

HUNTSMAN

Enriching lives through innovation



电子行业产品指南

Electronics Industry
Product Selector Guide

Araldite® 爱牢达® Probimer®

覆铜板行业内可信赖的产品系列

覆铜板市场趋势

普通 Tg 和高 Tg 无卤素覆铜板

• 出于对环境的保护，越来越多的覆铜板和终端制造商需求无卤素材料，包含普通 Tg 和高 Tg。

高速产品用覆铜板

• 高速信号通讯和存储要求覆铜板具有高速传输和信号完整性特性，更低的 Dk 和 Df 是具体的特性表现。

无铅 FR-4 覆铜板

• 基于对环境的保护电子行业要求使用无铅焊接。

亨斯迈解决方案

- 提供无铅产品解决方案。
- 提供无卤产品解决方案。
- 提供低 Dk/Df 产品解决方案。
- 提供各种环氧、苯并噁嗪单体及客户定制产品。
- 提供实验室、中试及量产产品。

主要产品

产品	产品应用描述	无卤素覆铜板用产品	高速覆铜板用产品	适合无铅化覆铜板用产品
爱牢达® LZ 8290 H62 树脂	双酚 A 型苯并噁嗪树脂	***	***	
爱牢达® LPY 11040 树脂	双酚 F 型苯并噁嗪树脂	**		
爱牢达® LPY 11051 (LZ8260 N70) 树脂	DCPD 型苯并噁嗪树脂		**	
爱牢达® LZ 8270 N70 树脂	酚酞型苯并噁嗪树脂	**		
爱牢达® LPY 11016 A/B 树脂	无卤高速高频苯并噁嗪树脂		**	
爱牢达® LZ 8291 / HZ 8293 树脂	环氧改性双酚 A 型苯并噁嗪树脂	**		
爱牢达® LPY 11018 A/B 树脂	Mid Tg(160°C) 无卤素树脂配方	**		
爱牢达® LPY 11049 A/B 树脂	High Tg(180°C) 无卤无磷树脂配方	**		
爱牢达® XTW 9820 树脂	FR4 自然色低溴环氧树脂			**
爱牢达® XTW 8053 A/B 树脂	Mid Tg (150°C) 适合无铅的树脂配方			**
爱牢达® XTW 28391 A/B 树脂	High Tg (180°C) 适合无铅的树脂配方			**

*** 极推荐 ** 推荐

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Laminating Product Selector Guide

General market trend in Laminating industry

Halogen-Free standard and high Tg laminates

- Environmental and health specs are the market drivers of halogen-free standard Tg laminates for the greatest market potential, though performance and safety are not compromised.
- Telecom OEMs are looking for halogen-free laminates with improved thermal reliability and more performance.

High speed laminates

- Signal integrity and transmission speed are the technology drivers of high speed laminates whereas in some regions, high speed laminates made of halogen-free materials are also required in the future, in addition to Japan and Europe.

FR4 and lead-free laminates

- Environmental and health aspects are the market drivers of lead-free soldering. Fine pitch and high layer count requirements require more FR4 and lead-free laminates with more robust performance. HDI (High Density Interconnect) circuit boards require higher thermal reliability and good Dimension stability.

Total Solution for Laminating industry

- Huntsman provides solutions for Lead-free products.
- Huntsman provides solutions for Halogen-free products.
- Huntsman provides solutions for Low Dk/Df products.
- Huntsman provides a series of Epoxy resin, Benzoxazine components and products for customers special usage.
- Huntsman provides products which are made by lab, pilot run and mass production.

Major Products

Product Name	Description	Halogen free products	High speed products	Lead-free FR4 products
Araldite® LZ 8290 H62 Resin	~ BIS-A type benzoxazine component	***	***	
Araldite® LPY 11040 Resin	~ BIS-F type benzoxazine component	**		
Araldite® LPY 11051 (LZ 8260 N70) Resin	~ DCPD type benzoxazine component		**	
Araldite® LZ 8270 N70 Resin	~ Phenolphthalein type benzoxazine component	**		
Araldite® LPY 11016 A/B Resin	~ High Tg, 170oC, halogen-free low Dk/Df formulation system		**	
Araldite® LZ 8291 / HZ 8293 Resin	~ High Tg, adjustable 150-170oC, halogen-free formulation system	**		
Araldite® LPY 11018 A/B Resin	~ Mid Tg, 160oC, halogen-free formulation system	**		
Araldite® LPY 11049 A/B Resin	~ High Tg, 180oC, halogen-free and phosphorus free formulation system	**		
Araldite® XTW 9820 Resin	Nature color FR-4 epoxy			**
Araldite® XTW 8053 A/B Resin	Mid Tg, 150oC, lead-free compatible system			**
Araldite® XTW 28391 A/B Resin	High Tg, 180oC, lead-free compatible system			**

