

## \*\*\*\*\* Hei-Cast 8263 \*\*\*\*\*

## 1. Description

Hei-Cast 8263 is a flame retardant type polyurethane resin for vacuum casting application with the specific properties so far not obtainable with the prevailing urethane cast materials. Well-balanced physical properties, difficult-inflammability and excellent dimensional stability of Hei-Cast 8263 makes it possible to apply this innovative product as a flame retardant type cast material for the manufacture of prototypes which require UL94 V-0 and 5VA specification and for the monitoring of mechanical strength of the molded parts. Hei-Cast 8263 is also suited for short run production.

## 2. Basic Properties

Item		Value	Remarks
Appearance	Part A	Clear, pale yellow / Black	Polyols
	Part B	Clear, pale yellow	Isocyanates
Color of Article		Milky white / Black	
Viscosity (mPa.s, 25°C)	Part A	1000	Viscometer Type BM
	Part B	160	
Specific Gravity (25°C)	Part A	1.30	Specific Gravity Cup
	Part B	1.19	Standard Hydrometer
Mixing Ratio	A : B	100 : 150	Parts by weight
Pot Life	25°C	5 minutes	Resin 100g
		4 minutes 50 seconds	Resin 300g
	35°C	3 minutes	Resin 100g
S. G. of Finished Article	25°C	1.30	JIS K-7112

## 3. Basic Physical Properties

Item		Value	Remarks
Hardness	Type D	83	JIS K-7215
Tensile Strength	MPa	68	JIS K-7113
Elongation	%	15	
Bending strength	MPa	93	JIS K-7171
Young's modulus in flexure	MPa	2200	
Impact strength	kJ/m <sup>2</sup>	10	JIS K-7110 Izod V Notch
Shrinkage	%	0.3	Inhouse specification
Heat Deflection Temperature	°C	80	JIS K-7191(1.80 MPa)
		85	JIS K-7191(0.45 MPa)
Heatproof temperature (Tg)	°C	90	TMA Method
Coefficient of thermal expansion	/°C	$8 \times 10^{-5}$	JIS K-6911
Difficult-inflammability	UL-94	V-0	2.5mm
		5VA	3.0mm
Demold Time	Minute	60	Mold temp. :over 60°C

Remarks: Test piece curing condition: Mold temperature:60°C 60°C×60 min.+25°C×24 hours.

Physical properties listed above are typical values measured in our laboratory and not the values for specification. When using our product, it must be noted that physical properties of final product may differ depending on the contour of article and the molding condition.

## 4. Physical properties vs. Temperature

Temperature°C	Bending strength (MPa)	Young's modulus in flexure(MPa)	Impact strength (kJ/m <sup>2</sup> )
-20	122	2520	8.3
±0	108	2410	9.4
+20	95	2310	9.6
+40	68	2030	12.2
+50	60	1810	13.3
+60	53	1630	12.6
+70	38	1280	11.5
+80	28	1080	11.8

Remarks: Measurement of physical properties at each environmental temperatures.

#### 5. electrical properties

Item		Unit or Terms	Value
Surface resistivity		Ω	9.9×10 <sup>15</sup>
Volume resistivity		Ω · cm	1.1×10 <sup>16</sup>
Breakdown voltage		KV/mm	14.8
CTI test		C.T.I.	600
Permittivity ε	60Hz	25°C	4.3
		60°C	4.8
	100kHz	25°C	4.0
		60°C	4.2
Dielectric loss tangent tan δ	60Hz	25°C	0.018
		60°C	0.065
	100kHz	25°C	0.023
		60°C	0.024

#### 6. Chemical resistance

Chemicals	Weight change (%)	Loss of gloss	Discoloration	Crack	Warpage	Swelling	Degradation	Dissolution
Distilled water	0.15	○	○	○	○	○	○	○
10%Sulfuric acid	0.17	○	○	○	○	○	○	○
10%Hydrochloric acid	0.23	○	○	○	○	○	○	○
10%Sodium hydroxide	0.23	○	○	○	○	○	○	○
10%Ammonia water	0.20	○	○	○	○	○	○	○
Acetone*1	6.88	○	○	○	○	○	○	○
Acetone	32.90	○	○	×	×	×	○	○
Toluene	0.15	○	○	○	○	○	○	○
Methylene chloride*1	17.69	○	○	○	○	△	○	○
Methylene chloride	85.00	○	○	×	×	×	×	○
Trichloroethane	0.00	○	○	○	○	○	○	○
Ethyl acetate	11.75	○	○	○	○	△	○	○
Ethanol	1.43	○	○	○	○	○	○	○
Gasoline	0.00	○	○	○	○	○	○	○

