SolutionPartner

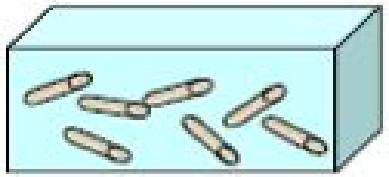
Introduction of LUCON

Thermally Conductive Materials

LG Chem
Tech Center

Introduction of Thermally conductive Plastics

☐ Definition

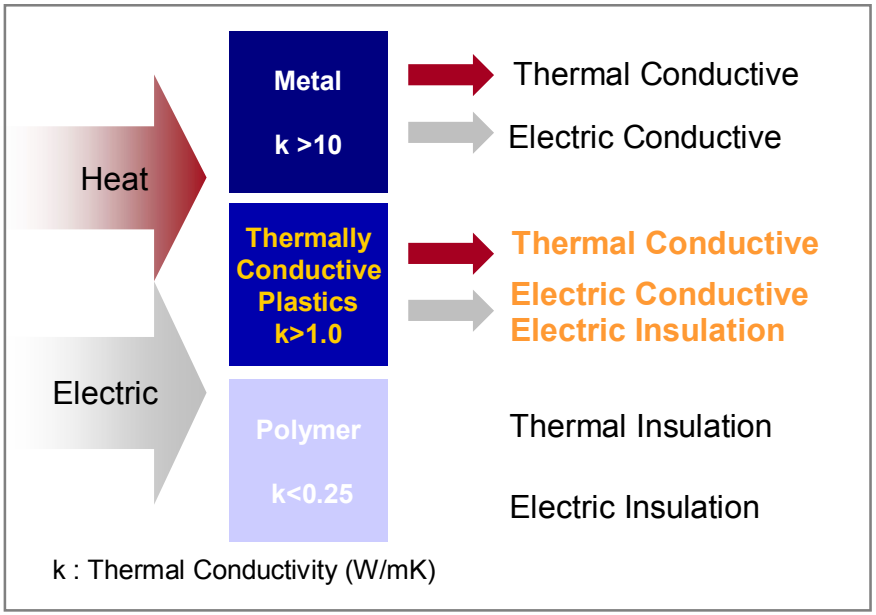


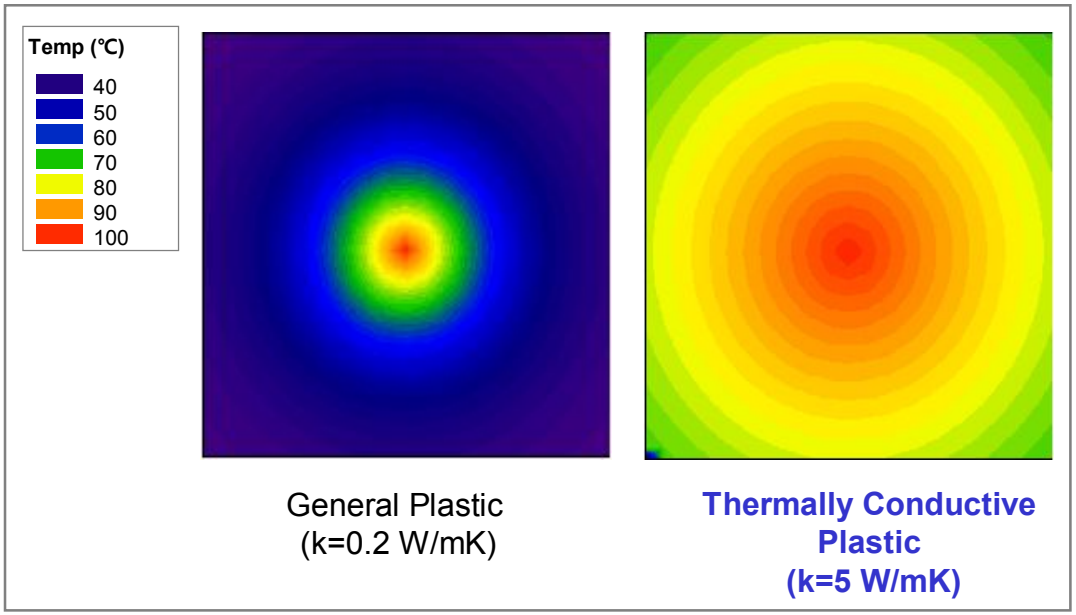
Polymer
(Low conductivity)

