

## Melting Furnaces in Customized Dimensions

### Tilting Furnaces with Electrohydraulic Lifting Platforms

Depending on the material flow and space requirements in a foundry, the charging height and pouring height may need to be different for a tilting furnace. For instance, if loading is performed at ground level and the metal is poured into a machine at a higher level, then an optional electro-hydraulic lifting platform can adjust for the difference. The operation of the lifting platform is by means of a 2 hand operation with a manual throttling valve. It can also be interlocked with other machinery and be motor driven operated.



Tilting furnace K 240/12 with lifting platform for charging and pouring at different levels

### Melting Furnaces for Heavy Metals

Our melting furnaces in the K and T product lines can be upgraded with adapted electrical heating for melting of heavy metals like lead and zinc. The melting furnace is equipped with a special crucible, in most cases a steel crucible. The melting power is tailored to the type of metal to ensure optimum utilization of the melting furnace.



Tilting furnace K 240/11 for melting of lead



Steel crucible with special suspension brackets for high charge weight

## Rotary Table System for Continuous Pouring

For continuous processes, multiple crucible furnaces can be combined on a rotary table system. For example, when using three furnaces with a rotation in 120° steps, loading takes place at the first space, de-gassing at the second space, and bale-out at the third. This ensures a continuous supply of liquid metal at the pouring location. The rotary table is designed with an emergency drain below in case of crucible breakage.



Rotary table system with 3 x T 150/11

## Magnesium Melting Furnaces

For a variety of projects, Nabertherm has supplied melting furnaces to be upgraded by the customer for the melting of magnesium. Nabertherm supplied the furnace with all necessary control systems and the steel crucible. The furnaces were completed by the customer with the safety devices, pump systems for bale-out, and gas supply systems. We are capable of implementing furnace systems to provide for a crucible volume of 1500 liters of magnesium.



Tilting furnaces for magnesium K 1500/75 S with 1500 liters crucible volume

## Laboratory Melting Furnaces



Melting furnace K 4/10



Melting furnace KC 2/15

These compact melting furnaces for the melting of non-ferrous metals and alloys are one of a kind and have a number of technical advantages. Designed as tabletop models, they can be used for many laboratory applications. The practical counter balanced hinge with shock absorbers and the spout (not for KC) on the front of the furnace make exact dosing easy when pouring the melt. The melting furnaces are available for furnace chamber temperatures of 1000, 1300, or 1500 °C. This corresponds to melt temperatures of about 80 °C - 110 °C lower.

- Tmax 1000 °C, 1300 °C, or 1500 °C
- Crucible sizes of 0,75, 1,5 or 3 liters
- Crucible with integrated pouring spout of iso-graphite included with delivery
- Additional spout (not for KC), mounted at the furnace for exact pouring
- Only fiber materials are used which are not classified as carcinogenic according to TRGS 905, class 1 or 2
- Compact bench-top design, simple emptying of crucible by tilting system with gas damper
- Crucible for heating up of melting furnace insulated with a hinged lid, lid opened when pouring
- Defined application within the constraints of the operating instructions
- Controls description see page 78

### Additional equipment

- Other crucible types available, e.g. steel
- Design as bale-out furnace without tilting device, e.g. for lead melting
- Over-temperature limiter for the furnace chamber with automatic reset to protect against overtemperature. The limit controller switches off the heating when the pre-set limit temperature has been reached and does not switch it on again until the temperature falls below the setting again.
- Observation hole for melt



Melting furnace KC 2/15

Model	Tmax furnace °C	Tmax melt bath °C	Crucible	Volume in l	Outer dimensions <sup>4</sup> in mm			Heating power in kW <sup>3</sup>	Weight in kg
					W	D	H		
K 1/10	1000	850	A 6	0.75	520	680	660	3.0	85
K 2/10	1000	850	A10	1.50	520	680	660	3.0	90
K 4/10	1000	850	A25	3.00	570	755	705	3.6	110
K 1/13 <sup>1</sup>	1300	1150	A 6	0.75	520	680	660	3.0	120
K 2/13 <sup>1</sup>	1300	1150	A10	1.50	520	680	660	3.0	125
K 4/13 <sup>1</sup>	1300	1150	A25	3.00	570	755	705	5.5	170
KC 1/15 <sup>2</sup>	1500	1320	A6	0.75	580	630	580	10.5	170
KC 2/15 <sup>2</sup>	1500	1320	A10	1.50	580	630	580	10.5	170

<sup>1</sup>Outer dimensions of furnace, transformer in separate housing (500 x 570 x 300 mm)

<sup>2</sup>Switchgear and controller mounted in a floor standing cabinet

<sup>3</sup>Depending on furnace design connected load might be higher

<sup>4</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request.

