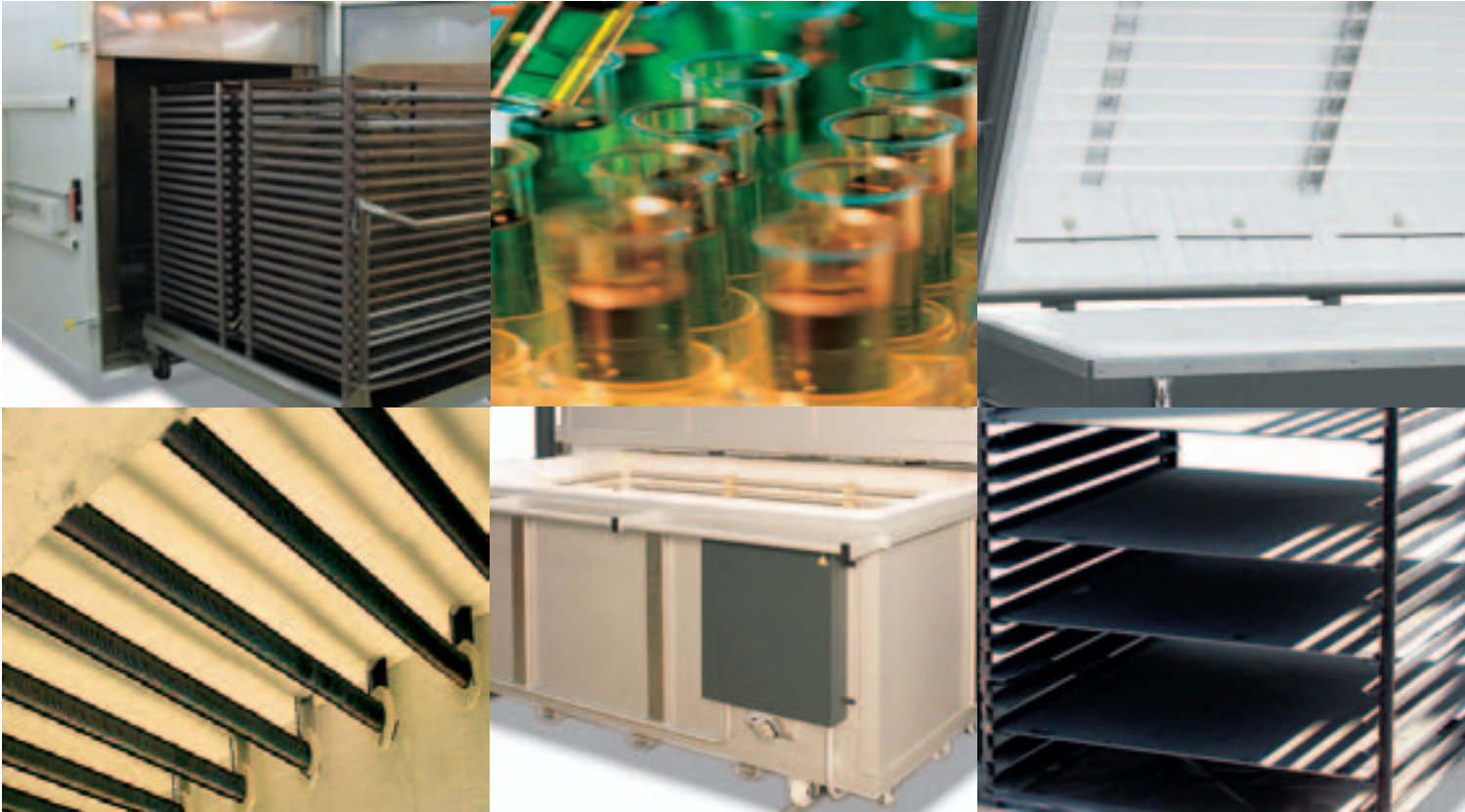


G l a s s



**Fusing
Decorating
Cooling
Tempering
Melting
Debinding
Sintering
Laboratory**



Made in Germany

With over 300 employees, Nabertherm has developed and produced industrial furnaces in many fields for over 50 years. 150,000 customers in all countries of the world are part of the company's success story. A wide range of standard furnaces and a high value added of skilled labour in our factory provide for short delivery times.

Experienced sales partners or own sales companies in key countries assure for individual quotes and after sales service tailored to the needs of our customers.

Setting Standards in Quality and Reliability

From a wide range of standard furnaces up to state-of-the-art sintering plants including integrated afterburning systems, Nabertherm can provide it all. With customised fully-fledged heat treatment systems technology, even complicated production processes can be solved. The innovative Nabertherm control and automation technology assures the professional monitoring, control and documentation of thermal treatment processes.

Sophisticated technical details like our concept of freely radiating heating elements on ceramic support tubes which provide for not only a perfect temperature distribution and energy efficiency but also for a long service life are the key competitive edge.

World-Wide Sales Network

With our world-wide sales network we are close to every customer in order to provide for the necessary support and service you need. Reference customers with respective furnaces are also close to you helping you to make the right decision.

Customer Service and Spare Parts

Our experienced staff members in the service department will help you to solve any problem. Whether on site or with the help of telecommunications, they will be available for you. For fully-fledged heat treatment plants we recommend our teleservice via modem anyways. Particularly proud we are upon our world-wide spare parts service. In no time we will reach you all over the world. If you need an answer for your application, our R&D department will take care of the respective testing in our laboratory which is equipped with all kind of furnaces.

Experience in other Industry Segments and Applications

Beyond the production of furnaces for glass processing, Nabertherm offers a wide range of standard furnaces and systems for many other industry segments. Please, ask for advice or visit our website. The modular design and technology of our products will make sure that we can solve most of your problems without expensive modifications.

Table of Contents

	Page
Fusing, Bending, Slumping, Cooling, Decorating, Sintering, Pâte de Verre	
Fusing furnaces	4
Fusing furnaces with movable table	6
Add-on capacity and accessories for fusing furnaces	7
Top-loading fusing kilns with lid heating	8
Fusing chamber furnaces	14
Top-hat furnaces with table	9
Top-hat furnaces with tub	10
Multi-purpose top-hat furnaces	12
Multi-purpose top-hat furnaces with SiC rod heating	13
Multifunction chamber kilns	14
Glass beads cooling furnace/multifunction furnace	14
Economy chamber kilns	15
Top-loading kilns for cooling and Pâte de Verre	15
Professional chamber kilns	16
Shuttle kilns and pit-type furnaces	18
Accessories for bogie hearth furnaces and top-loading furnaces, loading devices	20
Furnace with interchangeable table for decorating (infrared heating)	21
Drying, Debinding, Tempering, Cooling, Coating (with Air Circulation)	
Low-temperature ovens up to 450 °C, electrically or indirect gas heated	22
Low-temperature ovens, in accordance with EN 1539	23
Air circulation chamber furnaces up to 850 °C	24
Air circulation bogie hearth furnaces up to 850 °C	25
Preheating Furnaces for Moulds	26
Heat Treatment of Technical Glass and Quartz Glass	
Combi chamber furnaces for debinding/sintering with fresh-air preheating	27
High-temperature chamber furnaces	28
High-temperature top-hat and elevating platform furnaces	30
High-temperature top-loading furnaces	32
High-temperature protective furnace gas/vacuum chamber furnaces	32
Laboratory Furnaces	34
Plant Concepts including Catalytic and Thermal Afterburners, Continuous Furnaces	36
Process Control and Documentation	37
The Nabertherm Product Range	39



Fusing Furnaces



GF 920

Model	T _{max} °C	Inner dimensions in mm			Outer dimensions in mm			Connected power/kW	Connected voltage	Weight in kg
		w	d	h	W	D	H			
GF 75	950	500	500	350	850	750	1270	3,6	1-phase	70
GF 75/R	950	500	500	350	850	750	1270	5,5	3-phase*	70
GF 190	950	1000	500	350	1340	910	1350	7,2	3-phase	165
GF 240	950	1000	800	350	1450	1200	1270	11,0	3-phase	260
GF 380	950	1200	1000	380	1650	1400	1400	15,0	3-phase	350
GF 420	950	1650	850	380	2100	1250	1400	18,0	3-phase	350
GF 520	950	1200	1150	380	1650	1550	1400	15,0	3-phase	350
GF 600	950	2000	1000	380	2450	1400	1400	22,0	3-phase	540
GF 920	950	2100	1150	380	2550	1550	1400	26,0	3-phase	670
GF 1050	950	2300	1200	380	2750	1600	1400	32,0	3-phase	780

*2 phases connected



GF 240



GF 75

GF 75 - GF 1050

The GF 75 - GF 1050 furnaces are especially used for glass fusing applications. Their special construction with infrared ceiling heating elements and lightweight fibre insulation provides for an exact process control sequence -, producing optimal fusing results. Infrared heating avoids direct contact with the heating elements. The furnace can thus also be opened during operation and continues to heat in this state. Temperature losses on the table surface are kept to a minimum.

