

# Laboratory Chamber & Tube Furnaces



Testing  
Analysing  
Ashing  
Drying  
Preheating  
Debinding  
Firing  
Sintering  
Annealing  
Melting

## Laboratory Chamber & Tube Furnaces



### Experts in Furnaces

THERMCONCEPT develops, designs and manufactures furnaces and systems for a broad range of production and research applications. Many in our workforce have decades of experience in furnace engineering. The expertise we have amassed is deployed on a day-to-day basis in order to plan and realise your ideal furnace solution.

### Engineering

Our highly-skilled development engineers and designers, hardware and software professionals, technicians and mechanics create cost-efficient and reliable furnace solutions. Direct contact with users enables us to design furnaces that are practical to use. Our aim is to deliver crucial technical and financial benefits.



### Fast and flexible

Many applications can be achieved with our extensive range of standard furnaces. The advantages for you are proven, fully-developed models, excellent value for money and quick delivery times. Of course, we also supply customised furnaces specially designed to meet your specific application. In close consultation with you, we develop a furnace system which meets your challenging tasks both reliably and economically.



### Global Sales and Service Network

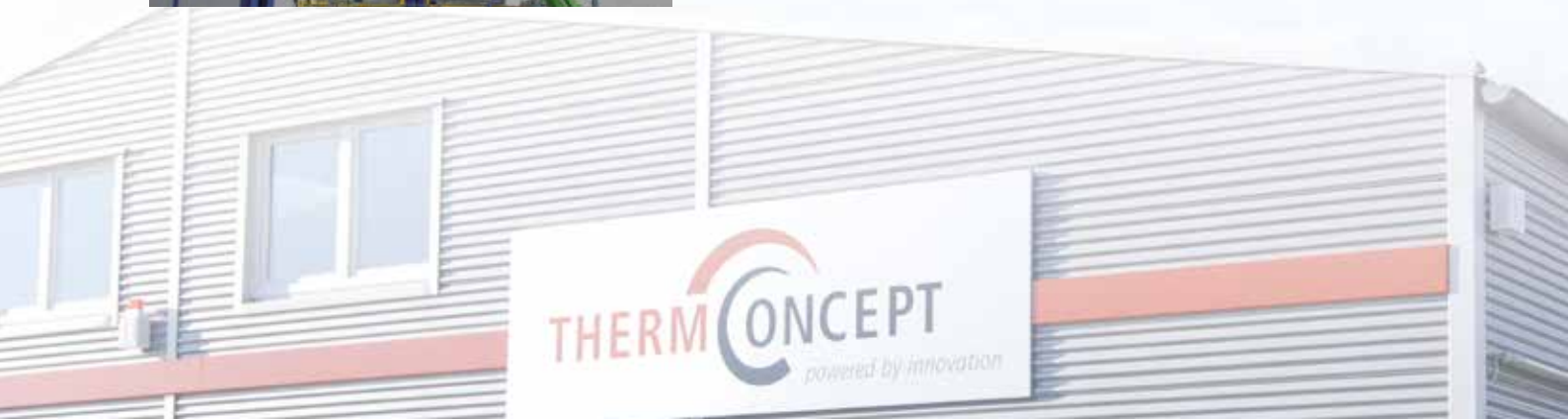
THERMCONCEPT furnaces and systems are proven in daily use at satisfied customers in many countries worldwide. Our international distribution network ensures that our customers receive individual support, rapid responses and expert local service.

### THERMCONCEPT *powered by innovation*

Furnaces and industrial heat treatment systems made by THERMCONCEPT are synonymous for

- top quality
- proven technology
- practical and service-friendly design
- customer-specific and application-based solutions
- maximum thermal efficiency and value for money
- eco-friendly materials
- professional service.

THERMCONCEPT is your partner for high-performance furnaces and systems for wide-ranging and challenging applications in production and research.



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## Laboratory Chamber Furnaces

T max 1100 °C, 1200 °C and 1300 °C



- Very high temperature uniformity inside the furnace chamber
- Double-walled housing with rear-ventilation to ensure low outer-casing temperatures
- Parallel-guided door moving up-wards with hot insulation surface to the rear, away from operator
- Insulation made of high grade ceramic fibre with low thermal mass
- Door collar made of strong fire bricks
- Wear-resistant fire brick insulation in the furnace bottom
- Delivery includes ceramic bottom plate
- Heating elements on ceramic supporting tubes, mounted in front of the insulation for free heat radiation
- Powerful heating elements in both sides providing fast heating rates
- Heating elements controlled by solid state relays for very precise temperature control, wear-free and noiseless
- Exhaust pipe in the rear wall (KLS 45/... in the ceiling)

### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]
KLS 05/11	1100	210 x 200 x 150	6	550 x 580 x 650	2,0	230 V 1/N
KLS 10/11	1100	200 x 250 x 200	10	560 x 640 x 720	2,7	230 V 1/N
KLS 15/11	1100	220 x 300 x 230	15	560 x 640 x 720	4,0	400 V 3/N
KLS 30/11	1100	280 x 380 x 280	30	590 x 690 x 790	4,0	400 V 3/N
KLS 45/11	1100	300 x 500 x 300	45	660 x 810 x 820	6,0	400 V 3/N
KLS 05/12	1200	180 x 200 x 140	5	550 x 580 x 650	2,0	230 V 1/N
KLS 10/12	1200	200 x 250 x 200	10	560 x 640 x 720	4,0	400 V 3/N
KLS 15/12	1200	220 x 300 x 230	15	560 x 640 x 720	4,0	400 V 3/N
KLS 30/12	1200	280 x 350 x 280	27	590 x 690 x 790	4,5	400 V 3/N
KLS 45/12	1200	300 x 500 x 300	45	660 x 810 x 820	6,0	400 V 3/N
KLS 05/13	1300	200 x 250 x 140	7	550 x 580 x 650	2,5	230 V 1/N
KLS 10/13	1300	200 x 250 x 180	9	560 x 640 x 720	4,0	400 V 3/N
KLS 15/13	1300	230 x 300 x 230	16	590 x 690 x 790	4,0	400 V 3/N
KLS 30/13	1300	270 x 350 x 270	26	590 x 690 x 790	6,0	400 V 3/N
KLS 45/13	1300	300 x 500 x 300	45	660 x 810 x 820	6,0	400 V 3/N

## Laboratory Chamber Furnaces

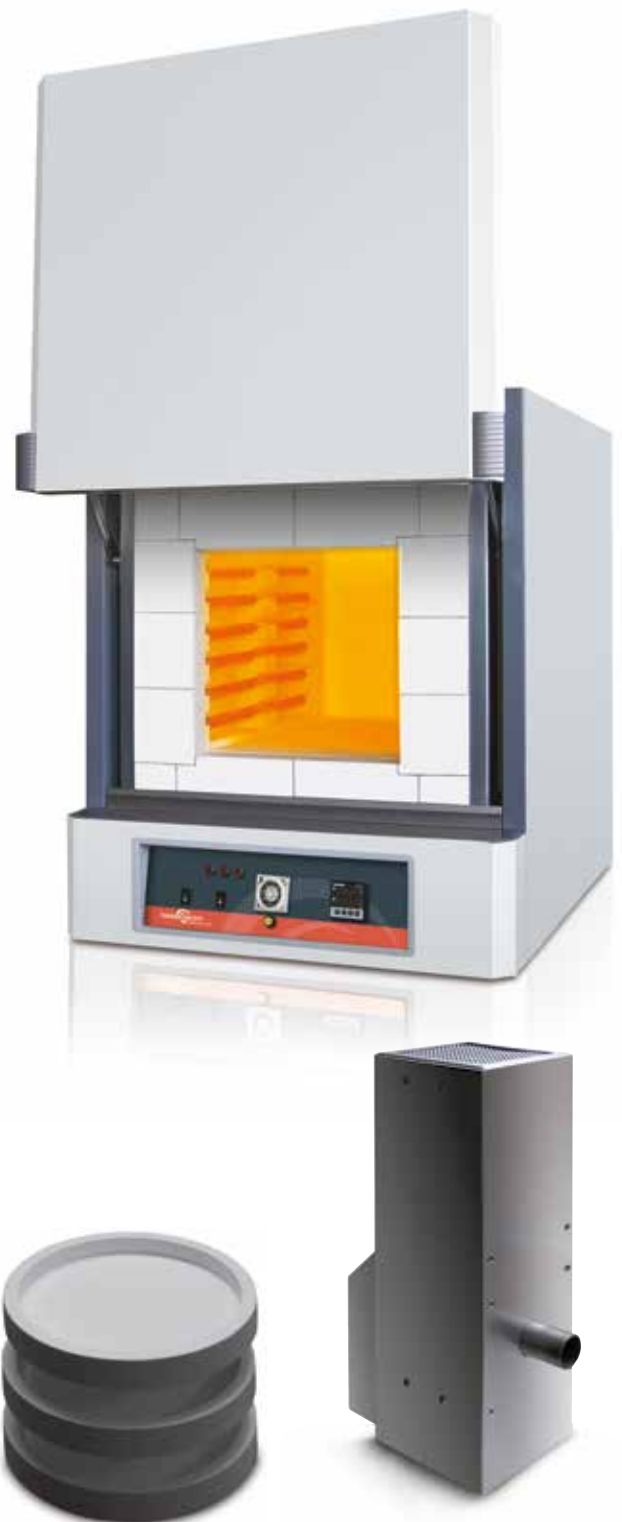
### Wide range of furnaces

THERMCONCEPT laboratory chamber furnaces are available in sizes from 5 litres to 45 litres (see Technical Data page 4). The inner dimensions and maximum operating temperatures are adapted to the needs of laboratories. Our range of furnaces also includes models with a Voltage of 230 V. Special dimensions and sizes in between are of course available upon request

### Accessories

Due to many different accessories and extras our laboratory chamber furnaces can be adapted to individual needs and applications:

- Vent with fan or with catalytic converter
- Adjustable temperature limiter to protect furnace and charge acc. EN 60519-2
- Protective gas connection at the rear side
- Quartz protection tubes for heating elements
- Pre-heating of process air
- Parallel-guided swing door
- Further accessories see page 13