*** highly recommended ** recommended

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覆铜板行业内可信赖的产品系列

特殊树脂

差异化的性能
产品的差异化性能将依靠特殊树脂来提供
通过选择具有特殊性能的树脂并在产品配方中使用，可满足覆铜板产品的特殊性能需求。

亨斯迈方案

亨斯迈具有多种多样不同的特殊树脂供不同工业使用，根据不同需要其中的部分可以用在覆铜板的生产和制造。

主要特殊树脂产品

产品	分子式	产品应用描述
爱牢达® EPN 1138 树脂		酚醛环氧树脂
爱牢达® ECN 1280 树脂		邻甲酚醛环氧树脂
爱牢达® Tactix 756 树脂		双环戊二烯型酚醛环氧树脂
爱牢达® Tactix 742 树脂		三官能环氧树脂
爱牢达® CY 179-1 树脂		脂环型环氧树脂
爱牢达® XB 9721 树脂		四官能缩水甘油胺型环氧树脂
爱牢达® MY 816 树脂		萘系环氧树脂

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Laminating Product Selector Guide

Specialty Resin

Differentiated performance
Specialty components are required to offer differentiated performance.
A selection of different material classes in the application in laminate can promote selected properties.

Huntsman Solutions

Huntsman Advanced Materials has exposure in various industries with wide spectrum of products. Some of these products can be used in laminates as required.

Major Specialty Resin

Product Name	Molecular formula	Description / Application
Araldite® EPN 1138 resin		Novolac epoxy resin
Araldite® ECN 1280 resin		Cresol novolac epoxy resin
Araldite® Tactix 756 resin		DCPD Novolac epoxy resin
Araldite® Taxtix 742 resin		Tri-functional epoxy resin
Araldite® CY 179-1 resin		Cyclo-aliphatic epoxy resin
Araldite® XB 9721 resin		Tetra-functional epoxy resin
Araldite® MY 816 resin		Naphthalene Diepoxy resin

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双酚 A 型苯并噁嗪树脂环己酮溶液

爱牢达® LZ 8290 H62 树脂

基本描述：

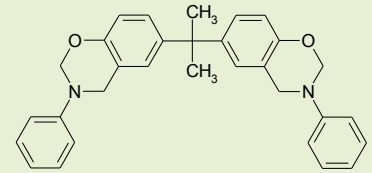
爱牢达® LZ 8290 H62 树脂为无结晶的双酚 A 型苯并噁嗪树脂的环己酮溶液，用于无卤素以及高速高频基材的配方设计，以满足印刷电路板行业严苛的性能要求。

应用：

- 无卤素系列印刷电路板
- 高速高频绝缘基材

特点：

- 低吸水性
- 低的介电常数，Dk: 3.1
- 高 Tg, DSC Tg>170°C
- 相比环氧树脂，有较好的耐燃烧性



树脂特性：

测试项目	单位	指标范围	测试方法
25°C 粘度	m.Pas	1,500 - 3,000	ISO 12058-1
水含量	%	< 0.4	ISO 760 :1978
固体含量	% w/w	60.5 - 63.5	ISO 3251

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Laminating Industry Product Selector Guide

Bis-phenol A Benzoxazine in cyclohexanone

Araldite® LZ 8290 H62 Resin

General description:

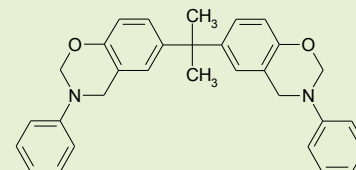
Araldite® LZ 8290 H62 Resin is a crystallization free bisphenol-A based benzoxazine in the solution of cyclohexanone that could be applied for the design of halogen free, low Dk & Df laminating products.

