SAMSUNG SDI

The Optimum for Stronger, Lighter & More Efficient

INFINO® PPA

Value+ your imagination

Drive continuous growth in high-value products and a stronger customer focus

SAMSUNG SDI Chemical Division provides values to turn your imagination into reality with our innovative materials and optical solutions. We will strengthen our global competitive edge by developing high-end, differentiated products, strengthening product portfolios, and building foundations for global business.

Continued Demand for Metal Replacement

With the latest trends favoring lightweight, bigger size yet thin-wall applications, the market is increasingly calling for the development of lightweight and economically viable materials that could replace metals. A growing number of companies in the IT and display industries are pushing for bigger size yet slimmer design; key players in the automotive and E&E industries are trying to reduce weight and CO_2 emissions. To that end, these companies are actively implementing R&D to secure new metal replacement materials.

- Excellent mechanical strength
- Excellent high temperature properties
- Lighter than metal
- Cost reduction & Process efficiency

High Performance PPA, the Optimum for Stronger, Lighter & More efficient

Polyphthalamide(PPA) is a semi-crystalline material of the polyamide family that is formed by the reaction of aromatic acids with aliphatic diamines. Due to aromatic components, PPA has exceptional properties, such as high melting and glass transition temperature, chemical resistance and low moisture absorption compared with aliphatic polyamide. Thanks to such properties, PPA is used to replace metals in high temperature automotive applications, the housing for high temperature electrical connectors, LED and other applications.

Our Proposal

INFINO® High Performance Engineering Plastics of SAMSUNG SDI is made by combining traditional polymer with its progressive performance and technology. We also provide integrated solutions to help you to be more innovative and more efficient.

Material Solution

Design Solution

Technical Solution

Eco Way Solution

***INFINO*® PPA** offers unique value with its strong performance and proprietary design solutions. It is the most optimized material that can help your products stronger, lighter and more efficient.

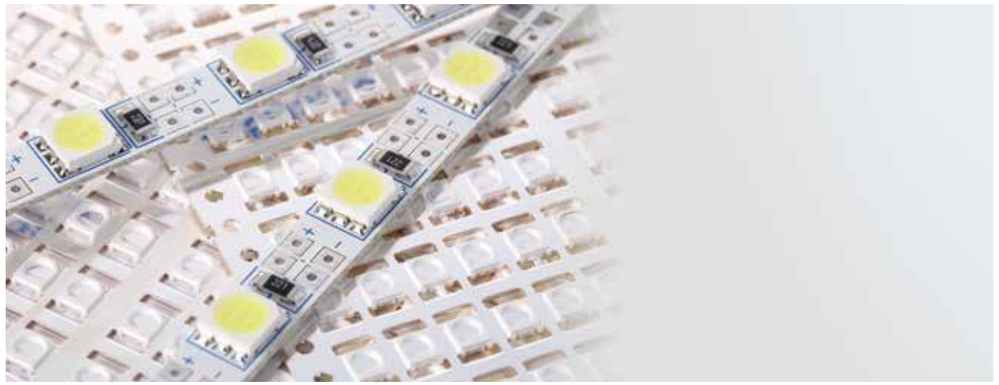
- Superior high temperature properties
- High strength and high stiffness
- Easy processing and excellent mechanical properties
- Outstanding appearance
- Low moisture absorption and low gas emission
- Excellent dimensional stability

Product Portfolio

INFINO® PPA				
LED	Connector	Automotive	Metal alternative	Special PA
TK-4046H	HX-4300G	HA-4350G	MX-4500G	XD-9010 *
TK-6036H	HX-4302G	HA-4450G	MX-4506	XD-9020 *
TK-6058WR	HX-4450G	HA-4350GH	CF-4150	
	HX-4452G	HA-4353G	MKD-1016	
		HA-4650A *	HM-4600G *	
		HA-4351G *	HM-4650G *	

* Under Development

LED Reflector

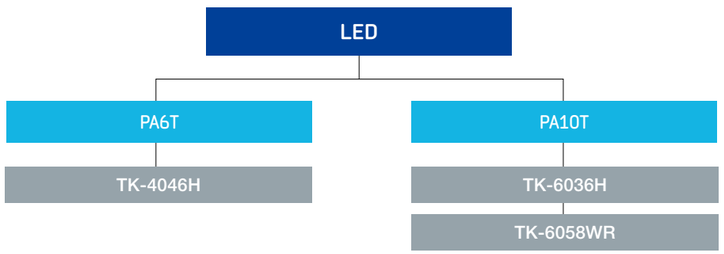


INFINO® PPA for LED reflector has outstanding reflectance for high initial brightness and high thermal and mechanical properties that endure SMT & curing processes. It also provides excellent reliability under LED working conditions.

