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LCP Film

Special Solution Casting Technology

Thermotropic Liquid Crystalline Polyester Film

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Features 1

★ Utilizing our own developed special thermoplastic resin.

★ Molecules will be aligned(liquid crystal state) when melted (Alpha Moss condition).

★ With our casting method (molding using a solvent), instead of melt molding (Melt molding), in order to eliminate imbalance due to unbalanced center of gravity,suppleness and high strength characteristics can be realized.

★ It is an aromatic polyester resin obtained by ester linkage in a linear chain with basic structure such as parahydroxybenzoic acid.

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Features 2

★ Excellent heat resistance (>270℃) Appropriate for solder flow
High melting point
High glass transition temperature stance

★ Excellent Flame retardancy

★ Excellent Stiffness like metal & Softness like rubber
High Tensile Strength(crystallinity) and Tensile modulus
High rigidity

★ Low viscosity, High fluidity

★ Low Moisture absorption

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Features 3

★Excellent High insulation properties at high frequencies

★Excellent Low dielectric properties at high frequencies

★Excellent Chemical resistance

★Excellent Gas barrier property

★Excellent Energy characteristics at high frequencies.

★Non-oriented LCP Film

Property

Property	Unit	Conditions	Resutls
Electrical Characteristics			
Relative permittivity	-	1GHz	3.09
Volume resistivity	Ω・cm	23℃	39 x 10^{17}
Water absorption Characteristics			
Water absorption	ppm/℃	85℃/85%RH@168hr	< 0.1
Mechanical Characteristics			
Tensile Strength	Mpa	25℃	60[*1]
Modulus of elasticity	Mpa	25℃	3000[*1]
Growth rate	%	25℃	7[*1]
Heat Characteristics			
Solar heat resistance	-	270℃/30 sec	PASS
Melting Point		300℃/3 sec	PASS
Melting Point	℃	DSC method	316
Thermal Conductivity	W/m・K	-	0.38

*1 Aneling : 300℃/60min

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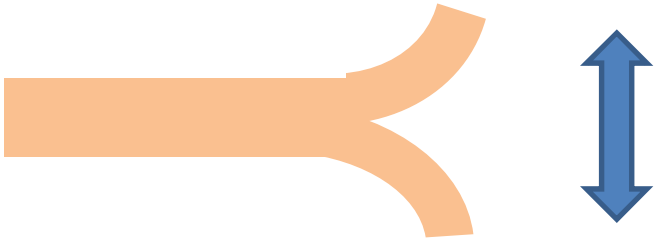
Tear Strength

LCP Film	JP World	Competitor
Method	**Cast**	**Extrusion (Melt process)**
Tear propagation resistance (mN)	**54**	**38**



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Comparison

Item		Unit	LCP	PET	PI
Melting Point（Tg）			316	149	>300
Solder heat resistance		270℃×30s	○	×	○
Dielectric property	Dielectric Constant	1GHz	3	3.2	3.3
	Dielectric tangent	1GHz	0.004	0.005	0.009
Water Absorption : 85 ℃ × 85% RH × 168 h		(%)	<0.1	0.3	1.6
Moisture Vapour Transmission Rate Ambient Temp x 24h		(%)	1.3	2.2	2