Application:

- Halogen free laminate
- Low Dk&Df materials

Advantage:

- Lower moisture absorption
- Lower Dk, Dk: 3.1
- High Tg, Tg>170°C
- Better flammability than epoxy



Typical resin properties:

Item	Unit	Value	Test Method
Viscosity at 25°C	m.Pas	1,500 - 3,000	ISO 12058-1
Water content	%	< 0.4	ISO 760 :1978
Solid content	% w/w	60.5 - 63.5	ISO 3251

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双酚 F 型苯并噁嗪树脂丁酮溶液

爱牢达® LPY 11040 N75 树脂

基本描述：

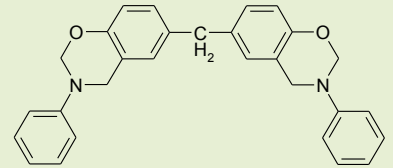
爱牢达® LPY 11040 N75 树脂为较高反应活性的双酚 F 型苯并噁嗪树脂的丁酮溶液，用于高性能无卤素树脂配方设计，以满足印刷电路板行业严苛的性能要求。

应用：

- 无卤素系列印刷电路板
- 高可靠性多层印刷电路板
- 基于高密度互连技术的印刷电路板

特点：

- 低吸水性
- 较好的韧性
- 高 T_g, DSC T_g>170°C
- 优异的阻燃特性



树脂特性：

测试项目	单位	指标范围	测试方法
25°C 粘度	m.Pas	300 - 800	ISO 12058-1
水含量	%	< 0.3	ISO 760 :1978
固体含量	%	73.5 - 76.5	ISO 3251

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Laminating Industry Product Selector Guide

Bis-phenol F Benzoxazine in butanone

Araldite® LPY 11040 N75 Resin

General description:

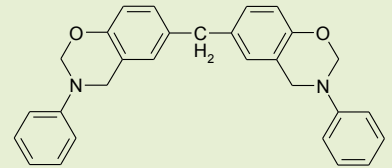
Araldite® LPY 11040 N75 Resin is a middle molecular weight bisphenol-F based benzoxazine MEK solution that has been specially designed to meet the stringent requirements of the halogen free printed circuit board industry.

Application:

- Halogen free laminate
- High reliability Multilayer PCBs
- High density interconnect PCBs

Advantage:

- Lower moisture absorption
- Good toughness
- High Tg, Tg > 170°C
- Better flammability



Typical resin properties:

Item	Unit	Value	Test Method
Viscosity at 25°C	m.Pas	300 - 800	ISO 12058-1
Water content	%	< 0.3	ISO 760 :1978
Solid content	%	73.5 - 76.5	ISO 3251

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酚酞型苯并噁嗪树脂丁酮溶液

爱牢达® LZ 8270 N70 CI 树脂

基本描述：

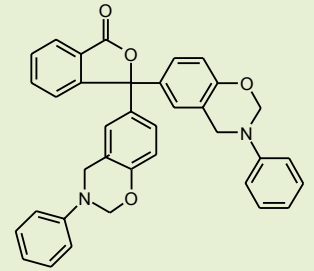
爱牢达® LZ 8270 N70 CI 树脂为酚酞型苯并噁嗪树脂的丁酮溶液，用于无卤素高 Tg 以及高模量基材的配方设计，以满足印刷电路板行业严苛的性能要求。

应用：

- 无卤素覆铜板
- 提高树脂体系 Tg
- 高刚性高模量材料

特点：

- 低树脂流动
- 高 Tg, DMA Tg>220°C
- 自阻燃特性
- 优异的耐热性



树脂特性：

测试项目	单位	指标范围	测试方法
25°C 粘度	m.Pas	100-1,000	ISO 12058-1
固体含量 (w/w)	%	69 - 71	ISO 3251

配方案例及性能：

项目	样板 1	样板 2
LZ 8270 N70 CI 树脂	90 g (固体)	90 g (固体)
酚醛树脂	10 g	10 g
SiO ₂		42 g
2- 甲基咪唑	0.1 g	0.1 g
胶水胶化时间 @171°C	300 s	300 s
压合条件	60 min @ 210°C	
基板树脂含量	40%	40%
DSC Tg (°C) 20°C/min	210	205
DMA Tg (°C) 5°C/min tanδ	230	225
DMA 储存模量 (GPa)	22.6	22.2
Td (5% 热失重)	390	420
阻燃性 (燃烧时间)	V1 (90 s)	V1 (80 s)
* 基板由 8 张 7628 玻璃布制作 PP 叠合压制而成		
* 混合适当种类和比例的环氧树脂可使树脂体系获得优异的耐热性		

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Laminating Industry Product Selector Guide

Phenolphthalein Benzoxazine in butanone

Araldite® LZ 8270 N70 CI Resin

General description:

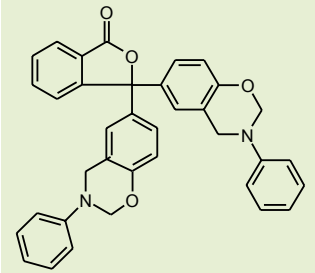
Araldite® LZ 8270 N70 CI Resin is a high molecular weight phenolphthalein based benzoxazine MEK solution that has been specially designed to meet the stringent requirements of the halogen free printed circuit board industry.