## Compact muffle furnaces

T max 1100 °C



- Compact muffle furnaces with outstanding price-performance ratio
- Suitable for many applications in laboratories
- Compact outer dimensions and design to minimize space requirements
- Powder-coated, double-walled housing with long service life
- Insulation complete made of high-grade fibre material with low thermal mass for short heat-up times
- High quality heating wire with long service life
- Heating wire mounted in quartz glass tubes, protected against mechanical damages and waste gases, service friendly design
- Heating elements switched by solid state relays for precise furnace control, wear-free and noiseless
- Exhaust pipe in the furnace ceiling



### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]
KLE 03/11	1100	130 x 180 x 130	3	400 x 450 x 450	1,0	230 V 1/N
KLE 05/11	1100	160 x 200 x 160	5	430 x 470 x 480	1,5	230 V 1/N
KLE 09/11	1100	190 x 250 x 190	9	460 x 520 x 510	2,0	230 V 1/N
KLE 15/11	1100	220 x 300 x 220	15	490 x 570 x 540	3,0	230 V 1/N

## Muffle Furnaces

T max 1100 °C and 1200 °C

- Universal muffle furnaces for ambitious laboratory applications
- Compact design for minimum space requirements
- Stainless steel casing, long service life, extremely resistant
- Resistant fibre module as inner chamber, high mechanical durability, short heating cycles, low power consumption
- Door collar made of strong fire bricks to protect insulation against mechanical damages
- High-quality heating elements, long service life
- Heating wire embedded in ceramic plates with good protection against damages, service-friendly and cost-effective
- Heating elements controlled by solid state relays for very precise temperature control, wear-free and noiseless
- Exhaust pipe in the rear wall



### Accessories:

- Vent with fan
- Vent with fan and catalytic converter
- Adjustable temperature limiter to protect furnace and charge acc. EN 60519-2
- Further accessories see page 13



### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]	Weight [kg]
KL 03/11	1100	180 x 140 x 100	3	380 x 415 x 400	1,2	230 V 1/N	20
KL 05/11	1100	230 x 170 x 130	5	430 x 445 x 425	2,4	230 V 1/N	35
KL 09/11	1100	230 x 240 x 170	9	430 x 515 x 465	3,0	230 V 1/N	45
KL 15/11	1100	250 x 340 x 170	15	450 x 615 x 465	3,5	230 V 1/N	50
KL 03/12	1200	180 x 140 x 100	3	380 x 415 x 400	1,2	230 V 1/N	20
KL 05/12	1200	230 x 170 x 130	5	430 x 445 x 425	2,4	230 V 1/N	35
KL 09/12	1200	230 x 240 x 170	9	430 x 515 x 465	3,0	230 V 1/N	45
KL 15/12	1200	250 x 340 x 170	15	450 x 615 x 465	3,5	230 V 1/N	50

## Ashing furnaces

T max 1100 °C and 1200 °C



- Similar to chamber furnaces KLS (page 4), but specially adapted for ashing of organic probes
- Pre-heating of combustion air through ceramic inlet-channels in the furnace bottom
- Heating wire mounted in quartz glass tubes, protected against mechanical damages and waste gases, service friendly design
- Large exhaust outlet in the furnace ceiling and stainless steel stack with a height of 350 mm on top of the furnace
- Double-walled housing with rear-ventilation to ensure low outer-casing temperatures
- Very good temperature uniformity in the furnace chamber
- Parallel-guided door moving up-wards with hot insulation surface to the rear, away from operator
- Insulation made of high grade ceramic fibre with low thermal mass
- Door collar made of strong fire bricks
- Wear-resistant fire brick insulation in the furnace bottom
- Delivery includes ceramic bottom plate
- Heating elements on ceramic supporting tubes, mounted in front of the insulation for free heat radiation
- Powerful heating elements in both sides providing fast heating rates
- Heating elements controlled by solid state relays for very precise temperature control, wear-free and noiseless

### Accessories:

- Parallel-guided swing door
- Adjustable over-temperature protection of furnace and charge acc. EN 60519-2
- Further accessories see page 13



### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height*	Power [kW]	Voltage [V]
KLS 05/11/ASH	1100	210 x 200 x 150	6	550 x 580 x 650	2,0	230 V 1/N
KLS 10/11/ASH	1100	200 x 250 x 200	10	560 x 640 x 720	3	230 V 1/N
KLS 05/12/ASH	1200	180 x 200 x 140	5	550 x 580 x 650	2,0	230 V 1/N
KLS 10/12/ASH	1200	200 x 250 x 200	10	560 x 640 x 720	4,0	400 V 3/N



## Laboratory chamber furnaces

with ceramic muffle

T max 1000 °C, 1100 °C and 1150 °C

- Chamber furnaces with integrated ceramic muffle, high mechanical and chemical resistance
- Furnaces designed especially and recommended for ambitious laboratory applications with aggressive waste gases
- Suitable for assay of precious metals or ashing of organic substances
- Delivery including ceramic muffle
- Heating elements wound around outside the ceramic muffle, heating on all 4 sides for high temperature uniformity inside the chamber
- Heating elements protected against aggressive waste gases atmospheres
- Heating elements controlled by solid state relays for very precise temperature control, wear-free and noiseless
- Exhaust pipe in the rear wall
- KLS 07/11/M with double-walled housing and rear ventilation to ensure low outercasing temperatures, parallel-guided door moving up-wards with hot insulation surface to the rear, away from operator, insulation made of high grade ceramic fibre with low thermal mass, collar made of fire bricks to ensure high wear resistance against mechanical stress
- KLS 03/10/M and KLS 02/11/M with userfriendly swing door with multilayer insulation made of high grade fibre

### Accessories:

- Adjustable temperature limiter to protect furnace and charge acc. EN 60519-2
- Further accessories see page 13



KLS 07/11/M



KLS 02/11/M



KLS 03/10/M

### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]	Weight [kg]
KLS 03/10/M	1000	140 x 200 x 110	3	320 x 350 x 410	1,5	230 V 1/N	20
KLS 02/11/M	1100	100 x 140 x 100	2	320 x 350 x 410	1,5	230 V 1/N	20
KLS 07/11/M	1150	210 x 280 x 110	7	550 x 580 x 650	2,7	230 V 1/N	60

## Laboratory chamber furnace

for asphalt tests according ASTM D 6307-98

T max 600 °C



- Chamber furnace especially developed for analysis of asphalt at 540 °C according to ASTM D 6307-98
- With integrated balance for weight loss determination, software and interface for data storage, max. probe weight is 2500 gr.
- Thermal after burner, mounted to the exhaust on top of the furnace, for cleaning of waste gases emerging from the probe
- Very high temperature uniformity in the furnace chamber
- Double-walled housing with rear-ventilation to ensure low outer-casing temperatures
- Swing door with electrical locking at process temperature above 150 °C
- Insulation made of high grade ceramic fibre with low thermal mass
- Door collar made of strong fire bricks
- Wear-resistant fire brick insulation in the furnace bottom
- Powerful heating elements in both sides providing fast heating rates, for fast heat-up in approx. 35 min to 540 °C
- Heating elements on ceramic supporting tubes, mounted in front of the insulation for free heat radiation
- Heating elements covered with quartz glass tubs for protection
- Heating elements controlled by solid state relays for very precise temperature control, wear-free and noiseless
- According to norm with automatic switch off after test has been finished



### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Weight [V]
KLS 30/06/BIT	600	300 x 300 x 300	27	605 x 595 x 515 / 1130	4	400 V 3/N

## Laboratory furnaces with weighing system

T max 1200 °C

- Laboratory chamber furnaces with integrated weighing system for measuring and documentation of mass loss at different temperatures
- Balance mounted underneath the furnace and connected with inductor and charge tray inside the furnace
- Switchgear mounted in a separate housing also underneath the furnace
- Delivery upon request with balance and software for documentation
- Very high temperature uniformity in the furnace chamber
- Double-walled housing with rear-ventilation to ensure low outer-casing temperatures
- Parallel-guided door moving up-wards with hot insulation surface to the rear, away from operator
- Insulation made of high grade ceramic fibre with low thermal mass
- Door collar made of strong fire bricks
- Wear-resistant fire brick insulation in the furnace bottom
- Heating elements on ceramic supporting tubes, mounted in front of the insulation for free heat radiation
- Powerful heating elements in both sides providing fast heating rates
- Heating elements controlled by solid state relays for very precise temperature control, wear-free and noiseless
- Other dimensions and temperature upon request

### Accessories:

Due to a wide range of accessories and extras laboratory chamber furnaces can be easily adapted to different laboratory applications:

- Vent with fan or with catalytic converter
- Adjustable temperature limiter to protect furnace and charge acc. EN 60519-2
- Protective gas connection on the furnace rear
- Quartz protection tubes for heating elements
- Pre-heating of process air
- Parallel-guides swing door
- Further accessories see page 13



### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Power [kW]	Weight [V]
KLS 05/12/WS	1200	180 x 200 x 140	5	2,0	230 V 1/N
KLS 10/12/WS	1200	200 x 250 x 200	10	4,0	400 V 3/N
KLS 15/12/WS	1200	220 x 300 x 230	15	4,0	400 V 3/N
KLS 30/12/WS	1200	280 x 350 x 280	27	4,5	400 V 3/N

## Special laboratory furnaces

### Chamber furnaces KLS with moveable bottom

Upon request laboratory chamber furnaces KLS 30/.. and KLS 45/.. can be supplied with manually moveable furnace bottom. This design allows access to the bottom from 3 sides and very easy charging.

Chamber furnaces with moveable bottom are available for a max. operating temperature of 1100 °C and 1200 °C, a switchgear in a sep. housing is included.

A suitable work bench adapted to the furnace size is optionally available.



### Laboratory furnace for testing and production of fuel cells

Electrically heated chamber furnace up to 1100 °C, individually adapted to customers specification, with double-wing door and pressure indenter for testing and small scale production of fuel cells.

