

**POLYURETHANE SYSTEM HOUSE**

**H & K L t d .**  
**P r o d u c t I n t r o d u c t i o n**

Sep. 17, 2024

**Company Name** H&K Ltd.

**Foundation** February 1, 1973

**Capital** ¥20 million

**Location** [Head Office]  
2-19-6 Yanagibashi, Taito-ku, Tokyo , 111-0052 Japan  
TEL 81-3-3865-3690  
[Chiba Plant]  
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TEL 81-478-72-2231



**Operations** Development and manufacture of polyurethane-based casting agents, adhesives, elastic paving agents and foams

**Production-Volume** 190 t/ month

**Site Area** 10517 m<sup>2</sup>

ISO 9001/14001 certified plant (May 22, 1998/May 9, 2003)

### ◆Group Companies

Heisen Yoko Co., Ltd.

\*Our sales are delegated to Heisen Yoko Group.

Koyo Sangyo Co., Ltd.

Heisen Trading (Shanghai) Co., Ltd.



## H&K Product-Series



**Hei-Ad 1000 Series**  
◇ Potting Agent



**Hei-Ad 2000 Series**  
◇ Industrial Adhesive



**Hei-Cast 8000 Series**  
◇ Casting Agent



**Hei-Ad 4000 Series**  
◇ 1 Liquid Moisture Curing Adhesive



**Hei-Ad 5000 Series**  
◇ Urethane Form



**Hei-Mex 6000 Series**  
◇ Urethane and EVA Paint /Urea Spray

**7000 Series**  
◇ Subsidiary Material

**Hei-Nate 9000 Series**  
◇ Isocyanate Product

Rubber materials and various synthetic resins are widely used as electrical insulating materials, but the urethane resin developed by H&K and the grade for electrical and electronic components of Hei-Ad 1000 series have excellent properties in terms of electrical properties, workability, and safety. They are ideal for potting industrial electrical equipment.

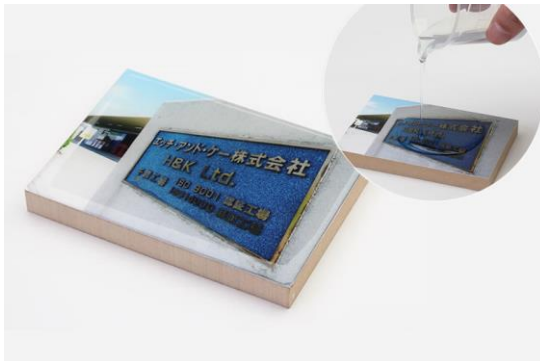
## ◆For electric and electronic components



### Features

- Have good electric insulation
- Excellent water and moisture resistance
- Low shrinkage
- Room temperature curable

## ◆For photographic



### Features

- Have excellent discoloration resistance
- Prevent fading of photos

# Hei-Ad 1000 Series — Product Lineup

Item			Uses	For electric and electronic components	For photographic
Product name				1430	A
Appearance	A comp.	-		Black	Pale yellow transparent
	B comp.			Pale yellow transparent	Pale yellow transparent
	Cured product			Black	Colorless Clear
Viscosity (25°C)	A comp.	mPa·s		2400	590
	B comp.			800	180
Specific gravity (25°C)	A comp.	-		0.92	1.18
	B comp.			1.14	0.99
	Cured product			0.99	1.15
Mixing ratio	A:B	By weight		100:40	100:40
Pot life	-	25°C/100g		60 min.	30 min.
Hardness	Type	JIS K-7215		A58	D81
Tensile strength	MPa	JIS K-7113 or		1.9	45
Elongation	%	JIS K-6911		250	-
Modulus of elasticity in tension	-	JIS K-6911		-	1500
Tearing strength	N/mm	JIS K-7171		16	-
Bending strength	MPa	JIS K-6911		-	50
Bending modulus	MPa	JIS K-6911		-	1700
Coefficient of thermal expansion	/°C	JIS K-6911		$16 \times 10^{-5}$	-
Breakdown voltage	kV/mm			22.9	-
Surface resistance force	$\Omega$			$2.6 \times 10^{14}$	-
Volume resistivity	$\Omega \cdot \text{cm}$			$2.0 \times 10^{15}$	$>1 \times 10^{15}$
Dielectric constant	60Hz	JIS K-6911		3.9(25°C)/4.1(60°C)	-
	100kHz			3.1(25°C)/3.3(60°C)	-
Dielectric dissipation factor	60Hz	JIS K-6911		0.05(25°C)/0.09(60°C)	-
	100Hz			0.05(25°C)/0.06(60°C)	-
Boiling water absorption	%	100°C×1h		-	0.3
Linear expansivity	Ppm/K	( $\alpha_1$ ) temperature decrease.		-	70
Shear bond strength (SUS/SUS, 25°C)	MPa	25°C×24h		-	11.2
Reaction rate	%	25°C/20h		-	95<
Transmittance	%	450-600nm		-	95<



# Hei-Ad 2000 Series — Industrial Adhesives

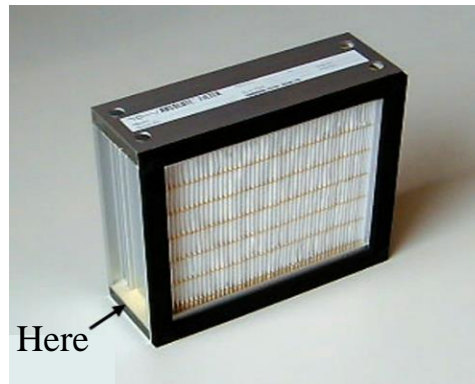
Hei-Ad 2000 Series is a room temperature curing two-part urethane that exhibits extremely good adhesion to a wide range of materials.