Application:

- Halogen free material
- High Tg
- High modulus

Advantage:

- Low resin flow
- High Tg, DMA Tg>220°C
- Excellent flammability



Typical resin properties:

Item	Unit	Value	Test Method
Viscosity at 25°C	m.Pas	100-1,000	ISO 12058-1
Solid content	% w/w	69 - 71	ISO 3251

Basic formulation and properties

Item	Sample 1	Sample 2
LZ 8270 N70 CI Resin	90 g (solid)	90 g (solid)
Novolac Resin	10 g	10 g
SiO ₂	/	42 g
2-methyl imidazole	0.1 g	0.1 g
Varnish GT@171°C	300 s	300 s
Press condition	60 min @ 210°C	
Resin Content	40%	40%
DSC Tg (°C) 20°C/min	210	205
DMA Tg (°C) 5°C/min tanδ	230	225
DMA Storage modulus(GPa)	22.6	22.2
Td (5% weight loss)	390	420
Flammability (Burning time)	V1 (90 s)	V1 (80 s)

* Laminate sample: 8 layers 7628(glass fiber cloth) ply up.
* Mix with proper ratio epoxy can reach excellent thermal resistance

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覆铜板行业内可信赖的产品系列

环氧改性双酚 A 型苯并噁嗪树脂体系

爱牢达® LZ 8291 N80 CI / HZ 8293 N68 CL 树脂

基本描述：

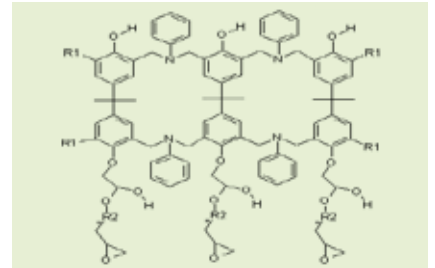
爱牢达® LZ 8291 N80 CI/HZ 8293 N68 CL 树脂为酚醛树脂固化的由环氧树脂改性的苯并噁嗪树脂体系，用于无卤素覆铜板的胶水配方设计，以满足印刷电路板行业严苛的性能要求。

应用：

- 无卤素系列印刷电路板
- 高 Tg 印刷电路板

特点：

- 优良的耐吸水性
- Tg>170 °C



树脂特性： LZ 8291 N80 CI 树脂

测试项目	单位	指标范围	测试方法
25°C 粘度	m.Pas	200-2,000	ISO 12058-1
固体含量	% w/w	79-81	ISO 3251

树脂特性： HZ 8293 N68 CL 树脂

测试项目	单位	指标范围	测试方法
25°C 粘度	m.Pas	500-2,500	ISO 12058-1
固体含量	% w/w	66-68	ISO 3251

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Laminating Industry Product Selector Guide

Epoxy modified Bisphenol A benzoxazine resin system

Araldite® LZ 8291 N80 CI / HZ 8293 N68 CL Resin

General description:

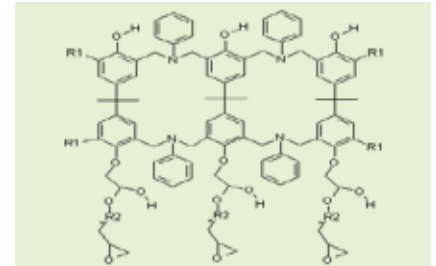
Araldite® LZ 8291 N80 CI/HZ 8293 N68 CL Resin is a phenolic novolac curing benzoxazine resin system for halogen free laminating, that has been specially designed to meet the stringent requirements of the halogen free printed circuit board industry.

Application:

- Halogen free laminate
- High Tg PCBs

Advantage:

- Good moisture resistance
- Tg > 170°C



Typical resin properties: LZ 8291 N80 CI Resin

Item	Unit	Value	Test Method
Viscosity at 25°C	m.Pas	200-2,000	ISO 12058-1
Solid content	% w/w	79-81	ISO 3251

Typical resin properties: HZ 8293 N68 CL Resin

Item	Unit	Value	Test Method
Viscosity at 25°C	m.Pas	500-2,500	ISO 12058-1
Solid content	% w/w	66-68	ISO 3251

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基于双酚 F 苯并噁嗪树脂的高可靠性 Tg-150 无卤素树脂体系

