

## Advanced Materials

### HeraLock<sup>®</sup> Tape HL800

#### Low Temperature Co-Fireable Tape (DPIS\*)

\* Development Product Information Sheet

US Patented

#### Description:

Heraeus' new HL800 low-temperature co-fireable ceramic (LTCC) tape is self-constraining, allowing near zero x-y shrinkage for the production of high performance LTCC devices with no additional processing or tooling.

HL800 has properties appropriate for applications such as general-purpose packaging, automotive modules and RF applications requiring low-loss at high frequencies.

The main difference between HL800 and all other LTCC tapes is its unique shrinkage properties during firing. Free-sintered HL800 densifies by shrinking in the z-axis.

#### Lamination Conditions – isostatic

Pressure:	210 bar
Temperature:	70 °C
Dwell Time:	240 sec.
Pre-heating:	180 sec.

#### Key Benefits:

- Near zero (0.5 %) x-y shrinkage with no added processing steps
- Resists camber
- Cavity structures cut into the green HeraLock<sup>®</sup> tape show no x-y shrinkage or distortion after firing
- Lead and cadmium free

#### Typical Fired Electrical Properties of HL800:

Dielectric Constant @ 2.5 GHz :	6.8 ± 10%
Dissipation Factor (loss tangent) @ 2.5 GHz:	< 5 * 10 <sup>-3</sup>
Thermal Coefficient of Expansion (25°C to 300°C):	5.7 * 10 <sup>-6</sup> /K
Insulation Resistance (@ 25°C):	> 10 <sup>13</sup> Ωcm

## Advanced Materials

### HeraLock<sup>®</sup> Tape HL800

#### Low Temperature Co-Fireable Tape (DPIS\*)

**\* Development Product Information Sheet**

*US Patented*

**Burnout and Firing Profile in a Box Oven:**

Ramp at 6 K/min to 300 °C for start of burnout  
 Burnout: ramp at 2.5 K/min to 470 °C  
 (typically no holds are required during burnout)  
 Ramp at 3 K/min to 880 °C  
 Firing peak: 880 °C for 45 minutes  
 Cool at 9 K/min to 700 °C  
 Cool at 27 K/min to room temp.

**Recommended Setter:** Porous or Honeycombed

**Typical Unfired Properties of HL800:**

Green Density: 2.0 ± 0.2g/cm<sup>3</sup>

Green Sheet Thickness: 130µm

**Typical Fired Properties of HL800:**

Shrinkage (free sintered):  
 x,y < 0.5%  
 z 32.0%

Fired Density: 3.2 ± 0.2 g/cm<sup>3</sup>

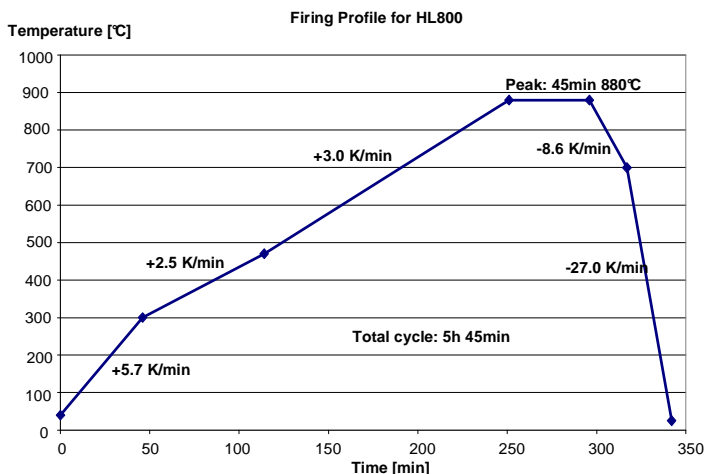
Fracture Strength: > 160 MPa (4 point bending)

Porosity: < 5%

**Co-Fire Conductor System for HL800:**

Similar to Standard LTCC Heratape CT800

**The information given in this datasheet is preliminary and subject to change.**



2/2

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  
 Internet: www.heraeus-th.com  
 SM071108

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  
 Internet: 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) 3357 5473  
 E-Mail: th.hmts@heraeus.com  
 Internet: www.heraeus-th.com

**W. C. Heraeus**