Adhesives of the same or different materials and sealing materials are used for joining batteries, sealing air-conditioning filters for clean rooms, edges of table tops covering sections of particle boards and plywood, and lining of system kitchen sinks.

## ◆Cleanroom filter adhesive

### Features

- Low outgas
- Use of plant-based raw materials



## ◆Kitchen backing and bonding applications

### Features

- Hard to foam
- High hardness



## ◆Table edge

### Features

- Immediate curability
- Excellent mechanical strength
- Coloring property



## ◆Other applications

- Adhesives for artificial turf
- Filter end plate
- Adhesive for cork



## ◆For filter adhesives and table edges (2000 series: Special order)

Item			Uses	Adhesives for filters		Table edge			For artificial turf Adhesive	For dust collector filter end plate
				A	B	A	B	C		
Appearance	A comp.	-	-	White	White	Opaque	Opaque	Pale white	Dark gray	Light gray
	B comp.			Pale yellow transparent	Brown color	Colorless Clear	Clear	Clear	Pale yellow transparent	Pale yellow transparent
	Cured product			White	Pale yellow	White	White	White	Dark gray	Light gray
Viscosity (25°C)	A comp.	mPa·s	-	1500	900	1200	3500	3800	10000	1400
	B comp.			300	200	700	1400	1400	250	700
Specific gravity (25°C)	A comp.	-	-	1.00	0.98	1.05	1.08	1.31	1.37	1.06
	B comp.			1.17	1.24	1.20	1.15	1.15	1.22	1.20
Mixing ratio	A:B	By weight	-	100:50	100:40	100:50	100:45	100:53	100:25	100:44
Pot life	25°C/100g	-	-	8-10 min.	5.5 min	50 sec	70 sec	70 sec	12 min.	3 min 40 s
Product specific gravity	-	-	-	1.08	1.08	1.11	1.11	1.27	1.37	1.12
Hardness	Type	-	-	A70	A75	A75	A78	A90	A92	A65
Tensile strength	MPa	JIS K-7312	-	10	8	7	5	10	-	9
Elongation	%			170	120	190	110	75	-	250
Tear strength	N/mm			16	14	30	14	19	-	-
Shrinkage rate	%	-	-	-	-	0.9	-	-	-	0.4
Features				Long pot life	Equivalent to UL94 V-2	Yellowing	Hard yellowing	Hard yellowing	Low hardness	Rebound modulus: 41%



## ◆ Adhesives for kitchen backing and cork (2000 series: Special order)

Item		Uses	Kitchen backed bonding applications		For cork
			A	B	
Appearance	A comp.	-	White	White	White
	B comp.		Black	Colorless clear	Brown
	Cured product		Black	White	Cream
Viscosity (25°C)	A comp.	mPa·s	1500	6200	15000
	B comp.		1800	180	200
Specific gravity (25°C)	A comp.	-	0.99	1.34	1.33
	B comp.		1.22	1.12	1.23
	Cured product		1.15	-	-
Mixing ratio	A:B	By weight	100:80	100:50	100:25
Pot life	-	25°C/100g	1.5 min /3.5 min	2.5 min	10 min
Hardness	Type	JIS K-7215	D78	D78	D70
Tensile strength	MPa	JIS K-7113	34	27	15
Elongation	%		80	80	110
Bending strength	MPa	JIS K-7171	-	13	-
Bending modulus	MPa		-	540	-
Impact strength	kJ/m <sup>2</sup>	JIS K-7110 Izod V Notch	-	3	-
Shrinkage rate	%	In-house standards	0.3	-	0.7
Coefficient of thermal expansion	°C <sup>-1</sup>	JIS K-6911	1.2 × 10 <sup>-4</sup>	-	-
Features			Kitchen backing	Undersink	High hardness

