

**Product Information Vol. C1**

**Inquiry and Contact...**

**Marketing Department**

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**URL: [http://www.yama-ph.co.jp/index\\_e.html](http://www.yama-ph.co.jp/index_e.html) (inquiry Form)**

**1 Outline**

LTCC (Low Temperature Co-fired Ceramic) is the multi-layered glass ceramic substrate which is co-fired with conductive paste at lower firing temperature than that of the alumina sheet. We can provide not only LTCC Green sheets which are our main products, but also blank substrates or other trial product samples. Please feel free to contact us.

**2 Features**

**< Features >**

- Made in Japan: All products are in-house manufactured in Japan
- Various Form: Customers can select the preferable products i.e. size, thickness, color and shape (roll or individual sheet).
- Eco-Friendly: All products are free from environmentally hazardous substances.
- Customized: We can customize products to meet every customers' requirement.  
In addition, we can also totally propose LTCC products and conductive paste suitable for the needs.
- Quantity: We can accept small scale-orders in addition to mass production.
- Others: We can develop sheets made of materials other than LTCC.

**< Main Products >**

	Product Name	unit	GCS50*	GCS60*	GCS71*	GCS74*	GCS79*	ACS*
<b>Substrate</b>	Type	-	低誘電率 Low-k	低損失 Low-loss	一般 Standard	高強度 High Strength	高反射 High-Ref.	アルミナ Alumina
	Dielectric constant	-	5.0	6.0	7.1	7.4	7.9	-
	Dielectric loss (tanδ) at 1MHz	%	< 0.3	< 0.1	< 0.3	< 0.3	< 0.3	-
	Sintered density	g/cm <sup>3</sup>	2.34	2.79	2.85	3.02	3.10	>3.80
	Fracture strength	MPa	120	240	250	300	210	>380
	Thermal Expansion Coefficient	ppm/°C	3.9	4.8	5.3	5.7	4.9	6.3
	Thermal conductivity	W/m·K	1.1	2.1	2.6	3.3	1.7	36.4
	Reflectance at t0.4mm, λ=450nm	%	-	-	85	87	92	-
<b>Green sheet</b>	Firing shrinkage (X-Y)	%	12.8±0.5	13.1±0.5	13.0±0.3	13.3±0.3	12.8±0.3	13.0-14.0
	Firing shrinkage (Z)	%	(32)	(30)	(28)	(29)	(30)	19-23
	width	mm	□100~500	□100~500	□100~500	□100~500	□100~500	□100~500
	thickness	μm	30~200	30~300	30~300	30~200	30~200	50~200

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