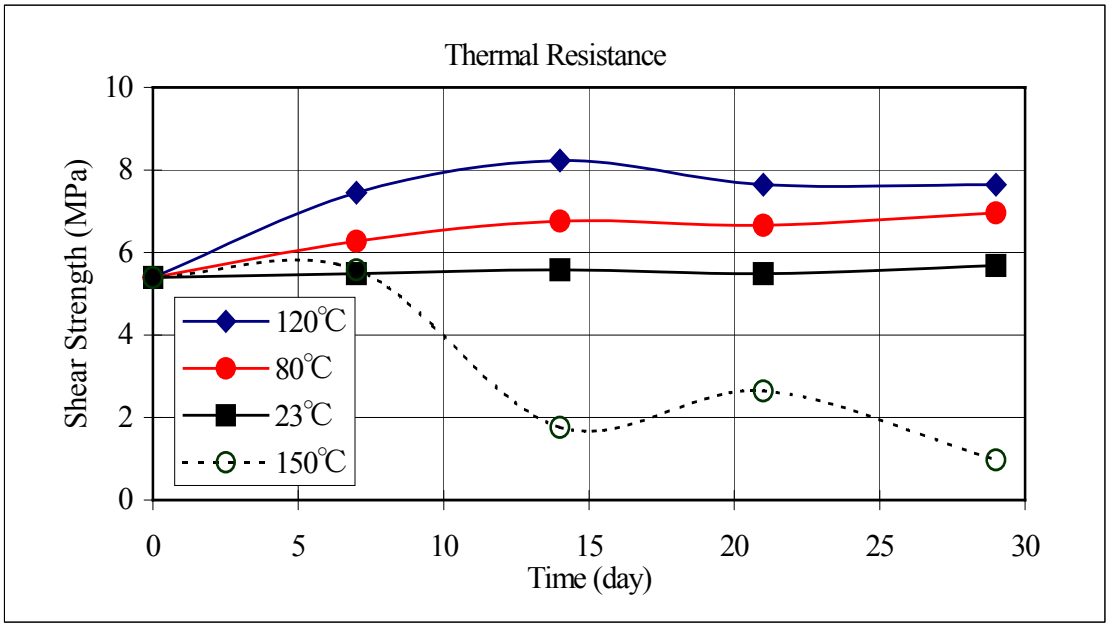
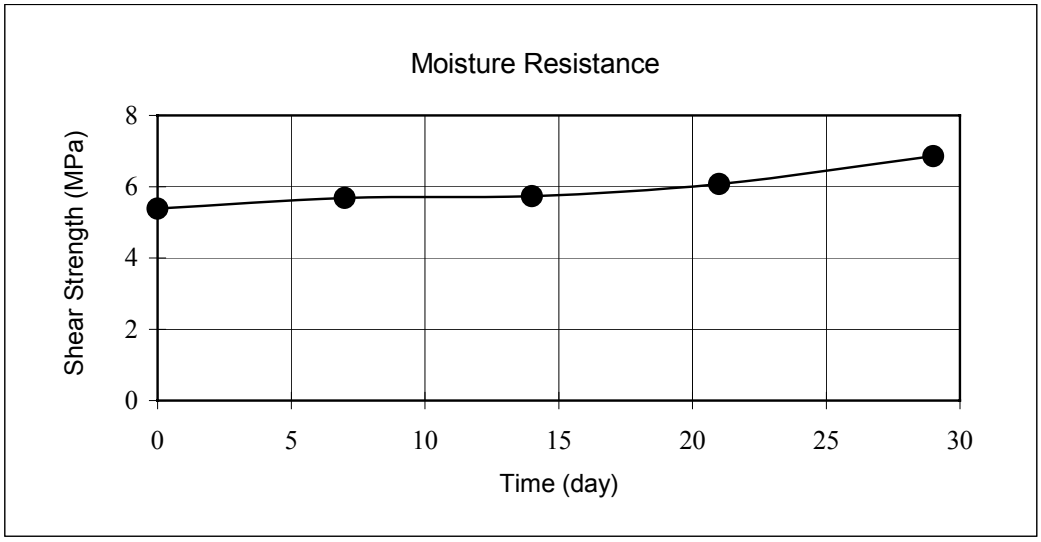
12. Thermal Resistance

Steel (SPCC, SB) test coupons were cleaned with xylene, open time for 5 minutes, cured for 7 days at 23°C, 50% RH.