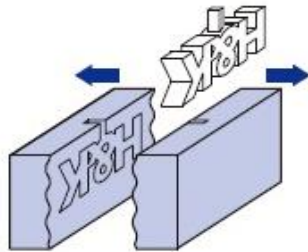
## ◆Silicone mold of preparation



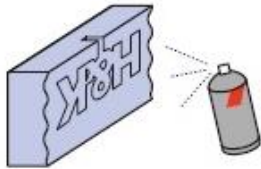
①Creating a master model



②Silicone injection

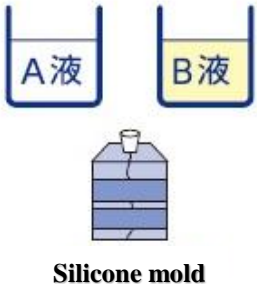


③Parting

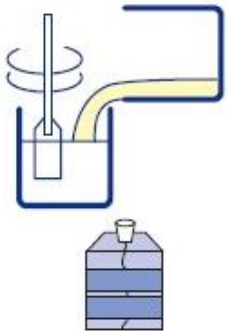


④Applying mold release agent

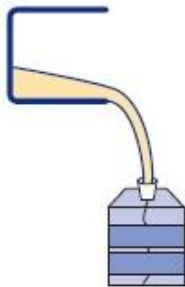
## ◆Atmospheric casting



①Preliminary defoaming



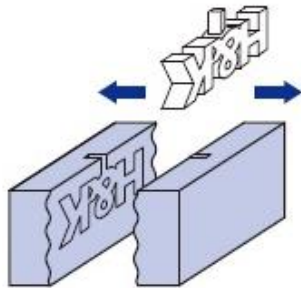
②mixing



③Casting/Injection



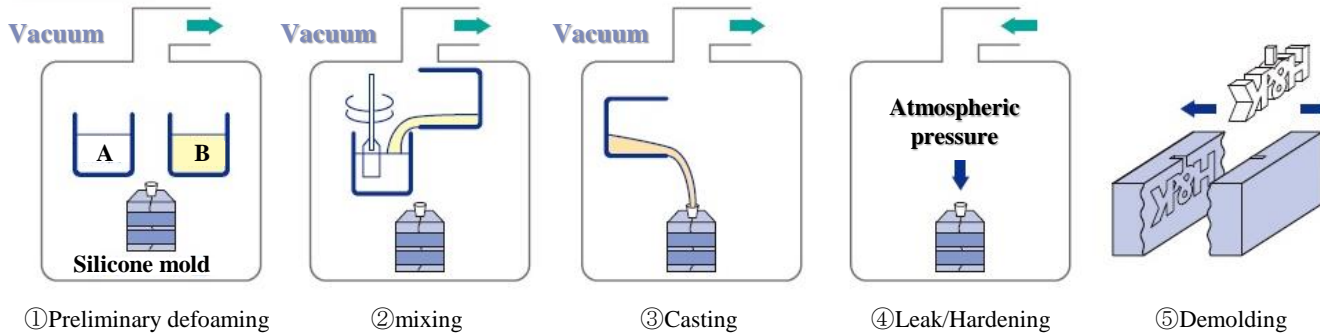
④Hardening



⑤Demolding

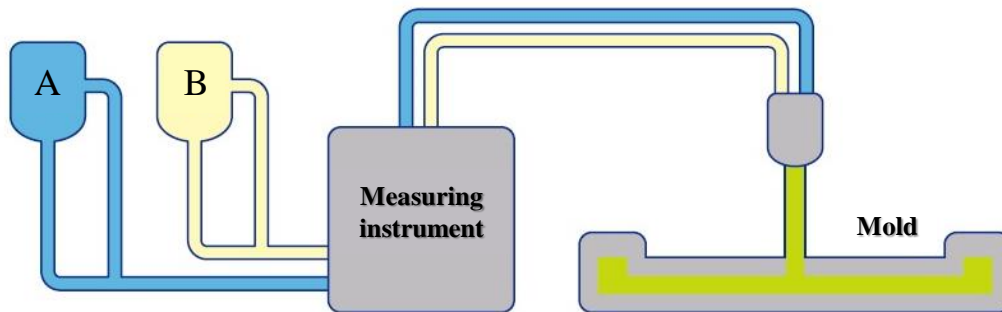
# Hei-Cast 8000 Series — Molding Methods

## ◆ Casting under vacuum



**Vacuum casting machine**

## ◆ Low pressure casting



A method in which resin with a pot life of 1 to 2 minutes is measured, stirred, mixed, poured, and molded using a low-pressure casting machine. Silicone mold, simple resin and oil can be used. Productivity is lower than high-pressure bases, but the initial capital investment is small and the mold cost is low, so it is suitable for prototyping and small-scale production of aero parts, bumpers, and other small parts.



**Low pressure discharger**

# Hei-Cast 8000 Series — Casting Agent

General-purpose Hei-Cast is a two-part urethane casting agent. It is used in a wide range of fields, including crafts such as accessories and garage kits, hobbies, and various types of molded goods, taking advantage of its low-viscosity, instant-cure resin.

## ◆For crafting and hobby

### Features

- Ultra-low viscosity
- Solvent content
- Normal temperature/pressure casting possible



## ◆For jigs

### Features

- Solvent-free, low viscosity
- Excellent curability and short-time demolding
- Good cutting workability

## ◆Low shrinkage type

### Features

- Low shrinkage
- Mold materials such as preservation type and inversion type, mock-ups, Suit for the manufacture of instruments in the production process



# Hei-Cast 8000 Series — Vacuum-Casting Agent

Industrial "Hei-Cast" is a series of high physical properties urethane for vacuum-casting and low-pressure/high-pressure casting. It has physical properties similar to those of various industrial plastics, and is widely used as a resin for prototyping and small-volume production of various industries.

## ◆ ABS · PP and Acrylic-grade

### Features

- Prototype and small-lot production applications
- Physical properties that approximate those of each industrial plastic



ABS grade cast product

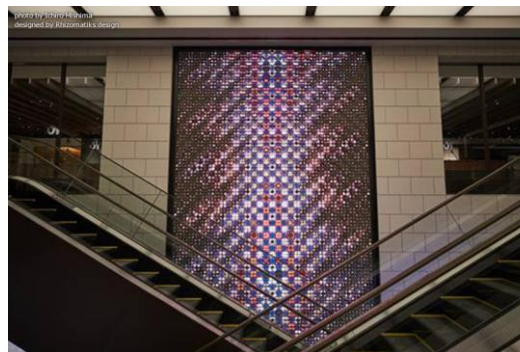


Acrylic grade cast product

## ◆ Flame retardant grade

### Features

- Flame retardant properties not obtained with conventional urethane casting materials
- UL94 V-0, 5VA certification



Wall panel of the department store  
(Flame retardant grade)



Semiconductor transport tray  
(Antistatic grade)

## ◆ Antistatic grade

### Features

- Antistatic property
- Physical properties close to ABS

# Hei-Cast 8000 Aeries — Casting Agent

## ◆ Urethane Elastomer

Urethane elastomers are widely used as prototype models, food samples, vehicle components, potting, and dome applications.