- T_{max} 950 °C
- Infrared heating elements for short heat-up times and energy saving operation
- Lid heating elements for direct radiation on the glass surface
- Low-noise heating operation with solid-state relays
- NiCr-Ni thermocouple inside the furnace for precise temperature measurement
- Insulation with special ceramic fibres for short heat-up and cool-down times
- Housing made from high-quality stainless steel and lid with ventilation slits (Avoidance of rust formation during drying of plaster moulds)
- Attractive design and solid construction
- Gas operated dampers provide for very easy opening and closing of hood
- Adjustable locks for easy handling
- Large metal handle for opening and closing the furnace
- Fresh air openings with brick plugs for air supply, glass processing observation and for fast cooling
- Solid chassis on wheels with shelf to store glass and tools
- Controller C 290 with up to 12 segments per programme, 9 different programs can be stored



Furnace table with lightweight refractory bricks as an option

Fusing Furnaces with movable Table



GFM 1050

GFM 420 - GFM 1050

The GFM series has been developed for special production requirements. Different tables are available on a modular basis. As standard version this system is delivered with a freestanding table on wheels. The system can be expanded with various table heights and numerous options. A cost saving feature is the interchangeable table system which allows to charge one table while the other one is in the furnace.

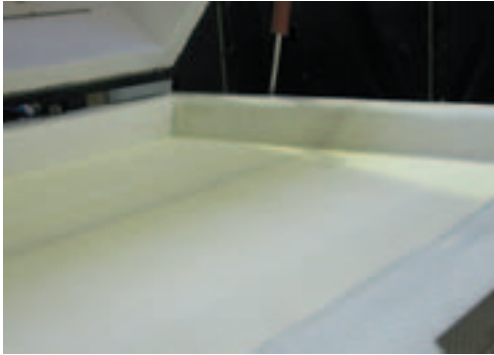


GFM 1050

- Infrared heated in hood which is attached to stand
- Delivered with one table
- Freely movable table on wheels
- Infrared heating elements for short heat-up times and energy-saving operation
- Lid heating elements for direct radiation on the surface of the glass
- Low-noise heating operation with solid-state relays
- NiCr-Ni thermocouple inside the furnace for precise temperature measurement
- Insulation with special ceramic fibres for short heat-up and cool-down times
- Housing made from high-quality stainless steel and lid with ventilation ports (Avoidance of rust formation during drying of plaster moulds)
- Attractive design and solid construction
- Gas operated dampers provide for very easy opening and closing of hood
- Adjustable locks for easy handling
- Large metal handle for opening and closing furnace
- Fresh air openings with brick plugs for air supply, glass processing observation and for fast cooling
- Controller C 290 with up to 12 segments per programme, 9 different programs can be stored

Model	T _{max} °C	Inner dimensions in mm			Outer dimensions in mm			Connected power/kW	Connected voltage	Weight in kg
		w	d	h	W	D	H			
GFM 420	950	1650	850	380	2400	1480	1400	18,0	3-phase	410
GFM 520	950	1200	1150	380	1950	1780	1400	15,0	3-phase	430
GFM 600	950	2000	1000	380	2750	1630	1400	22,0	3-phase	610
GFM 920	950	2100	1150	380	2850	1780	1400	16,0	3-phase	740
GFM1050	950	2300	1200	380	3050	1830	1400	32,0	3-phase	860

Options and Accessories for Fusing Furnaces



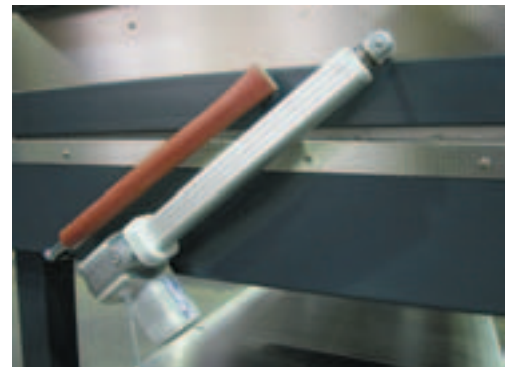
GF & GFM series table concepts
 Table, flat, fibre-insulated



Table, flat, brick-insulated

Additional features for fusing furnaces GF and GFM

- Automatic lid opening for faster cooling, programmable via the extra controller function, for models GF 380 and/or GFM 380 up.

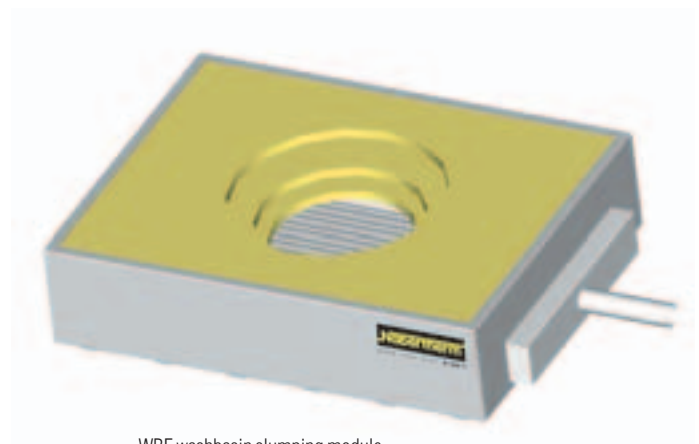


Automatic lid opening via an electromechanical spindle

Washbasin slumping module WBE as option for models GF 380 and/or GFM 380 up

For complex slumping applications floor heating is needed. Therefore, we offer the washbasin slumping module WBE as an option for fusing furnaces GF and GFM. It can also be retrofitted because of its separate floor heating and independent control. When the glass reaches a defined deformation, the floor heating of the slumping module is switched-off automatically.

- Floor heating via infrared heating elements
- Heat-resistant stainless steel frame
- High quality fibre floor insulation
- Independent control of floor heating
- Fully adjustable mechanical switch-off for preselected basin slumping
- Carrying handles for easy mounting of the module
- Different module sizes available
- Easy handling



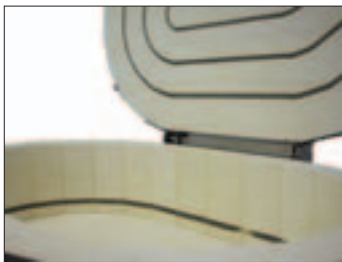
WBE washbasin slumping module

Top-Loading Fusing Kilns with Lid Heating



F 30

F 110



Kiln interior with circular lower side heating

F 30 - F 110

This well-priced kiln range is the ideal choice for many fusing applications. The insulation is made from lightweight refractory bricks with protected heating elements in the lid, models F 75 and F 110 have additional side heating. The kilns are controlled via controller C 290.