On the top of the furnace a pneumatic pressure indenter with up to 500 kg is mounted to press stacked fuel cells during the heating cycle.



Also bogie hearth furnaces or chamber furnaces of individual sizes and temperatures for large scale production are available.



## Furnace accessories

### Exhaust systems

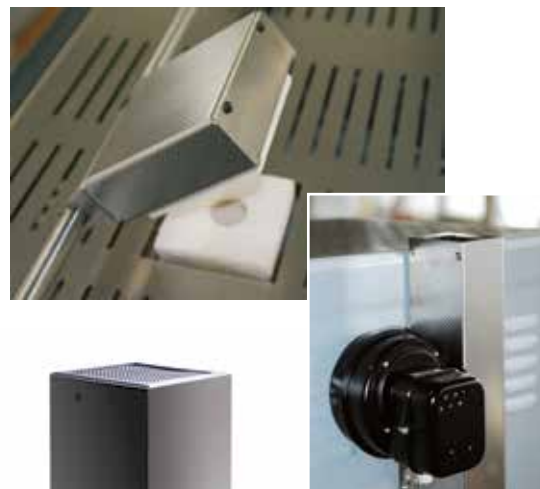
Manual or automatic inlet ports for fresh process air for or cooling, upon request also with pre-heating.

Automatic inlet- and outlet flaps, controlled via furnace control system.

Vapor vent for controlled extraction of waste gases and warm air, mounted on the rear of the furnace, can be connected to existing waste gas stack.

Vapor vent with fan, to accelerate extraction of emerging waste gases and warm air from the furnace chamber. Controlled by extra funktion of furnace controller.

Vapor vent with fan and integrated catalytic converter. Organic parts or the emerging waste gases will be split catalytic in CO<sub>2</sub> and steam, smells will be minimized. Also controlled by extra funktion of furnace controller.



### Protective gas atmosphere

Protective gas port on the furnace housing, to flush furnace chamber with non-flammable protective gas like Argon or Nitrogen.

Semi-gastight version of the furnace housing with additional silicone sealing, to minimize gas flushing losses and provide a better protective gas atmosphere.

Manual, semi-automatic and fully automatic gassing systems, adapted to individual applications, with flow meter, valve, pressure minimizer, controlled via furnace controller.



### Charge tray and crucibles

Stackable charge trays and containers, crucibles and boats made of ceramic, in different sizes and materials.



### Bottom plates and collecting pans

Bottom plates and collecting pans made of ceramic and steel, to protect furnace bottom, available in different sizes.

- Ceramic bottom plates up to 1300 °C
- Ceramic collecting pans up to 1300 °C
- Steel collecting pans up to 1100 °C



### Charging tongs and heat-resistant gloves

Charging tongs and heat-resistant gloves for easy charging a hot furnace.

Heat-resistant gloves for short term contact temperature of 600 °C or 900 °C. Charging tongs with length of 300 and 500 mm.



## Chamber Furnaces with 5-side heating

T max 1300 °C and 1400 °C



- Chamber furnaces for complex laboratory applications and simulation of production processes
- Extremely short heating up times, excellent temperature uniformity
- Double-walled casing with rear-ventilation to ensure low outer-casing temperatures
- Side walls and door of outer casing made of stainless steel, door lintel also made of stainless steel
- Swing door hinged to the right side
- Door safety switch
- Delivery including furnace base
- Efficient multilayer insulation made of high grade insulation panels and strong fire bricks for low heat losses, low energy consumption and low energy costs
- Heated from 5 sides (left, right, door, rear wall, bottom), excellent temperature uniformity in the chamber
- High grade heating elements on ceramic supporting tubes, mounted in front of the insulation for free heat radiation
- Bottom heating elements protected by silicon carbide plates with high mechanical strength and heat conductivity
- Also bogie hearth furnaces or chamber furnaces with individual sizes and temperatures for large scale production are available.



### Accessories:

- Parallel-guided door moving side-wards, with hot insulation surface to the rear, away from the operator
- Multi-zone control
- Pre-heating of process air
- Manually or automatically operated exhaust flap
- Controlled cooling system to accelerate cooling times and to remove waste gases
- Protective gas connection
- Manual and automatic gassing system
- Stackable charge trays and containers
- Catalytic and thermal waste gas treatment



### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]	Weight [kg]
KC 16/13	1300	250 x 250 x 250	16	650 x 800 x 1400	7	400 V 3/N	160
KC 32/13	1300	320 x 320 x 320	33	700 x 850 x 1450	8	400 V 3/N	190
KC 64/13	1300	400 x 400 x 400	64	780 x 950 x 1520	11	400 V 3/N	250
KC 128/13	1300	500 x 500 x 500	125	880 x 1050 x 1620	15	400 V 3/N	300
KC 16/14	1400	250 x 250 x 250	16	700 x 850 x 1400	8	400 V 3/N	250
KC 32/14	1400	320 x 320 x 320	33	780 x 900 x 1450	10	400 V 3/N	330
KC 64/14	1400	400 x 400 x 400	64	860 x 970 x 1520	12	400 V 3/N	365
KC 128/14	1400	500 x 500 x 500	125	960 x 1080 x 1620	18	400 V 3/N	470



## Annealing Furnaces

T max 1300 °C

- Rugged chamber furnaces especially designed for robust heat treatment purposes
- Double-walled housing with rear-ventilation to ensure low outer-casing temperatures
- Side walls and door of outer casing made of stainless steel, door lintel also made of stainless steel
- Parallel-guided door, moving downwards, can be opened up to T max.
- Delivery including furnace base (KM 50/13 - KM 90/13)
- Efficient multilayer insulation made of high grade and strong fire bricks for low heat losses, low energy consumption and low energy costs
- Heating from three sides (both side walls and bottom) for good temperature uniformity inside the furnace chamber
- High grade heating elements on ceramic supporting tubes, mounted in front of the insulation for free heat radiation (KM 50/13 - KM 90/13)
- Bottom heating elements protected by silicon carbide plates with high mechanical strength and heat conductivity
- Exhaust pipe in the rear wall



### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height*	Power [kW]	Voltage [V]	Weight [kg]
KM 10/13	1300	250 x 250 x 120	8	500 x 600 x 700	2,5	230 V 1/N	75
KM 15/13	1300	250 x 250 x 200	13	500 x 700 x 700	3,6	230 V 1/N	85
KM 20/13	1300	250 x 350 x 200	18	500 x 700 x 700	6,0	400 V 3/N	85
KM 30/13	1300	250 x 500 x 200	25	500 x 850 x 700	7,0	400 V 3/N	95
KM 50/13	1300	350 x 500 x 250	44	1000 x 1300 x 1400	13	400 V 3/N	250
KM 70/13	1300	350 x 750 x 250	66	1000 x 1400 x 1400	20	400 V 3/N	330
KM 90/13	1300	350 x 1000 x 250	88	1000 x 2000 x 1400	22	400 V 3/N	500



## Systems, Tools and Accessories

THERMCONCEPT delivers specially developed hardening accessories that have been proven in practical use over many years. Our accessories are specially designed to complement the various annealing furnaces, thus enabling inert gas hardening or oxidation-free hardening that is easy in handling and economical in operation. Please contact us for practical advice in selecting the most useful components and how they are handled in practice.



### Diamond Block System

#### Oxidation-free hardening up to 1300 °C

- Specially suitable for all types of high-speed steel and high-alloy chrome steels
- Multiple use of carbonaceous block, ensures protective atmosphere
- Oxidation or decarburisation of the component is almost completely eliminated
- Easy to operate, superb results, high product quality
- Can be used in all chamber furnaces



### Gas Grid System

#### Hardening and cooling under inert gas up to 1200 °C

- Enables bright annealing with subsequent gas/air-quenching
- No loss of time during heat-up due to use of ultra-thin foil containers
- Can be used with forming gas, nitrogen and inert gases such as argon and helium
- Very low gas consumption due to small container volumes
- Available with optional thermocouple for continuous measurement of the temperature inside the container



### Hardening Box System

#### Hardening, annealing, carburising, nitriding up to 1100 °C

- All hardening boxes match the inside dimensions of the annealing furnaces
- By using a neutral annealing compound, virtually oxidation-free hardening is possible
- Also available with gas connection for inert gas hardening or as atmosphere box with hinged lid that stays in the furnace
- Easy handling, reliable process
- Also available with optional thermocouple for continuous measurement of the temperature inside the container



### Accessories and Tools

#### Hardening foils, envelopes and containers for oxidation-free annealing of steels up to 1200 °C

- Hardening foils, envelopes and containers for oxidation-free annealing of steel up to 1200 °C
- Thermo-chemically stable hardening oils for tank temperature of 50 - 150 °C
- Materials for cleaning, degreasing and corrosion protection
- Carburizing granulate, nitriding powder and neutral annealing compound
- Baskets and furnace grids
- Charging wagons
- Hand tools and heat-resistant gloves
- Charging tools such as shovels, draw-hooks and charging plates
- Hardness tester



Ask for our special brochures!