**Food samples**



**Vehicle parts**

### **Features**

- Some products can adjust the hardness.
- Clear and hard-yellowing products available.

## ◆ Urethane Gel

Urethane Gel is a material that can be used in a variety of fields, including medical models, nursing care products, shock absorbers, adsorbents, stain removal applications, anti-vibration applications such as machinery and acoustics, promotional POP, and anti-slip applications.



**Gel mat**

### **Features**

- Softness can be adjusted.
- Difficult yellowing and high transparency
- Can be used as a pressure sensitive adhesive.
- Exclusive coating agent can inhibit tack.



## ◆Low-pressure casting agent

The low-pressure casting agent is a two-part urethane system developed for an automatic injection machine, which gives a molded product with high fluidity and excellent heat and impact resistance. This product has been used as a prototype material for large plastic parts such as bumpers and door panels, as well as in automotive products such as aero parts.



**Automobile bumpers**



**Automobile door trim**

### **Features**

- Have good fluidity
- Excellent heat and shock resistance

## ◆Casting agent for hobby, jig, low shrinkage type

Item		Uses	For crafting and hobby				For jigs		Low shrinkage Type
Product name			8011	8012W	8017	8019	8030	8035	8040
Appearance	A comp.	-	Colorless clear	Colorless clear	Colorless clear	Colorless clear	Colorless clear	Colorless clear	Brown
	B comp.		Dark brown	Clear yellow	Brown clear	Brown	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent
	Cured product		Beige	White	Ivory/white	Ivory	White	White	Light brown
Viscosity (25°C)	A comp.	mPa·s	30	30	20	35	200	140	159
	B comp.		50	25	15	20	40	30	26
Specific gravity (25°C)	A comp.	-	0.97	0.97	0.95	0.96	1.00	1.00	-
	B comp.		1.17	1.17	1.13	1.13	1.18	1.16	-
	Cured product		1.12	1.12	1.09	1.09	1.13	1.12	1.76
Mixing ratio	A:B	By weight	100:100	100:100	100:100	100:100	100:100	100:100	100:100:500 (glass filler)
Pot life	-	25°C/100g	90 sec	120 sec	30/90/ 120/180 sec	120/180 sec	120 sec	120 sec	25 min
Demolding Time	-	-	-	-	-	-	15-20 min/25 °C 12 min/60 °C	15-20min/25 °C 8 min/60 °C	8 hrs or more/25°C
Hardness	Type	JIS K-7215	D75	D75	D70	D70	D75	D73	D84
Tensile strength	MPa	JIS K-7113	35	36	24	24	37	36	-
Elongation	%		5	7	40	40	45	15	-
Bending strength	MPa	JIS K-7171	57	55	32	32	50	44	-
Bending modulus	MPa		1300	1370	780	780	1180	1050	-
Impact strength	kJ/m <sup>2</sup>	JIS K-7110 Izod V Notch	2~3	3~4	3	3	5	5	-
Shrinkage rate	%	In-house standards	1.0~1.2	1.0~1.2	1.2	1.2	0.8	0.8	0.09
Coefficient of thermal expansion	°C <sup>-1</sup>	JIS K-6911	13 × 10 <sup>-5</sup>	13 × 10 <sup>-5</sup>	14 × 10 <sup>-5</sup>	14 × 10 <sup>-5</sup>	13 × 10 <sup>-5</sup>	14 × 10 <sup>-5</sup>	-
Heat deflection temperature (1.80MPa)	°C	JIS K-7191	75	70	65	65	75	75	54 (0.45MPa)
Features			Solvent content	Solvent content	Solvent content	Xylene Free	Good liquidity	Good curability	Low shrinkage

## ◆ Vacuum-Casting Agent ABS and Acrylic-grade

Item		Uses	ABS grade					Acrylic grade	
Product name			8150	8160	8152	Z2910	Z2970	8744/8744LP	8754
Appearance	A comp.	-	Colorless clear /Black/Beige	Colorless clear /Black/Beige	Colorless clear/Ivory/Black	Colorless clear /Black	Black	Colorless clear	Pale yellow transparent
	B comp.		Colorless clear	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Colorless clear	Pale yellow transparent
	Cured product		Milky white /black/beige	Milky white /black/beige	Milky White/Ivor/Black	Black/Milky White	Black	Colorless clear	Colorless clear
Viscosity (25°C)	A comp.	mPa·s	800	800	800	2000	130	1200	500
	B comp.		160	200	200	200	800-1400	140	120
Specific gravity (25°C)	A comp.	-	1.09	1.12	1.11	1.12	1.15	1.05	1.06
	B comp.		1.19	1.20	1.19	1.20	1.16	1.09	1.18
	Cured product		1.21	1.23	1.22	1.22	1.22	1.13	1.20
Mixing ratio	A:B	By weight	100:200	100:200	100:200	100:250	100:150	100:150	100:150
Pot life	-	25°C/100g	5 min	5.5 min	5.5min 8min(L type)	7 min	7-8 min	8 min/18min	7.5 min
Demolding Time	Mold temp. >60°C	-	45-60 min	25-60 min	30-60 min	60 min	45-60 min	60 min/60-90min	60-90 min
Hardness	Type D	JIS K-7215	84	83	84	85	82	82	85
Tensile strength	MPa	JIS K-7113	73	67	60	70	60	60	70
Elongation	%		16	15	15	20	20	30	50
Bending strength	MPa	JIS K-7171	78	80	80	86	70	80	90
Bending modulus	MPa		1790	1800	2000	2200	1700	2000	2200
Impact strength	kJ/m <sup>2</sup>	JIS K-7110 Izod V Notch	12	20	14.5	11.2	60 (Unnotched)	10	13
Shrinkage rate	%	In-house standards	0.3	0.3	0.3	0.28	-	0.3	0.3
Coefficient of thermal expansion	°C <sup>-1</sup>	JIS K-6911	6 × 10 <sup>-5</sup>	9 × 10 <sup>-5</sup>	7 × 10 <sup>-5</sup>	8.6 × 10 <sup>-5</sup>	-	9 × 10 <sup>-5</sup>	5 × 10 <sup>-5</sup>
Heat deflection temperature (1.80MPa)	°C	JIS K-7191	100	95	115(Tg)	135	150	75	90
Features			Equivalent to UL94 HB Low shrinkage	Equivalent to UL94 HB Hold type	Tg115°C	High heat resistance	Poly urea resin High heat resistance Good mold retention	Hard yellowing 8744LP is the long pot life of 8744.	Yellowing type

