

# *Epoxy resin* *for functional materials*

**AICAAITRON**

*General-purpose document / 汎用資料*

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# Outline : About Epoxy resin for functional materials

Speciality & Performance Materials Co., AICA KOGYO CO.,LTD

Epoxy resin is a well-balanced adhesive with various properties. It is used in a wide range of fields.  
エポキシ樹脂は、様々な特性面でバランスの良い接着剤で、幅広い分野に使用されております。

## Excellent characteristic aspects of epoxy resin / エポキシ樹脂の優れた特性面

Excellent adhesion

Excellent low moisture permeability

Small cure shrinkage

Excellent mechanical strength

Excellent heat resistance

Excellent chemical resistance

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# 1. UV cure type / UV硬化型エポキシ樹脂

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## General Type / 汎用タイプ

Properties	Z-590E7P	Z-303NK2	Z-303-26	Test method
Feature/特徴	UV quick cure <b>Good deep curable</b> (3.9mm)	UV curable <b>Good WVTR</b> High Tg	UV curable <b>Low out gas</b>	—
Component/成分	Cation epoxy	Cation epoxy	Cation epoxy	—
Appearance/外観	White liquid	White liquid	White liquid	Visually
Viscosity/粘度[mPa·s]	28,000	38,000	78,000	Coneplate type
T.I.	2.6	2.2	1.2	1rpm / 10rpm
Specific gravity/比重	1.1	1.2	1.2	JIS-K-6833
Cure condition/硬化性(mJ/cm <sup>2</sup> )	2,000	6,000	6,000	Heraeus D bulb (100mW/cm <sup>2</sup> )
After cure/熱養生条件	—	120°C × 30min	120°C × 30min	—
Hardness/硬度	D81	D86	D80	Durometer
Cure shrinkage/硬化収縮率[%]	—	—	2.4	Vol/vol
Moisture permeability/透湿度 [g/m <sup>2</sup> ·24h]	—	11	12	85°C85%RH, 1mmt
Tg[°C]	140	200	138	DMA
Share strength/接着強度[MPa]	29	34	42	Glass/Glass
storage temperature/保存温度	Less than 10°C	Less than -15°C	15-30°C	

※The data and contents indicated in this sheet are based on the results of research and investigation in the company, and it shall be that they are highly reliable. However, it does not guarantee the use by the customer. Moreover, since it may be different with the purpose of use and an operating condition, please confirm by the preliminary examination.  
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# 1. UV cure type / UV硬化型エポキシ樹脂

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## Clear Type / 透明タイプ

Properties	Z-303CW8	Z-303CW36	Z-590VM	Z-590VM9	Test method
Feature/特徴	High Tg	Hard & Fast cure	High Tg & Clear	Clear & strong adhesion	
Appearance/外観	Transparency Liquid	Transparency Liquid	Transparency Liquid	Transparency Liquid	Visual
Cure type/硬化タイプ	UV+Thermal cure	UV cure	UV cure	UV cure + after thermal	-
Viscosity /粘度	40 mPa·s	85 mPa·s	800 mPa·s	160mPa·s	25°C
Density/比重	1.1 g/cm <sup>3</sup>	1.1 g/cm <sup>3</sup>	1.1 g/cm <sup>3</sup>	1.1 g/cm <sup>3</sup>	Liquid
Refractive index nD/屈折率	1.49	1.50	-	-	589nm
UV Cure condition/UV条件	5,000 mJ/cm <sup>2</sup>	5,000 mJ/cm <sup>2</sup>	5,000 mJ/cm <sup>2</sup>	5,000 mJ/cm <sup>2</sup>	LED-UV(365nm)
After cure condition/熱養生条件	80 °C1 h	-	120°C30min.	120°C30min.	-
Pencil hardness/鉛筆硬度	H	3H	-	-	JIS K5600-5-4, 750g
Hardness/デュロメータ硬度	D 85	D 70	D 88	D78	Durometer
Cure shrinkage/硬化収縮率	3.1%	3.3 %	-	-	
Elastic modulus E' /貯蔵弾性率	1.5 GPa	1.4 GPa	2.0 GPa	2.3 GPa	DMA at 30°C
Tg/ガラス転移温度	152°C	93 °C	161 °C	81°C	DMA
Total light transmittance/全光線透過率	>99%	>99%	>99%	>99%	JIS K 7361
Glass adhesive/せん断接着強度	23 MPa	-	30 MPa	47 MPa	Share strength

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### 3. Thermosetting type / 熱硬化型エポキシ樹脂

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It cures only with heat. / 熱で硬化します。  
Storage stability is good. / 保存安定性良好です。

Properties	Z-599MTL	Z-599LC2	Test method
Feature/特徴	High Tg	Low temperature thermosetting 10°C storage	—
Component/主成分	Anion epoxy	Anion epoxy	—
Appearance/外観	Brown liquid	Brown liquid	Visually
Viscosity/粘度[mPa·s]	70,000	40,000	Cone plate type
T.I.	1.0	3.5	1rpm / 10rpm
Specific gravity/比重	1.2	1.1	JIS-K-6833
<b>Thermosetting condition / 熱硬化条件</b>	<b>100°C × 30min. or 80°C × 60min.</b>	<b>80°C × 30min. or 70°C × 60min.</b>	—
Hardness / 硬度	D84	D86	Durometer
Cure shrinkage/硬化収縮率[%]	—	—	
Moisture permeability/透湿度 [g/m <sup>2</sup> ·24h]	—	< 1	40°C90%R.H., 1mmt
Tg[°C]	181	141	DMA
Share strength/接着強度[MPa]	10(SUS/SUS)	42	Glass/Glass
Pot life	1week	4 weeks	
storage temperature/保存温度	Less than 10°C	Less than 10°C	

