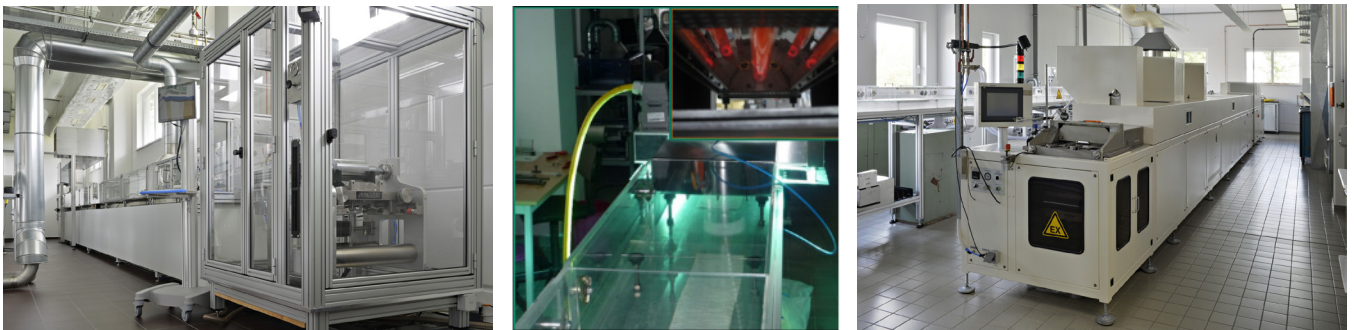


# LTCC tapes according to Heraeus formula

The tape casting technique is predestined for the production of thin, planar ceramic tapes, which can be used individually or laminated as LTCC or HTCC multilayer components. In future, tapes made of Low Temperature Co-fired Ceramics (LTCC) for the series Heratape®CT 700 and CT 800 of Heraeus Deutschland GmbH & Co. KG are cast for customer projects at the extended tape casting pilot plant at Fraunhofer IKTS in Hermsdorf. As a result, these tapes are available again in the usual quality for users.

Fraunhofer IKTS has long-standing experience in casting and functionalizing ceramic and glass-ceramic tapes of various compositions and thicknesses. In its highly modern tape casting facility at the institute's site in Hermsdorf, ceramic tapes are manufactured according to customer requirements for a variety of applications. Considerable equipment for the preparation of ceramic slurries and the casting of tapes by the doctor blade method on stone or on roll is available. Furthermore, tapes for laboratory and pilot-plant scale can be realized by single- and triple-slot dies in batch and continuous processes.



*Discontinuous casting plant with integrated UV modules at the tape casting facility of Fraunhofer IKTS in Hermsdorf.*



*Casting of a LTCC slurry according to the Heraeus Deutschland GmbH & Co. KG formula.*

## Portfolio of LTCC Tapes (in cooperation with Heraeus Deutschland GmbH & Co. KG)

Name		Maximum casting width [mm]	Maximum tape thickness [ $\mu\text{m}$ ]	Firing Peak [ $^{\circ}\text{C}$ ]
IKTS CT 702	Lead-free LTCC tape	300	200	870
IKTS CT 708	Lead-Free LTCC basic tape for CT 765	300	200	870
IKTS CT 765	High K (~65) Lead-Free LTCC tape	180	180	870

Detailed information on debinding and sintering profile as well as sintering aggregates can be provided on request.

Compatible pastes for the tapes can be recommended.

### Selected physical and electrical properties (all data refer to measurements of Heraeus Deutschland GmbH & Co. KG)

Physical and electrical properties	IKTS CT 702	IKTS CT 708	IKTS CT 765
Fired density [g/cm <sup>3</sup> ]	>96 % theor. 3.2	3.0	5.57
Thermal coefficient of expansion [ppm/K]	7.3 (25–300 $^{\circ}\text{C}$ )	7.6 (25–300 $^{\circ}\text{C}$ ) 9.3 (25–800 $^{\circ}\text{C}$ )	9.1 (25–300 $^{\circ}\text{C}$ ) 10.5 (25–600 $^{\circ}\text{C}$ )
Dielectric constant	7.5–7.9 (1 kHz, 25 $^{\circ}\text{C}$ )	6.4 $\pm$ 0.1 (2.5 GHz, 25 $^{\circ}\text{C}$ )	65 $\pm$ 4 (1 GHz, 25 $^{\circ}\text{C}$ ) 68.7 $\pm$ 0.1 (2.5 GHz, 25 $^{\circ}\text{C}$ )
Dissipation factor	3 x 10 <sup>-3</sup> % (2.5 GHz, 25 $^{\circ}\text{C}$ )	0.3 % (2.5 GHz, 25 $^{\circ}\text{C}$ )	<0.2 % (1 GHz, 25 $^{\circ}\text{C}$ ) <0.2 % (2.5 GHz, 25 $^{\circ}\text{C}$ )
Thermal conductivity [W/mK]	4.3	4.3	--

All measurements were carried out on sintered tapes or laminates.

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