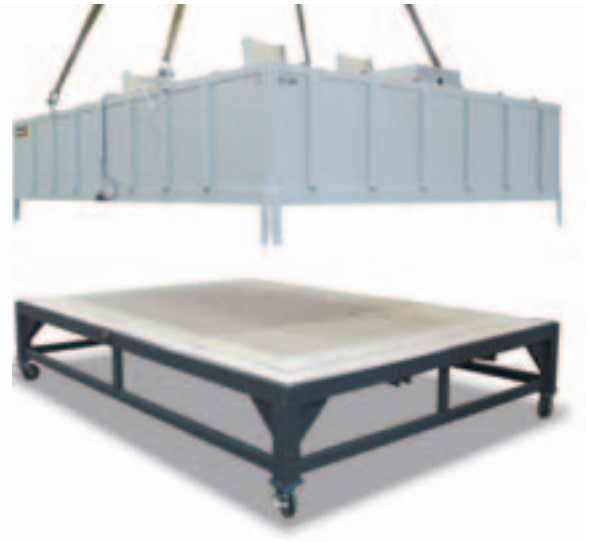
- Lid heating for direct radiation of goods
- Spring-loaded lid opening
- High quality heating elements, dimensioned for long service life
- Level stacking surface made from lightweight refractory bricks
- Low-noise operation with solid-state relays
- Thermocouple optimally positioned for immediate temperature measurement
- Energy-saving insulation made from lightweight refractory bricks
- Housing cover made from structured stainless steel
- Lid with adjustable locks for easy handling
- Low wear & tear lid sealing (brick on brick construction)
- Higher chassis available as an option
- Controller C 290 with up to 12 segments per programme, 9 different programs can be stored



F 110

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connected power/kW	Connected voltage	Weight in kg
		w	d	h		W	D	H			
F 30	950	Ø 410		230	30	650	800	500	2,0	1-phase	50
F 75	950	750	520	230	75	950	880	680	5,5	3-phase	80
F 110	950	930	590	230	110	1120	950	680	7,5	3-phase	95

Top-Hat Furnaces with Table



HG 2000, standard version

Top-hat furnace **HG 1196/S** with customized specifications, hood and table heating; table heating can be switched-off during fusing

HG 750 - HG 4800

Nabertherm markets this range of top-hat furnaces for bending and slumping of large glass parts. With varying table designs and different types of hood opening systems, these furnaces can be optimally adapted to individual processes. Heating elements from lid and table provide for good temperature uniformity.

- Heating from lid and table
- 3-zone temperature control (lid-inner circular element, lid-outer circular element, table) for optimal temperature distribution
- Table heating can be switched-off for fusing
- Heating elements mounted on ceramic support tubes for free heat radiation and long service life
- Table heating elements covered by SiC tiles for level stacking support
- Hood insulated with high-quality fibre materials
- Table insulated with multiple layers of resistant, lightweight refractory bricks
- In standard version, hood is lifted by crane
- Protection guides for easy hood opening and closing
- Manually-operated vapour vent flaps
- Furnace table on fixed chassis for user-friendly charging height (800 mm)



Heating elements in furnace hood

Optional Equipment

- Tailor-made furnaces in customized dimensions
- Hood side heating in case of high hood dimensions
- Interchangeable table system on rails, electrically powered on request (see page 11 for details)
- Electro-hydraulically driven hood
- Cooling system (see page 11 for details)
- Table on wheels for free movement
- Automatically driven vapour vent flaps

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connected power/kW	Connected voltage	Weight in kg
		w	d	h		W	D	H			
HG 750	900	2100	1200	300	756	2550	1800	1350	35	3-phase	1200
HG 1000	900	1750	1000	550	960	2200	1450	1600	33	3-phase	1500
HG 1500	900	2100	1250	550	1440	2550	1700	1600	44	3-phase	2000
HG 1800	900	2450	1850	400	1813	2950	2350	1600	45	3-phase	2500
HG 2000	900	2450	1500	550	2020	2900	1950	1600	55	3-phase	2500
HG 2640	900	3000	2200	400	2640	3500	2700	1450	75	3-phase	3400
HG 3000	900	3500	2200	400	3080	4000	2800	1600	75	3-phase	3800
HG 4800	900	5500	2100	400	4620	6000	2700	1600	90	3-phase	4500

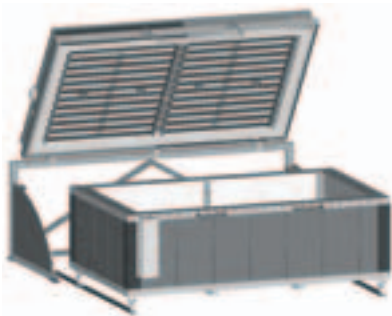
Top-Hat Furnaces with Tub



GW 1660,
standard version

GW 830 - GW 8000

For slumping and bending of complex glass parts, e.g. glass furniture, shower cabins, etc., tub furnaces are the right choice. Full coverage heating: from the lid, all 4 sides and the tub bottom. Due to the modular system additional tubs in customized dimensions can be provided.



GW 1660 with open lid

- Full coverage heating: from lid, all 4 sides and bottom
- 3-zone temperature control from top to bottom for optimal temperature distribution
- Heating elements mounted on ceramic support tubes for free heat radiation and long service life
- Table heating elements covered by SiC tiles
- Hood insulated with high-quality fibre materials
- Tub bottom insulated with multiple layers of insulation, lightweight refractory bricks on the hot face
- Hinged hood as standard version
- Gas operated dampers provide for easy hood opening
- Manually operated vapour vent flaps
- Tub on wheels can be pulled out manually
- Rails on floor for perfect tub guidance included

Additional Features

- Furnaces tailor-made to individual customer measurements
- Interchangeable table system on rails, electrically driven on request (see page 11 for details)
- Electro-hydraulically driven hood instead of hinged cover
- Cooling system (see page 11 for details)
- Tub insert to elevate bottom height, in order to use the furnace for glass fusing applications (in this product version the tub heating can be switched off)



Tub heating elements covered by SiC tiles to create level stacking support

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connected power/kW	Connected voltage	Weight in kg
		w	d	h		W	D	H			
GW 830	900	1200	1150	600	690	2140	1980	1250	36	3-phase	820
GW 840	900	1650	850	600	700	2590	1680	1250	36	3-phase	980
GW 1200	900	2000	1000	600	1000	2940	1830	1250	40	3-phase	1210
GW 1500	900	2100	1150	600	1200	3040	1980	1250	70	3-phase	1420
GW 1660	900	2300	1200	600	1380	3240	2030	1250	80	3-phase	1780
GW 2200	900	2300	1200	800	2200	3240	2030	1250	90	3-phase	2160
GW 8000	900	3700	2700	800	4700	9000	3700	1400	180	3-phase	2980



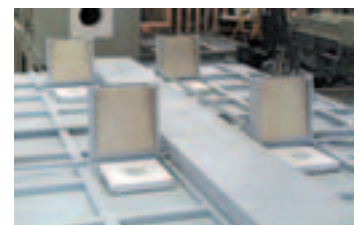
Top-hat furnace **GW 2208/S** tailor-made, electro-hydraulically driven hood, tub can be pulled out on rails.

Additional Features

- Automatic lid opening for faster cooling, programmable via the Controller extra function
- Automatically driven vapour vent flaps in the hood for preselected cooling
- Powerful cooling system
An efficient fan system, mounted to the furnace, cools the double-walled housing from the back. This system shortens cooling times by up to 50 % subject to cycles and charge. Direct contact between the cooling air and charge, hence turbulences in the firing chamber are avoided, protecting the glass from any damage.
- Interchangeable table system running on rails
To shorten process times and optimise operational capacity, two or more furnace tubs, placed alternately under the hood, can be used. An automatic tub changing system is also available on request.



Automatic lid opening via electromechanical spindle



Automatically driven vapour vent flaps



Cooling system

Multi-Purpose Top-Hat Furnaces



Top-Hat Furnace H 1920/S
in customized dimensions, with an optional bogie changing system. The changing takes place at 1200 °C



H 250

H 125 - H 3000

These top-hat furnaces were specially developed for cooling complex structures or when the process requires the treatment of warm glass, e.g., the welding process in glass apparatus manufacturing. The wide-opening electro-hydraulically driven hood allows furnace opening even at high temperatures and provides easy access from 3 sides.

