

LTCC Tape

CT765

Low Temperature Co-firing Ceramic Tape

Description

Heratape® CT765 is a High-k Low Temperature Co-firing Ceramic (LTCC) with a K value of 65. CT765 is supplied at following thicknesses and usable width:

	Thickness		Width	
CT765	4.3 mil	90 µm	12.6 inch	320 mm
		150 µm		

Other thicknesses are available on request. CT765 can also be provided as single sheets.
CT765 is a free sintering LTCC tape.

Typical Properties of Green Tape

Color	grey
Green Density	3.09 g/cm ³
Laminated Density	3.13 g/cm ³
Compressibility	14.5 %
Weight Loss	9.3 %

Note: All measurements were performed on 9-layer tape laminates (tape thickness: 130 µm) due to Heraeus' recommended process guidelines.

Recommended Process Guidelines

CT765 can be processed with typical LTCC process parameters. Recommended process guidelines are:

Storage and Pre-treatment

Storage	Kept in sealed bags at 25 °C.
Pre-Treatment	Not necessary.

Lamination

Equipment	Isostatic press
Pressure	210 bar (21 N/mm ²)
Temperature	70 °C
Pre-heating	3 min
Total Time (incl. Pre-heating)	10 min

Tape must be kept in a sealed, evacuated bag during lamination in order to prevent moistening by isostatic press media.

Firing

	900 °C_3h
Ramp Rate (25 °C to 500 °C)	2 K/min
Time at 500 °C	30 min
Ramp Rate (500 °C to Peak Temp.)	3 K/min
Peak	180 min/900 °C
Cooling	3 K/min
Total Time	15 hours

Firing should be done in an box oven in air with 3000 l/h air flow. Alumina setters are recommended.

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Properties

Typical Fired Physical and Chemical Properties

Color	grey
Thermal Coefficient of Expansion (25 – 300 °C)	9.1*10 ⁻⁶ /K
(25 – 600 °C)	10.5*10 ⁻⁶ /K
Tape Shrinkage x,y	19.3 % ± 0.5
z (unlaminated to fired)	28.9 % ± 4.0
Fired Density	5.57 g/cm ³
Flexural Strength 4 point bended	t.b.d.
Thermal Conductivity	t.b.d.
Pb-content	<40 ppm
Chemical Stability	t.b.d.

Note: All physical testing is performed on 9-layer tape substrates (tape thickness: 130 µm) with no metallization, and processed according to Heraeus' recommended processing guidelines

Typical Fired Electrical Properties

Dielectric Constant (1 MHz)*	65 ± 4.0
(2.5 GHz)**	68.7 ± 0.5
(100 GHz)	t.b.d.
Dissipation Factor (1 MHz)*	< 0.2 %
(2.5 GHz)**	< 0.2 %
(100 GHz)	t.b.d.
Temperature Coefficient of Frequency (-40 °C/80 °C) Tf	-12.9 ppm/K (600 MHz)
Bulk Resistivity	t.b.d.
Break Down Voltage	t.b.d.

Note: *Testing is performed on a pressed and fired pill with silver metalization.

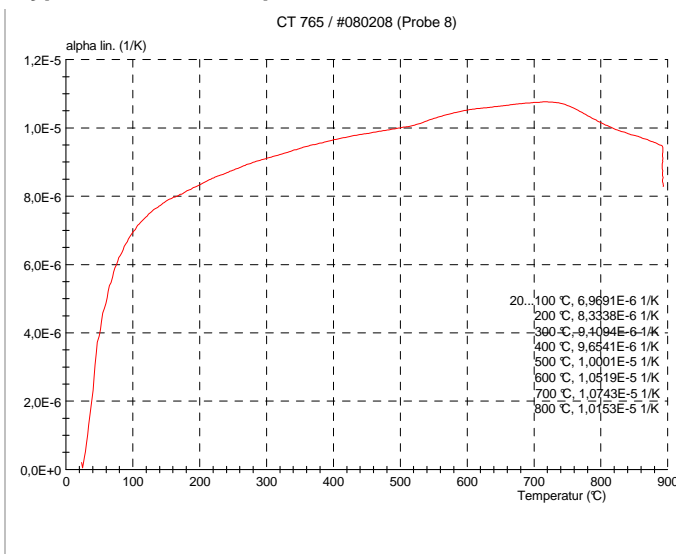
**HF measurements were performed on test circuits made of fired substrates by means of a vector network analyzer. All other electrical testing is performed on parts manufactured according to Heraeus' recommended process guidelines with silver-based conductor systems.

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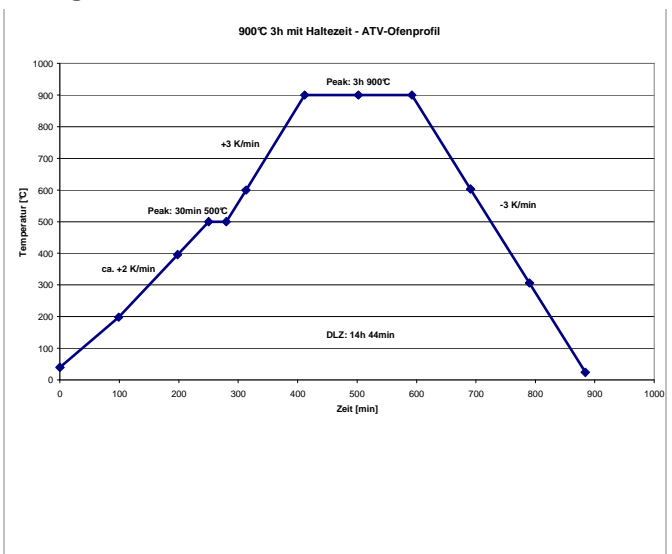
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Appendix

Typical Thermal Properties

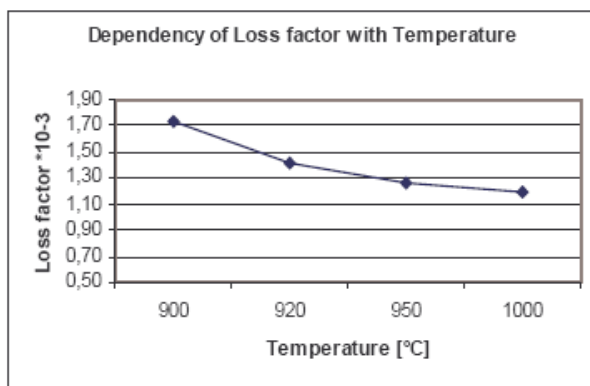


Firing Profile

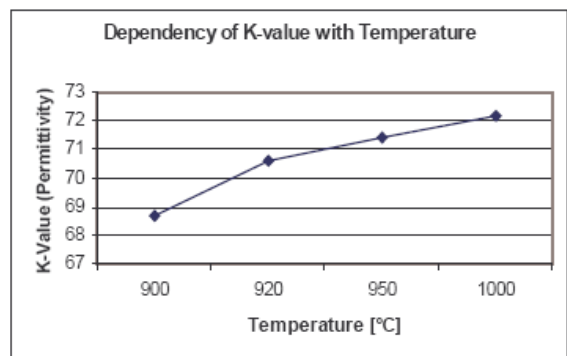


Typical HF-Data

Loss Factor of Heratape CT 765



K Value of Heratape CT 765



Note: HF measurements were performed on test circuits made of fired substrates by means of a vector network analyzer.

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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: info@heraeus-th.com
Internet: 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@4cmd.com
Internet: www.heraeus-th.com

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
Internet: www.heraeus-th.com