Benzine	0.00	○	○	○	○	○	○	○
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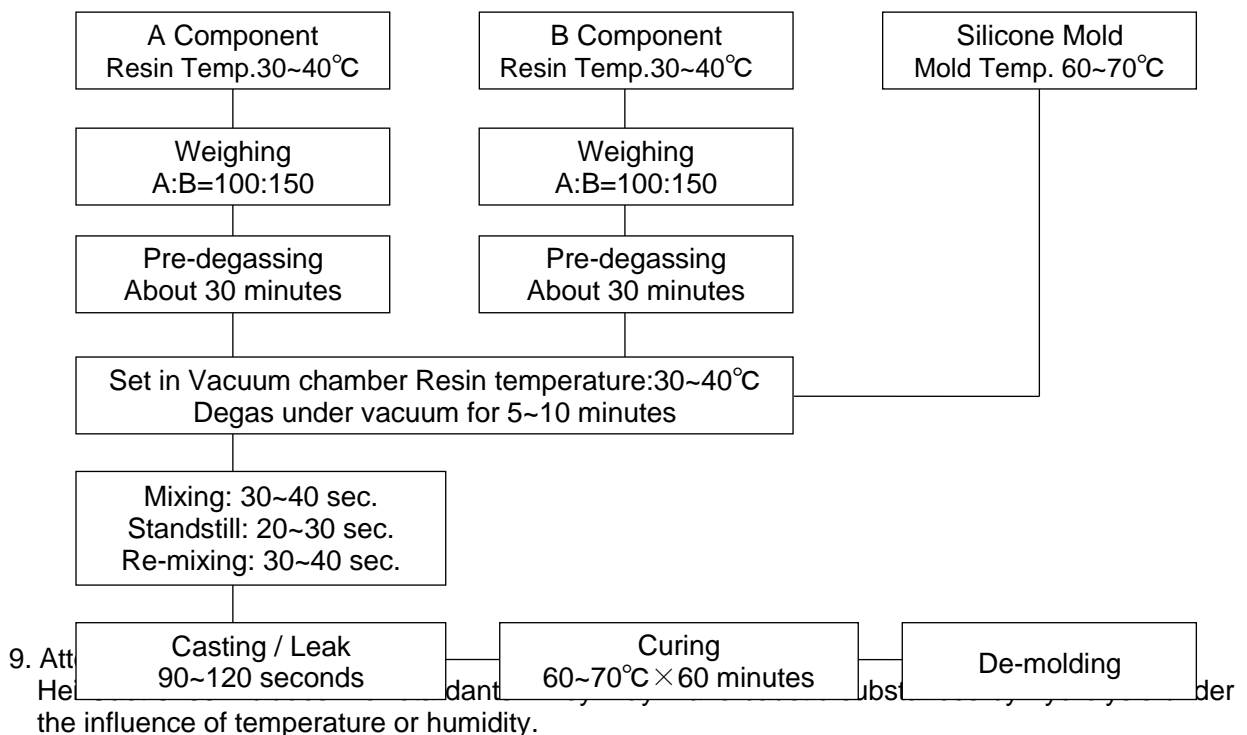
Tested according to JIS K-6911. Changes after 24 hrs. immersion in each chemicals were observed. Those marked with \*1 were immersed for 60 min. respectively.

○:Good, △:Slightly No good, ×: Bad

7.Vacuum Casting Process

- (1) Pre-degassing  
Degass both A and B components in a de-gassing chamber for about 30 minutes. Degass material as much as you need. We recommend to degas the material which has been pre-heated to temperature of 40~50°C.
- (2) Temperature of resin  
Keep a temperature of 30~40°C for both A and B component during casting. The higher, the liquid temperature, the shorter is the pot life and the lower, the liquid temperature, the longer is the pot life. Extremely too low temperatures may cause insufficient mixing and improper curing.
- (3) Mold temperature  
Keep the temperature of silicone mold to 60~70°C in advance. Too low mold temperatures may cause improper curing to result in lower physical properties. Mold temperatures should be controlled precisely as they 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-gass B component for 5~10 minutes while it is stirred from time to time. Add A component to B component, stir for 30~40 seconds and leave it for a while. Stir it again for 30~40 seconds and then pour the mixture into silicone mold quickly. Release vacuum in 1 and half to 2 minutes after commencement of the mixing.
- (5) Curing condition  
Place filled mold in thermostatic oven of 60~70°C for 45 to 60 minutes and demold the article. Perform post curing at 70~80°C for 2-3 hours depending on the requirements.

8.Flow chart of vacuum casting



Please be careful, electronic board and aluminum board may be corrode, when used them with Hei-Cast 8263.

#### 10. The Identification code of molding

JIS K6899-1/6899-4(Plastic-code and abbreviation) Part4:Fire retardant

PUR FR(14+41) PUR:Polyuretane resin

FR:Fire retardant

Code14:Aliphatic/Alicyclic bromine compound

Code41:Chloridizathion organic phosphorous compound

#### 11.Precautions in handling

- (1) As both A and B components are sensitive to water, don't allow water get into material or don't allow moisture in the air come into prolonged contact with the material. Close container tight after use.
- (2) Penetration of water into A component may lead to generation of much air bubbles in the cured product. If this should happened, we recommend to heat A component to 100°C and degas it under vacuum for about 30 minutes.
- (3) B component will react with moisture to become turbid or to cure into a solid material. Do not use the material when it has lost the transparency or it has shown any hardening as these materials will lead to much lower physical properties.
- (4) B component in part or in whole may freeze when it is stored for longer period of time at temperatures below 5°C. Frozen material can be used after melting. Warm up container to 60 ~70°C for 1~2 hours and use the material after stirring it well.
- (5) B component is prone to deteriorate by the prolonged heating at temperatures over 50°C and the cans can be inflated by the increased inner pressure.
- (6) When B component is stored in a frozen state, it deteriorates more quickly on age than a liquid material. We recommend to melt it completely and store at 20~25°C.

#### 12.Precautions in Safety and Hygiene

- (1) B component contains more than 1% of 4,4'-Diphenylmethane diisocyanate. Install local exhaust within the work shop to secure good ventilation of the 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 for vacuum pump to ensure that air is exhausted to the outside of the work shop.

#### 13.Dangerous Goods Classification according to Fire Services Act

Part A Component: Dangerous Goods Class No. 4, Petroleum Class No. 4

Part B Component: Dangerous Goods Class No. 4, Petroleum Class No. 4

#### 14.Delivery Form

A Component: 1 kg tin can.

B Component: 1 kg tin can.

In using our products based on the technical information contained herein, you are requested to thoroughly test our products as to their suitability for your intended application and determine their validity with your own responsibility. As the applications and processing conditions of our products to be applied by users are beyond our control, we can not bear any responsibility for this technical information in terms of accuracy, the results obtained from their use and the possible infringement of patent rights of any third parties.