- Maximum temperature 1280 °C
- Very high temperature uniformity through 5-sides heating
- Multi-layer, high-quality insulation
- Heating elements mounted on support tubes for free heat radiation inside the furnace
- Electro-hydraulically driven for practically vibration-free opening
- Bottom heating elements protected by SiC tiles
- Easy charging from 3 sides
- Table working height: 800 mm
- Hood safety switch

Optional Equipment

- Manually or electrically operated interchangeable table system to shorten process times
- Customized dimensions
- Controlled fan cooling system: the preset cooling curve will be carried out exactly via variable fan speed
- Automatically driven vapour vent flaps
- Multi-zone control for optimal temperature distribution
- Completely automatic process control and documentation



Top-hat furnace **H 730/F** in customized dimensions, fibre lining for quick heating and cooling and drawer-type table

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connected power/kW	Connected voltage	Weight in kg
		w	d	h		W	D	H			
H 125	1280	800	400	400	125	1330	1100	1900	12	3-phase	1250
H 250	1280	1000	500	500	250	1530	1200	2100	18	3-phase	1400
H 500	1280	1200	600	600	500	1730	1300	2200	36	3-phase	1800
H 1000	1280	1600	800	800	1000	2130	1500	1500	48	3-phase	2800
H 1350	1280	2800	620	780	1354	3400	1320	2700	75	3-phase	3500
H 3000	1280	3000	1000	1000	3000	2200	4000	3200	140	3-phase	6200

Multi-Purpose Top-Hat Furnaces with SiC Rod Heating



HC 1275,
with moveable table



HC 1500

HC 665 - HC 1500

For temperatures beyond 1350 °C we recommend furnaces with SiC rod heating. The top-hat construction with 4-sides heating provides for exceptional temperature uniformity.

- SiC rod heating on 4 sides of the furnace hood for short cycle times and high temperature uniformity
- High electrical connected power for short cycle times
- Hood insulation made from fibre materials provides for short cycle time and low energy consumption
- Table built from lightweight refractory bricks allows for heavy loads and level stacking surface
- Electro-hydraulic driven hood for vibration-free opening and closing of furnace hood
- Thyristor powered heating
- Operating temperatures of 1400, 1450 and 1500 °C



Manually or electrically driven table as option



Heating from 4 sides with SiC rods

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connected power/kW	Connected voltage	Weight in kg
		w	d	h		W	D	H			
HC 665	1400	1100	550	1100	1400	2350	2050	4000	186	3-phase	3000
HC 1275	1400	850	1000	1500	1275	2100	2500	4400	180	3-phase	4100
HC 1440	1400	840	2400	840	1440	2100	3900	3560	400	3-phase	4700
HC 1500	1400	1000	1000	1500	1500	2250	2500	4400	190	3-phase	5300
HC 1280	1450	800	1600	1000	1280	2050	3100	3900	151	3-phase	4200
HC 700	1500	800	800	1100	700	2050	2300	4000	100	3-phase	3100
HC 1400	1500	800	1600	1100	1400	2050	3100	4000	151	3-phase	4500

Multi-Purpose Chamber Kilns



MF 140

Chamber furnace for glass fusing MF 140

The multi-purpose kiln MF 140 is suitable for fusing, porcelain painting and decoration firing of glass and ceramics. Pâte de Verre techniques can also be carried out using this kiln. The heating can be adapted to process requirements. During e.g. glassfusing, the side heating is turned down and the lid heating is used. Simple and compact structure, the MF 140 is an ideal choice for the private sector or for small studios.

- Tabletop version
- Stand as an option
- 4-sides heating from both sides, ceiling and bottom (only top heating for fusing)
- Ratio of top to side heating power adjustable
- High-quality heating elements, positioned in protective grooves
- Heating elements with long service life
- Long-life „K“ type thermocouple
- Safety door contact switch
- Multi-layer insulation consisting of lightweight refractory bricks on the hot face and backed by fibre insulation for low energy consumption
- Housing made from high-quality, structured stainless steel plate
- Exhaust air vent in the backwall, air inlet opening in the door

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
		w	d	h		W	D	H			
MF 140	1100	560	610	400	140	1090	850	650	11	3-phase	90

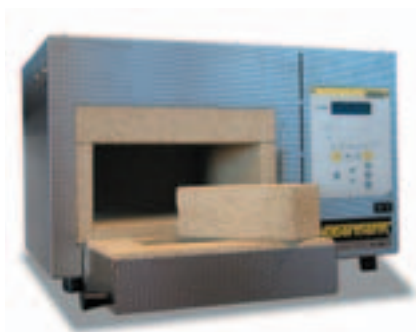
Glass beads cooling furnace / Multi-purpose kiln MF 5

A high-quality furnace is indispensable for professional glass beads tempering. The MF 5 model is the ideal furnace for cooling large glass beads or glass jewellery. For charging the glass beads the door is equipped with a slit which can be closed with a filler piece when the furnace is used for other applications. The infrared heating prevents from direct contact with heating elements. The furnace can thus also be opened during operation without heating interruption.

Due to its maximum temperature of 950 °C, this furnace is multifunctional, and can be used e.g. for fusing and enamelling applications, for decorating and for preheating frits and other materials.

- Heating from furnace ceiling
- Heating protected in quartz glass tubes no door contact switch necessary
- Multi-layer insulation structure
- Table-top model
- Housing made from high-quality stainless steel
- Low energy consumption
- Easy handling
- Low-noise heating operation with solid-state relays
- Comfortable charging with glass beads
- Controller easy to operate
- Maximum temperature 950 °C

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
		w	d	h		W	D	H			
MF 5	950	220	240	100	5	485	370	320	1,6	1-phase	15



MF 5

Economy chamber kilns N 60/L Entry - N 100 Entry

These chamber kilns have an attractive design and excellent processing qualities. The models N 60.. - N 100.. are suitable for glass decoration, small fusing jobs, glass cooling and slumping.

- Table-top device as standard, stand available as an option
- Heating from both sides with high-quality heating elements
- High-quality heating elements on support tubes with free radiation of heat guarantee a long service life
- Low-noise heating operation with solid-state relays
- High-quality Pt-RhPt thermocouple
- Multi-layered insulation with lightweight refractory bricks inside the furnace chamber and special backed insulation for lower power consumption
- Wide-opening door with door safety switch and special surface-hardened fibres
- Housing made from high-quality, structured stainless steel
- Smoothly adjustable inlet air opening for improved ventilation and short cool-down times
- Vapour vent in the ceiling



N 60/L Entry table-top model
(supplied without table)



N 100 Entry

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
		w	d	h		W	D	H			
N 60/L Entry	1150	350	400	460	60	590	790	700	3,6	1-phase	82
N100/L Entry	1150	400	450	575	100	640	840	815	7,0	3-phase	100
N 60 Entry	1300	350	400	460	60	590	790	700	5,5	3-phase*	82
N 100 Entry	1300	400	450	575	100	640	840	815	9,0	3-phase	100

*2 phases connected

Top-Loading Kilns for Cooling and Pâte de Verre

S 70/12 - S 500/13

For applications such as cooling large objects or „Pâte de Verre“ technology, when complex sculptures are melted into special shapes over several days models S 70/12 - S 500/13 are the perfect choice. The 5-sides heating from all four sides and bottom provides for optimal temperature uniformity.