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Application 1

★ Adhesion and Heat dissipation of Electronics material

★ FPC circuit board

★ LED board

★ Solar battery

★ Speaker

★ Microphone

★ Etc

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Application 2

SONY
make.believe

Hi-Res AUDIO

DSEE HX
Digital Sound Enhancement Engine

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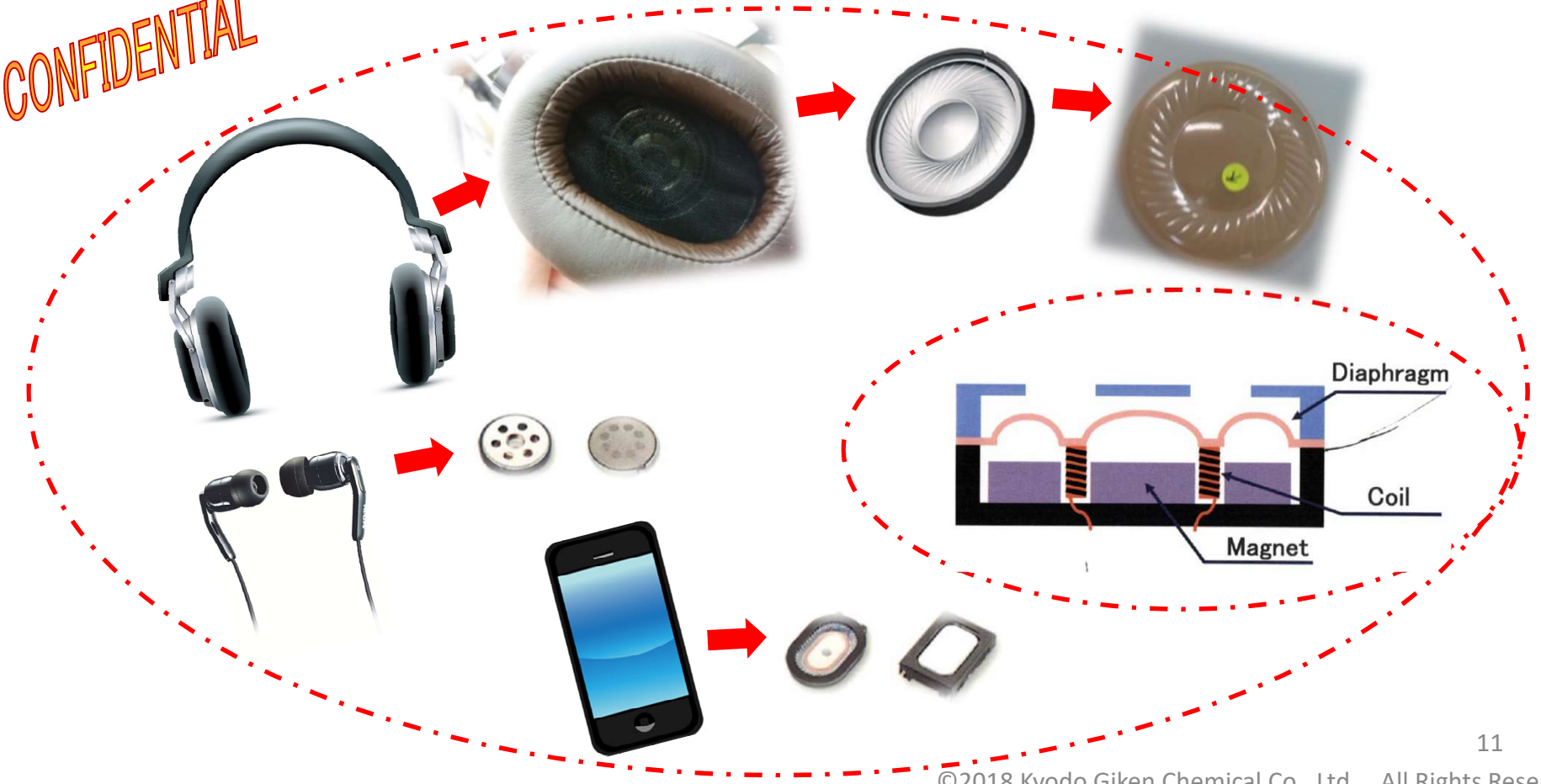
Application 3

Diaphragm for Acoustic parts

As a Speaker diaphragm material,
it produces delicate and high quality sound, moreover, makes the sound sensitive and low distortion.



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Viscoelastic Property 1

Object : Confirm the Viscoelastic characteristic by the change of extended vibration load frequency.
Samples : LCP film thickness: 25 μm
PET film thickness: 25μm
PEEK film thickness: 29μm
Measuring instrument : A & D Company Ltd.
Measurement condition : Storage modulus ・loss modulus between 1Hz to 100Hz.
Sensor : Forced oscillation and vibration
Load : 400gf
Frequency : 1Hz~100Hz

Test results : LCP is superior to PET and PEEK in the sounds expression which is hard to resonate, less sensitive and less delicate.