## ◆ Vacuum-Casting agent PP, Flame-retardant, Feat-resistant, Anti-static grade

Item		Uses	PP grade				Flame retardant grade	Heat resistant grade	Anti-static grade
Product name			8530	8550	8570	8571A/8570B	8263	8095	Z2300
Appearance	A comp.	-	Black	Colorless clear /Black	Slightly cloudy /Black	Colorless clear /Black	Pale yellow transparent	Black/Pale yellow transparent	Black
	B comp.		Pale yellow transparent	Pale yellow transparent	Slightly cloudy	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent
	Cured product		Black	White translucent /Black	Milky white /Black	Milky white /Black	Milky white	Black /Pale yellow	Black
Viscosity (25°C)	A comp.	mPa·s	400	700	1000	800	1000	530	1700
	B comp.		160	600	300	300	160	40	200
Specific gravity (25°C)	A comp.	-	1.05	1.06	1.11	1.12	1.31	1.03	1.09
	B comp.		1.19	1.19	1.17	1.18	1.19	1.22	1.20
Mixing ratio	A:B	By weight	100:100	100:200	100:200	100:200	100:150	100:200	100:200
Pot life	-	25°C/100g	8 min	7 min	10 min.	5 min 45 s	5 min	4 min	6 min
Product specific gravity	-		1.13	1.14	1.21	1.21	1.30	1.20	1.22
Hardness	Type	JIS K-7215	D70	D76	D85	D84	D83	D80	D83
Tensile strength	MPa	JIS K-7113	22	34	50	51	68	47	60
Elongation	%		80	72	50	30	15	19	8
Bending strength	MPa	JIS K-7171	33	39	65	59	93	65	75
Bending modulus	MPa		830	960	1600	1400	2200	1580	1850
Impact strength	kJ/m <sup>2</sup>	JIS K-7110 Izod V Notch	12	10	11	15	10	7	10
Shrinkage rate	%	In-house standards	0.6	0.3	0.4	0.4	0.3	0.4	0.3
Coefficient of thermal expansion	°C <sup>-1</sup>	JIS K-6911	10 × 10 <sup>-5</sup>	9.8 × 10 <sup>-5</sup>	8 × 10 <sup>-5</sup>	-	8 × 10 <sup>-5</sup>	8 × 10 <sup>-5</sup>	-
Heat deflection temperature (1.80MPa)	°C	JIS K-7191	65	70	80	80	80	135	95
Demolding Time		Mold temperature >60° C	60-90 min.	60-90 min.	60-90 min.	30 min.	60 min.	60-70 min.	30-60 min.
Features			Low viscosity High impact resistance	Long pot life High hinge characteristics	Long pot life High heat resistance	Thin walls allow for quick demolding	UL94 V-0 Certification	High heat resistance	Antistatic

## ◆ Vacuum casting agent for Elastomers and Gels

Item		Uses	3 liquid type		High hardness	Food samples		Urethane gel
<b>Product name</b>			8400	8434	8400A/8430B	8477	8479	8421
<b>Appearance</b>	A comp.	-	Colorless clear/black	Colorless clear/black	Colorless clear/black	Colorless clear	Colorless clear	Colorless clear
	B comp.		Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Colorless clear	Colorless clear	Colorless clear
	C comp.		Pale yellow transparent	Pale yellow transparent	-	-	-	-
	Cured product		Milky white/black	Milky white/black	Milky white/black	Colorless clear	Colorless clear	Colorless clear
<b>Viscosity (25°C)</b>	A comp.	mPa·s	600	600	600	780	1000	800
	B comp.		40	160	200	770	220	2000
	C component		1100	890	-	-	-	-
<b>Specific gravity (25°C)</b>	A comp.	-	1.00	1.00	1.00	1.03	1.06	1.02
	B comp.		1.14	1.17	1.20	1.12	1.13	1.07
	C comp.		0.99	0.98	-	-	-	-
<b>Mixing ratio</b>	A:B:(C)	By weight	100:100:0-500 (C)	100:100:0-700 (C)	100:100	100:18	3:1	100:19-30
<b>Pot life</b>	25°C/100g	-	6 min	5.5 min	5-6 min	90 min	30 min	20 min
<b>Product specific gravity</b>	-	-	1.13/1.02	1.14/1.02	1.15	1.05	1.10	1.04
<b>Hardness</b>	Type A	JIS K-7215	A90/10	A90/10	A94	A35	A50	C0-31 A0-A24
<b>Tensile strength</b>	MPa	JIS K-7312	18/0.9	22/0.9	31	1.1	1.4	-
<b>Elongation</b>	%		200/430	260/380	270	180	120	-
<b>100% modulus</b>	MPa		-	9.2/0.3	14	0.8	-	-
<b>200% modulus</b>	MPa		-	16/0.5	22	-	-	-
<b>Tear strength</b>	N/mm		69/4.6	71/5.2	84	5	4.8	-
<b>Repulsion modulus</b>	%		50/-	46/-	-	-	-	-
<b>Shrinkage rate</b>	%	In-house standards	0.6/0.4	0.8/0.8	0.7 (Thickness: 4mm)	0.05/25°C 0.5/60°C	0.05/25°C 0.8/60°C	-
<b>Features</b>			Hardness adjustable	Hardness adjustable	High hardness	Hard yellowing Room temperature curing Low shrinkage	Hard yellowing Low heat generation temperature Low shrinkage	Hard yellowing Hardness adjustable