13. Moisture Resistance

Steel (SPCC, SB) test coupons were cleaned with xylene, open time for 5 minutes, cured for 7 days at 23°C, 50% RH. Then placed in the humidity chamber for 85°C × 85% RH for up to 28 days.



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14. Chemical Resistance

In chemical resistance testing, cured adhesive is cut into dumbbell (No. 3) test piece according to JIS K 6251 and immersed in the given chemical solution listed below for a period of 7 days under 40°C. After the end of immersion, the dumbbell samples were wiped off and subjected to measurement immediately.

Chemical	Volume change (%)	Shear strength change (%)	Elongation change (%)	Hardness change (%)
KOH, 10%	-2.5	-25	+3.6	-23
H_2SO_4, 10%	-1.4	-37	-32	-9.1

Application Method

(A) Double spread coating

(1) Remove the rust, oil, grease and dirt from the surface of adherend thoroughly with sandpaper and alcohol.
(2) Apply the adhesive to both sides of test piece with blade type applicator so that a uniform thin layer is formed.
(3) Allow to set for more than 7 minutes (in case of 23°C and 50% RH) until the adhesive becomes tacky. Press the adherends together tightly, and leave it for further moisture cure. The time period capable of providing a strong temporary adhesion is 7 - 20 minutes after the application of adhesive. If left over for more than this time period, no strong adhesion can be obtained, requiring the reapplication of the adhesive. One can also adhere the substrates immediately after coating if temporary fixation is not required.

(B) Single spread coating

(1) Remove the rust, oil, grease and dirt from the surface of adherend thoroughly with sandpaper and alcohol.
(2) Apply the adhesive to one side of test piece so that a uniform thin layer is formed.
(3) Adhere the test piece within 5 minutes. Here, since no temporary fixation of the pieces is possible, fix temporarily using a jig, etc.

Precautions in handling this adhesive

(1) After the use of adhesive, clean off excess adhesive from opening of tube and tighten with its cap firmly.
(2) Use and store the adhesive out of the reach of children.
(3) Avoid direct skin contact of adhesive and avoid breathing its vopor.
(4) In case of eye contact, flush eyes with copious amounts of cold tap water for 15 minutes. Immediately seek professional medical assistance.

(5) In case of skin contact, wipe off the adhesive with cloth, etc. and wash the skin with mild soap and cold water.
(6) Prior to its use, confirm whether application method and purpose are appropriate.
(7) Using localized ventilation to maintain exposure below the allowable concentration limits.
(8) Store the adhesive away from high temperature, high humidity and direct sunlight and away from heat sources.
(9) Work has to be carried out in accordance with related laws such as the Labor Safety and Hygiene Law.
(10) Please read the MSDS (Material Safety Data Sheet) for this product.

Storage method

To ensure the quality of the stored adhesive, protect it from contamination by using its original container and always closing the lid tightly after use. Store sealed adhesive in locations outside of direct sunlight and places where temperatures of 10 to 25°C and low relative humidity (< 40% RH) are maintained.

Disposal method

Handle this adhesive as accordance with local hazardous waste provisions.

Packaging

150 g laminated tube, packed in a decorative box.
460 g cartridge.

Notice: FOR INDUSTRIAL USE ONLY

Prior to the use of this product, the user is required to accept the following sales terms.
(1) The described data herein are test values obtained by the test methods based on our company's standards. We can not assume responsibility for the results obtained by others over whose methods we have no control. For this reason, prior to the use of this product, the individual users are required to judge by themselves whether its application purpose and method are appropriate, and to accept all responsibility and dangers accompanying this.
(2) Our company does not accept liability for any injury or damage due to the incorrect handling of this product.
(3) Regarding any items other than the ones described in this document, our company does not accept liability for damages arising from them unless they are specified in a written contract.

These are typical properties and not product specifications.