## High Temperature Furnaces with SiC-rod heating

T max 1400 °C, 1500 °C and 1600 °C

- Excellent uniformity inside the furnace chamber
- Double-walled housing with rear-ventilation to ensure extremely low outer-casing temperatures
- Parallel-guided door moving up-wards with hot insulation surface to the rear, away from operator
- Insulation made of high grade ceramic fibre with low thermal mass
- Door collar made of strong fire bricks to protect insulation against mechanical damages
- Wear-resistant fire brick insulation in the furnace bottom
- Delivery includes ceramic bottom plate
- Powerful SiC-rod heating elements mounted in two sides of the furnace providing very fast heating times
- Heating elements controlled by solid state relays for very precise temperature control, wear-free and noiseless
- Exhaust pipe in the furnace ceiling

### Accessories:

- Adjustable temperature limiter to protect furnace and charge acc. EN 60519-2
- Further accessories see page 13

### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]
KLC 05/14	1400	150 x 250 x 140	6	550 x 580 x 650	3,5	230 V 1/N
KLC 10/14	1400	200 x 250 x 180	9	560 x 670 x 720	4,5	400 V 3/N
KLC 15/14	1400	220 x 310 x 220	15	590 x 690 x 790	6,0	400 V 3/N
KLC 30/14	1400	250 x 480 x 270	33	600 x 730 x 800	12,0	400 V 3/N
KLC 05/15	1500	150 x 250 x 140	6	550 x 580 x 650	5,0	400 V 3/N
KLC 10/15	1500	200 x 250 x 180	9	560 x 640 x 720	6,5	400 V 3/N
KLC 15/15	1500	220 x 310 x 220	15	590 x 690 x 790	9,0	400 V 3/N
KLC 30/15	1500	250 x 420 x 270	30	600 x 730 x 800	12,0	400 V 3/N
KLC 05/16	1600	150 x 240 x 150	6	550 x 580 x 650	5,3	400 V 3/N
KLC 10/16	1600	210 x 240 x 180	9	560 x 640 x 720	6,0	400 V 3/N
KLC 15/16	1600	220 x 310 x 220	15	590 x 690 x 790	7,0	400 V 3/N
KLC 30/16	1600	250 x 420 x 270	28	600 x 730 x 800	11,5	400 V 3/N

## High Temperature Furnaces with MoSi<sub>2</sub> heating elements

T max 1500 °C, 1600 °C, 1750 °C and 1800 °C

- Compact bench top furnaces with user-friendly parallel-guided door moving up-wards
- Double-walled housing with rear-ventilation to ensure low outercasing temperatures
- Insulation made of high grade aluminium oxide fibre with low thermal mass for very fast heating and cooling
- High grade heating elements made of Molybdenum-Disilicide (MoSi<sub>2</sub>) mounted in two sides
- Low power rating
- Heating elements controlled by thyristors for very precise temperature control, wear-free and noiseless
- High temperature uniformity inside the furnace chamber
- Exhaust pipe in the furnace ceiling

### Accessories:

- Automatically driven exhaust flap in the ceiling
- Controlled cooling system to accelerate cooling times
- Protective gas connection, manual or automatic gassing system
- Semi-gastight housing with silicone sealing
- Control and documentation software
- Softstart switch



### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]	Weight [kg]
HTL 01/15	1500	120 x 90 x 120	1	520 x 470 x 680	1,6	230 V 1/N	75
HTL 01/16	1600	120 x 90 x 120	1	520 x 470 x 680	1,6	230 V 1/N	75
HTL 02/16	1600	110 x 120 x 150	2	740 x 440 x 630	1,5	230 V 1/N	76
HTL 04/16	1600	150 x 150 x 150	4	740 x 440 x 630	3	230 V 1/N	83
HTL 10/16	1600	200 x 250 x 200	10	790 x 540 x 680	4	400 V 3/N	97
HTL 16/16	1600	200 x 300 x 260	16	830 x 550 x 735	8	400 V 3/N	175
HTL 20/16	1600	250 x 320 x 260	21	880 x 570 x 735	8	400 V 3/N	210
HTL 02/17	1750	110 x 120 x 150	2	740 x 440 x 630	1,5	230 V 1/N	76
HTL 04/17	1750	150 x 150 x 150	4	740 x 440 x 630	3	230 V 1/N	83
HTL 10/17	1750	200 x 250 x 200	10	790 x 540 x 680	4	400 V 3/N	97
HTL 16/17	1750	200 x 300 x 260	16	830 x 550 x 735	8	400 V 3/N	175
HTL 20/17	1750	200 x 320 x 260	21	880 x 570 x 735	8	400 V 3/N	210
HTL 02/18	1800	110 x 120 x 150	2	740 x 440 x 630	1,5	230 V 1/N	76
HTL 04/18	1800	150 x 150 x 150	4	740 x 440 x 630	3	230 V 1/N	83
HTL 10/18	1800	200 x 250 x 200	10	790 x 540 x 680	4	400 V 3/N	97
HTL 16/18	1800	200 x 300 x 260	16	830 x 550 x 735	8	400 V 3/N	175
HTL 20/18	1800	200 x 320 x 260	21	880 x 570 x 735	8	400 V 3/N	210



## High Temperature Furnaces

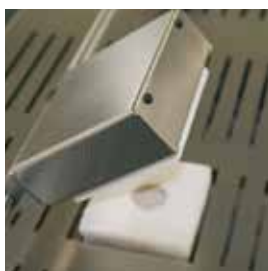
with MoSi<sub>2</sub> heating elements

T max 1600 °C, 1750 °C and 1800 °C

- High temperature chamber furnaces with chamber volume of 16 - 70 litres\*
- Furnaces with highest operation standard on precision and comfort. Very fast heating and cooling cycles, low power rating
- Double-walled housing with rear-ventilation to ensure very low outer-casing temperatures
- Door, door housing and furnace front made of stainless steel
- Parallel-guided door moving side-wards with hot insulation surface to the rear, away from operator
- Insulation made of high grade aluminium oxide fibre with low thermal mass for very fast heating and cooling
- High grade heating elements made of Molybdenum Disilicide (MoSi<sub>2</sub>) mounted in two sides, additional heating from the rear wall available
- Heating elements controlled by thyristors for very precise temperature control, wear-free and noiseless
- Sophisticated process control systems
- Exhaust hole in the furnace ceiling with manual vapor vent flap

### Accessories:

- Autom. driven exhaust flaps for extended ventilation of furnace chamber
- Controlled cooling system to accelerate cooling times
- Protective gas connection
- Manual or automatic gassing system
- From HTK 40/... with re-inforced bottom for higher work load



### Technical Data

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]	Weight [kg]
HTK 16/16	1600	200 x 300 x 260	16	820 x 655 x 1570	8,0	400 V 3/N	285
HTK 20/16	1600	250 x 320 x 260	21	870 x 675 x 1570	8,0	400 V 3/N	295
HTK 40/16	1600	300 x 350 x 350	37	920 x 705 x 1660	11	400 V 3/N	375
HTK 50/16	1600	250 x 550 x 350	48	870 x 905 x 1660	18	400 V 3/N	655
HTK 70/16	1600	400 x 400 x 400	64	1020 x 755 x 1710	12	400 V 3/N	545
HTK 16/17	1750	200 x 300 x 260	16	820 x 655 x 1570	8,0	400 V 3/N	285
HTK 20/17	1750	250 x 320 x 260	21	870 x 675 x 1570	8,0	400 V 3/N	295
HTK 40/17	1750	300 x 350 x 350	37	920 x 705 x 1660	11	400 V 3/N	375
HTK 50/17	1750	250 x 550 x 350	48	870 x 905 x 1660	18	400 V 3/N	655
HTK 70/17	1750	400 x 400 x 400	64	1020 x 755 x 1710	12	400 V 3/N	545
HTK 16/18	1800	200 x 300 x 260	16	820 x 655 x 1570	8,0	400 V 3/N	285
HTK 20/18	1800	250 x 320 x 260	21	870 x 675 x 1570	8,0	400 V 3/N	295
HTK 40/18	1800	300 x 350 x 350	37	920 x 705 x 1660	11	400 V 3/N	375
HTK 50/18	1800	250 x 550 x 350	48	870 x 905 x 1660	18	400 V 3/N	655
HTK 70/18	1800	400 x 400 x 400	64	1020 x 755 x 1710	12	400 V 3/N	545

## Elevator Furnaces

T max 1100 - 1800 °C

- Elevator furnaces with chamber volume of 1, 2 and 8 litres and temperatures from 1100 °C to 1800 °C
- Double-walled housings with rear-ventilation to ensure very low outer-casing temperatures
- Casing made of strong and sleek framework construction
- Reliable vibration-free bottom lifting with electro-mechanical movement
- Insulation made of high grade aluminium oxide fibre with low thermal mass for very fast heating and cycles
- Low power rating
- Switch gear and control unit integrated in furnace housing for comfortable operation of controller
- For large scale production furnaces with an usable volume of up to 2000 litre are available



### Technical Data

Model	T max [°C]	Inner dimensions Width x Depth x Height [mm] or ø x Height [mm]	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]
ELS 08/11	1100	180 x 200 x 210	7,5	630 x 810 x 1220	2,0	230 V 1/N
ELS 08/14	1400	180 x 180 x 230	7,4	630 x 810 x 1220	4,5	400 V 3/N
ELHT 01/16	1600	Ø 105 x 55	0,5	520 x 470 x 680	1,9	230 V 1/N
ELHT 02/16	1600	Ø 105 x 100	1,0	520 x 470 x 680	3,6	230 V 1/N
ELHT 08/16	1600	200 x 200 x 200	8,0	620 x 770 x 1900	8,0	400 V 3/N
ELHT 08/17	1700	200 x 200 x 200	8,0	620 x 770 x 1900	8,0	400 V 3/N
ELHT 08/18	1800	200 x 200 x 200	8,0	620 x 770 x 1900	8,0	400 V 3/N



## Tube Furnaces 1-zone and 3-zone design

T max 1200 °C

- Wide range of 17 standard furnaces
- Tube diameter 20 mm to 105 mm
- Heated length 250 mm to 900 mm
- Integrated ceramic tube with 2 fibre plugs included
- Use of separate work tube possible, e.g. to operate with different atmospheres
- Integrated safety grid for low surface temperatures on the tube module
- Sophisticated casing partly made of stainless steel
- Insulation made of high grade ceramic fibre with low thermal mass
- Powerful heating and fast heating times
- Heating elements controlled by solid state relays for very precise temperature control, wear-free and noiseless
- Switchgear and control unit integrated in the furnace housing underneath the tube module for comfortable operation of the controller

### Accessories:

- Adjustable temperature limiter to protect furnace and charge acc. EN 60519-2
- 3-zone design for high temperature uniformity
- Further accessories see page 29

### Technical Data: 1-zone models

Model	T max [°C]	Outer dimensions [mm] Width x Depth x Height	Tube-Ø Inner [mm]	Heated length [mm]	Tube length [mm]	Power [kW]	Voltage [V]	Weight [kg]
ROS 20/250/12	1200	350 x 345 x 495	20	250	500	1,0	230 V 1/N	14
ROS 20/400/12	1200	450 x 345 x 495	20	400	600	1,3	230 V 1/N	18
ROS 38/250/12	1200	350 x 345 x 495	38	250	500	1,3	230 V 1/N	21
ROS 38/450/12	1200	500 x 345 x 495	38	450	600	1,8	230 V 1/N	22
ROS 50/250/12	1200	350 x 345 x 495	50	250	450	1,3	230 V 1/N	23
ROS 50/450/12	1200	500 x 345 x 495	50	450	650	1,5	230 V 1/N	24
ROS 75/600/12	1200	650 x 400 x 635	75	600	800	3,5	230 V 1/N	32
ROS 75/800/12	1200	850 x 400 x 635	75	800	1000	3,5	230 V 1/N	37
ROS 105/500/12	1200	550 x 400 x 675	105	500	750	2,4	230 V 1/N	31
ROS 105/750/12	1200	800 x 400 x 675	105	750	1000	3,5	230 V 1/N	36
ROS 105/900/12	1200	950 x 400 x 675	105	900	1200	3,5	230 V 1/N	41

## Tube Furnaces Designs

### Standard design: Horizontal operation

Tube module fixed on furnace housing.  
Switchgear and control unit integrated in the base



### Optional: Vertical operation

Tube module fixed on solid base frame.  
Switchgear and control unit mounted in a separate cabinet.