- Heating elements protected in grooves, 5-sides heating from all four sides and bottom
- High quality heating elements with long service life
- Low-noise heating operation with solid-state relays
- High-quality Pt-RhPt thermocouple for precise temperature measurement
- Safety lid contact switch
- Multi-layer insulation for low energy consumption and low outside temperatures
- Solid housing made from high-quality structured stainless steel
- Brick insulated lid with adjustable lock for easy handling
- Low wear & tear lid sealing (brick on brick construction)
- Lid opening assisted by gas dampers



S 300/13

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting Voltage	Weight in kg
		b	t	h		B	T	H			
S 70/12	1200	440	380	420	70	920	800	795	3,6	1-phase	120
S 70/13	1300	440	380	420	70	920	800	795	5,5	3-phase*	120
S 100/13	1300	480	430	490	100	960	850	865	5,5	3-phase*	160
S 300/13	1300	920	570	610	320	1440	1015	950	15,0	3-phase	430
S 500/13	1300	1150	650	690	515	1670	1095	1030	24,0	3-phase	580

*only 2 phases connected



Firing chamber

Professional Chamber Kilns



N 100/G



N 660/G



Rack systems and trays for temperatures of up to 850 °C can be supplied

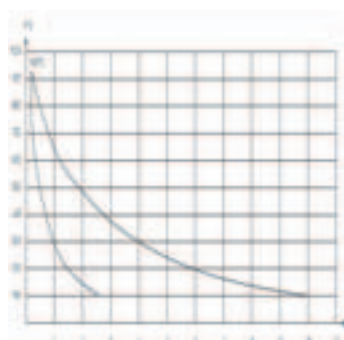
N 100/G - N 2200/14

These high-quality chamber kilns are suitable for heavy duty jobs in glass industry. These models can ideally be used for cooling, bending/slumping and glass decoration.

- 5-sides heating for excellent temperature uniformity
- Available as 900 °C version for decorating, bending/slumping and cooling; for higher temperatures of up to 1400 °C for sintering/tempering of special glass
- Heating elements on support tubes provide for free heat radiation and long service life
- Vapour vent in the middle of the roof (excellent ventilation)
- Smoothly adjustable and easy-to-operate air inlet flap or sliding damper
- Self-supporting roof arch provides for high stability and maximum protection from dust contamination
- Double-walled, non-warping door with fibre seal (from model N 440..) or brick on brick for models N 100.. to N 300..
- Special door lock for easy handling
- Multi-layer insulation consisting of lightweight refractory bricks and backed by special fibre insulation
- Fibre insulation instead of bricks for fast process cycles available as option
- Models up to N 300/.. are supplied with a removable stand
- Floor heating elements protected by SiC tiles to provide for level stacking floor

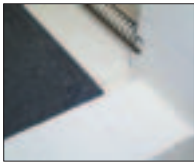


Chamber kiln with optional fibre insulation for shorter cycle times



Comparison of cooling curves between brick and fibre insulation

Standard Version and Optional Equipment



SiC floor plate easy to remove for cleaning of furnace bottom.



Smoothly adjustable air inlet flap for optimal air supply during the firing process and short cooling times. Automatic drive available as an option. (N 100/G - N 300/14)



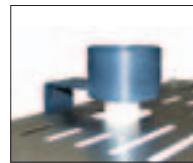
Double-walled housing for low outside temperatures – with side panels made from structured, stainless steel (N 100/G - N 660/14).



Optional Equipment:
Loading rack for chamber kilns. The rack charged with goods is loaded into the kilns using a pallet truck. (N 100/G - N 660/14)



Free heat radiation through heating elements on ceramic support tubes; optimal positioning of heating elements for excellent temperature distribution.



Vapour vent opening in the middle of the furnace roof for regular removal of exhaust air (roof flap for N 440 ff.).

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
		w	d	h		W	D	H			
N 100 /G	900	400	530	460	100	710	1150	1430	7,0	3-phase	270
N 150 /G	900	450	530	590	150	760	1150	1560	9,0	3-phase	305
N 200 /G	900	500	530	720	200	810	1150	1690	11,0	3-phase	345
N 200 /GS	900	400	1000	500	200	710	1270	840	16,0	3-phase	300
N 250 /GS	900	500	1000	500	250	810	1270	855	18,0	3-phase	370
N 300 /G	900	550	700	780	300	860	1340	1750	15,0	3-phase	430
N 360 /GS	900	600	1000	600	360	910	1270	955	20,0	3-phase	500
N 440 /G	900	600	750	1000	450	1000	1450	1820	20,0	3-phase	700
N 500 /GS	900	600	1400	600	500	910	1670	955	22,0	3-phase	1000
N 660 /G	900	600	1100	1000	660	1000	1800	1820	26,0	3-phase	850
N 1000 /G	900	800	1000	1250	1000	1290	1730	1960	40,0	3-phase	1680
N 1500 /G	900	900	1200	1400	1500	1390	1930	2120	57,0	3-phase	2300
N 2200 /G	900	1000	1400	1600	2200	1490	2130	2320	75,0	3-phase	2800
N 100	1300	400	530	460	100	710	1150	1430	9,0	3-phase	270
N 150	1300	450	530	590	150	760	1150	1560	11,0	3-phase	305
N 200	1300	500	530	720	200	810	1150	1690	15,0	3-phase	345
N 200 /S	1300	400	1000	500	200	710	1270	840	18,0	3-phase	300
N 250 /S	1300	500	1000	500	250	810	1270	855	20,0	3-phase	370
N 300	1300	550	700	780	300	860	1340	1750	20,0	3-phase	430
N 360 /S	1300	600	1000	600	360	910	1270	955	22,0	3-phase	500
N 440	1300	600	750	1000	450	1000	1450	1820	30,0	3-phase	700
N 500 /S	1300	600	1400	600	500	910	1670	955	24,0	3-phase	1000
N 660	1300	600	1100	1000	660	1000	1800	1820	40,0	3-phase	850
N 1000	1300	800	1000	1250	1000	1370	1770	1980	57,0	3-phase	1800
N 1500	1300	900	1200	1400	1500	1470	1970	2140	75,0	3-phase	2500
N 2200	1300	1000	1400	1600	2200	1570	2170	2340	110,0	3-phase	3100
N 100 /H	1340	400	530	460	100	740	1170	1430	11,0	3-phase	310
N 150 /H	1340	450	530	590	150	790	1170	1560	15,0	3-phase	380
N 200 /H	1340	500	530	720	200	840	1170	1690	20,0	3-phase	420
N 300 /H	1340	550	700	780	300	890	1360	1750	27,0	3-phase	550
N 440 /H	1340	600	750	1000	450	1030	1470	1820	40,0	3-phase	800
N 660 /H	1340	600	1100	1000	660	1030	1820	1820	52,0	3-phase	950
N 1000 /H	1340	800	1000	1250	1000	1370	1770	1980	75,0	3-phase	2320
N 1500 /H	1340	900	1200	1400	1500	1470	1970	2140	110,0	3-phase	2700
N 2200 /H	1340	1000	1400	1600	2200	1570	2170	2340	140,0	3-phase	3600
N 100 /14	1400	400	530	460	100	690	1060	1430	15,0	3-phase	345
N 150 /14	1400	450	530	590	150	740	1060	1560	20,0	3-phase	400
N 200 /14	1400	500	530	720	200	790	1060	1690	22,0	3-phase	450
N 300 /14	1400	550	700	780	300	840	1230	1750	30,0	3-phase	550
N 440 /14	1400	600	750	1000	450	1120	1485	1825	40,0	3-phase	1320
N 660 /14	1400	600	1100	1000	660	1220	1585	1935	57,0	3-phase	1560
N 1000 /14	1400	800	1000	1250	1000	1380	1770	2000	75,0	3-phase	2500
N 1500 /14	1400	900	1200	1400	1500	1480	1970	2160	110,0	3-phase	3000
N 2200 /14	1400	1000	1400	1600	2200	1580	2170	2360	140,0	3-phase	3900



Shuttle Kilns and Pit-Type-Furnaces



W 1500/H



Shuttle kiln **W 15000/S** in customized dimensions, electro-hydraulic lift door and shuttle running on rails as an option



Shuttle kiln in customized dimensions for tempering quartz rods

W 1000/G - W 10000/14

Shuttle kilns offer many advantages for cooling, decorating or sintering special glass in production. The shuttle can be loaded outside the furnace. Several shuttles can be used, so that one shuttle can be charged while the other shuttle is in the kiln.

