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a VERDER company

CHAMBER FURNACE, CERAMIC FIBRE INSULATION - HTK KE

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Chamber furnaces of type HTK KE furnaces are insulated with ceramic fibre.

The rectangular design with a front door allows for easy loading and unloading. The HTK range is available in up to six different sizes. The smallest designs with a capacity of 8 litres and 25 litres are typically employed by laboratories for research and development. The 80 litre, 220 litre, 400 litre or 600 litre furnaces are predominantly used as pilot manufacturing systems or large scale production.

The furnaces can be used under a defined Oxygen mixture or 100 % pure Oxygen. The heating elements are CrFeAl, allowing temperatures of up to 1350 °C, or $MoSi_2$ that allow temperatures up to 1800 °C. Inert gas atmospheres are possible; however, poor atmospheric quality must be accepted. Due to the porous nature of the insulation, vacuum operation is limited to a rough vacuum range for short durations.

APPLICATION EXAMPLES

ceramic injection moulding (CIM), debinding in air, sintering in air

STANDARD FEATURES

- Hydrogen partial pressure operation if requested
- Operation under air or with 100 % Oxygen in the HTK KE
- Precisely controlled vacuum pumping speeds appropriate for powders
- Data recording for quality management

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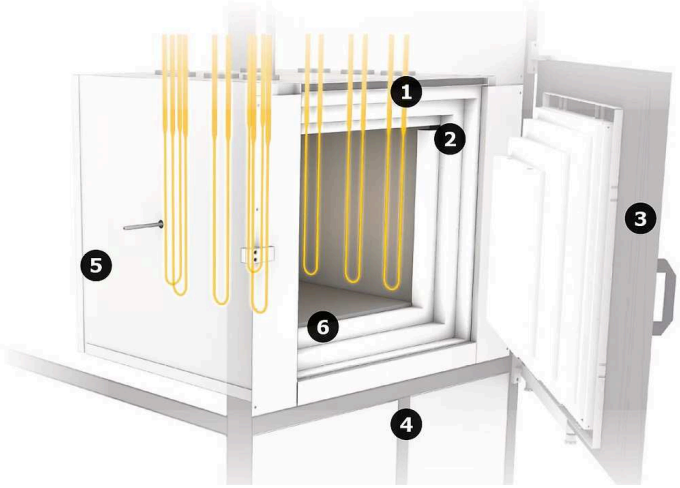
TECHNICAL DETAILS

View inside of the HTK KE

1. frame
2. water cooled vessel
3. heating cassette
4. groove for the sealing
5. front door
6. graphite insulation

Inside the chamber, heating elements are positioned at the bottom, left, right, and top sides of the furnace chamber allowing for improved temperature uniformity. For larger volumes, the back wall and front are equipped with heating elements to maintain excellent temperature uniformity. The HTK W, HTK MO, HTK GR and HTK KE furnaces are surrounded by a water cooled vessel; thus classifying, the HTK systems as a cold wall furnace. The cooling water is guided through the double walled vessel.



View inside HTK KE

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TECHNICAL DETAILS (MODELS)

	HTK 8 KE/13-1G	HTK 25 KE/13-1G	HTK 80 KE/13-1G
Insulation material	Ceramic fibre	Ceramic fibre	Ceramic fibre
Dimensions: External H x W x D (mm)	2100 x 1300 x 1100	2200 x 1900 x 1800	2300 x 2100 x 2200
Transport weight (kg)	1200	1700	2000
Usable space			
Volume (l)	8	25	80
H x W x D, usable space without retort (mm)	200 x 200 x 200	250 x 250 x 400	400 x 400 x 500
H x W x D, usable space with retort (mm)	180 x 180 x 200	230 x 230 x 400	380 x 380 x 400
Thermal values			
Tmax vacuum (°C)	1100	1100	1100
Tmax atmospheric pressure (°C)	1350	1350	1350
-Delta-T, between 500 and 1500°C (K) according to DIN 17052	± 10	± 10	± 10
Max. heat-up rate (K/min)	10	10	10
Cooling time (h)	6	6	8
Connecting values			
Power (kW)	8	16	45
Voltage (V)	400	400	400
Current (A)	20	40	3 x 65
Series fuse (A)	3 x 63	3 x 63	3 x 80
Vacuum (option)			
Leakage rate - clean, cold and empty (mbar l/s)	5x10-3	5x10-3	5x10-3
Vacuum range depending on the pumping unit	rough or fine vacuum	rough or fine vacuum	rough or fine vacuum

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	HTK 8 KE/13-1G	HTK 25 KE/13-1G	HTK 80 KE/13-1G
Cooling water required			
Flow (l/min)	15	20	40
Max. inlet temperature (°C)	23	23	23
Gas supply			
Nitrogen or Argon flow, others on request (l/h)	200-2000	200-2000	200-2000
Controller	on request	on request	on request

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	HTK 220 KE/13-1G	HTK 400 KE/13-1G	HTK 600 KE/13-1G
Insulation material	Ceramic fibre	Ceramic fibre	Ceramic fibre
Dimensions: External H x W x D (mm)	2500 x 2300 x 2600	2500 x 2300 x 2600	2500 x 2500 x 2900
Transport weight (kg)	3000	3800	4500
Usable space			
Volume (l)	220	400	600
H x W x D, usable space without retort (mm)	600 x 600 x 600	650 x 700 x 900	650 x 750 x 1200
H x W x D, usable space with retort (mm)	560 x 560 x 560	630 x 680 x 900	630 x 730 x 1200
Thermal values			
Tmax vacuum (°C)	1100	1100	1100
Tmax atmospheric pressure (°C)	1350	1350	1350
-Delta-T, between 500 and 1500°C (K) according to DIN 17052	± 10	± 10	± 10
Max. heat-up rate (K/min)	10	10	10
Cooling time (h)	10	12	12-16
Connecting values			
Power (kW)	80	120	200
Voltage (V)	400	400	400
Current (A)	3 x 120	3 x 180	3 x 290
Series fuse (A)	3 x 160	3 x 250	3 x 315
Vacuum (option)			
Leakage rate - clean, cold and empty (mbar l/s)	5x10-3	5x10-3	5x10-3
Vacuum range depending on the pumping unit	rough or fine vacuum	rough or fine vacuum	rough or fine vacuum
Cooling water required			
Flow (l/min)	60	100	175

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	HTK 220 KE/13-1G	HTK 400 KE/13-1G	HTK 600 KE/13-1G
Max. inlet temperature (°C)	23	23	23
Gas supply			
Nitrogen or Argon flow, others on request (l/h)	1000-10000	1000-10000	1000-10000
Controller	on request	on request	on request

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