

PEL-URETHANE-XU-50A/XU-50B

1.Description

(1)PEL-URETHANE XU-50 is a polyurethane resin developed for vacuum cast molding application which has a deflection temperature under load as high as 145°C.

2.Basic Properties

Item		Value	Remarks
Appearance	A Comp.	Gray/black	Polyol
	B Comp.	Clear to pale yellow	Isocyanate
Color of Final Article		White/black	
Viscosity (mPa.s, 25°C)	A Comp.	800	Viscometer Type BM
	B Comp.	170	
Specific Gravity (25°C)	A Comp.	1.16	Viscosity cup
	B Comp.	1.19	Standard Hydrometer
Mixing Ratio	A : B	100 : 200	Parts by weight
Pot Life	25°C	5min. and 15 sec.	Resin 100g
	35°C	3min. and 15 sec.	Resin 100g
S.G. of Finished Article		1.22	JIS K-7112

Comp. = component

3.Basic Physical Properties

Item		Value	Remarks
Hardness	Shore D	87	Wallace Hardness Tester
Tensile Strength	MPa	54	JIS K-7113
Elongation	%	10	
Bending strength	MPa	87	JIS K7171
Young's modulus in flexure	MPa	1900	
Impact strength	kJ/m ²	13	JIS K7110 Izod V Notch
Shrinkage	%	0.2	In-house specification
Deflection temp. under load	°C	145	JIS K-7207(1.80MPa)
Possible de-mold time		60 min.	Mold temp. higher than 70°C

Remarks: Curing condition: Cure at 70°C, 70°C x 60 min. + 25°C x 24 hrs.

Physical properties listed above are typical values measured in our laboratory and not the values for specification. Please note that physical properties of final product may differ depending on the contour of article and the molding condition.

4. Heat sag test(Stepwise test) Unit: mm

	100°C	110°C	120°C	130°C	140°C	150°C
Test specimen 1 (Thickness: 2.4 mm)	0	0	0	2	7	20
Test specimen 2 (Thickness: 2.5 mm)	-	0	1	2	7	20

Remarks: Test specimen 1: Test started leaving test specimen for 3 hrs. at 25°C after de-molding.

Test specimen 2: Test started leaving test specimen for 17 hrs. at 25°C after de-molding.

Curing condition of test specimen: Cure at 70°C, 70°C x 60 min.

Dimension of cured sample: 150 x 25 x thickness (mm)

Physical properties listed above are typical values measured in our laboratory and not the values for specification. Please note that physical properties of final product may differ depending on the contour of article and the molding condition.

5. Vacuum Molding Process

(1) Pre-degassing

Degas both A and B components in a de-gassing chamber for about 10 min.

Degas material as much as you need.

We recommend to heat liquid to about 50°C before degassing.

(2) Temperature of resin

Keep a temperature of 30 ~ 40°C for both A and B components during casting.

When the temperature of material is high, the pot life of mixture will become short and

when the temperature of material is low, the pot life of mixture will become long.

Extremely too low temperatures may cause insufficient mixing and/or improper curing.

Please avoid to heat resins for prolonged time or repeatedly as heat accumulated may cause oxidation.

(3) Mold temperature

Keep temperature of silicone rubber mold pre-heated to 70°C.

Too low mold temperatures may cause improper curing to result in lower physical properties. Mold temperature should be controlled precisely as it will affect the dimensional accuracy of the finished article.

(4) Casting

Containers are set in such a way that A component is added to B component.

Apply vacuum to the chamber and de-gas B component for 5 ~ 10 min. while it is stirred from time to time.

Add A component to B component and stir for mixing and then cast the mixture into silicone rubber mold.

Release vacuum timely after pouring.

(5) Curing condition

Place filled mold in thermostatic oven, cure for 60 min. and de-mold.

Perform post curie depending on the requirements.

6. Precautions in handling

- (1) Both A and B components are sensitive to water. Don't allow water get into material or moisture come prolonged contact with material. Close container tight after each use.
- (2) Penetration of water into A component may lead to generation of much air bubbles in the cured product. In such case, heat A component to 80⁰C and degas under vacuum for about 15 min.
- (3) A component may get oxidized if it is heated for many hours. Please store it at room temperature.
- (4) B component will react with moisture to become turbid or to cure into solid material. Do not use material if it has lost transparency extremely or has hardened already.
- (5) B component in part or in whole may freeze when it is stored at temperatures below 5⁰C for longer period of time. Frozen material can be used after melting at 60 ~ 70⁰C for 1~2 hrs. followed by well stirring.
- (6) Prolonged heating of B component at temperatures over 50⁰C will affect its quality and the cans may be inflated by the increased inner pressure.

- (7) When B component is stored in a frozen state, it deteriorates more quickly on storage than a liquid material. We recommend to melt frozen material completely and store it at 20~25⁰C.

7. Precautions in Safety and Hygiene

- (1) B component contains more than 1% of 4,4'-Diphenylmethane diisocyanate. Install local exhaust within work shop to secure good ventilation of air.
- (2) Take care that hands or skin are not coming in direct contact with raw materials. In case of contact, wash with soap and water immediately. It may irritate hands or skin if they are left in contact with raw materials for longer period of time.
- (3) If raw materials get into eyes, rinse with flowing water for 15 minutes and call a doctor.
- (4) Install duct to ensure that exhaust gas from vacuum pump is drawn outside.

8. Dangerous Materials Classification according to the Fire Services Act

A Component: No.3 Petroleum Group, Dangerous Materials No.4 Group.

B Component: No.4 Petroleum Group ,Dangerous Materials No.4 Group.

9. Delivery Form

A Component: 1 kg Royal can.

B Component: 1 kg Royal can.

