

## LTCC Powder 51K65



### Lead Free Powder for Casting LTCC Tape / DPIS\*

#### \* Development Product Information Sheet

#### Description

51K65 is a premixed lead free and gray LTCC dielectric powder and designed for tape applications such as LTCC and passive component manufacture. In these applications the relatively very low loss of this material allows for the production of high performance components and multilayer circuits.

51K65 is compatible with Heraeus binder system TOP 7765 and other binder systems typically used in tape fabrication. In tape form this material is also compatible with Heraeus' silver and gold conductor systems.

#### Typical Properties (Fired)

Color <sup>4)</sup> :	gray
Relative Dielectric Constant K ( $\epsilon_r$ ) <sup>3)</sup> :	61 – 67 (1.5 VAC, 1 MHz, 25°C)
Dissipation Factor ( $\tan \delta$ ) <sup>3)</sup> :	< 0.01 (1.5 VAC, 1 MHz, 25°C)
TCE <sup>4)</sup> : (Temp. Coeff. of Expansion)	c. 9.1 ppm / K (25 – 300°C)

#### Typical Properties (Powder)

Powder Density	5.3 – 5.9 g / cm <sup>3</sup> (Pycnometer in Helium)
Average Particle Size (D50)	0.35 – 0.75 $\mu$ m (Equipment – Helos BA)
Specific Surface (BET)	6.0 – 10 m <sup>2</sup> / g (Equipment – Gemini)
Pb Element Content <sup>1)</sup>	< 100 ppm (ICP <sup>2)</sup> analysis method)
Shelf Life:	12 months, with correct storage (in a dry place and with the container tightly shut).

1. Raw materials applied are entirely lead free.
2. Inductively Coupled Plasma
3. Measured on discs manufactured according to Test Procedure "TP LTCC 2".
4. Measured on fired tape.

## LTCC Powder

### 51K65



Lead Free Powder for Casting LTCC Tape / DPIS\*

The descriptions and engineering data shown here have been compiled by Heraeus using commonly-accepted procedures, in conjunction with modern testing equipment, and have been compiled as according to the latest factual knowledge in our possession. The information was up-to date on the date this document was printed (latest versions can always be supplied upon request). Although the data is considered accurate, we cannot guarantee accuracy, the results obtained from its use, or any patent infringement resulting from its use (unless this is contractually and explicitly agreed in writing, in advance). The data is supplied on the condition that the user shall conduct tests to determine materials suitability for a particular application.

Europe [TH]  
W. C. Heraeus GmbH

Thick Film Materials Division  
Heraeusstr. 12 – 14  
63450 Hanau  
Germany  
Tel: +49 (6181) 35 – 5466  
E-Mail: [th-info@heraeus.com](mailto:th-info@heraeus.com)  
Internet: [www.heraeus-th.com](http://www.heraeus-th.com)

North America  
Heraeus Incorporated

Thick Film Materials Division  
24 Union Hill Road  
W. Conshohocken, PA 19428  
USA  
Tel: +1 (610) 825 – 6050  
E-Mail: [techservice.hcd@heraeus.com](mailto:techservice.hcd@heraeus.com)  
Internet: [www.thickfilm.net](http://www.thickfilm.net)

Asia [TH]  
Heraeus Materials Technology Shanghai  
Ltd.

No. 1 Guang Zhong Road  
Zhuanquiao Town, Minhang District  
201108 Shanghai  
People's Republic of China  
Tel: +86 (21) 6442 6838  
E-Mail: [th.hmts@heraeus.com](mailto:th.hmts@heraeus.com)  
Internet: [www.heraeus-th.com](http://www.heraeus-th.com)