### Optional: Universal operation

Tube module fixed on solid base frame with adjustable inclination angle. Switchgear and control unit mounted in a separate cabinet



### Technical Data: 3-zone models

Model	T max [°C]	Outer dimensions [mm] Width x Depth x Height	Tube-Ø Inner [mm]	Heated length [mm]	Tube length [mm]	Power [kW]	Voltage [V]	Weight [kg]
ROS 38/500/12-3	1200	650 x 400 x 510	38	500	800	2,0	230 V 1/N	25
ROS 50/500/12-3	1200	650 x 400 x 510	50	500	800	2,2	230 V 1/N	26
ROS 50/750/12-3	1200	800 x 400 x 510	50	750	900	3,5	230 V 1/N	35
ROS 75/750/12-3	1200	800 x 400 x 600	75	750	900	3,7	400 V 3/N	40
ROS 105/750/12-3	1200	800 x 400 x 600	105	750	1000	3,9	400 V 3/N	41
ROS 105/900/12-3	1200	950 x 400 x 600	105	900	1200	4,0	400 V 3/N	43



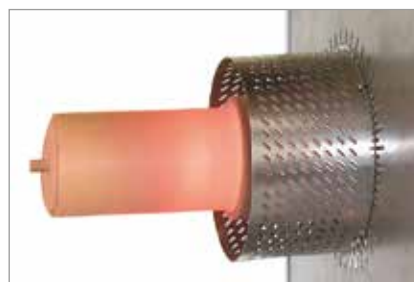
## Modular Tube Furnaces

T max 1100 °C and 1300 °C

- Tube diameter up to 200 mm
- Heated length 400 and 500 mm and individually expandable
- Suitable for a wide range of work tubes made of different materials (glass, ceramic, metal) with different diameters
- Heating elements embedded in high grade vacuum-formed fibre insulation, for excellent temperature uniformity
- Powerful heating and fast heating cycles
- Heating elements controlled by solid state relay (1100 °C) and thyristors (1300 °C) for very precise temperature control, wear-free and noiseless
- Switchgear and control unit integrated in the furnace housing underneath the tube module for comfortable operation of the controller

### Accessories:

- 3-zone design for high temperature uniformity
- With solid base frame also suitable for vertical operation
- Adjustable temperature limiter to protect furnace and charge acc. EN 60519-2
- Further accessories see page 29



### Technical Data: 1-zone models

Model	T max [°C]	Outer dimensions [mm] Width x Depth x Height	Tube-Ø [mm]	Heated length [mm]	Power [kW]	Voltage [V]	Weight [kg]
ROM 70/500/11	1100	620 x 500 x 620	70	500	2,4	230 V 1/N	30
ROM 100/500/11	1100	620 x 500 x 620	100	500	2,7	230 V 1/N	32
ROM 150/500/11	1100	620 x 670 x 550	150	500	3,5	230 V 1/N	41
ROM 200/500/11	1100	620 x 670 x 550	200	500	3,5	230 V 1/N	44
ROM 70/400/13	1300	520 x 500 x 900	70	400	2,0	400 V 3/N	110
ROM 100/400/13	1300	520 x 500 x 900	100	400	3,0	400 V 3/N	110
ROM 150/400/13	1300	520 x 500 x 900	150	400	4,5	400 V 3/N	120
ROM 200/400/13	1300	520 x 600 x 1000	200	400	6,0	400 V 3/N	130



## Split Tube Furnaces

T max 1100 °C, 1500 °C

- Tube diameter up to 300 mm
- Heated length from 200 mm up to 500 mm and individually expandable
- Split design allows to insert tubes with large flanges
- Due to flexible insulation plugs on both ends, the furnace can be easily adapted to different tube diameters
- Heating elements embedded in high grade vacuum-formed fibre insulation, for excellent temperature uniformity
- Powerful heating and fast heating cycles
- Accelerate cooling of furnace and tube by opening hinged casing
- Heating elements controlled by solid state relays for very precise temperature control, wear-free and noiseless
- Switchgear and control unit integrated in the furnace housing underneath the tube module for comfortable operation of the controller

### Accessories:

- 3-zone design for high temperature uniformity
- With solid base frame also suitable for vertical operation
- Adjustable temperature limiter to protect furnace and charge acc. EN 60519-2
- Further accessories see page 29



### Technical Data:

Model	T max [°C]	Tube-Ø [mm]	Heated length [mm]	Power [kW]	Voltage [V]
ROK 70/250/11	1100	70	250	1,6	230 V 1/N
ROK 70/500/11	1100	70	500	2,4	230 V 1/N
ROK 100/250/11	1100	100	250	2,4	230 V 1/N
ROK 100/500/11	1100	100	500	3,0	230 V 1/N
ROK 150/250/11	1100	150	250	3,0	230 V 1/N
ROK 150/500/11	1100	150	500	3,5	230 V 1/N
ROK 200/250/11	1100	200	250	3,0	230 V 1/N
ROK 200/500/11	1100	200	500	3,5	230 V 1/N
ROK 250/400/11	1100	250	400	6,0	400 V 3/N
ROK 300/400/11	1100	300	400	9,0	400 V 3/N
ROK 45/200/15	1500	45	200	1,5	230 V 1/N
ROK 45/400/15	1500	45	400	2,5	230 V 1/N
ROK 95/200/15	1500	95	200	3,4	230 V 1/N
ROK 95/400/15	1500	145	400	5,0	400 V 3/N
ROK 145/200/15	1500	145	200	6,0	400 V 3/N
ROK 145/400/15	1500	195	400	7,0	400 V 3/N
ROK 195/200/15	1500	195	200	7,0	400 V 3/N



## High Temperature Tube Furnaces with SiC-rod heating

T max 1400 °C, 1500 °C and 1600 °C



- Tube diameter 20 mm to 105 mm
- Heated length 180 mm to 610 mm
- Process tubs can be easily changed
- Integrated safety grid for low surface temperature on tube module
- Insulation made of high grade ceramic fibre with low thermal mass
- Powerful SiC-rod heating elements, mounted parallel to the tube, fast heating
- Heating elements controlled by solid state relays for very precise temperature control, wear-free and noiseless
- Switchgear and control unit integrated in the furnace housing underneath the tube module for comfortable operation of the controller

### Accessories:

- Solid base frame for vertical operation
- Adjustable temperature limiter to protect furnace and charge acc. EN 60519-2
- Tubes for operation with water-cooled flanges
- Special accessories for operation under inert gas or vacuum
- Further accessories see page 29

### Technical Data:

Model	T max [°C]	Outer dimensions [mm] Width x Depth x Height	Tube-Ø Inner [mm]	Heated length [mm]	Tube length [mm]	Power [kW]	Voltage [V]	Weight [kg]
ROC 20/180/14	1400	600 x 350 x 520	20	180	600	3,5	400 V 3/N	35
ROC 38/180/14	1400	600 x 400 x 675	38	180	750	3,5	400 V 3/N	37
ROC 50/180/14	1400	600 x 400 x 675	50	180	750	3,5	400 V 3/N	40
ROC 20/250/14	1400	665 x 350 x 520	20	250	600	3,5	400 V 3/N	35
ROC 38/250/14	1400	665 x 400 x 675	38	250	800	3,6	400 V 3/N	39
ROC 50/250/14	1400	665 x 400 x 675	50	250	800	3,6	400 V 3/N	42
ROC 50/450/14	1400	850 x 400 x 745	50	450	1000	4,0	400 V 3/N	51
ROC 75/450/14	1400	850 x 400 x 745	75	450	1000	5,5	400 V 3/N	58
ROC 105/450/14	1400	850 x 400 x 785	105	450	1000	7,0	400 V 3/N	64
ROC 50/610/14	1400	1150 x 400 x 745	50	610	1300	4,5	400 V 3/N	51
ROC 75/610/14	1400	1150 x 400 x 745	75	610	1300	6,5	400 V 3/N	63
ROC 38/180/15	1500	600 x 400 x 675	38	180	750	3,5	400 V 3/N	48
ROC 50/180/15	1500	600 x 400 x 675	50	180	750	3,5	400 V 3/N	51
ROC 50/250/15	1500	665 x 400 x 675	50	250	800	3,6	400 V 3/N	51
ROC 50/450/15	1500	850 x 400 x 745	50	450	1000	4,0	400 V 3/N	53
ROC 75/450/15	1500	850 x 400 x 745	75	450	1000	5,5	400 V 3/N	63
ROC 50/610/15	1500	1150 x 400 x 745	50	610	1300	4,5	400 V 3/N	56
ROC 75/610/15	1500	1150 x 400 x 745	75	610	1300	6,5	400 V 3/N	68
ROC 38/250/16	1600	665 x 350 x 520	38	250	600	3,5	400 V 3/N	48
ROC 50/250/16	1600	665 x 400 x 675	50	250	800	4,0	400 V 3/N	48
ROC 50/450/16	1600	850 x 400 x 745	50	450	1000	5,5	400 V 3/N	55
ROC 75/450/16	1600	850 x 400 x 745	75	450	1000	6,5	400 V 3/N	63
ROC 50/610/16	1600	1150 x 400 x 745	50	610	1300	6,0	400 V 3/N	58