爱牢达® LPY 11018 A/B 树脂

基本描述：

爱牢达® LPY 11018 树脂是由 A, B 组分组成的高耐热高可靠性无卤素 Tg-150 树脂体系，为满足印刷电路板行业的无卤素环保要求以及兼容无铅制程等严苛的性能要求而设计。

应用：

- 无卤素系列印刷电路板
- 高可靠性多层印刷电路板
- 高密度互连印刷电路板

特点：

- 优异的耐水性
- DSC Tg>155°C
- 较低的线膨胀系数
- 优异的耐热性

树脂特性：

覆铜板特性：

测试项目	测试方法	单位	测量值
剥离强度	IPC-TM-650 2.4.8	N/mm	1.6
DSC Tg	IPC-TM-650 2.4.25	°C	160
T-288 分层时间	IPC-TM-650 2.4.24	min	>60
CTE (50-260°C)	IPC-TM-650 2.4.24	%	2.6
漂锡测试	IPC TM 650 2.4.13	cycle	>20
PCT 吸水率	Huntsman(120°C * 300min)	%	0.35
PCT 浸锡测试	Huntsman(120°C * 300min)	min	>5
介电常数 (1G Hz)	IPC TM 650 2.5.5a		4.2
介电损耗 (1G Hz)	IPC TM 650 2.5.5a		0.011
阻燃性	UL 94		V0

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Laminating Industry Product Selector Guide

Bis-F Benzoxazine based high performance Tg-150 resin system

Araldite® LPY 11018 A/B Resin

General description:

Araldite® LPY 11018 A/B Resin is a 2-component 11018A, 11018B high performance halogen free system for the production of laminate and prepreg for the use in non-halogen Tg-150°C level printed circuit board.

Application:

- Halogen free laminate
- High reliability printed circuit board
- High density interconnect printed circuit board

Advantage:

- Excellent moisture resistance
- DSC Tg>155°C
- Low CTE
- Excellent thermal resistance

Typical resin properties:

Typical laminate properties:

Properties	Tests method	Unit	Values
Peel strength	IPC-TM-650 2.4.8	N/mm	1.6
DSC Tg	IPC-TM-650 2.4.25	° C	160
T-288	IPC-TM-650 2.4.24	min	>60
CTE (50-260°C)	IPC-TM-650 2.4.24	%	2.6
Solder float	IPC TM 650 2.4.13	cycle	>20
PCT water absorption	Huntsman(120°C * 300min)	%	0.35
PCT 288° C solder dip	Huntsman(120°C * 300min)	min	>5
Dk (1G Hz)	IPC TM 650 2.5.5a		4.2
Df (1G Hz)	IPC TM 650 2.5.5a		0.011
Flammability	UL 94		V0

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无卤无磷高 Tg 苯并噁嗪树脂体系

爱牢达® LPY 11049 A/B 树脂

基本描述：

爱牢达® LPY 11049 A/B 树脂是由 A, B 组分组成的高耐热高可靠性无卤无磷高 Tg 苯并噁嗪树脂体系，为满足印刷电路板行业的无卤素环保要求以及兼容无铅制程等严苛的性能要求而设计，另外采用新型阻燃技术避免常用磷系阻燃剂潜在的环境隐患。

应用：

- 无卤素系列印刷电路板
- 高可靠性多层印刷电路板
- 高密度互连印刷电路板

特点：

- 无卤无磷
- 低吸水性
- 高 Tg, DSC Tg>170°C
- 优异的耐热性

覆铜板特性：

测试项目	测试方法	单位	测量值
剥离强度	IPC-TM-650 2.4.8	N/mm	1.6
DSC Tg	IPC-TM-650 2.4.25	°C	183
T-288 分层时间	IPC-TM-650 2.4.24	min	>60
漂锡测试	IPC TM 650 2.4.13	cycle	>15
PCT 吸水率	Huntsman(120°C * 180min)	%	0.3
PCT 浸锡测试	Huntsman(120°C * 180min)	min	>5
介电常数 (1G Hz)	IPC TM 650 2.5.5a		4.3
介电损耗 (1G Hz)	IPC TM 650 2.5.5a		0.011
阻燃性	UL 94		V0

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Laminating Industry Product Selector Guide

Phosphorous & halogen free High Tg Benzoxazine resin system

Araldite® LPY 11049 A/B Resin

General description:

Araldite® LPY 11049 A/B Resin is a halogen free and phosphorus free High Tg benzoxazine based resin system for laminate and prepreg industrial. It designed for satisfy requirements of lead free and halogen free process. And new flame retardant technology was used to avoid the potential pollution of phosphorus.