## ◆Low-pressure casting agent

Item			Low pressure casting agent							
Uses										
Product name			8601	8603	8610	8615	8636	8660	Z1050	J0006/3-70
Appearance	A comp.	-	Black	Black	Black	Colorless clear/black	Black	Milky white /Black	Beige/Black	Colorless clear/Black
	B comp.		Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent
	Cured product		Black	Black	Black	Milky white /black	Black	Beige/Black	Beige/Black	White/Black
Viscosity (25°C)	A comp.	mPa·s	1700	1440	1300	1700	1200	1000-2000	3300	1200
	B comp.		160	160	200	160	200	300-400	200	200
Specific gravity (25°C)	A comp.	-	1.02	1.04	1.03	1.05	1.04	1.30	1.07	1.05
	B comp.		1.19	1.19	1.19	1.19	1.19	1.20	1.19	1.19
	Cured product		1.13	1.17	1.17	1.19	1.17	1.31	1.20	1.15
Mixing ratio	A:B	By weight	100:100	100:125	100:109	100:150	100:125	100:130	100:150	100:125
Pot life	25°C/100g	-	30~40 sec	120 sec	65 sec	240 sec	75 sec	60-90 sec	60-90 sec	70 sec
Hardness	Type	JIS K-7215	D70	D78	D77	D76	D77	D85	D84	D80
Tensile strength	MPa	JIS K-7113	39	31	32	45-55	35	65	65	45
Elongation	%	-	40	80	60	60-100	80	10	20	30
Bending strength	MPa	JIS K-7171	42	49	35	55-60	48	80	80	60
Bending modulus	MPa	-	1160	1290	920	1400-1600	1150	2000	1800	1200
Impact strength	kJ/m <sup>2</sup>	JIS K-7110 Izod V Notch	5.9	12	10	15-20	12	8	14	14.3
Shrinkage rate	%	In-house standards	0.2	0.56	0.6	0.35 (2mm thick)	0.4	0.3	0.18(2mm thick) 0.29(3mm thick)	0.4(40°C) 0.5(60°C)
Coefficient of thermal expansion	°C <sup>-1</sup>	JIS K-6911	7 × 10 <sup>-5</sup>	8 × 10 <sup>-5</sup>	-	9 × 10 <sup>-5</sup>	8 × 10 <sup>-5</sup>	6.6 × 10 <sup>-5</sup>	7.1 × 10 <sup>-5</sup>	-
Heat deflection Temperature (1.80MPa)	°C	JIS K-6911	70	90	90	85	130°C(Tg)	80	95 105(0.45MPa)	120(Tg)
Demolding Time	-	-	20 min/25 ° C.	30 min/60 ° C.	30 min/60 ° C.	30-45 min/60 ° C.	30 min/60 ° C.	20 min/25 ° C.	30-60min/60°C	-
Features			Flexible Low temperature curing	Heat-resistance Impact-resistance	Low flexural modulus	High growth rate High impact-resistance	Tg:130°C	Flame retardancy UL approved (94V-0,94-5VA)	Tg:135°C High flexural modulus	Good low temperature curing



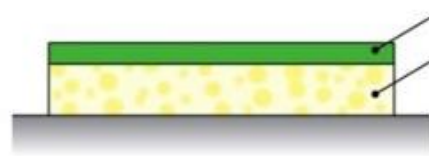
# Hei-Ad 4000 Series — 1 Liquid Moisture Curing Adhesive

Hei-Ad 4000 is a one-part moisture-curing urethane binder. Because of its excellent wettability against rubber chips and woodchips, it has a wide range of experience in all-weather elastic paving materials, including tennis courts, golf-course walking paths, ILB, ground, and walking paths.

## ◆ For field construction



Cross-section



Top coat  
Rubber tip  
+  
Binder

### Features

- 1 liquid moisture curing type
- Schools, parks, sports facilities, etc.

## ◆ For interlocking blocks



### Features

- 1 Moisture-heated press molding

## ◆ Other applications

### Cork binder

- Cork mat, cork board
- Cork allomastic
- Cork stopper



Uses	Product name	Uses and Features
<b>For elastic paving materials</b>	Binder 4146	Winter binder
	Binder 4247	Binder and TDI free for summer
	NE-20	Curing accelerators for binders (used as needed)
	Primer L	Primer for asphalt application and low odor
	Pre-processing solution P	Used for recycled black rubber chips Color rubber chips are used when strength is required
<b>For ILB</b>	4185	DOP free
<b>For cork</b>	A	Low hardness, cork mat/cork board
	B	High hardness, cork aromatic
	C	Medium hardness and cork liquor plugs

# Hei-Ad 5000 Series — Urethane Foam

Hei-Ad 5000-series is a two-part polyurethane foam system. Hard and semi-hard foam is superior in heat resistance and compression set, and has a long track record in the field of air filters for various industrial machines.