Conductive Filler
(High Conductivity)

Thermally Conductive Plastics

☐ Concept





Introduction of Thermally Conductive Plastics

☐ Benefits

Aluminum heat sink

- **Weight Reducing Effect**
  - Relatively lighter than metals
    (Specific Gravity : Al: 2.7, Plastic: 1.5)
- **Design Flexibility**
  - Increased design flexibility by Injection molding
  - Increased Productivity
- **Easy Installation**
- **Cost Saving**
  - No post processing or surface treatment

Thermoplastic heat sink

Introduction of Thermally conductive Plastics

☐ Applications

- Connectors
- Encapsulated Windings
- Housings / Enclosures
- Heat Sinks
- Heaters / Heat tubes
- LED Lighting
- Switches / Resistors
- Electro-motors
- Heat exchangers

LED Housing

LED Heat Sink

CPU heat spreader

Electro motors

Heat exchangers

Power resistor

Overmolded heat pipe

Heat tubes

Introduction of Thermally conductive Plastics

☐ Types

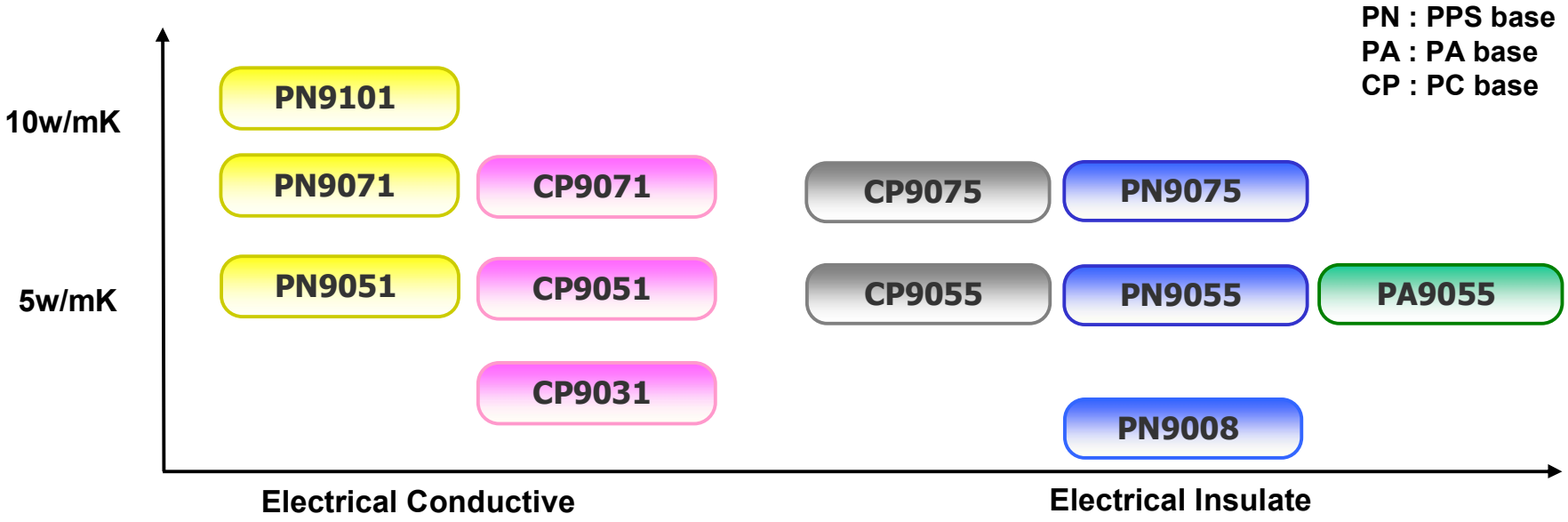
Thermally Conductive Polymer

Electrical Insulate	Electrical Conductive
Ceramic Filler : BN, MgO etc.	Metal & Carbon Filler
PPS, PC, PA etc.	PPS, PC, PA etc.