	Density		Poisson's ratio	Elastic modulus			Sonic Speed		Loss Coefficient
	g/cm^3	kg/m^3		Mpa	Pa	dyne/cm^2	cm/sec	m/sec	
LCP	1.4	1400	0.39	2.90E+03	2.90E+09	2.90E+10	203273.7	2033	0.042
PET	1.39	1390	0.39	2.50E+03	2.50E+09	2.50E+10	189412.6	1894	0.025
PEEK	1.33	1330	0.39	4.20E+03	4.20E+09	4.20E+10	251282.0	2513.0	0.007
Magnesium	1.7	1700		2.20E+04	2.20E+10			5140	0.005
Aluminum	2.7	2700		6.86E+03	6.90E+09			5130	0.002

Sonic Speed : A large value can express a delicate sound
Loss coefficient : A low value is easy to make resonance at specific frequency

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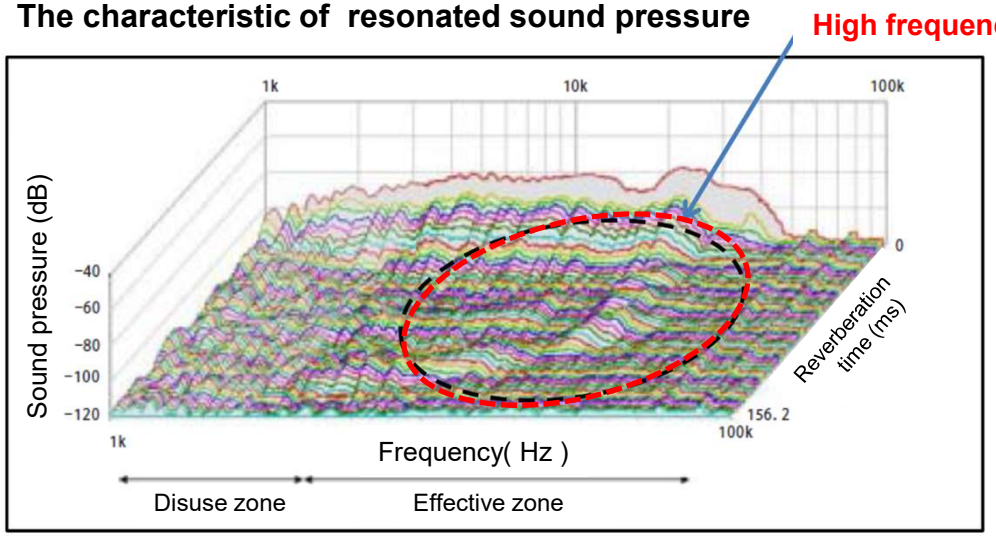
Viscoelastic Property 2