## ◆Rigid urethane foam



**Air filter end plate**



**Pumice**

## ◆Semi-rigid urethane foam



**Fiber drum packing**

### **Other applications**

- Medical model
- Filler in the partition at the sleeves of the train
- Mower tires

## ◆Polyurethane Foam (5000 series: Special order)

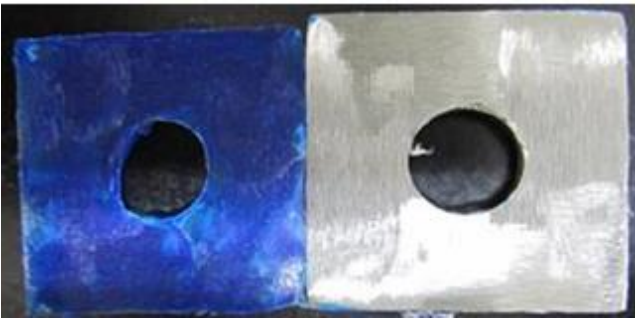
Item		Uses	Rigid polyurethane form			Semi-rigid polyurethane foam			
			A	B	C	A	B	C	D
Appearance	A comp.	-	Black	Pale yellow transparent	Pale yellow transparent	Black	Skin color	Black	White
	B comp.		Dark brown	Dark brown liquid	Dark brown	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Brown
	Cured product		Black	Beige	Beige	Black	Skin tone	Black	White
Viscosity (25°C)	A comp.	mPa·s	1000	430	960	1290	1100	1020	1730
	B comp.		180	180	180	470	250	700	440
Specific gravity (25°C)	A comp.	-	1.04	1.06	1.06	1.03	1.04	1.03	1.04
	B comp.		1.24	1.23	1.23	1.17	1.17	1.21	1.19
Mixing ratio	A:B	By weight	100:90	100:110	100:150	100:48	100:64	100:46	100:46
Cream thyme	25°C	-	30 sec	20 sec	30 sec	20 sec	15 sec	35 sec	20 sec
Rise Time	25°C	-	90 sec	100 sec	180 sec	75 sec	75 sec	230 sec	105 sec
Free foaming density	g/cm <sup>3</sup>	-	0.38	100	35~39	0.31	0.13~0.15	0.31	0.20
Hardness	Type	JIS K-7215	D45	A90	-	C32	C25	C45	C17
Tensile strength	MPa	JIS K-7312	9.3	-	-	1.6	0.6	1.8	0.7~0.8
Elongation	%		10	-	-	150	195	339	79~100
Bending strength	MPa	JIS	16	2.0	44	-	-	-	-
Bending modulus	MPa		-	56	-	-	-	-	-
Maximum deflection	Mm		13	-	-	-	-	-	-
Tearing strength	N/mm	JIS K-7312	-	-	-	7.2	2.7	11.3	2.4~3.0
Compressive set	%	JIS K-6400 20% compression 80°C × 96 hrs	-	-	-	86	93	-	73~78
Foaming magnification	-	-	3 times	15 times	26 times	3 times	7 times	3 times	5 times
Examples of adoption			Air filter end plate	Train sleeve partition filling	Perimeter filling of flower pot	Air filter end plate	Medical model filling	Golf course lawn hunting cart tire	Fiber drum packing

# Hei-Mex 6000 Series — Water-based urethane and EVA Paints

## ◆ Peelable

Peelable is a urethane paint that can be painted with a spray or brush and dried to create a strong coating. It can be applied to metals, resins, etc. at room temperature, and can be easily removed after curing.

### Examples of peelable applications



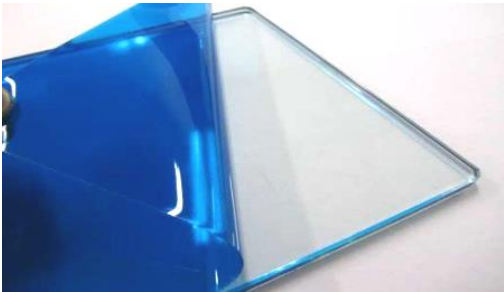
**Rust prevention of iron products**



**Prevention of scratches and stains on resin and metal surfaces**



**Glass protection during construction**



**To prevent tack by coating the gel**

## ◆Polyurea Resin (Urea Spray)

Polyurea resins are compounds composed mainly of urea bonds formed by chemical reactions between isocyanates and amines.

The tack-free time is short from seconds to tens of seconds and has tough physical properties.

### Features

- Can be applied by spraying
  - Short curing
  - Tough physical properties
  - Solvent-free and environmentally friendly
  - Concrete, metals and plastics
- Can be applied to various base materials such as





## ◆ Water-based urethane and EVA Paints

Product No.	Type	Of the coating film Appearance	Solids content (%)	Viscosity	Tensile strength (MPa)	Elongation (%)	Uses and Features
6508	Urethane resin Water-based	Blue	56	45000 mPa·s	5	750	Rust-proofing applications for metal products
6510	Urethane resin Water-based	Clear (Can be colored)	45	3000 mPa·s	5	750	Prevention of scratches and stains on metals, resin products, etc. High heat resistance, soft coating
6600	Urethane resin Water-based	Clear	56	<20 sec Iwata-cup NK-2	5	850	Prevention of Tack of Gel
6805	Urethane resin Water-based	Translucent	45	<20 sec Iwata-cup NK-2	-	-	Anti-bacterial and anti-mildew properties
6401	Urethane resin Solvent-based	Clear (Can be colored)	22	<110 sec Iwata-cup NK-2	35	350	Prevention of scratches and stains on metals, resin products, etc. Available in water, good weather resistance
6404	Urethane resin Solvent-based	Clear (can be colored)	15	<60 sec Iwata-cup NK-2	-	-	Rust-proofing applications for metal products
6511	EVA Water-based	Blue	50	3400 mPa·s	1.5	370	For glass protection

