

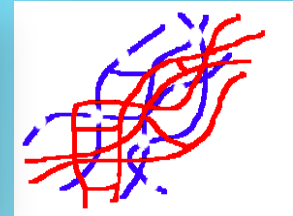
# NEW Product

## 超高耐熱ビスマレイミド系樹脂

## HR 3030/3032/3070

低軟化点・超高耐熱・高熱分解温度、低収縮のビスマレイミド系樹脂

Low softening point, ultrahigh heat resistance, high thermal decomposition temperature, low shrinkage bismaleimide resin



\*IPN構造

### 基礎情報 Typical physically

項目/Article	測定方法/Method	単位/unit	H R 3030	H R 3032	H R 3070
分子量/Molecular weight	G P C	M w	670	1000	660
軟化点/Softeng point	フローテスター/Flow tester	℃	78	75	No data
溶融粘度/Melt viscosity (150℃、)	ICI粘度計/150℃	dpa.s	1.3	1.7	No data
ゲルタイム/Gel Time	ホットプレート/Hot plate 171℃	sec	2600	1600	1500

### 封止材特性 Properties of molding compound

配合内容/Formulation	項目/item	3030	3032
作成条件/Condition: 100℃ 2本ロール混練/Roll Mixing 180℃ 成型温度/ Molding temp	エポキシ/Epoxy	0%	0%
	HR Resin	18.7%	18.6%
	シリカ/Sillica	79.2%	79.8%
	添加剤/Others	2.1%	1.6%
	ガラス転移点/Tg (After Cure 0/200℃*4h/230℃*4h)	TMA	244/257/263
熱分解温度/Thermal Decomposition (℃) 200℃*4h weight loss 1%/5% 230℃*4h weight loss 1%/5%	TG-DTA 10℃/min	360/460	380/470
		360/460	384/467
成型収縮率/Mold Shrinkage (%) (After Cure 0/200℃*4h/230℃*4h)		0/0.04/0.04	0/0.04/0.04
曲げ強度/Flexural strength (Mpa) 200℃/230℃	JIS K6911	164/167	170/172
曲げ弾性率/Flexural modulus (Mpa) 200℃/230℃		22100/21900	21900
線膨張係数/CTE ppm/℃ a1/a2 200℃*4h	TMA	12/44	15/65
スパイラルフロー/SF 180℃、inch	6.68Mpa	18	32
ゲルタイム/Gel time 180℃、sec	ブラベンダー/Brabender	43	48

\*異種の架橋高分子網目が相互に侵入し合った網目構造をもつ混合物であり、略称としてIPNと呼ばれる

上記数値は参考値であり保証するものではありません

## CCL特性 Properties of CCL

配合内容/Formulation	項目/item	3070
	エポキシ/Epoxy	0%
	HR resin	60%
	フィラー/Filler	0%
	溶剤/solvent	MEK 39.9%
製造プロセス/Manufacturing process	プレス条件/Press conditions	200℃×90min or 230℃×90min 6.5℃/min,40Kg/cm2.
ガラス転移点 Tg (℃) 200℃プレス/230℃プレス (Press temperature)	TMA (XY) 2ply 200µm DMA 2ply 200µm	- /280 No data
熱分解温度/Thermal Decomposition (℃) 200℃プレス (Press temperature) 1%減量温度/5%減量温度 (Weight loss)	TG-DTA 2ply 200µm (昇温速度/Heating rate 10℃/min)	No data
230℃プレス (Press temperature) 1%減量温度/5%減量温度 (Weight loss)		340/380
半田耐熱/Solder heat resistance (200℃プレス/230℃プレス (Press temperature))	320℃/30秒 4ply 200µm	No data
曲げ強度/Flexural strength (Mpa) 200℃プレス/230℃プレス (Press temperature)	JIS K6911 16ply 1.6mm	No data
曲げ弾性率/Flexural modulus (Gpa) 200℃プレス/230℃プレス (Press temperature)		No data
線膨張係数/CTE (ppm/℃) X : Y 200℃プレス/230℃プレス (Press temperature)	TMA 2ply 200µm	- / 7
誘電率・誘電正接 (Dk/Df) プレス230℃ (Press temperature)	空洞共振法 Cavity resonance method	No data
ピール強度/Peel Strength (KN/m) 200℃プレス/230℃プレス (Press temperature)	12µm銅箔(Copper foil) 18µm銅箔(Copper foil)	No data
吸水率/Water absorption rate (%)	85℃/85%RH/168Hr 16ply 1.6mm	No data
吸水後半田耐熱 Solder heat resistance after water absorption	PCT5Hr後半田耐熱288℃/ PCT 5 Hr latter solder resistance 288 °C 2ply 200µm	No data