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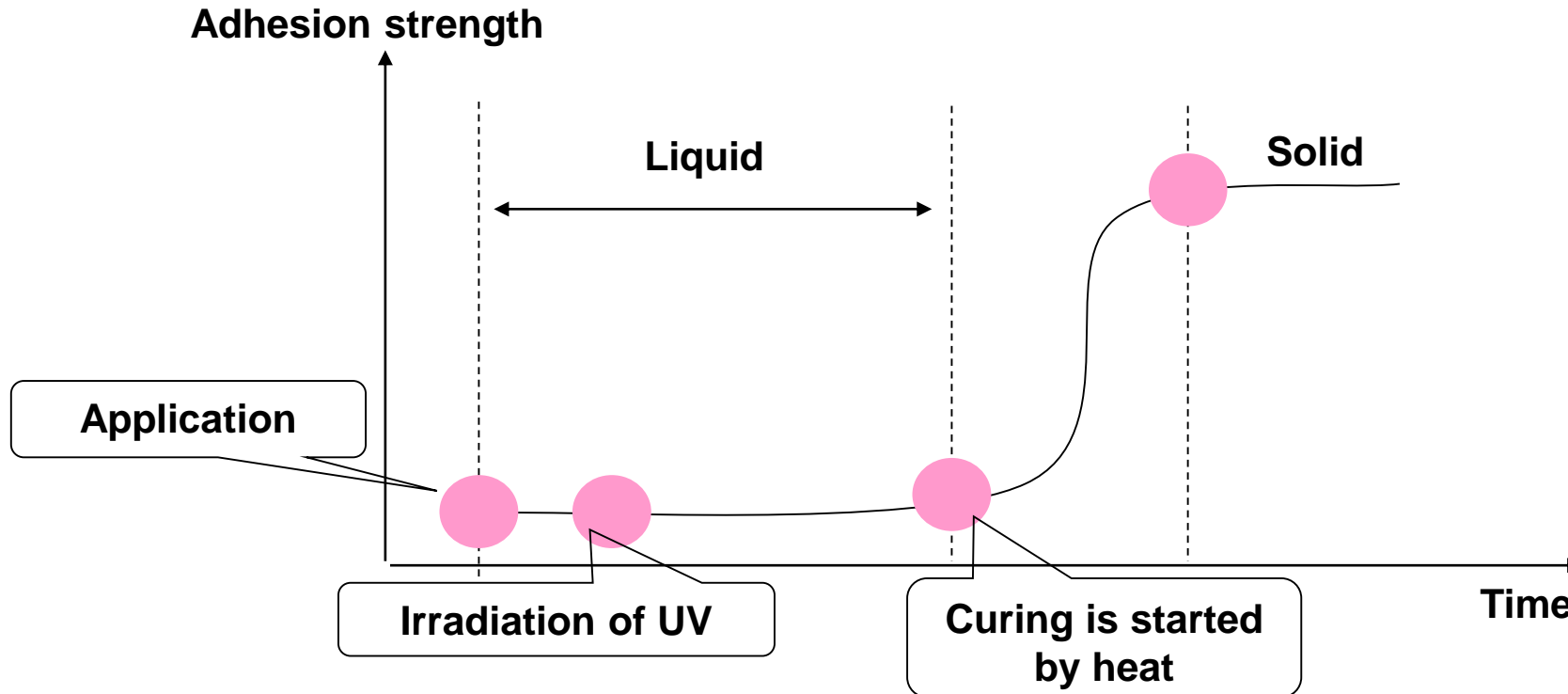


## 4. UV delay cure type / 遅延硬化型UVエポキシ樹脂

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~Concept of UV Delay Cured Resin~



By attaching after UV irradiation, it is designed to be able to irradiate UV even to areas not exposed to UV. / UV照射後に貼り合わせることで、UVが当たらない箇所にもUV照射することが出来る設計です。  
It can be cured at very low temperature. / 非常に低温での硬化が可能です。

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## 4. UV delay cure type / 遅延硬化型UVエポキシ樹脂

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After UV irradiation, it is cured by applying heat. / UV照射後に熱で硬化します。

Properties	Z-306CKW4	Z-306CKD3	Test method
Feature	Fill material	DAM material	—
Main component	Epoxy	Epoxy	—
Appearance	Transparent liquid	White liquid	Visually
Viscosity [mPa·s]	18	340,000	E Type meter
Density [g/cm <sup>3</sup> ]	1.1	1.4	Liquid
Refractive index nD	1.49	1.56	589nm、Liquid
UV condition	2,000 mJ/cm <sup>2</sup>	2,000 mJ/cm <sup>2</sup>	400mW/cm <sup>2</sup> *
Cure condition	70°C × 30min or 80°C × 10min.	70°C × 30min or 80°C × 10min.	—
Pot life after UV	< 20min.	< 20min.	23°C
Hardness*	D71	D85	JIS K 6253, durometer
Cure shrinkage [%] *	3.0	1.5	Vol/vol
Water vapor permeability [g/m <sup>2</sup> ·24h] *	79	7	Cup method 60°C90%RH, 1mmt
Water absorption rate [%] *	2.2	0.2	23°C、24h
Elastic modulus [GPa] *	1.0	6.3	DMA at 25°C
Tg [°C] *	59	81	DMA

\*LED-UV(365nm), 2000mJ, 70°C × 30min.



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Please consult anything without hesitation**