## Cleaning Furnace for Riser Tubes Electrically Heated



SRO 170/1000/11

Riser tubes for low-pressure melting furnaces must be cleaned in regular intervals. To remove deposits the pipe must be removed from the furnace and heated. In comparison to applying an open flame to heat the pipe, the SRO 170/1000/11 furnace offers the advantages of very uniform tube heating. The quality of the heat treatment is clearly better and the life-time of the risers can be extended when cleaned regularly. The heated rising tube can be removed from the furnace hot and returned to the low-pressure melting furnace.

The furnace is charged from above using a crane provided by the customer. Located in the lower section of the furnace is a steel catch drawer which is filled with sand or sizing compound. The rising tube hangs in the receptacle with a crane eye and the deposits drip into the drawer. Designed as a drawer, it can be easily pulled out, emptied and filled again.

- Tmax. 1100 °C
- Charging opening with collar plate and swing lid on the furnace. Charging of the rising tube using the customer crane
- Max. dimensions of the rising tube: L: 1000 mm, outer dimension 90 mm with single-side flange with an outer diameter of 115 mm
- Only fiber materials are used which are not classified as carcinogenic according to TRGS 905, class 1 or 2
- Heated length: 1000 mm
- Charge receptacle with crane eye for holding smaller risers
- Steel catch draw, filled by the customer with sand, which collects deposits
- Steel collector designed as a drawer
- Furnace on rollers
- Switchgear and control equipment fastened directly to the furnace
- Defined application within the constraints of the operating instructions
- NTLog Basic for Nabertherm controller: recording of process data with USB-flash drive
- Controls description see page 78

### Additional equipment

- Design for other riser dimensions on request
- Switchgear on rollers
- Process control and documentation via VCD software package or Nabertherm Control Center (NCC) for monitoring, documentation and control see page 78



Furnace SRO 170/1000/11 with suspended pipe



To be pulled with crane eye for riser tubes with flange

Model	Tmax °C	Outer dimensions <sup>2</sup> in mm			Outer tube-Ø/ mm	Heated length/mm	Heating power in kW <sup>1</sup>	Electrical connection*
		W	D	H				
SRO 170/1000/11	1100	590	640	1700	90	1000	12,0	3-phase

<sup>1</sup>Depending on furnace design connected load might be higher

\*Please see page 79 for more information about supply voltage

<sup>2</sup>External dimensions vary when furnace is equipped with additional equipment. Dimensions on request.



## Chamber Ovens

Electrically Heated or Gas-Fired



Chamber oven KTR 1500



Chamber oven KTR 4500



Chamber oven KTR 6125

The chamber ovens of the KTR range can be used for complex drying processes and heat treatment of charges to an application temperature of 260 °C. The high-performance air circulation enables optimum temperature uniformity throughout the work space. A wide range of accessories allow the chamber ovens to be modified to meet specific process requirements. The design for the heat treatment of flammable materials in conformance with EN 1539 (NFPA 86) is available for all sizes.

- Tmax 260 °C
- Electrically heated (via a heating register with integrated chrome steel heating elements) or gas-fired (direct or indirect gas-fired including injection of the hot air into the intake duct)



Chamber oven KTR 1500 with charging cart

- Temperature uniformity up to +/- 3 °C according to DIN 17052-1 (for design without track cutouts) see page 74
- High-quality mineral wool insulation provides for outer temperatures of < 25 °C above room temperature
- Only fiber materials are used which are not classified as carcinogenic according to TRGS 905, class 1 or 2
- High air exchange for fast drying processes
- Double-wing door for furnaces KTR 3100 and larger



Chamber oven KTR 22500/S with chamber lightning and drive-in tracks with insulated plugs which provide for an optimal temperature uniformity

- Over-temperature limiter with adjustable cutout temperature for thermal protection class 2 in accordance with EN 60519-2 as temperature limiter to protect the oven and load
- Incl. floor insulation
- Defined application within the constraints of the operating instructions
- NTLog Basic for Nabertherm controller: recording of process data with USB-flash drive
- Controls description see page 78

**Additional equipment**

- Track cutouts for level drive-in of charging cart
- Base frame to charge the oven via a charging forklift
- Additional door in the back for charging from both sides or to use the oven as lock between two rooms
- Fan system for faster cooling with manual or motor-driven control of the exhaust flaps
- Programmed opening and closing of exhaust air flaps
- Air circulation with speed control, recommendable for processes with light or sensitive charge
- Observation window and furnace chamber lighting
- Safety technology according to EN 1539 (NFPA 86) (models KTR .. LS) for charges containing solvents see page 55
- Charging cart with or without rack system
- Design for clean room heat treatment processes
- Rotating systems for tempering processes
- Process control and documentation via VCD software package or Nabertherm Control Center (NCC) for monitoring, documentation and control see page 78



KTR 3100/S for curing of composites in vacuum bags incl. pump and necessary connections in the oven chamber



Direct gas-fired at a chamber oven