## エポキシ樹脂との相溶性 Epoxy resin compatibility

HR3032 / HR3053	Bis phenol E Type(R710)	Bis phenol A Type	Bis phenol F Type
HR resin 5% surface-active agent 5%	○	○	○
HR resin 10% surface-active agent 5%	○	○	○
HR resin 15% surface-active agent 5%	○	△ (Remaining Dissolution)	Non-measurement
HR resin 20% surface-active agent 5%	○	△ (Remaining Dissolution)	Non-measurement
HR resin 30% surface-active agent 5%	△ (Remaining Dissolution)	△ (Remaining Dissolution)	△ (Remaining Dissolution)

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各種溶剤溶解性 Solvent solubility

HR3030

Type of solvent	NV 10%	NV 20%	NV 30%	NV 40%	Type of solvent	NV 10%	NV 20%	NV 30%	NV 40%
MEK	◎	×	×	×	Toluene	×	×	×	×
PGM	×	×	×	×	Xylene	×	×	×	×
PGM-A c	◎	×	×	×	THF	◎	◎	×	×
DMA c	◎	◎	◎	○	Cyclohexane	◎	◎	×	×
NMP	◎	◎	◎	○	2-propanol (IPA)	×	×	×	×
γ-butyrolactone	◎	◎	◎	○	N,N-dimethylformamide (DMF)	◎	◎	◎	○
Ethyl acetate	×	×	×	×	Methoxybenzene (anisole)	◎	◎	×	×
Methyl alcohol	×	×	×	×	2-(2-Butoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	×	×	×	×
Ethyl alcohol	×	×	×	×	2-(2-Ethoxyethoxy)ethyl Acetate (Ethyl Carbitol Acetate ・ Carbitol Acetate)	◎	×	×	×

HR3032

Type of solvent	NV 10%	NV 20%	NV 30%	NV 40%	Type of solvent	NV 10%	NV 20%	NV 30%	NV 40%
MEK	◎	◎	×	×	Toluene	×	×	×	×
PGM	×	×	×	×	Xylene	×	×	×	×
PGM-A c	◎	×	×	×	THF	◎	◎	○	×
DMA c	◎	◎	◎	○	Cyclohexane	◎	◎	○	×
NMP	◎	◎	◎	○	2-propanol (IPA)	×	×	×	×
γ-butyrolactone	◎	◎	◎	○	N,N-dimethylformamide (DMF)	◎	◎	◎	○
Ethyl acetate	×	×	×	×	Methoxybenzene (anisole)	◎	◎	×	×
Methyl alcohol	×	×	×	×	2-(2-Butoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	×	×	×	×
Ethyl alcohol	×	×	×	×	2-(2-Ethoxyethoxy)ethyl Acetate (Ethyl Carbitol Acetate ・ Carbitol Acetate)	◎	×	×	×

◎ excellent ○ Good × No Good

Method ; Temp ≤50°C Ultrasonic vibration ≤100min

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各種溶剤溶解性 Solvent solubility

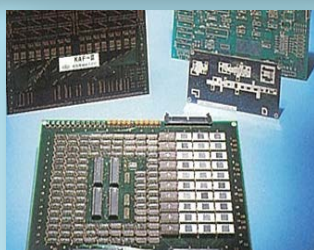
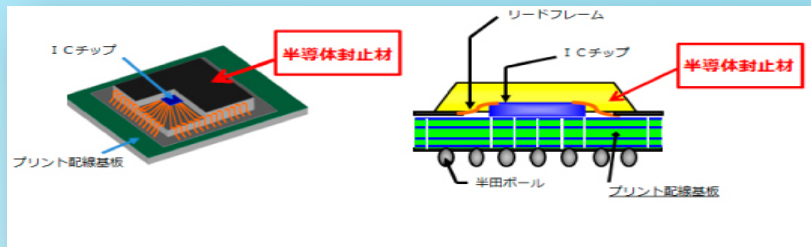
HR3070

Type of solvent	NV 10%	NV 60%	Type of solvent	NV 10%	NV 60%
MEK	◎	◎	Ethyl alcohol	×	×
PGM	◎	◎	Toluene	○	×
PGM-A c	◎	◎	Xylene	○	×
DMA c	◎	◎	THF	◎	◎
NMP	◎	◎	Cyclohexane	◎	◎
γ-butyrolactone	◎	◎	2-propanol (IPA)	×	×
Ethyl acetate	○	○	N,N-dimethylformamide (DMF)	◎	◎
Butyl acetate	○	○	Methoxybenzene (anisole)	◎	◎
n-butyl lactate	○	○	2-(2-Butoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	○	○
Methyl alcohol	×	×	2-(2-Ethoxyethoxy)ethyl Acetate (Ethyl Carbitol Acetate · Carbitol Acetate)	◎	◎

◎ excellent ○ Good × No Good

Method ; Temp ≤50°C Ultrasonic vibration ≤100min

イメージ図



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