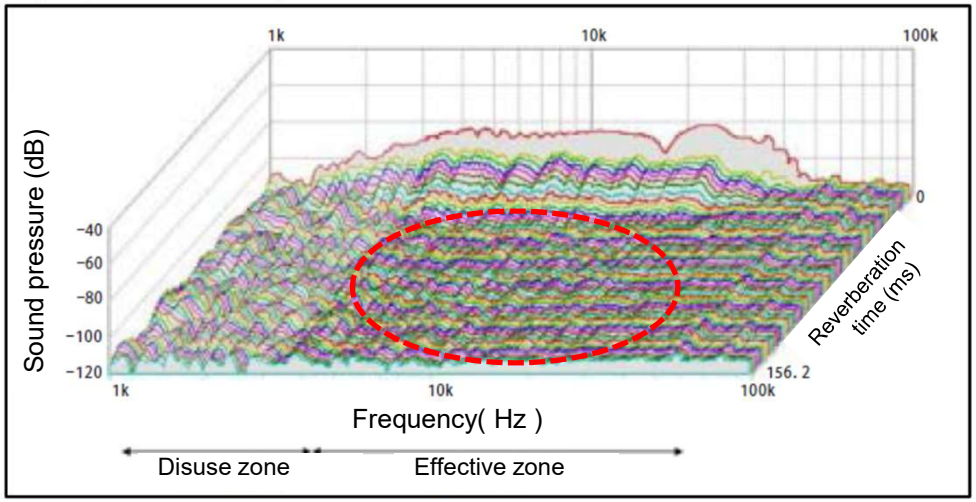
Low loss coefficient

The characteristic of resonated sound pressure



High loss coefficient

The characteristic of non resonated sound pressure



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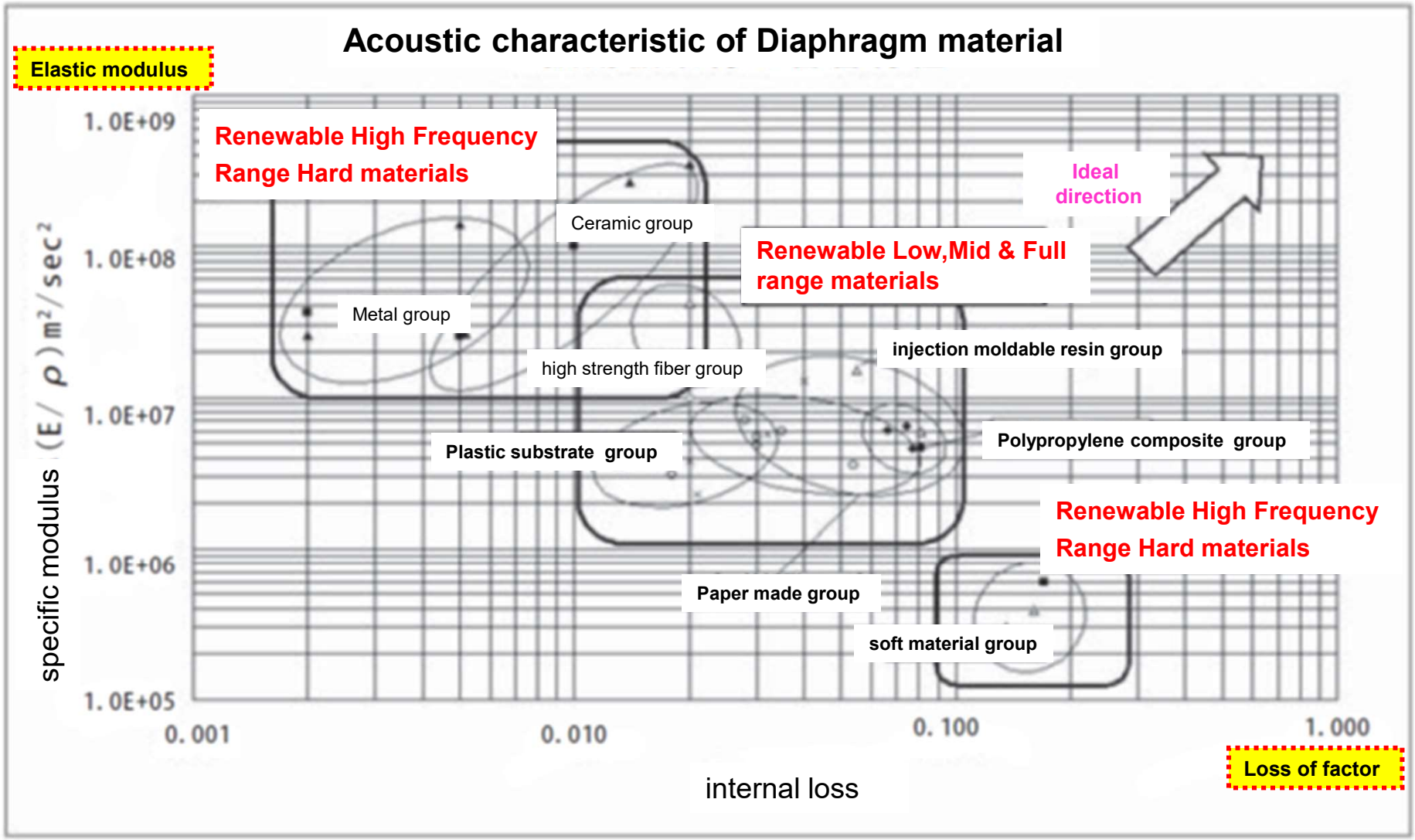
Viscoelastic Property 3



