

LTCC stands for "Low Temperature Co-fired Ceramics," a ceramic that can be co-fired with conductors at lower temperatures than common alumina. In addition to green sheets, we also handle as-sintered boards without wiring patterns and other materials. By carefully listening to customer needs and proposing optimal product types and sizes, we can respond to a wide variety of demands, including product miniaturization, low profile, high frequency compatibility, and improved productivity.



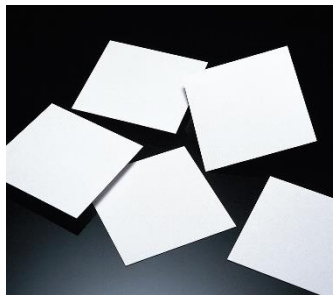
LTCC Green Sheets

LTCC Green Sheets are made by mixing alumina powder and glass powder and forming them into sheets. Our green sheets offer low shrinkage ratio deviation ($<\pm 0.3\%$) and high printability (L/S: $50\mu\text{m}/50\mu\text{m}$), enabling high-density, high-precision machining. In addition, various features can be provided by changing the characteristics of each powder and the balance of mixing, so we propose an optimal design to suit your needs.



Green Sheets of Glass/Ceramics Powders

In addition to LTCC, we also support sheet processing of ceramic powder and glass powder. It is possible to form sheets of various materials such as alumina, zirconia, cordierite, and glass, so please feel free to consult us.



Alumina Substrates

(Al_2O_3 Substrates)

Our alumina substrates are products with excellent flatness and surface smoothness ($R_a \approx 0.1$). Due to durable against repeated heating, it is used in a variety of applications. We offer a wide range of substrates with thicknesses of about $80\mu\text{m}$ to 1mm and a maximum size of about $\square 270\text{mm}$. It can also be machined into a particular shape, such as a disc.

● Features

Custom design support

Our green sheets are customizable in size and thickness, shrinkage rate, coloring, various physical properties, and product form (rolls or pieces). We offer a wide range of solutions on request, including proposals for colors and optimal metal paste.

Available for small lot orders

Both standard and custom products can be provided, from small quantities such as tens sheets for prototypes to mass production.

Environmentally Friendly

All of our green sheets are environmentally friendly products (for example, lead-free, and so on).

Contact Information

New Product Development Department
4207 Ikonobecho, Tsuzukiku, Yokohama, 224-0053 Japan
URL : <https://www.yama-ph.co.jp/en/contact/> (Inquiry form)

This products information is subject to changed or updated without notice.

Yamamura Photonics offers green sheets with various features as standard products. Refer to the table below for the characteristics of each product. In addition, we also offer custom design support from small lots. To respond to your request, we can change the size and thickness, control the shrinkage ratio, design each property value, and introduce the optimal metal paste, so please feel free to inquire.

Normal Type / Low Dielectric Constant Type / Low Loss Type

	Product Name	単位	GCS50*	GCS60*	GCS71*
Substrate	Type		Low-k	Low-loss	Standard
	Dielectric constant		5.0	6.0	7.1
	Dielectric loss (tanδ) at 1MHz	%	< 0.3	< 0.1	< 0.3
	Sintered density	g/cm ³	2.34	2.79	2.85
	Flexural Strength	MPa	120	240	250
	Thermal Expansion Coefficient	ppm/°C	3.9	4.8	5.3
	Thermal conductivity	W/m·K	1.1	2.1	2.6
	Reflectance at t0.4mm, λ=450nm	%	-	-	85
Green sheet	Firing Shrinkage (X-Y)	%	12.8±0.5	13.1±0.5	13.0±0.3
	Firing Shrinkage (Z)	%	(32)	(30)	(28)
	Size	mm	□100~500	□100~500	□100~500
	Thickness	μm	30~200	30~300	30~300

High Strength Type / High Reflectivity Type / Alumina Substrate

	Product Name	単位	GCS74*	GCS79*	ACS*
Substrate	Type		High Strength	High-Ref.	Alumina
	Dielectric constant		7.4	7.9	-
	Dielectric loss (tanδ) at 1MHz	%	< 0.3	<0.3	-
	Sintered density	g/cm ³	3.02	3.10	> 3.80
	Flexural Strength	MPa	300	210	> 380
	Thermal Expansion Coefficient	ppm/°C	5.7	4.9	6.3
	Thermal conductivity	W/m·K	3.3	1.7	36.4
	Reflectance at t0.4mm, λ=450nm	%	87	92	-
Green sheet	Firing Shrinkage (X-Y)	%	13.3±0.3	12.8±0.3	13.0-14.0
	Firing Shrinkage (Z)	%	(29)	(30)	19-23
	Size	mm	□100~500	□100~500	□100~500
	Thickness	μm	30~200	30~200	50~200

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