Application:

- Halogen free laminate
- Low Dk&Df materials

Advantage:

- Halogen and phosphorous free
- Lower moisture absorption
- High Tg, DSC Tg>170°C
- Excellent thermal resistance

Typical laminate properties:

Properties	Tests method	Unit	Values
Peel strength	IPC-TM-650 2.4.8	N/mm	1.6
DSC Tg	IPC-TM-650 2.4.25	° C	183
T-288	IPC-TM-650 2.4.24	min	>60
Solder float	IPC TM 650 2.4.13	cycle	>15
PCT water absorption	Huntsman(120°C * 180min)	%	0.3
PCT 288° C solder dip	Huntsman(120°C * 180min)	min	>5
Dk (1G Hz)	IPC TM 650 2.5.5a		4.3
Df (1G Hz)	IPC TM 650 2.5.5a		0.011
Flammability	UL 94		V0

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覆铜板行业内可信赖的产品系列

双环戊二烯型苯并噁嗪树脂丁酮溶液

爱牢达® LPY 11051 树脂

基本描述：

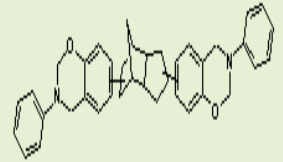
爱牢达® LPY 11051 树脂为环戊二烯型苯并噁嗪树脂的丁酮溶液，用于无卤素以及高速高频基材的配方设计，以满足印刷电路板行业严苛的性能要求。

应用：

- 无卤素系列印刷电路板
- 高速高频绝缘基材

特点：

- 低吸水性
- 低的介电常数, Dk: 2.8
- 高 Tg, DSC Tg>170°C
- 较好的阻燃性



树脂特性：

测试项目	单位	指标范围	测试方法
25°C 粘度	m.Pas	200 - 1,500	ISO 12058-1
固体含量 (w/w)	%	69 - 71	ISO 3251

配方案例及性能：

项目	样板 1	样板 2
LPY 11051 树脂	100 g (固体)	100 g (固体)
酚醛树脂	/	20 g
溶剂	20 g	30 g
2- 甲基咪唑	0.1 g	0.1 g
胶水胶化时间 @171°C	1000 s	310 s
压合条件	60 min @ 210°C	
基板树脂含量	50%	50%
DSC Tg (°C) 20°C/min	175	175
DMA Tg (°C) 5°C/min tanδ	200	205
Dk 1G Hz	3.8	4
Df 1G Hz	0.007	0.008
阻燃性 (燃烧时间)	V1 (200 s)	V1 (200 s)
* 基板由 5 张 2116 型玻璃布制作 PP 叠合压制而成		
* 混合适当种类和比例的环氧树脂可使树脂体系获得优异的耐热性		

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Laminating Industry Product Selector Guide

DCPD Benzoxazine in butanone

Araldite® LPY 11051 Resin

General description:

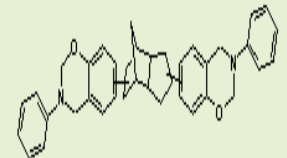
Araldite® LPY 11051 Resin is a DCPD based benzoxazine MEK solution that has been specially designed to meet the stringent requirements of the halogen free printed circuit board industry.

Application:

- Halogen free laminate
- Low Dk&Df materials

Advantage:

- Low moisture absorption
- Lower Dk, Dk: 2.8
- High Tg, Tg > 170°C
- Better flammability



Typical resin properties:

Item	Unit	Value	Test Method
Viscosity @ 25°C	m.Pas	200 - 1,500	ISO 12058-1
Solid content	% w/w	69 - 71	ISO 3251

Basic formulation and properties

Item	Sample 1	Sample 2
LPY 11051 Resin	100 g (solid)	100 g (solid)
Novolac Resin	/	20 g
SiO ₂	20 g	30 g
2-methyl imidazole	1.0 g	0.1 g
Varnish GT@171°C	1000 s	310 s
Press condition	60 min @ 210°C	
Resin Content	50%	50%
DSC Tg (°C) 20°C/min	175	175
DMA Tg (°C) 5°C/min tanδ	200	205
Dk 1G Hz	3.8	4
Df 1G Hz	0.007	0.008
Flammability (Burning time)	V1 (200 s)	V1 (200 s)
* Laminate sample : 5layers 2116 (glass fiber cloth) ply up.		
* Mix with proper ratio epoxy can reach excellent thermal resistance		