- For temperatures of 900, 1280, 1340 and 1400 °C
- 5-Sides heating: all four sides and shuttle
- Automatic power contact of shuttle when moved into the kiln
- Heating elements mounted on support tubes for long service life
- Floor heating protected by SiC tiles on the bogie providing level stacking floor
- Multi-layer insulation consisting of lightweight refractory bricks and backed by special fibre insulation
- Side walls and door are doubled-walled with result of low outside temperatures
- Self-supporting roof arch
- Freely moving shuttle with rubber tires
- Adjustable air inlet damper as standard
- Vapour vent in the furnace roof



S 3000 - S 14500

Further details about these pit-type-furnaces can be furnished on request.

Top-loading furnace with useful volume of 14500 litres for tempering of quartz glass at working temperatures of 1100 °C

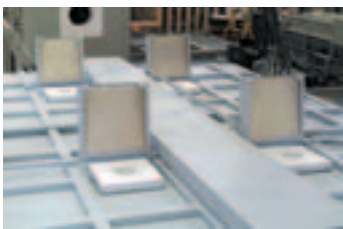


W 5440/S

Automatic shuttle changing with two shuttles, cooling system, protection fence, customized dimensions

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
		w	d	h		W	D	H			
W 1000/G	900	800	1600	800	1000	1400	2350	1880	40	3-phase	3000
W 1500/G	900	900	1900	900	1500	1500	2650	2010	57	3-phase	3500
W 2200/G	900	1000	2200	1000	2200	1600	2950	2120	75	3-phase	4000
W 3300/G	900	1000	2200	1200	3300	1600	3550	2320	110	3-phase	5300
W 5000/G	900	1000	3600	1400	5000	1600	4350	2520	140	3-phase	7500
W 7500/G	900	1000	5400	1400	7500	1600	6150	2520	185	3-phase	9100
W10000/G	900	1000	7100	1400	10000	1600	7850	2520	235	3-phase	11000
W 1000	1280	800	1600	800	1000	1470	2400	1820	57	3-phase	3000
W 1500	1280	900	1900	900	1500	1570	2700	2010	75	3-phase	3500
W 2200	1280	1000	2200	1000	2200	1670	3000	2120	110	3-phase	4000
W 3300	1280	1000	2200	1200	3300	1670	3600	2320	140	3-phase	5300
W 5000	1280	1000	3600	1400	5000	1670	4400	2520	185	3-phase	7500
W 7500	1280	1000	5400	1400	7500	1670	6200	2520	235	3-phase	9100
W 10000	1280	1000	7100	1400	10000	1670	7900	2520	300	3-phase	11000
W 1000/H	1340	800	1600	800	1000	1470	2400	1880	75	3-phase	3500
W 1500/H	1340	900	1900	900	1500	1570	2700	2010	110	3-phase	3800
W 2200/H	1340	1000	2200	1000	2200	1670	3000	2120	140	3-phase	4400
W 3300/H	1340	1000	2200	1200	3300	1670	3600	2320	185	3-phase	5500
W 5000/H	1340	1000	3600	1400	5000	1670	4400	2520	235	3-phase	8000
W 7500/H	1340	1000	5400	1400	7500	1670	6200	2520	370	3-phase	10000
W10000/H	1340	1000	7100	1400	10000	1670	7900	2520	440	3-phase	12000
W 1000/14	1400	800	1600	800	1000	1470	2400	1880	75	3-phase	3500
W 1500/14	1400	900	1900	900	1500	1570	2700	2010	110	3-phase	3800
W 2200/14	1400	1000	2200	1000	2200	1670	3000	2120	140	3-phase	4400
W 3300/14	1400	1000	2200	1200	3300	1670	3600	2320	185	3-phase	5500
W 5000/14	1400	1000	3600	1400	5000	1670	4400	2520	235	3-phase	8000
W 7500/14	1400	1000	5400	1400	7500	1670	6200	2520	370	3-phase	10000
W10000/14	1400	1000	7100	1400	10000	1670	7900	2520	440	3-phase	12500

Additional Features for Shuttle Kilns and Pit-Type Furnaces, Charging Aids and Devices



Automatically driven vapour vent flaps



Cooling system for shorter cycle times

- Customized dimensions
- Additional shuttles
- Second door instead of back wall for charging from both sides
- Electro-hydraulic lift door
- Rail operation for heavy loads
- Electrical shuttle drive
- Controlled cooling system:
the preset cooling curve is carried out exactly via a variable speed fan
- Automatically driven vapour vent flaps
- Heat protection shuttle to minimize heat loss when the charged shuttle has left the kiln
- Multi-zone temperature control for optimal temperature uniformity
- Fully automatic process control and documentation
- Load weights up to 50 tons

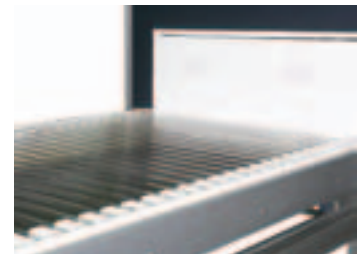
Furnaces with interchangeable Tables for Decorating (Infrared Heating)



IR 500/90 - IR 1000/90

Fast-firing furnaces with interchangeable tables for glass and porcelain decorating at maximum temperatures of 900°C. The infrared heating heats up the surface of the charge. The resulting fast cycles are perfect especially for the production of small batches. The interchangeable table system shortens cycle times, as one table can be loaded while the other table in the furnace.

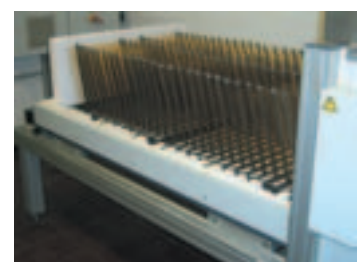
- Heating by infrared heating elements and reflectors in the furnace chamber
- Fibre insulation for fast firing cycles (up to 3 hours from cold to cold depending on application and temperature)
- Interchangeable table with castors, for easy manual movement
- Automatically driven vapour vent flaps
- Controller easy to operate



Reflectors in the furnace table



Glass decoration



Vertical charging of coated sheets made of special glass

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting Voltage	Weight in kg
		w	d	h		W	D	H			
IR 500/90	900	1600	900	350	500	6000	1400	1300	36	3-phase	1100
IR1000/90	900	3200	900	350	1000	12000	1400	1300	72	3-phase	2000

Low-Temperature Ovens up to 450 °C Electrically or Indirect Gas Heated



N 2000/45 HA



N 3744/45 HAS

In customized dimensions

N 560/25 - N 10000/45

The low-temperature air circulation ovens are suitable for many applications and processes like preheating, drying, debinding, cooling or even for coating. The modular construction allows for customized variations which are tailored to specific needs.

- Chamber oven structure
- Maximum temperature 250 or 450 °C
- Oven bottom at ground level for entry with forklift or charging cart
- Electric heating via tube heating elements or indirect gas heating via radiation tubes
- Horizontal (type HA) or vertical (type A) air circulation
- Optimal temperature uniformity in accordance with DIN 17052-1
- Adjustable air outlets in sidewalls to tailor airflow to different charges
- Furnace chamber made from 1.4301 stainless steel for 450 °C-models
- High-quality mineral wool insulation for low outside temperatures
- Adjustable air inlet and outlet vents
- Double-wing door from model N 1500/..