KEY FEATURES

- High reflectance and low yellow index
- High persistency rate of reflectance
- High flowability and processability
- Good physical properties
- Low moisture absorption
- Excellent chemical and hydrolysis resistance
- Superior heat resistance

PRODUCT LINE UP



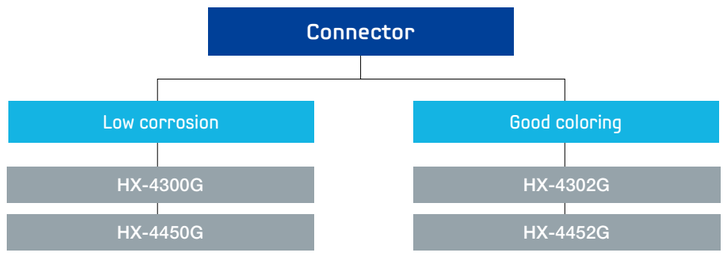
Connector

INFINO® PPA for connector has the highest stiffness and strength compared with other PPAs under high temperatures and chemical exposure. It also produces a minimum amount of blistering when it is heated to the elevated temperatures in all types of soldering processes.

KEY FEATURES

- Low corrosion of screw/mold of an injection molding machine
- Low gas emission
- Flammability value:
  (UL 94V-0 from wall thicknesses of 0.4 mm)
- High heat deflection temperatures (HDT 280°C)
- Well suited for SMT-reflow soldering
- Excellent mechanical properties
- Contains no halogen
  (compliant with WEEE & RoHS directives)

PRODUCT LINE UP



Automotive

INFINO® PPA can provide optimized automotive solutions armed with high strength, excellent heat and chemical resistance. It is also designed to reduce weight and improve fuel efficiency for automotive products.

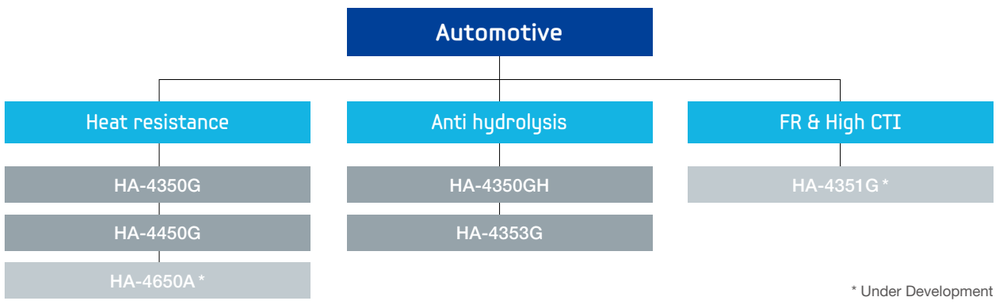
KEY FEATURES

- Superior high temperature performance
- Excellent chemical resistance
- Low moisture absorption
- Strength of physical properties
- High modulus when reinforced
- Wear-resistance
- Good electrical properties

APPLICATIONS

- Hot air system: Brake piston, Start motor housing
- Hot water system: Water outlet, Thermostat housing
- Fuel system: Fuel rail
- Electric system: High voltage connector

PRODUCT LINE UP



* Under Development

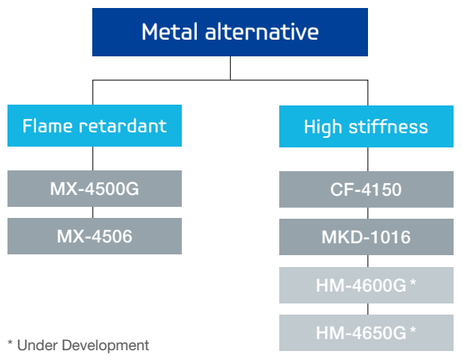
More Possibilities for Metal Alternative

INFINO® PPA for metal alternative has superior mechanical properties that can replace metal. It is ideal for high-quality metal replacement and, in particular, for very stiff, thin-wall, complex components with long flow paths.

KEY FEATURES

- High strength and rigidity
- Excellent impact resistance
- Excellent dimensional stability
- Low warpage
- Outstanding surface finish
- High flowability and easy processing
- Low moisture absorption

PRODUCT LINE UP



* Under Development

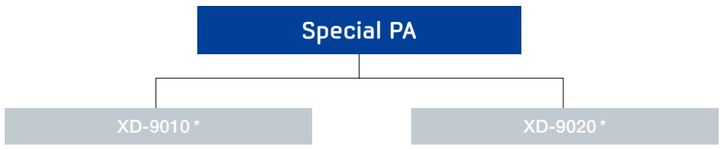
Special PA Materials

INFINO® PPA XD series is the trade name of MXD6, developed by SAMSUNG SDI. This is a crystalline polyamide derived from MXDA(m-xylene diamine) and adipic acid. *INFINO*® PPA XD series has excellent strength and gas barrier properties that can be used for package, film, structural materials and other applications.

