***** Hei-Cast 8030 *****

1.Description

Hei-Cast 8030 is an urethane cast resin used for various cast molding applications.
Its significant features being low viscosity and excellent cure property, Hei-Cast 8030 offers the following characteristics.

(1) For its low viscosity, precise duplicate can be produced by vacuum molding as well as by casting under normal pressure depending upon the shape of article.
(2) For its excellent cure property, short molding cycle will become possible.
(3) For its excellent impact strength, Hei-Cast 8030 is ideal for the molding of proto-types such as housings for OA equipment, body and cases of household electrical equipment, etc.
(4) For its rigidity, the cured material is easy to cut and plane. Thus, Hei-Cast 8030 is also suited for making jigs used in the production line by cutting out jigs from the block.

2.Basic Properties

Item		Value	Remarks
Appearance	A Comp.	Clear, colorless	Polyols
	B Comp.	Clear, pale yellow	Isocyanates
Color of Article		White	
Viscosity (mPa.s,25°C)	A Comp.	200	Viscometer Type BM
	B Comp.	40	
Specific Gravity (25°C)	A Comp.	1.00	Standard Hydrometer
	B Comp.	1.18	
Mixing Ratio	A : B	100 : 100	Parts by weight
Pot Life	25°C	2 minutes	Resin 100g
		1min and 55s	Resin 300g
	35°C	1min and 20s	Resin 100g
S. G. of Finishe Article	25°C	1.13	JIS K-7112

3.Basic Physical Properties

Item		Value	Remarks
Hardness	Type D	75	JIS K-7215
Tensile Strength	MPa	37	JIS K-7113
Elongation	%	45	
Bending strength	MPa	50	JIS K-7171
Young's modulus in flexure	MPa	1180	
Impact strength	kJ/m^2	5	JIS K-7110 Izod V Notch
Shrinkage	%	0.8	In house specification
Heat deflection temperature	°C	75	JIS K-7191(1.80 MPa)
Coefficient of thermal expansion	/°C	13×10^{-5}	JIS K-6911
Difficult-inflammability	UL-94	HB approved product	UL-94 test in our laboratory
Demold Time	Min.	15-20	Mold temperature 25°C
		12	Mold temperature 60°C

Remarks: Color of cured material changes yellow on exposure to sun light or UV ray.
Curing condition :Mold temperature:60°C 60°C×60 min.＋25°C×24 hrs.
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 flexture(MPa)	Impact strength (kJ/m^2)
-20	80	1690	4.7
0	67	1480	5.9
20	54	1700	5.6
40	41	1030	4.2
60	24	730	4.8
80	15	540	4.9

Remarks: Measurement of physical properties at each environmental temperatures.

5.Chemical resistance

Chemicals	Weight change (%)	Loss of gloss	Discoloration	Crack	Warpage	Swelling	Degradation	Dissolution
Distilled water	0.75	○	○	○	○	○	○	○
10%Sulfuric acid	0.70	○	○	○	○	○	○	○
10%Hydrochloric acid	2.31	○	△	○	○	○	○	○
10%Sodium hydroxide	0.59	○	○	○	○	○	○	○
10%Ammonia water	1.20	○	○	○	○	○	○	○
Acetone*1	15	×	○	×	—	××	××	×
Toluene	0.73	△	○	○	○	○	○	○
Methylene chloride*2	—	×	○	××	—	××	××	×
Trichloroethane	0.22	○	○	○	○	○	○	○
Ethyl acetate	15	△	○	○	○	×	○	○
Ethanol	5.0	○	○	○	○	×	○	○
Gasoline	-0.01	○	○	○	○	○	○	○
Benzine	0.20	○	○	○	○	○	○	○

Tested according to JIS K-6911. Changes after 24 hrs. immersion in each chemicals were observed. Those marked with *1 mark and *2 mark were immersed for 40 min. and 15 min. respectively.
○:Good, △:Slightly No good, ×: Bad