Additional Features

- Customized dimensions up to 30 000 litres and load weight up to 50 tons
- Shuttle furnace structure for outside charging
- Additional floor insulation for improved temperature uniformity, supplied as standard for 450 °C models, on request with loading ramps for pallet truck or tracks for ground level entry with charging cart
- Lift door
- Observation window; furnace chamber lighting
- Catalytic or thermal afterburner systems



Heating register for electric heating



Indirect gas heating by radiation tubes

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage
		w	d	h		W	D	H		
N 560/ 25..	250	750	1000	750	560	1070	1680	1070	13,0	3-phase
N 1000/ 25..	250	1000	1000	1000	1000	1380	1820	1200	17,5	3-phase
N 1500/ 25..	250	1500	1000	1000	1500	1880	1820	1200	20,5	3-phase
N 1500/ 25..1	250	1000	1500	1000	1500	1380	2320	1200	20,5	3-phase
N 2000/ 25..	250	1500	1100	1200	2000	1880	1930	1420	20,5	3-phase
N 2000/ 25..1	250	1100	1500	1200	2000	1480	2330	1420	20,5	3-phase
N 4000/ 25..	250	1500	2200	1200	4000	1880	2830	1420	46,0	3-phase
N 4000/ 25..1	250	2200	1500	1200	4000	2380	2330	1420	46,0	3-phase
N 5600/ 25..	250	1500	2500	1500	5600	1880	2780	2260	64,5	3-phase
N 6750/ 25..	250	1500	3000	1500	6750	1880	3280	2260	91,0	3-phase
N 7200/ 25..	250	2000	1500	2400	7200	2380	2330	2620	91,0	3-phase
N 10000/ 25..	250	2000	2500	2000	10000	2380	2780	2760	111,0	3-phase
N 560/ 45..	450	750	1000	750	560	1190	1800	1190	19,0	3-phase
N 1000/ 45..	450	1000	1000	1000	1000	1500	1940	1320	39,0	3-phase
N 1500/ 45..	450	1500	1000	1000	1500	2000	1940	1320	39,0	3-phase
N 1500/ 45..1	450	1000	1500	1000	1500	1500	2440	1320	39,0	3-phase
N 2000/ 45..	450	1500	1100	1200	2000	2000	2050	1540	45,0	3-phase
N 2000/ 45..1	450	1100	1500	1200	2000	1600	2550	1540	45,0	3-phase
N 4000/ 45..	450	1500	2200	1200	4000	2000	2950	1540	64,0	3-phase
N 4000/ 45..1	450	2200	1500	1200	4000	2500	2450	1540	64,0	3-phase
N 5600/ 45..	450	1500	2500	1500	5600	2000	2900	2380	90,0	3-phase
N 6750/ 45..	450	1500	3000	1500	6750	2000	3400	2380	109,0	3-phase
N 7200/ 45..	450	2000	1500	2400	7200	2500	2550	2740	109,0	3-phase
N 10000/ 45..	450	2000	2500	2000	10000	2500	2900	2880	135,0	3-phase

Low-Temperature Ovens in accordance with EN 1539



WB 5800/25HAS
 in customized specifications



Air inlet vent and powerful exhaust air fan mounted on the roof supplied as standard

EN 1539 Safety Features

During certain processes, solvents, organic binders or other combustible substances are released and volatilised. The safety technology required by EN 1539 is installed in order to avoid the formation of inflammable mixtures. The design of the safety features is tailored to the specific application.

- Powerful exhaust air fan
- Defined and monitored air circulation
- Visual and acoustic signal in case of disturbance or break-down
- C 40 Controller
- Temperature selection limiter
- Additional features of atmosphere monitoring as option

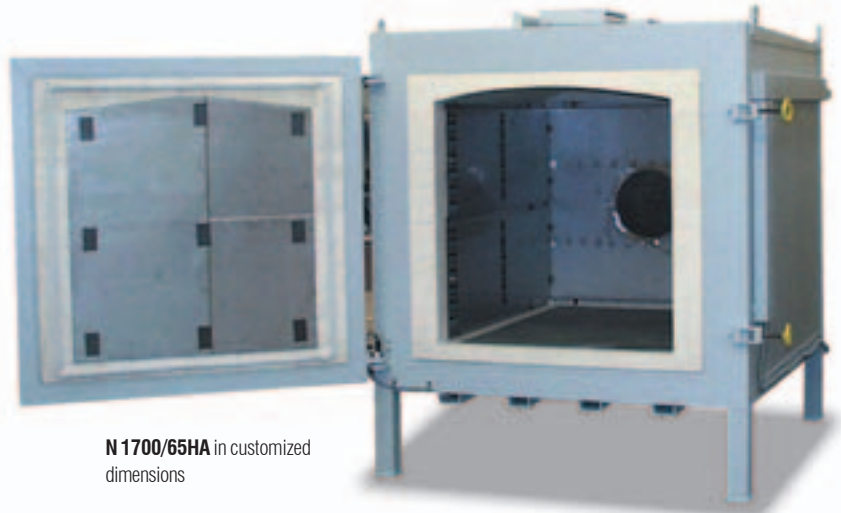


W 28800/S in customized dimensions

Air Circulation Chamber Furnaces up to 850 °C



N 120/65HA



N 1700/65HA in customized dimensions

N 15/65HA, N 30/45HA - N 500/85HA

For special applications e.g. cooling and coating of special glasses needing excellent temperature distribution or good ventilation of the furnace chamber, we recommend our air-circulation furnaces. Our standard range lives up to most requirements. For special applications customized versions are available.

- Maximum temperatures up to 450, 650 or 850 °C
- N 15/65HA is available as table-top model in stainless steel, other models are freestanding and include a stand
- Optimal temperature distribution according to DIN 17052-1 up to $\Delta T < 6$ K
- Horizontal air circulation
- High air circulation hence optimal temperature uniformity
- Shelves allow charging in different levels
- Air guidance box provides for optimal air circulation and temperature distribution
- Standard equipment: one shelf and tracks for two further shelves

Additional Features

- Vapour vent flap control with cooling fan
- Air inlet and exhaust fans
- Safety features in accordance with EN 1539
- Customized dimensions
- Automatic door opening for fast cooling
- Vertical air circulation in case of specific charge requirements
- Roller conveyors
- Cooling station
- Fan speed control for air circulation
- Charging aids
- Additional shelves

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight Kg
		w	d	h		W	D	H			
N 30/45 HA	450	290	420	260	30	607+255	1175	1315	3,0	1-phase	195
N 60/45 HA	450	350	500	350	60	667+255	1250	1400	3,6	1-phase	240
N120/65 HA	450	450	600	450	120	767+255	1350	1500	7,0	3-phase	310
N250/45 HA	450	600	750	600	250	1002+255	1636	1860	13,0	3-phase	610
N500/45 HA	450	750	1000	750	500	1152+255	1886	2010	19,0	3-phase	1030
N 15/65 HA ¹	650	295	340	170	15	470	845	460	2,7	1-phase	55
N 30/65 HA	650	290	420	260	30	607+255	1175	1315	3,6	1-phase	195
N 60/65 HA	650	350	500	350	60	667+255	1250	1400	6,6	3-phase	240
N120/65 HA	650	450	600	450	120	767+255	1350	1500	9,6	3-phase	310
N250/65 HA	650	600	750	600	250	1002+255	1636	1860	19,0	3-phase	610
N500/65 HA	650	750	1000	750	500	1152+255	1886	2010	28,0	3-phase	1030
N 30/85 HA	850	290	420	260	30	607+255	1175	1315	6,0	3-phase*	195
N 60/85 HA	850	350	500	350	60	667+255	1250	1400	9,6	3-phase	240
N120/85 HA	850	450	600	450	120	767+255	1350	1500	13,6	3-phase	310
N250/85 HA	850	600	750	600	250	1002+255	1636	1860	21,0	3-phase	610
N500/85 HA	850	750	1000	750	500	1152+255	1886	2010	31,0	3-phase	1030

¹ tabletop model

**only 2 phases connected

Air Circulation Bogie Hearth Furnaces up to 850 °C

W 1000/65A - W 10000/85A

For heavy charge weights, air circulation furnaces are also available with movable bogies to be charged in front of the furnace.