KEY FEATURES

- High flexural modulus (10~25 GPa with various GF content)
- Superior appearance
- Low mold shrinkage
- Excellent gas barrier properties
- High heat resistance

PRODUCT LINE UP



* Under Development

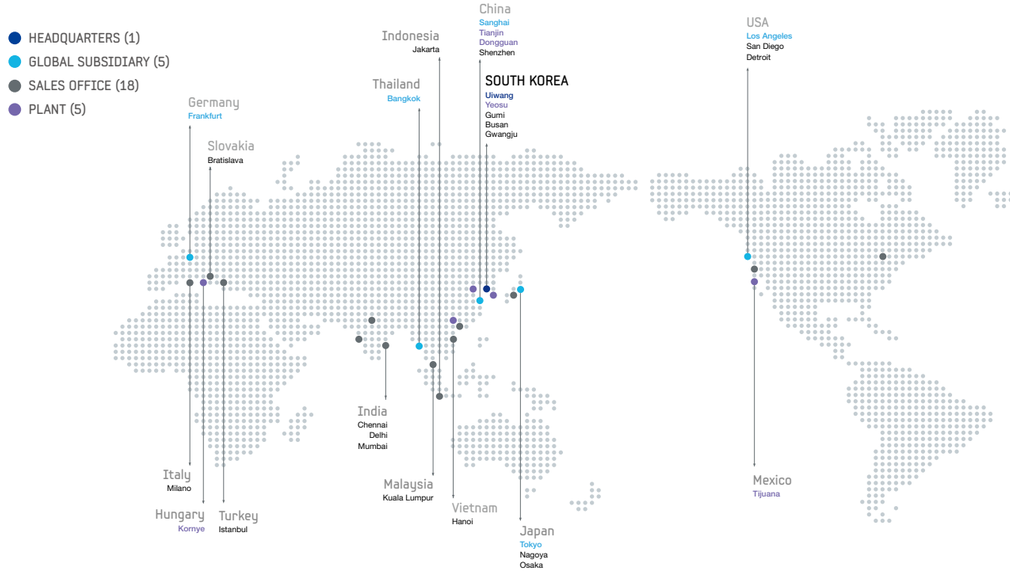
Product Selection Guide

				LED			Connector			
Properties	**Test Method**	**Condition**	**Unit**	**TK-4046H**	**TK-6036H**	**TK-6058WR**	**HX-4300G**	**HX-4302G**	**HX-4450G**	**HX-4452G**
		PHYSICALPROPERTIES								
Specific Gravity	ASTM D792	Natural Color	g/cm²	1.55	1.48	1.7	1.45	1.43	1.60	1.58
Mold Shrinkage (MD)	ASTM D955	Flow at 3.2mm(MD)	%			1.12	0.45-0.55	0.25-0.35	0.2-0.4	0.2-0.4
Mold Shrinkage (TD)	ASTM D955	X-Flow at 3.2mm(TD)	%				0.57-0.70	0.75-0.85	0.3-0.5	0.3-0.5
		MECHANICAL PROPERTIES								
Tensile Strength at yield	ASTM D638	5mm/min	kgf/cm²	1,000	1,000	500	1,700	1,450	1,600	1,500
	ISO 527-1A	5mm/min, 50mm/min*	Mpa	72 *	87 *	50 *	170	145	160	150
Tensile Strain at break	ASTM D638	5mm/min	%			1.8	3.0	3.5	3.0	3.0
	ISO 527-1A	5mm/min, 50mm/min*	Mpa	1.3 *	2.2 *	1.5 *	3.0	3.5	3.0	3.0
Tensile Modulus	ASTM D638	5mm/min	kgf/cm²				85,100	70,000	150,000	150,000
	ISO 527-1A	5mm/min	Mpa				9,600	7,000	15,000	15,000
Tensile Strength at Break	ASTM D638	5mm/min	kgf/cm²				1,700	1,450	1,600	1,500
	ISO 527-1A	5mm/min	Mpa				170	145	160	150
Flexural Strength	ASTM D790	2.8mm/min	kgf/cm²	1,500	1,500	850	2,200	2,200	2,400	2,400
	ISO 178	2mm/min	Mpa	122	135	87	220	220	240	240
Flexural Modulus	ASTM D790	2.8mm/min	kgf/cm²	72,500	60,000	44,000	100,000	95,000	135,000	135,000
	ISO 178	2mm/min	Mpa	6,900	5,800	3,500	10,800	9,500	13,500	13,500
Izod Impact Strength	ASTM D256	(notched)1/4	kgf-cm/cm			2.5	7	5	6	6
		(notched)1/8	kgf-cm/cm	3	3	3	6.5	5	6	6
Charpy Impact Strength	ISO 179 1eA	at 23°C, 4mm	KJ/m²	2	2.6	2	10	5	6	6
Izod Impact Strength	ISO 180 1A	at 23°C, 4mm	KJ/m²	2.8	2.6	3	9	5	6	6
Rockwell Hardness	ASTM D785	R-Scale	-			115	122	120	125	125
	ISO 2039-2	R-Scale	-	122	115	115	120	120	125	125
		THERMAL PROPERTIES								
Heat Deflection Temperature	ASTM D648	18.6kgf/cm², 6.4mm	°C	295	290	150	290	280	285	285
	ISO 75-2	Unannealed 1.8MPa, 4.0mm	°C			150		280	285	285
		FLAME CHARACTERISTICS								
Flammability	UL94	HB	mm	1.5	1.5	1.5				
		V-0	mm				0.4	0.4	0.4	0.4