## ◆ Polyurea Products

Item		Uses	Polyurea				Urethane-Urea
Product name			6200	6200LP	6300	6300LP	6710
Appearance	A comp.	-	Pale yellow transparent /Light gray	Pale yellow transparent /Light gray	Pale yellow transparent	Yellow transparent	Light gray
	B comp.		Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Pale yellow transparent	Dark brown
	Cured product		Milky white/Light gray	Milky white/Light gray	Pale yellow transparent	Pale yellow transparent	Light gray
Viscosity (25°C)	A comp.	mPa·s	400	500	500	800	1600
	B comp.		720	720	1700	1700	500
Specific gravity (25°C)	A comp.	-	1.02	1.02	1.06	1.06	1.06
	B comp.		1.12	1.12	1.10	1.10	1.18
Mixing ratio	A:B	Volume ratio	100:100	100:100	100:100 (weight ratio)	100:100 (weight ratio)	100:100
Pot life	25°C/100g	-	14 sec	25 sec	18 min	36 min	14 sec
Hardness	Type	JIS K-6253	D53	D51	D70	D68	D83
Tensile strength	MPa	JIS K-7312	30	31	30	21	38
Elongation	%		560	600	140	160	40
Tear strength	N/mm		108	104	137	122	-
Features			Standard spray type	Hei-Mex 6200 Long pot life	Hand-painted, yellowing-resistant type	Hei-Mex 6300 Long pot life	Chemical resistant spray type

Product No.	Uses and Features
Hei-Remover 7001	Silicone-based mold release agent that exhibits excellent mold releasability in small quantities
Hei-Remover 7001SP	Spray-type silicone release agent
Hei-Remover 94FXII	Spray-type fluorinated release agent
DHL PASTE (20kg/ cans) DH PASTE (1kg/ cans)	Dehydrating agent for polyurethane in paste form
Hei-Cast Filler GP	Fillers for Hei-Cast (fillers) Glass powder that can be added to Hei-Cast to enhance flexural modulus
Hei-Cast Toner	Colorants for Hei-Cast
High-Tool S7691	Two-component putty silicone



**Pasty dehydrating agent**



**Release agent**



**Two-component silicone putty**

H&K Ltd. has developed the 9000-series of isocyanate products, Hei-Nate, based on over 50 years of experience and experience in developing polyurethane resins.

In addition to existing grades, we will also develop and manufacture custom-made isocyanate products that meet our customers' wishes.



## About Hei-Nate products

### ① Sales of existing products

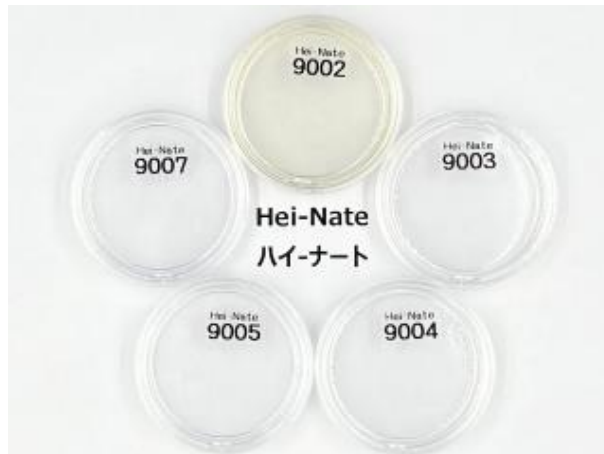
In addition to existing products, we also have developed products. If your desired grade is not available, please contact us.

### ② Improvement of existing products

We will improve existing products according to your requests.

### ③ New development

We select the optimal polyol and isocyanate according to the application and required characteristics and develop new products.



# Hei-Nate 9000 Series — Product Lineup

Product No.	Color	NCO%	Viscosity (25°C) /mPa · s	Composition	Features	Standard package
9002	Clear yellow	25.6	250	PPG modified MDI	For rigid/semi-rigid foam Low viscosity	20kg can
9003	Clear and yellowish	22.9	700	PPG modified MDI	For elastomers For rigid/semi-rigid foam	20kg can
9004	Clear and yellowish	15.4	750	PPG modified MDI	For sprays and elastomers Flexibility	18kg can 220kg drum
9005	Clear and yellowish	4.8	7500	PPG modified MDI	Providing flexibility	16kg can 208kg drum
9007	Clear and yellowish	9.5	3300	PPG modified MDI	Providing flexibility	18kg can
9101	Clear yellow	21.5	600	PEP modified MDI	For elastomers	20kg can 200kg drum
9201	Clear yellow	22.3	300	Castor oil-based modified MDI	For elastomers and low viscosity	20kg can
9202	Clear yellow	16.6	1800	Castor oil-based modified MDI	For elastomers	5kg can 20kg can
9203	Yellowish brown	24.2	1200	Castor oil-modified MDI	For adhesive	20kg can
9301	Clear and yellowish	13.0	2100	TDI adduct 75% Ethyl acetate 25%	For adhesive	20kg can
9401	Clear and yellowish	23.0	1200	HDI isocyanurate	For paints	20kg can 220kg drum