6.Electrical properties

Measurement	Unit/Condition	Value
Surface resistivity	Ω	1.0×10^{15}
Volume resistivity	Ω・cm	1.0×10^{14}
Dielectric breakdown voltage	KV/mm	16
Dielectric constant(60Hz)	ε	3.8
Dielectric loss tangent	tanδ	0.012
Coefficient of thermal conductivity	Cal/cm・°C・sec	4.9×10^{-4}

7.Weather resistance

Item		Blank	500 hours	1000 hours
Hardness	Type D	76	77	77
Tensile Strength	MPa	37	39	40
Elongation	%	45	31	23
Bending strength	MPa	50	53	56
Young's modulus in flexture	MPa	1250	1230	1320
Impact strength	kJ/m^2	4.8	2.8	2.5

Accelerated exposure method: Accelerated exposure test method for plastics construction materials.
Testing equipment: Sunshine carbon weather-o-meter

8.Normal Pressure Casting Process

(1) Temperature of resin
Keep a temperature of 20 ~ 30°C for both A and B components .
Higher liquid temperature means shorter pot life and lower liquid temperature means longer pot life.

(2) Mold temperature
Heat in advance silicone mold to temperature of 60 ~ 70°C and keep the temperature.
Too low mold temperatures may cause improper curing leading to lower physical properties. Mold temperatures should be controlled precisely as they will affect the dimensional accuracy of the article.

(3) Dosing
Mixing ratio is 100:100. Weigh necessary quantity of A- and B-component into the same cup/bucket within the accuracy of ±5%.

(4) Mixing
Quickly mix both components weighed with a stirrer for 15~20 seconds taking care not to entrap air.

(5) Cast the mixture speedily into the silicone mold or the like.

(6) Curing condition
Place filled mold in thermostatic oven of 60 ~ 70°C for 30 to 60 minutes and then demold the article from the mold. Perform post curing at 60 ~ 70°C for 2 ~ 3 hours depending on the requirements.

(7) Dispensing machine(Automatic casting machine)
Moldings from PU cast resins can be mass-produced on a 2 component PU dispensing machine that performs the process from dosing and mixing with a stirrer to cleaning of mix-head automatically. More information on such dispensing machine is available from our sales staff.

(8) Vacuum casting machine
Through the mixing of A- and B-component under vacuum, you can secure the casting of articles which are free from entrapped air bubbles. More information on such vacuum casting machine is also available from our sales staff.

9.Vacuum Casting Process

(1) Pre-degassing
Degass in a de-gassing chamber for 5~10 minutes.
Degass the volume as much as you need.

(2) Temperature of resin
Keep both A- and B- component at 20~30°C.
The higher, the liquid temperature, the shorter is the pot life and the lower is vice versa.