Product Selection Guide

Properties	Test Method	Condition		Unit	HA-4350G	HA-4450G	HA-4350GH	HA-4353G	MX-4500G	MX-4506	CF-4150	MKD-1016
					Automotive				Metal Alternative			
PHYSICALPROPERTIES												
Specific Gravity	ASTM D792	Natural Color		g/cm³	1.47	1.57	1.46	1.44	1.63	1.61	1.56	1.56
Mold Shrinkage (MD)	ASTM D955	Flow at 3.2mm(MD)		%	0.4	0.2	0.2	0.2	0.21-0.26	0.1-0.3	0.1-0.3	
Mold Shrinkage (TD)	ASTM D955	X-Flow at 3.2mm(TD)		%	0.8	0.6	0.6	0.6	0.26-0.31	0.3-0.5		0.3
MECHANICAL PROPERTIES												
Tensile Strength at yield	ASTM D638	5mm/min		kgf/cm²	2,100	2,500	2,200	2,000	1,900	1,900	2,200	2,700
	ISO 527-1A	5mm/min		Mpa	215	243	210	210	180	190	188	260
Tensile Strain at break	ASTM D638	5mm/min		%	2.5	2.3	2.5	2.7	3.6	3.0	2.7	4.2
	ISO 527-1A	5mm/min		Mpa	2.5	2.3	2.5	2.7	3.6	3.0	3.0	4.2
Tensile Modulus	ASTM D638	5mm/min		kgf/cm²	130,000	160,000	111,000	125,000	84,000	165,000		190,000
	ISO 527-1A	5mm/min		Mpa	13,000	12,500	11,000	12,500	8,200	16,500		
Tensile Strength at Break	ASTM D638	5mm/min		kgf/cm²	2,100	2,500	2,200	2,000	1,800	1,900		2,700
	ISO 527-1A	5mm/min		Mpa	215	243	210	210	170	190		
Flexural Strength	ASTM D790	2.8mm/min		kgf/cm²	2,800	3,400	2,900	2,800	2,400	2,800	2,800	3,400
	ISO 178	2mm/min		Mpa	280	340	270	280	230	280	273	330
Flexural Modulus	ASTM D790	2.8mm/min		kgf/cm²	110,000	140,000	110,000	100,000	154,000	140,000	135,000	156,000
	ISO 178	2mm/min		Mpa	10,500	14,000	10,000	10,500	15,100	14,000	15,500	16,000
Izod Impact Strength	ASTM D256	(notched)1/4		kgf-cm/cm	9.5	9.5	8	10	6	8.5		12
		(notched)1/8		kgf-cm/cm	9.5	9.5	8	10	7	8.5	12.5	13
Charpy Impact Strength	ISO 179 1eA	at 23°C, 4mm		KJ/m²	10	11	9	10	7	8.5	16	17
Izod Impact Strength	ISO 180 1A	at 23°C, 4mm		KJ/m²					7	8.5	16	17
Rockwell Hardness	ASTM D785	R-Scale		-					120	120		121
	ISO 2039-2	R-Scale		-					120	120	116	121
THERMAL PROPERTIES												
Heat Deflection Temperature	ASTM D648	18.6kgf/cm², 6.4mm		°C	285	287	270	278	240	240	280	250
	ISO 75-2	Unannealed	1.8MPa, 4.0mm	°C	280	282	265	275	240	240		250
FLAME CHARACTERISTICS												
Flammability	UL94	HB		mm							0.8, 3.0	0.8, 1.5, 3.0
		V-0		mm					0.8	3.0		

Global Network



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SCI-M-032014

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