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无卤高速高频苯并噁嗪树脂体系

爱牢达® LPY 11016 A/B 树脂

基本描述：

爱牢达® LPY11016 A/B 树脂是由 A, B 组分组成的双组分无卤高速高频高 Tg 苯并噁嗪树脂体系，可以满足印刷电路板行业高速高频信号传输的需要和无卤素环保的要求。

应用：

- 无卤无铅兼容制成印刷电路板
- 高速高频印刷电路板
- 高多层印刷电路板

特点：

- 低介电常数 / 低介电损耗
- 优异的耐水性
- 高 Tg, DSC Tg>170°C

覆铜板特性：

测试项目	测试方法	单位	测量值
剥离强度	IPC-TM-650 2.4.8	N/mm	1.0
DSC Tg	IPC-TM-650 2.4.25	°C	175
T-288 分层时间	IPC-TM-650 2.4.24	min	60
漂锡测试	IPC TM 650 2.4.13	cycle	>18
PCT 吸水率	Huntsman(120°C * 120min)	%	0.35
PCT 浸锡测试	Huntsman(120°C * 120min)	min	>5
介电常数 (1G Hz)	IPC TM 650 2.5.5a		3.85
介电损耗 (1G Hz)	IPC TM 650 2.5.5a		0.008
阻燃性	UL 94		V0

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Laminating Industry Product Selector Guide

Halogen free High speed & low loss Benzoxazine resin system

Araldite® LPY 11016 A/B Resin

General description:

Araldite® LPY 11016 A/B Resin is a benzoxazine based halogen free High Tg, High speed low loss resin system for laminate and prepreg industrial. It can meet the requirements of high speed/low loss signal transfer requirement of laminates.

Application:

- Halogen free laminate and prepregs
- High speed printed circuit board
- Multilayer printed circuit board

Advantage:

- Low Dk/Df
- Low water absorption
- High Tg, DSC Tg>170°C

Typical laminate properties:

Properties	Tests method	Unit	Values
Peel strength	IPC-TM-650 2.4.8	N/mm	1.0
DSC Tg	IPC-TM-650 2.4.25	° C	175
T-288	IPC-TM-650 2.4.24	min	60
Solder float	IPC TM 650 2.4.13	cycle	>18
PCT water absorption	Huntsman(120°C * 120min)	%	0.35
Solder dip after PCT	Huntsman(120°C * 120min)	min	>5
Dk (1G Hz)	IPC TM 650 2.5.5a		3.85
Df (1G Hz)	IPC TM 650 2.5.5a		0.008
Flammability	UL 94		V0

For more information, please visit www.huntsman.com/advanced_materials or email to: advanced_materials@huntsman.com

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覆铜板行业内可信赖的产品系列

酚醛树脂固化 Mid-Tg 环氧树脂体系

爱牢达® XTW 8053 A-1 N80_XTW 8053 B-1 A60 树脂

基本描述：

爱牢达® XTW 8053 A-1 N80_XTW 8053 B-1 A60 树脂为酚醛树脂固化的溴化环氧树脂体系，具有优异的耐热性兼容无铅制程，为满足印刷电路板行业的严苛要求而设计。

应用：

- 中 Tg 覆铜板和半固化粘结点
- 兼容无铅制程的多层印刷电路板
- 基于高密度互连工艺的印刷电路

特点：

- 优良的耐热性，T288 > 10 分钟
- 较好耐吸水性，可通过 PCT2 小时处理后 288°C 浸锡测试

覆铜板特性：

测试项目	测试方法	单位	测量值
剥离强度	IPC-TM-650 2.4.8	N/mm	1.4
DSC Tg	IPC-TM-650 2.4.25	°C	140
T-288 分层时间	IPC-TM-650 2.4.24	min	>10
漂锡测试	IPC TM 650 2.4.13	cycle	>10
PCT 吸水率	亨斯迈 (120°C * 120min)	%	0.3
PCT 浸锡测试	亨斯迈 (120°C * 120min)	min	>3
表面电阻	IEC 249	ohm	≥ 1.0E+13
体积电阻	IEC 249	ohm-cm	≥ 1.0E+15
介电常数 (1G Hz)	IPC TM 650 2.5.5a		4.5
介电损耗 (1G Hz)	IPC TM 650 2.5.5a		0.013
阻燃性	UL 94		V0

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Laminating Industry Product Selector Guide

Lead free Mid Tg epoxy resin system

Araldite® XTW 8053 A-1 N80_XTW 8053 B-1 A60 Resin

General description:

Araldite® XTW 8053 A-1 N80_XTW 8053 B-1 A60 Resin is a brominated epoxy two component system with excellent heat resistance that has been specially designed to meet the stringent requirements of the printed circuit board industry.

