Heraeus’ X-200W LTCC powder mix is designed to be cast into green tape used for module and passive component applications. In these applications, the relatively low permittivity and low loss of this material allow for the production of high performance components and multilayer circuits.

X-200W is compatible with binder systems typically used in tape fabrication. In tape form, this material is also compatible with Heraeus’ silver and gold conductor systems.

**Description**

- REACH® and ROHS® compliant
- Silver conductor compatible
- Lead and cadmium free
- High Q
- Near zero $T_f$ (temperature coefficient of frequency)

**Key Benefits**

- REACH® and ROHS® compliant
- Silver conductor compatible
- Lead and cadmium free
- High Q
- Near zero $T_f$ (temperature coefficient of frequency)

**Typical Properties (Powder)**

- **Particle Size**
  - D90: 5.0 – 7.0 $\mu$m
  - D50: 2.25 – 3.25 $\mu$m
- **Surface Area**: 2.4 – 3.0 $m^2/g$
- **Fired Density**: 3.0 – 3.2 g/cm$^3$

**Burnout and Firing in a Box Oven**

- **Heating Rate**: 5 – 5.5 °C/min
- **Peak Temperature**: 870 – 880 °C
- **Dwell Time at Peak**: 20 – 30 mins
- **Cooling Rate**: ~ 3 – 6 °C/min
- **Setter**: 96 % alumina

**Typical Fired Properties**

- **Dielectric Constant** at 30 MHz, 25 °C:
  - 8.8 – 9.5
- **Dissipation Factor** at 30 MHz:
  - $\leq 2 \times 10^{-3}$
- **Thermal Coefficient of Expansion** (25 – 300 °C):
  - 5.6 ppm/°C
- **Breakdown Voltage**:
  - > 1 kV at 25 μm
- **Insulation Resistance** (at 25 °C):
  - $> 10^{13}$ $\Omega$cm
- **Thermal Coefficient of Frequency ($T_f$)** (-40 – 80 °C):
  - $< 10$ ppm/°C
- **Thermal Conductivity**:
  - 3 W/mK

*30 MHz data measured on pressed disc, ~20mm diameter x 1.7 mm thick.*
Legend:

1) REACH compliant according to the latest ** Annex XIV to Regulation (EC) of the European Parliament and of the council on the Registration, Evaluation, Authorisation and Restriction of Chemicals ("REACH") by European Chemicals Agency and its subsequent amendments; the material does not contain any substance listed in Annex XIV.

2) RoHS compliant according to the latest ** Directives (European Union) of Restriction of Hazardous Substances ("RoHS") and its subsequent amendments (including the exceptions related to Pb)

* See the data sheet issue date (DD/MM/YY) as reference of validity of latest edition which is available on request.

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. This information was up to date on the date this document was printed (latest version 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 to in writing, in advance). The data is supplied on the condition that the user shall conduct tests to determine materials suitability for particular application.

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