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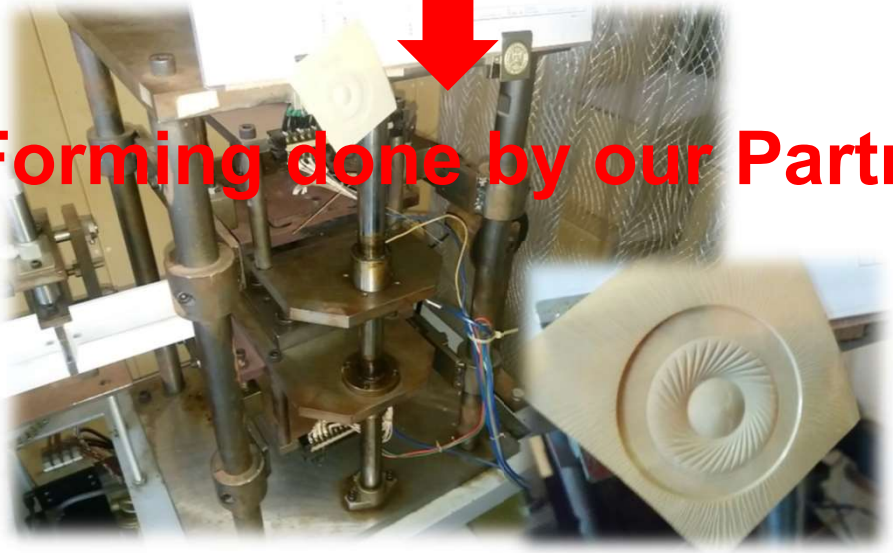
Supply Chain

We manufacture LCP Jumbo Rolls

Forming done by our Partner



Provide for
Set Maker
Module Maker

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Forming Condition

Forming conditions：200℃×0.5MPa×2~5min

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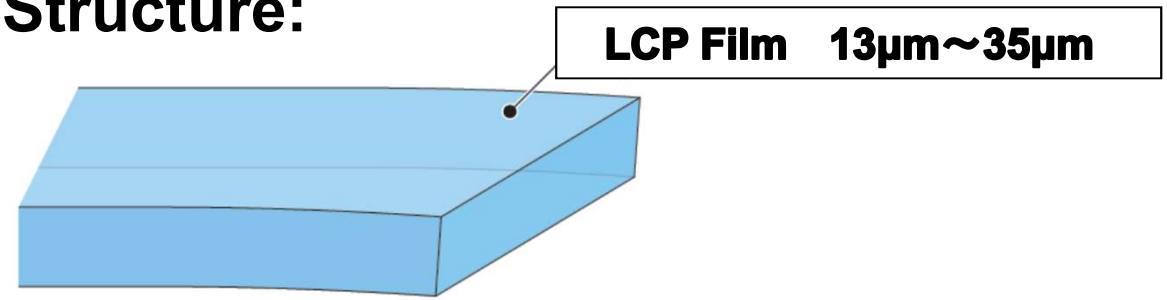
Available Sizes

Structure:



Sizes:

Products	Thickness(μm)	Color	Standard Roll Size
SAR 13	13	Brown	300mm x 20M
SAR 20	20		
SAR 25	25		
SAR 30	30		
SAR 35	35		

*Please inquire for more different thickness and width

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User is responsible for determining whether the KGK product is fit for a particular purposeand suitable for user's method of application.
Please remember that many factors canaffect the use and performance of a KGK product in a particular application.
The materials to be bonded with the product, the surface preparation of those materials, the product selected for use, the conditions in which the product is used, and the time and environmental conditions in which the product is expected to perform are among the many factors that can affect the use and performance of a KGK product. Given the variety of factors that can affect the use and performance of a KGK product, some of which are uniquely within the user's knowledge and control. It is essential that the user evaluate the KGK product to determine whether it is fit for a particular purpose and suitable for the user's method of application. KGK make no warranties on above data.

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