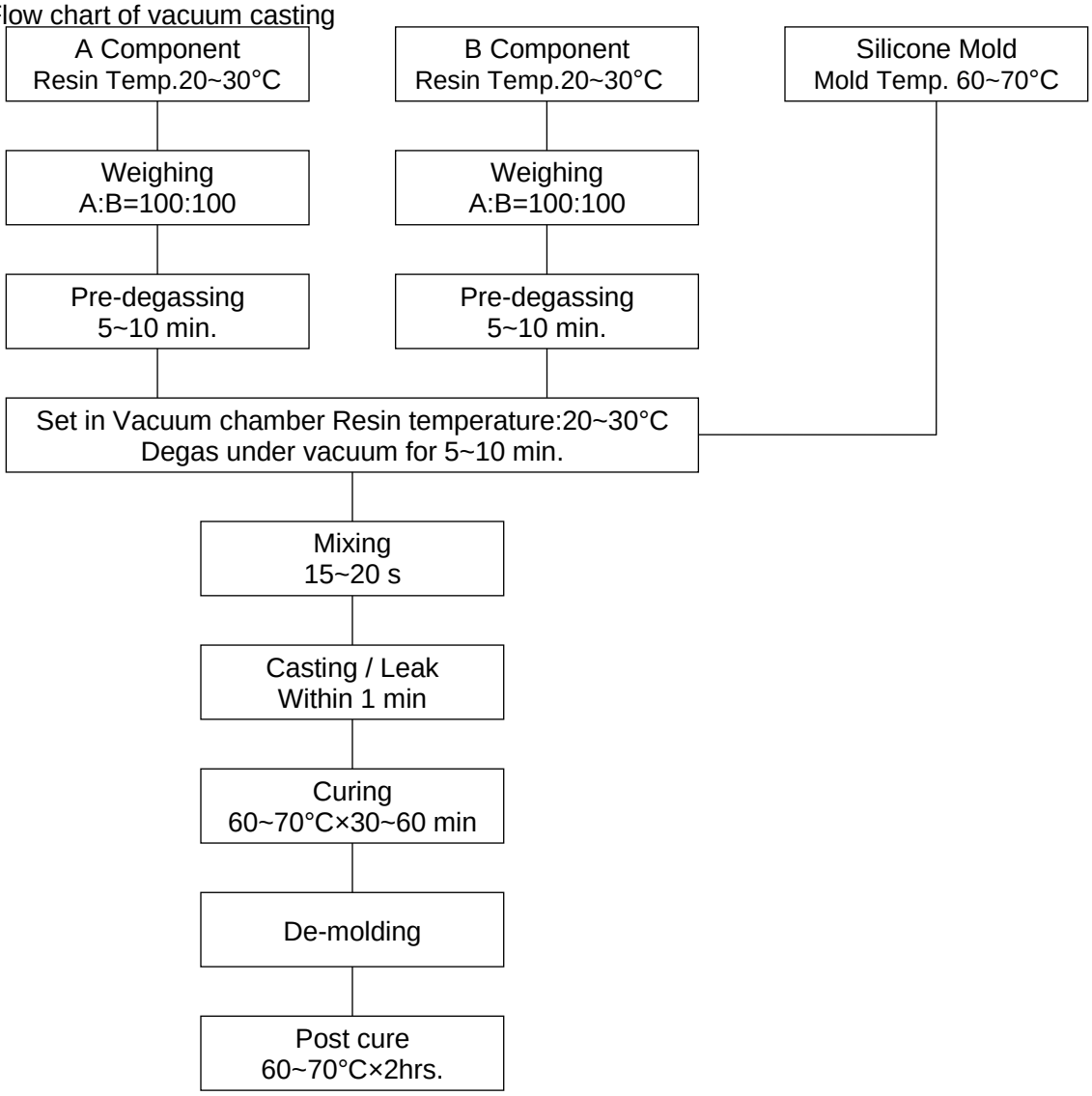
(3) old temperature
Keep temperature of silicone mold to 60~70°C previously.
Too low mold temperatures may cause insufficient mixing and improper curing.
Precise control of mold temperature is important to achieve accurate dimension of the

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 and stir for 15~20 seconds and the cast the mixture quickly into silicone mold.
Release vacuum within 1 minute counting from the start of mixing.

(5) Curing condition
Place filled mold in thermostatic oven of 60~70°C for 30 to 60 minutes and demold the article.
Perform post curing at 60~70 for 2-3 hours depending on the requirements.

10.Flow chart of vacuum casting



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 80~90°C and degas it under vacuum for about 30 minutes.
(3) A component in part or in whole may freeze when it is stored for longer period of time at temperatures below 10°C. Frozen material can be used after melting. Warm up container to 40 ~ 50°C for 1~2 hours and use the material after stirring it well.
(4) 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.

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 Materials Classification according to the Fire Services Act

A Component: Third Petroleum Group, Dangerous Materials Fourth Group.
B Component: Fourth Petroleum Group, Dangerous Materials Fourth Group.

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