## High Temperature Tube Furnaces with MoSi<sub>2</sub> heating elements

T max 1700 °C and 1800 °C

- Tube diameter from 38 mm to 75 mm
- Heated length from 200 mm to 400 mm
- Delivery with tube made of aluminium oxide C 799 and 2 fibre plugs
- Double-walled housing with rear-ventilation to ensure very low outer-casing temperatures
- Insulation made of high grade vacuum formed aluminium oxide fibre with low thermal mass for very fast heating and cooling cycles
- Powerful Molybdenum-Disilicide heating elements, mounted on 2 sides parallel to the tube, fast heating
- Heating elements controlled by thyristors for very precise temperature control, wear-free and noiseless
- Switchgear and control unit integrated in the furnace housing underneath the tube module for comfortable operation of the controller, for vertically operated furnaces switchgear in a sep. cabinet

### Accessories:

- 3-zone design for high temperature uniformity
- Solid base frame for vertical operation
- Adjustable temperature limiter to protect furnace and charge acc. EN 60519-2
- Different working tubs made of glass, ceramics, metal for various applications are available
- Gas-tight, water-cooled flanges for operation under inert gas or vacuum
- Further accessories see page 29



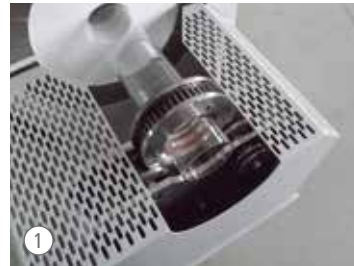
### Technical Data:

Model	T max [°C]	Outer dimensions [mm] Width x Depth x Height	Tube-Ø Inner [mm]	Heated length [mm]	Tube length [mm]	Power [kW]	Voltage [V]
ROHT 38/200/17	1700	460 x 460 x 750	38	200	800	3,6	400 V 3/N
ROHT 50/200/17	1700	460 x 460 x 750	50	200	800	3,6	400 V 3/N
ROHT 75/200/17	1700	460 x 460 x 750	75	200	800	3,6	400 V 3/N
ROHT 38/300/17	1700	560 x 460 x 750	38	300	900	3,6	400 V 3/N
ROHT 50/300/17	1700	560 x 460 x 750	50	300	900	5,4	400 V 3/N
ROHT 75/300/17	1700	560 x 460 x 750	75	300	900	5,4	400 V 3/N
ROHT 38/400/17	1700	660 x 460 x 750	38	400	1000	6,7	400 V 3/N
ROHT 50/400/17	1700	660 x 460 x 750	50	400	1000	6,7	400 V 3/N
ROHT 75/400/17	1700	660 x 460 x 750	75	400	1000	6,7	400 V 3/N
ROHT 38/200/18	1800	460 x 460 x 750	38	200	800	3,6	400 V 3/N
ROHT 50/200/18	1800	460 x 460 x 750	50	200	800	3,6	400 V 3/N
ROHT 75/200/18	1800	460 x 460 x 750	75	200	800	3,6	400 V 3/N
ROHT 38/300/18	1800	560 x 460 x 750	38	300	900	5,4	400 V 3/N
ROHT 50/300/18	1800	560 x 460 x 750	50	300	900	5,4	400 V 3/N
ROHT 75/300/18	1800	560 x 460 x 750	75	300	900	5,4	400 V 3/N
ROHT 38/400/18	1800	660 x 460 x 750	38	400	1000	6,7	400 V 3/N
ROHT 50/400/18	1800	660 x 460 x 750	50	400	1000	6,7	400 V 3/N
ROHT 75/400/18	1800	660 x 460 x 750	75	400	1000	6,7	400 V 3/N

## Special Tube Furnaces



- ① Horizontal rotating tube furnace with electric drive, splittable for easy access to change tube or reactor. Upon request with base or trolley and with adjustable inclination.



- ② Tube furnaces used for production of ceramic powder in protective gas atmosphere. The work tube is equipped with gas-tight, water cooled flanges made of stainless steel. Including gas control station for four furnaces.



- ③ Splitable tube furnace with base, adjustable inclination, for continuous drying, sintering and calcination processes. Furnaces can be individually adapted to customer own tubes, reactors and processes.



- ④ Vertical tube furnace with fixed bottom structure, for easy access to the inner chamber both vertical heating moduls are horizontally moveable. Especially designed for individual test equipment and high temperature uniformity. Modifications to meet individual requirements can be realized.

## Tube Furnace-Accessories

### Working Tubes

Tubes made of different materials and various diameters are available for different applications and operating temperatures.



### Plugs

Fibre plugs for all tube diameters and temperatures available, optional also with protective gas connection.



### Flanges

Gas-tight flanges made of stainless steel, with and without water cooling, for protective gas atmosphere or vacuum can be supplied.



### Gassing systems

For different furnace types we can supply manual or automatic gassing systems for non-flammable gases or for vacuum operation.



### Water cooling

Inner furnace casing with water-cooler coils and additional external cooling unit.





## Drying Cabinets with natural and forced air convection

T max 250 °C

- Very fast and accurate laboratory drying cabinets
- Designed for demanding and precise tests and drying processes and for materials and processes with high amount of humidity
- High quality and safe drying, heating and tempering in laboratories and industry
- Chamber volume 23 - 715 litres
- Temperature range starting from +10 °C above ambient temperature up to 250 °C
- Patented system with special air circulation inside the chamber for very homogeneous temperature uniformity during all drying, heating and sterilisation processes
- User-friendly, very accurate temperature control and fast temperature recovering after charging
- Standard version with micro-processor controller, LCD indication for process details
- Wide range of additional accessories and extras
- Also with natural thermal air circulation for very smooth air stream in the chamber, noise-free (models KTL 20/02 - KTL 700/02)

### Accessories:

- Also for 300 °C instead of 250 °C
- Window and illumination (from model 60)
- Cable feed through, door mounted on left side, drip tray
- Additional PT 100 sensor
- Software for Windows PC, interface for PC and recorder
- HEPA-Filter mounted in the air inlet
- Outer case made of stainless steel
- 1-, 3-, 9-point temperature measuring and 27-point according DIN 12880
- Possibility of validation (IQ, OQ) incl. 9-point measuring



### Technical Data:

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]	Weight [kg]
KTL 20/02	250	240 x 320 x 295	23	406 x 580 x 604	1,0	230 V 1/N	31
KTL 60/02	250	400 x 390 x 350	55	620 x 640 x 680	1,3	230 V 1/N	55
KTL 120/02	250	540 x 390 x 530	112	760 x 640 x 860	1,9	230 V 1/N	75
KTL 240/02	250	540 x 540 x 760	221	760 x 790 x 1090	1,9	230 V 1/N	100
KTL 400/02	250	540 x 540 x 1410	411	760 x 790 x 1910	3,6	400 V 3/N	150
KTL 700/02	250	940 x 540 x 1410	715	1160 x 790 x 1910	4,5	400 V 3/N	215
KTL 20/02/A	250	240 x 320 x 295	23	406 x 580 x 604	1,0	230 V 1/N	31
KTL 60/02/A	250	400 x 390 x 350	55	620 x 640 x 680	1,3	230 V 1/N	55
KTL 120/02/A	250	540 x 390 x 530	112	760 x 640 x 860	1,9	230 V 1/N	75
KTL 240/02/A	250	540 x 540 x 760	221	760 x 790 x 1090	1,9	230 V 1/N	100
KTL 400/02/A	250	540 x 540 x 1410	411	760 x 790 x 1910	3,7	400 V 3/N	150
KTL 700/02/A	250	940 x 540 x 1410	715	1160 x 790 x 1910	4,9	400 V 3/N	215

## Vacuum Drying Cabinets

T max 200 °C

- Fast, smooth, ecological - Lab dryer for high demands
- Vacuum-drying cabinets offer noiseless operation, very smooth probe heating
- Most suitable for drying of thermal instable and oxidation sensitive materials, parts with difficult shape, for drying of probes in vacuum
- Chamber volume of 26, 55 und 106 litres
- Temperature range starting from +5 °C above ambient temperature up to 200 °C
- User-friendly, very accurate temperature control and fast temperature recovering after charging
- Standard version with micro-processor controller, LCD indication for process details
- Wide range of additional accessories and extras e.g. base cabinet for vacuum station

### Accessories:

- Charge-thermocouple for independent measuring inside the chamber or on the probe
- Inner chamber made of stainless steel
- Base cabinet for vacuum station, to integrate vacuum pump and necessary devices
- Illumination, female plug in the chamber
- Chemical resistant vacuum pump (also with emission trap and emission condenser)
- Vacuum control system
- Additional PT 100 Sensor
- Software for Windows PC, interface for PC and recorder
- 1-, 3-, 9-point temperature measuring and 27-point according DIN 12880
- Possibility of validation (IQ, OQ) incl. 9-point measuring



### Technical Data:

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]	Weight [kg]
KTL 20/02/V	200	340 x 260 x 300	26	560 x 490 x 700	1	230 V 1/N	65
KTL 60/02/V	200	400 x 320 x 430	55	620 x 550 x 830	1,2	230 V 1/N	98
KTL 120/02/V	200	540 x 410 x 480	106	760 x 640 x 880	1,8	230 V 1/N	130