Application:

- Mid Tg laminate and prepregs
- Lead free compatible printed circuit board
- High density interconnect printed circuit board

Advantage:

- Good thermal resistance, T-288 > 10min
- Good moisture resistance, pass 2 hours PCT solder dip

Typical laminate properties:

Properties	Tests method	Unit	Values
Peel strength	IPC-TM-650 2.4.8	N/mm	1.4
DSC Tg	IPC-TM-650 2.4.25	° C	140
T-288	IPC-TM-650 2.4.24	min	>10
Solder float	IPC TM 650 2.4.13	cycle	>10
PCT water absorption	Huntsman(120°C * 120min)	%	0.3
PCT 288° C solder dip	Huntsman(120°C * 120min)	min	>5
Surface Resistance	IEC 249	ohm	≥ 1.0E+13
Volume Resistance	IEC 249	ohm-cm	≥ 1.0E+15
Dk (1G Hz)	IPC TM 650 2.5.5a		4.5
Df (1G Hz)	IPC TM 650 2.5.5a		0.013
Flammability	UL 94		V0

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酚醛树脂固化高 Tg 环氧树脂体系

爱牢达® XTW 28391 A-1 M75 CI / XTW 28391 B-1 M57 CI 树脂

基本描述：

爱牢达® XTW 28391 A-1 M75 CI / XTW 28391 B-1 M57 CI 树脂为酚醛树脂固化的溴化高 Tg 环氧树脂体系，具有优异的耐热性兼容无铅制程，为满足印刷电路板行业的严苛要求而设计。

应用：

- 高 Tg 覆铜板和半固化粘结片
- 兼容无铅制程的多层印刷电路板
- 基于高密度互连工艺的印刷电路

特点：

- 高 Tg, DSC Tg>170°C
- 优异的耐热性, T288 > 20 分钟
- 优异的耐吸水性, 通过 PCT5 小时处理后 288°C 浸锡测试

覆铜板特性：

测试项目	测试方法	单位	测量值
剥离强度	IPC-TM-650 2.4.8	N/mm	1.4
DSC Tg	IPC-TM-650 2.4.25	°C	175
T-288 分层时间	IPC-TM-650 2.4.24	min	>20
漂锡测试	IPC TM 650 2.4.13	cycle	>20
PCT 吸水率	Huntsman(120°C * 300min)	%	0.4
PCT 浸锡测试	Huntsman(120°C * 300min)	min	>3
表面电阻	IEC 249	ohm	≥ 1.0E+13
体积电阻	IEC 249	ohm-cm	≥ 1.0E+15
介电常数 (1G Hz)	IPC TM 650 2.5.5a		4.5
介电损耗 (1G Hz)	IPC TM 650 2.5.5a		0.013
阻燃性	UL 94		V0

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Laminating Industry Product Selector Guide

Lead free High Tg epoxy resin system

Araldite® XTW 28391 A-1 M75 CI / XTW 28391 B-1 M57 CI Resin

General description:

Araldite® XTW 28391 A-1 M75 CI / XTW 28391 B-1 M57 CI Resin is a brominated epoxy two component high Tg system with excellent heat resistance that has been specially designed to meet the stringent requirements of the printed circuit board industry.

Application:

- High Tg laminate and prepregs
- Lead free compatible printed circuit board
- High density interconnect printed circuit board

Advantage:

- High Tg, DSC Tg>170°C
- Excellent thermal resistance, T-288 >20 min
- Excellent moisture resistance, Pass 288C solder dip after PCT*5hours

Typical laminate properties:

Properties	Tests method	Unit	Values
Peel strength	IPC-TM-650 2.4.8	N/mm	1.4
DSC Tg	IPC-TM-650 2.4.25	° C	175
T-288	IPC-TM-650 2.4.24	min	>20
Solder float	IPC TM 650 2.4.13	cycle	>20
PCT water absorption	Huntsman(120°C * 300min)	%	0.4
PCT 288° C solder dip	Huntsman(120°C * 300min)	min	>3
Surface Resistance	IEC 249	ohm	≥ 1.0E+13
Volume Resistance	IEC 249	ohm-cm	≥ 1.0E+15
Dk (1G Hz)	IPC TM 650 2.5.5a		4.5
Df (1G Hz)	IPC TM 650 2.5.5a		0.013
Flammability	UL 94		V0

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