LG Chem. Thermally Conductive Plastics : LUCON 9000 Series

☐ Portfolio of LUCON 9000 series



Type	Grade	T.C (W/mK)	S.R (Ω)	UL94	Color
Electrical Conduction	PN9101	10	$<10^8$	V-0	Black
	CP9071	7	$<10^7$	V-0 (1.6T)	Black
Electrical Insulation	PA9055	5	$>10^{16}$	V-2 (1.6T)	White
	PN9075	7	$>10^{16}$	V-0	Light brown
	CP9075	7	$>10^{16}$	V-0 (1.6T)	White

Datasheet of LUCON 9000 series : Electrical Insulation

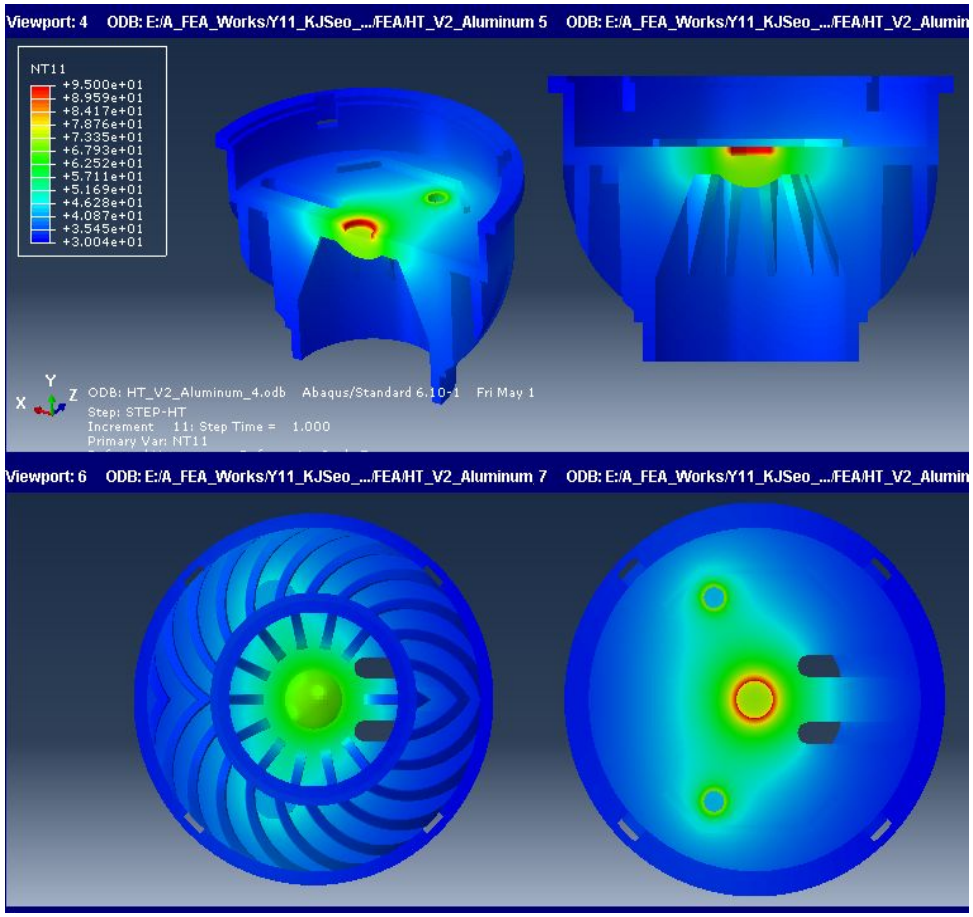
Property	Unit	Test Method	PN9008	PN9055	PN9075	PA9055	CP9055	CP9075
Mechanical								
Tensile Strength	kg_f/cm^2	D638	750	600	710	600	510	560
Elongation @ Break	%	D638	<5	<2	<2	5	2	2
Flexural Strength	kg_f/cm^2	D790	1200	750	760	720	580	580
Flexural Modulus	kg_f/cm^2	D790	110,000	117,500	140,000	76,000	100,500	110,000
Izod Impact	kg_f cm/cm	D256	2	2	<2	3	2	2
Physical								
Specific Gravity	-	D792	1.95	1.91	1.96	1.75	1.80	1.84
Mold Shrinkage	%	D955	0.4~1.0	0.4~0.8	0.4~0.8	0.4~0.8	-	-
Thermal								
Heat Deflection Temp.	°C	D648	250	250	260	200	130	135
Thermal Conductivity	W/m·K	E1461	2	5	7	5	5	7
Flammability								
Flame Retardancy	class	UL94	V-0(0.8T)	V-0(0.8T)	V-0(0.8T)	V-2(1.6T)	V-0(1.6T)	V-0(1.6T)
Electrical								
Surface resistance			$>10^{16}$	$>10^{12}$	$>10^{12}$	$>10^{16}$	$>10^{12}$	$>10^{12}$
Base Polymer			PPS	PPS	PPS	PA6,6	PC	PC