## High Temperature Ovens

T max 450 °C, 650 °C and 850 °C

- Air-circulation chamber furnaces up to 850 °C, suitable for tempering, ageing, pre-heating, drying, shrinking and testing
- Rugged casing made of high grade steel sheets
- Hinged door mounted on the right side
- Inner liner of heat-resistant stainless steel, long service life, extremely resilient, corrosion resistant
- 2 pairs of sheet-metal tray holders included as standard (KU 15/06/A without trays), sheet-metal trays optionally available
- Efficient insulation for low heat losses, low energy consumption and low energy costs
- High-grade heating elements with long service life
- Powerful air-circulation for high temperature uniformity inside the furnace chamber up to +/-5 K acc. to DIN 17052
- Base included in standard supply (KU 15/06/A as bench-type furnace without base)

### Accessories:

- Lift door with pneumatic drive
- Fresh air valve and exhaust flaps for extended ventilation of furnace chamber
- Controlled cooling system to accelerate cooling times
- Protective gas connection
- Annealing retort system

### Technical Data:

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions* [mm] Width x Depth x Height	Power [kW]	Voltage [V]	Weight [kg]
KU 40/04/A	450	300 x 400 x 300	35	570 x 1020 x 1305	3,2	230 V 1/N	115
KU 70/04/A	450	350 x 500 x 400	70	620 x 1120 x 1405	4,3	400 V 3/N	130
KU 140/04/A	450	450 x 600 x 500	140	720 x 1220 x 1505	5,8	400 V 3/N	205
KU 270/04/A	450	600 x 750 x 600	270	870 x 1390 x 1605	9,8	400 V 3/N	370
KU 540/04/A	450	750 x 900 x 800	540	1020 x 1540 x 1805	13,8	400 V 3/N	540
KU 15/06/A	650	300 x 350 x 150	15	500 x 900 x 440	2,6	230 V 1/N	63
KU 40/06/A	650	300 x 400 x 300	35	540 x 1050 x 1270	4,3	400 V 3/N	125
KU 70/06/A	650	350 x 500 x 400	70	590 x 1150 x 1370	8,3	400 V 3/N	140
KU 140/06/A	650	450 x 600 x 500	135	690 x 1250 x 1470	12,3	400 V 3/N	220
KU 270/06/A	650	600 x 750 x 600	270	840 x 1450 x 1620	16,8	400 V 3/N	480
KU 540/06/A	650	750 x 900 x 800	540	990 x 1600 x 1820	24,8	400 V 3/N	560
KU 40/08/A	850	300 x 400 x 300	35	850 x 1360 x 1470	7,1	400 V 3/N	290
KU 70/08/A	850	350 x 500 x 400	70	900 x 1460 x 1570	11,0	400 V 3/N	360
KU 140/08/A	850	450 x 600 x 500	135	1000 x 1560 x 167	15,1	400 V 3/N	580
KU 270/08/A	850	600 x 750 x 600	270	1150 x 1710 x 1770	21,1	400 V 3/N	770
KU 540/08/A	850	750 x 900 x 800	540	1300 x 1860 x 1970	31,1	400 V 3/N	920



## High temperature ovens

T max 750 °C, temperature uniformity +/- 3 K

- Air-circulation furnaces up to 750°C
- 4-side heating
- High grade heating elements with long service life
- Powerful, horizontal air circulation system from 4 sides
- Very uniform temperature homogeneity of up to +/- 3 K accord. DIN 17052

### Accessories:

- Semi-gastight version for protective gas operation
- Low-dust version with fully covered insulation available
- Lift door with pneumatic drive
- Fresh air valve and exhaust flaps for extended ventilation of furnace chamber
- Controlled fresh air system with fan to accelerate cooling times
- Manual or automatic gassing systems
- Annealing retort system



### Technical Data:

Model	T max [°C]	Inner dimensions [mm] Width x Depth x Height	Volume [l]	Outer dimensions [mm] Width x Depth x Height	Power [kW]	Voltage [V]	Weight [kg]
KU 40/07/A	750	300 x 400 x 300	35	610 x 1050 x 1410	5,5	400 V 3/N	140
KU 70/07/A	750	350 x 500 x 400	70	660 x 1150 x 1510	10,7	400 V 3/N	170
KU 140/07/A	750	450 x 600 x 500	135	760 x 1260 x 1610	14,3	400 V 3/N	290
KU 270/07/A	750	600 x 750 x 600	270	950 x 1460 x 1750	21,7	400 V 3/N	590
KU 540/07/A	750	750 x 900 x 800	540	1100 x 1610 x 1950	28,7	400 V 3/N	700



## Customized Furnaces

### Special furnace up to 1100 °C

Chamber furnace for testing fire protection plates and fire protection glass, up to 1000 °C in 10 minutes. Thickness of test plates between 25 - 100 mm. Max. temperature up to 1400 °C and slight over pressure are optional available.



### Chamber furnace with protective gas atmosphere up to 1700 °C

Chamber furnace with water cooled, gas tight chamber. The furnace can be used up to 1700 °C with protective gas atmosphere. An oxygen sensor monitors the O<sub>2</sub>-content in the exhaust gas. To increase the purity of the atmosphere, a vacuum pump can be used to evacuate the chamber before starting the process.



### Apparatus for Hot Modulus of Rupture (HMOR) tests

This furnace system was developed to investigate the hot modulus of rupture of new refractory materials. The furnace has a maximum temperature of 1600 °C. The gas tight design allows different gas atmospheres to be used. The oxygen partial pressure is monitored online through an oxygen sensor.

A walking beam system is installed so that 6 samples can be introduced simultaneously. The transport of the samples is semi-automatic. A sample size of 25 x 25 x 150 mm can be tested according to the three-point-bending method. All relevant process and experimental data are registered by the software supplied.



## Customized Furnaces

### Calibration furnace up to 1700 °C

The furnace shown was designed for high temperature calibration of thermocouples. Several thermocouples can be calibrated at the same time. The heating is splitted in 3 independently zones.

All 3 zones are controlled by a DC power pack, the furnace casing is water cooled.



### Rotating tube furnace up to 1600 °C

This rotary tube furnaces can be operated up to 1600 °C under inert gas atmosphere. The ceramic tube has an inner diameter of 80 mm and a total length of 1600 mm. In spite of the inert gas atmosphere, the product can be introduced and discharged continuously through sewer ports. The vacuum pump supplied can be used to evacuate the system before purging the tube with inert gas and start the process.



### Multi-purpose furnace 1700 °C / 1200 °C

The photo shows a high temperature box furnace for 1700 °C. Two tube furnaces for 1200 °C are installed on one side of the box furnace. This combination of three different furnaces is used to investigate highly corrosive materials in the glass industry.

The bottom drives up and down electromechanically and can be rotated simultaneously at predefined speeds.

Through the opening in the roof of the box furnace and by means of a lifting and turning mechanism specimens can be transferred between the three furnaces.



### Special tube furnace for pyrolyses

This custom designed tube furnace for pyrolysis on a pilot scale contains 4 working tubes. The heated length of 1.5 m is divided into 3 heating zones. The furnace can be operated up to 1250 °C. Each working tube has an inner diameter of 110 mm and a total length of 2.5 m. A special system compensates the thermal expansion of the ceramic tubes.





## Furnaces and plants for production

For all important heat treatment applications THERMCONCEPT supplies a wide range of furnaces and plants for production. Please ask for our special catalogues.

- Chamber-, bogie hearth-, hood- and pit-type furnaces
- Electrically heated or fuel-fired
- Large range of standard furnaces as well as tailor made furnace lines
- Normal- and protective gas atmosphere
- From manually up to fully automatic controlled operation



### High temperature chamber furnace up to 1600 °C

The shown chamber furnace with lift door is used for sintering of technical ceramics at high temperatures. The furnace is heated by MoSi<sub>2</sub>-heating elements. The usable volume is 43 m<sup>3</sup>, the usable dimensions are 13200 x 1800 x 1800 mm (wxdxh).

### Elevator furnace

Large scale elevator furnace up to 1800 °C, with up to 2000 litres inner volume and 1 t charge weight for sintering of insulation panels.

Both bottom hearths will be driven for loading and unloading to the left and right side. Due to the control system a fully automatic operation is possible.



### Chamber and bogie hearth furnaces up to 1400 °C

Electrically heated chamber and bogie hearth furnaces for up to 1400 °C, with heating wire on support tubes in 5 sides of the furnace.

Upon request with cooling system, lift door, multi-zone control, waste gas purification or protective gas operation. Bogie hearth furnace are also available with 2nd bogie, 2nd lift door, electric bogie drive and transverse shunting device.

Individual furnace sizes with inner dimensions adapted to customer processes are possible.



## Furnaces and plants for production

### Furnaces for debinding and sintering

Electrically heated air circulation furnaces for debinding up to 750 °C or chamber furnaces for sintering up to 1800 °C. Alternatively Combi-furnaces with air pre-heating system for both processes in one furnace are available.

Upon request also with catalytic or thermal waste gas purification system.



### Gas-heated furnaces up to 1600 °C

Gas-heated furnaces are supplied as chamber, bogie-heath and hood furnaces for applications up to 1600 °C. For more information please ask for our special brochures.



### Low-temperature ovens up to 450 °C

Air circulation chamber ovens for a temperature range up to 250 °C and 450 °C for pre-heating, drying, etc. With horizontal or vertical air stream, swing door and furnace base to allow charging by fork lift stacker.

Upon request with automatically driven vapour vent flaps, cooling system, electro-hydraulic lift door or bottom design for loading on floor level.

Special dimensions according to customers demand are possible to realize.



## Catalytic and thermal purification of exhaust air

Many thermal processes in technical ceramics, dental ceramics and other fields result in the release of volatile organic compounds. Compliance with emission limits requires the use of downstream exhaust air purification systems. THERMCONCEPT supplies catalytic and thermal exhaust air purification systems that are customised for the specific processes.

### Catalytic exhaust air purification system

THERMCONCEPT catalytic converters work with honeycomb ceramics that are coated with needle-shaped Perovskite crystals and which have a high resistance against most catalyst poisons.

Catalytic exhaust air purification systems are designed according to the volumetric flow of exhaust gas and the composition and concentration of the organic compounds. Depending on the specifically intended use, these compounds are catalytically oxidised at temperatures between 280 °C and 500 °C and are entirely converted into carbon dioxide and water.