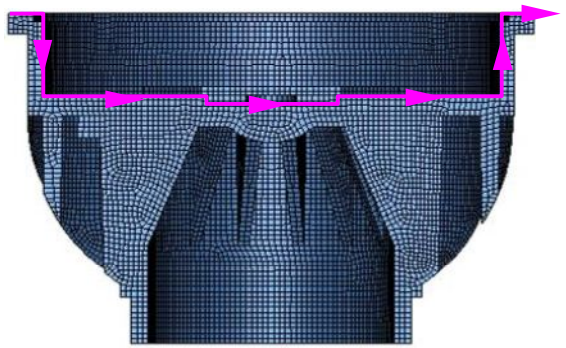
Datasheet of LUCON 9000 series : Electrical Conduction

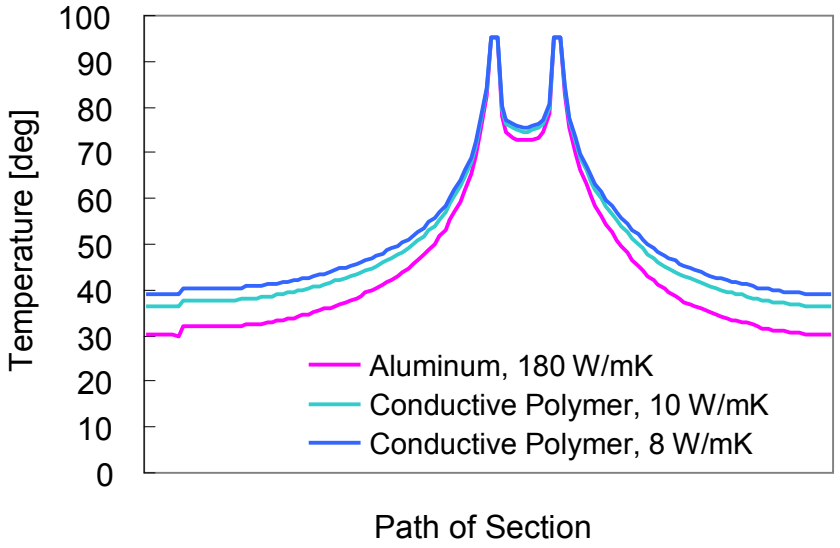
Property	Unit	Test Method	PN9051	PN9071	PN9101	CP9031	CP9051	CP9071
Mechanical								
Tensile Strength	kg_f/cm^2	D638	600	530	600	690	550	470
Elongation @ Break	%	D638	<5	<4	<4	<4	<5	<5
Flexural Strength	kg_f/cm^2	D790	850	800	900	900	700	650
Flexural Modulus	kg_f/cm^2	D790	110,000	117,500	120,000	65,000	60,500	85,000
Izod Impact	kg_f cm/cm	D256	2	2	2	<5	<5	<5
Physical								
Specific Gravity	-	D792	1.55	1.60	1.95	1.40	1.40	1.55
Mold Shrinkage	%	D955	-	-	-	-	-	-
Thermal								
Heat Deflection Temp.	°C	D648	210	230	260	130	130	130
Thermal Conductivity	W/m·K	E1461	5	7	10	3	5	7
Flammability								
Flame Retardancy	class	UL94	V-0(0.8T)	V-0(0.8T)	V-0(0.8T)	V-0(1.6T)	V-0(1.6T)	V-0(1.6T)
Electrical								
Surface resistance			$<10^7$	$<10^5$	$<10^5$	$<10^7$	$<10^{5\sim7}$	$<10^{5\sim7}$
Base Polymer			PPS	PPS	PPS	PC	PC	PC

LG Chem Thermally Conductive Plastics

☐ Design Solution for Thermal Management







Thank You