THERMCONCEPT supplies integrated plants consisting of the furnace system, the catalytic exhaust air purification unit and a PLC controller for the entire process. The plant also includes the required safety equipment in accordance with the EN 1539 standard and also can be supplied, on request, with a matching exhaust pipe.



①



②



④



③

### Furnace system for medical application

The photo shows a furnace system for medical application with catalytic exhaust gas purification incl. honeycombs for pre-cleaning, fine-cleaning, filter separator system against catalyst poisons, prepared for a flow rate of 80 nm<sup>3</sup>/hrs.

- ① Catalytic exhaust gas purification system KNV 300
- ② Catalytic exhaust gas purification system KNV 600 for the tyre industry
- ③ LaboKat KNV 50
- ④ Furnace system for medical application with KNV 150

## Thermal exhaust air purification systems

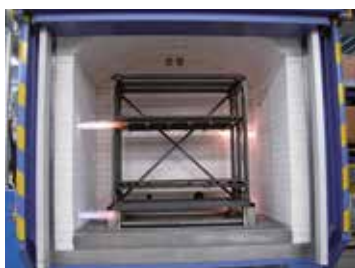
THERMCONCEPT designs, builds and supplies thermal post-combustion systems for different applications. This robust and versatile type of exhaust air purification is generally deployed when an undefined crude gas is used, or when catalyst poisons exclude the use of a catalytic purifier. Organic components in the exhaust air are burned completely at temperatures of approx. 750 °C.

- Standing, lying or suspended design
- With noise control measures (installation of silencers, noise control booths)
- Insulation with high-quality ceramic fibres for combustion temperatures up to 1200 °C
- Heating by means of gas or oil burners; electrical heating also possible
- Volumetric flow rates of 50 nm<sup>3</sup> /hr to 15000 nm<sup>3</sup> /hr
- Optionally fitted with heat exchangers for heat recovery
- Exhaust gas chimney and pipes available on request
- System fitted with the required safety equipment

### The THERMCONCEPT service range:

- Planning and design of exhaust air purification systems in new and old systems
- Support with official approval procedures and emission measurements
- Integration with upstream and downstream processes
- Integration in existing conveyor and handling solutions
- Tests in our high-temperature pilot plant

THERMCONCEPT deploys thermal post-combustion in furnace systems heated electrically or with gas. The priority is always to supply a customised turnkey solution for the user's specific process, comprising the furnace, thermal post-combustion unit, safety equipment and process control.



The photo shows a gas-fired furnace for dewaxing with thermal post-combustion, program flow control and temperature regulation using a Siemens-PLC S7 313 with TP 170 touch panel.



## Process control and documentation

State-of-the-art control technology is fitted as standard in THERMCONCEPT furnaces. Microprocessor controllers ensure precise furnace regulation of both simple and complex processes. The program controllers are extremely user-friendly. The wide range of standard controllers matches the various types of furnaces and covers most customer requirements.



### Eurotherm 3208/3204 temperature controller:

- 8 segments (4 ramps, 4 holding times)
- 1 program
- 1 programmable function
- Optional RS 232/485 and iTools
- Multi-zone control as option

### Eurotherm 3508/3504 temperature controller:

- Total of 500 segments, freely editable
- 10 programs
- 7-day preselect clock for delay program start
- Optional RS 232/485 and iTools
- Multi-zone control as option
- Several programmable functions (optional)
- Cascade control system (optional)

### Eurotherm 3216i/32h8i over-temperature controller:

- Alarm message in clear text
- Can be deployed as a temperature limiter or as a temperature selection limiter
- Alarms in accordance with FM/DIN 3440

### Bentrup TC 505 temperature controller:

- 5 segments per program (2 ramps, 2 holding times, 1 cooling ramp)
- 30 programs (6 fixed, 24 modifiable)
- Programmable lead time (00.00-99.59 hrs)
- Optional RS 232/485 and software
- Multi-zone control (max. 3 zones) as option
- Several programmable functions

### Bentrup TC 507 temperature controller:

- Up to 99 segments (ramp and holding time)
- Up to 99 programs can be stored
- Programmable lead time (00.00-99.59 hrs)
- Optional RS 232/485 and software
- Multi-zone control (max. 3 zones) as option
- Several programmable functions



## Process control and documentation

The control system can be extended as required. Software packages for managing the controller and for evaluating the processes are available, as is visualisation software. On request, we can install Siemens S7 control systems featuring Siemens touch panels as user interface.

In addition to our proven standard systems, we also design switching and control systems according to customer wishes, in compliance with special plant standards and equipment regulations.

### Siemens S7 controllers, Simatic Panel with remote maintenance:

PLC controllers based on the Siemens S7 controller, with remote maintenance option, are used to meet challenging requirements in respect of process control and documentation.

### THERMCONCEPT user interfaces:

THERMCONCEPT designs its own user interfaces that meet most requirements for simple operation and monitoring even in the standard version. In more advanced versions, all functions and the entire process can be graphically displayed, stored and read out via various interfaces.

### THERMCONCEPT software for control and analysis:

THERMCONCEPT supplies a range of software packages for programming, controlling, visualising and documenting temperature-related processes:

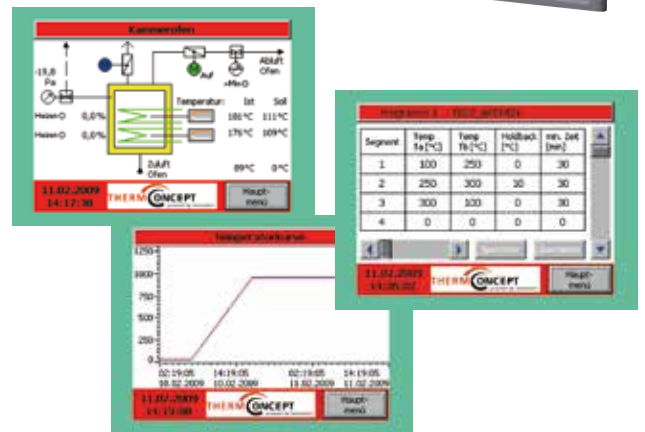
- Management of several furnaces simultaneously
- Furnace regulation from a central PC
- Detecting the temperature-time profile in accordance with DIN ISO 9000 ff.
- Documentation of batch data

### Process documentation:

Various graphics, line or dot recorders are available.

### Switching technology:

- From contactor control systems to thyristor control units
- Multi-zone control
- Cascade control system
- Remote maintenance systems
- Heating control using DC power packs
- Frequency-regulated drive controller
- Drive controllers for linear drives
- Control panel according to customer-specific plant standards and guidelines
- Air-conditioning for control panels





## Professional Service

With our skilled workforce we are able to provide you with a wide range of professional services relating to all furnaces, right from the beginning.

### Our consulting is your success

Trust on our very long experience in the furnace business. We turn your special requirements into a successful and reliable solution.



### Your application takes centre stage

Expert advice on applications and uses, to ensure you make the right investment decision.

### Carry out a test

You want to test your tool and probes first under realistic conditions? No problem. For trails and tests our test field is at your disposal.

### Everything from a single source

As system suppliers, we can also advise you on supplementary aids, tools and systems.



### Our service and support is manifold

You can expect a large service package and a wide range of support:

- Installation, set-up and commissioning of furnaces systems
- Intensive operator training
- Retrofitting, up-grading and modernising of existing furnace lines
- Modernisation of control systems
- Accomplishing of furnaces according AMS 2750D, NADCAP, FDA
- DKD Calibration / plant calibration at site or in our laboratories
- Temperature uniformity tests with calibrated measuring devices acc. to certified procedures
- Regular maintenance and service at site
- Repairs, modifications and upgrades of furnaces, change of insulation materials or mechanical components. Also available for other furnace brands



- Fast spare parts service
- All necessary spare parts on stock
- Also for other furnace brands

## The product range at a glance

### Technical Ceramics, Advanced Materials, Waste Air Purification

THERMCONCEPT furnaces are used for many different applications e.g. for technical ceramics, semi-conductor production, photo voltaics, bio-ceramics etc. We supply also furnaces for debinding and sintering, for crystal growing and thermal analysis. Our chamber-, bogie hearth-, elevator-, hood- and continous furnaces are either electrically heated or fuel-fired. All furnaces can be completed with catalytic converter or thermal afterburner.

### Dental

For de-waxing and pre-heating of moulds, sintering of Zirkonia, firing of dental ceramic compouds and for CAD/CAM-systems THERMCONCEPT offers a wide range of furnaces for manufacturing of dental prothesis as well as for industrial production of dental materials.

### Heat Treatment of Metal and Plastics

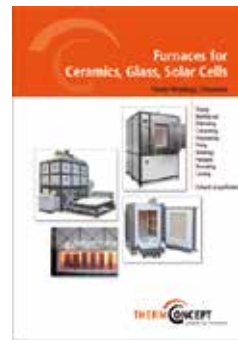
We supply industrial furnaces and plants for a wide range of different applications. Our furnaces and plants are used for annealing and hardening of metal and also used for tempering, ageing, pre-heating, drying and curing of metals and plastics. The product line consists of electrically heated and gas-fired furnaces.

### Annealing, Hardening, Tempering

Here you will find furnaces, heat treatment systems and accessories for a wide range of applications in tool shops and metal processing industry. Nearly all important heat treatment processes can be realised with our demanding equipment.

### Foundry

For foundries we supply electrically and fuel fired melting- and holding furnaces for light- and heavy metals. The range of furnaces include bale-out furnaces, tiltable furnaces and bath furnaces. For solution annealing and ageing of aluminium parts we have a wide range starting with air circulation chamber furnaces up to fully automatic heat treatment lines.



Brochure:  
Ceramic, Glass, Solar



Brochure:  
Dental Furnaces



Brochure:  
Thermal Process  
Technology



Brochure:  
Hardening, Tempering,  
Quenching



Brochure:  
Melting and Holding of  
Non-Ferrous Metals



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