Standard Version (different from chamber furnaces N 30/45HA ff.):

- Temperatures of up to 650 or 850 °C
- Freely steerable bogie on Tefolan wheels
- 3-sides heating: from both sides and from bogie
- Vertical air circulation with powerful fan in the furnace roof
- Air guidance sheets for optimal temperature uniformity

Additional Features

- Atmospheric boxes for protective-gas operation
- Electro-hydraulic lift-door
- Vapour vent systems
- Rail-operation, electric bogie drive
- Cooling system
- Multi-zone temperature control to optimize temperature distribution up to $\Delta T < 6$ K in accordance with DIN 17052-1
- Exhaust air flap control for faster cooling
- Customized dimensions



Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage
		w	d	h		W	D	H		
W 1000/65A	650	800	1600	800	1000	1450	2400	2300	42	3-phase
W 1500/65A	650	900	1900	900	1500	1550	2750	2400	58	3-phase
W 2200/65A	650	1000	2200	1000	2200	1650	3000	2500	77	3-phase
W 3300/65A	650	1000	3300	1000	3300	1650	4000	2500	90	3-phase
W 5000/65A	650	1200	3400	1200	5000	1850	4100	2700	110	3-phase
W 7500/65A	650	1400	3800	1400	7500	2050	4500	2900	140	3-phase
W 10000/65A	650	1600	3900	1600	10000	2250	4600	3100	220	3-phase
W 1000/85A	850	800	1600	800	1000	1450	2400	2300	42	3-phase
W 1500/85A	850	900	1900	900	1500	1550	2750	2400	58	3-phase
W 2200/85A	850	1000	2200	1000	2200	1650	3000	2500	77	3-phase
W 3300/85A	850	1000	3300	1000	3300	1650	4000	2500	90	3-phase
W 5000/85A	850	1200	3400	1200	5000	1850	4100	2700	110	3-phase
W 7500/85A	850	1400	3800	1400	7500	2050	4500	2900	140	3-phase
W 10000/85A	850	1600	3900	1600	10000	2250	4600	3100	220	3-phase

Bogie hearth furnace **W 1500/65A** with atmospheric box for operation under protective-gas as additional feature

Air circulation furnace in customized specifications

Air circulation furnace with horizontal air circulation for coatings on special glass panels. The customer required very dense load on 20 levels with a total of 40 shelves. In spite of this dense load, a temperature distribution of $\Delta T < 6$ K is reached using 2 powerful air circulation fans.

Furnace inner dimensions: 1100 x 1600 x 1350 mm
 Useful inner dimensions: 800 x 1300 x 1050 mm
 Volume: 2380 litres
 T_{max.}: 550 °C
 Supplied with 1.4828 stainless steel loading truck and shelves



N 2380/55 HAS air circulation furnace in customized version with charging cart and shelves made of 1.4828 stainless steel

Preheating Furnaces for Moulds



N 31/H



N 201/S in customized dimensions
with SiC plates protecting the
side heating

N 31/H - N 61/H, N 81 - N 1491, N 81/13 - N 641/13

The models N 31/H ff. have been specially developed for preheating of moulds but also for hardening jobs when toolmaking.

- 3-sides heating: from both sides and floor via freely radiating heating elements
- Floor heating protected by heat conductive SiC tiles
- Parallel motion swing door (protection of the user from heat radiation by the door)
- Multi-layer insulation
- Exhaust vent
- High temperature uniformity
- Controller, easy to operate



Mould for production of beer glasses

Additional Features

- Cooling fan
- Protective gas connection
- Sealed housing
- Side heating protected by SiC plates
- Visual and acoustic signal
- Loading aids, charging trays

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
		w	d	h		W	D	H			
N 31/H	1280	350	350	250	30	840	950	1320	13	3-phase	210
N 41/H	1280	350	500	250	40	840	1100	1320	15	3-phase	260
N 61/H	1280	350	750	250	60	840	1350	1320	20	3-phase	400
N 81	1200	500	750	250	80	1140	1900	1790	20	3-phase	820
N 161	1200	550	750	400	160	1180	1930	1980	30	3-phase	910
N 321	1200	750	1100	400	320	1400	2270	2040	47	3-phase	1300
N 641	1200	1000	1300	500	640	1690	2670	2240	70	3-phase	2100
N 761	1200	800	1900	500	760	1550	2540	2650	75	3-phase	2400
N 1491	1200	1660	1200	750	1490	2430	1840	3150	110	3-phase	5400
N 81/13	1300	500	750	250	80	1220	1960	1840	22	3-phase	900
N161/13	1300	550	750	400	160	1260	1990	2030	35	3-phase	1000
N321/13	1300	750	1100	400	320	1480	2330	2090	60	3-phase	1500
N641/13	1300	1000	1300	500	640	1770	2730	2290	80	3-phase	2500

Combined Chamber Furnaces for Debinding/Sintering with Fresh-Air Preheating



N 576/14 DBS in customized dimensions with scales for controlling the weight loss during debinding



N 200/HDB

N 200/HDB and N 300/HDB

In the production of small special glass components, e.g. glass filters or quartz glass bulbs, the transfer from the debinding furnace to the sintering furnace is often associated with many disadvantages and risks. The goods cannot be allowed to cool in between the processes, and the re-loading of the debinded parts leads to an incalculable quantity of rejected goods.

Since an optimum temperature distribution is a requirement in the lower temperature range the furnace has a preheating system. Blowing in the warm, separately controlled air ensures an optimum temperature distribution with the help of the controlled air swirl. During the debinding process, the vapour vent flap of the furnace is open so that the waste air can be immediately directed out of the furnace.

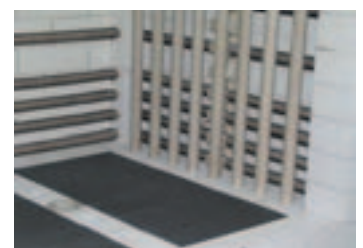
Through perforated ceramic pipes in the chamber the preheated air is very evenly blown horizontally in different layers into the furnace chamber. The heating zones of the furnace and the air preheating system are controlled separately but operate jointly up to about 500 °C. Subsequently, the air preheating switches off and the furnace continues the sintering process without having to cool down in between.

Standard Version N 200/HDB + N 300/HDB

- Horizontal blowing-in of preheated air up to max. 500 °C, continuation of the process up to the sintering temperature with 5-side heating in the furnace
- Bottom heating covered by SiC heat-conducting plate (level stacking support)
- Automatic control of vapour vent flaps
- Separate outlets for exhaust and cooling air
- Exhaust hood in stainless steel 1.4301
- Two-zone control, preheating of air inflows also controlled separately as a second heating source
- Temperature distribution better than +/- 7 K during the debinding process and better than +/- 10 K [according to DIN 17052-1] during the dwell time when sintering
- Safety matrix to protect furnace and charge in case of disturbance or break-down

Additional Features

- Customer-specific versions with respect to temperature and size
- Multi-zone control for processes requiring optimum temperature distribution
- Cooling fan to shorten process cycle
- Scales for measuring the weight loss during firing
- Thermal or catalytic afterburning systems



Preheated air is blown in through perforated ceramic pipes



Cooling fan as an option

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
		w	d	h		W	D	H			
N 200/HDB	1340	370	530	720	140	790	1060	1690+400	31	3-phase	490
N 300/HDB	1340	420	700	780	230	840	1230	1750+400	38	3-phase	580

High-Temperature Chamber Furnaces



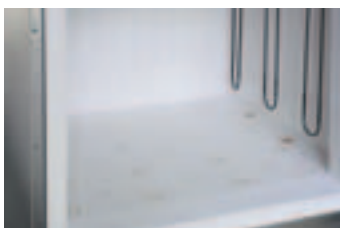
HT 16/17 standard version



HT 160/17
with cooling fan, automatic flap control and
start-up circuit



Parallel motion swivel door for lasting protection
of the collar insulation against destruction



Reinforced floor as protection for bottom insulation
HT 32/16

HT 04/16 - HT 450/17, HT 04/18 - HT 40/18

The HT 04/16 ff. high-temperature furnaces are the ideal choice for sintering special glass, e.g. quartz glass or for melting trials in the laboratory. Excellent temperature uniformity, solid construction provide for the necessary competitive edge with respect to quality.

- Maximum temperature 1600, 1750 or 1800 °C
- Furnace size from 4 to 450 litres, special sizes as an option
- High-quality molybdenum disilicide (MoSi_2) heating elements
- Chain guided parallel moving swivel door for precise operation protecting the collar fibre insulation
- Door labyrinth sealing provides for optimum temperature distribution
- Door area armored with stainless steel to avoid burn damages
- Reinforced floor as protection for bottom insulation as standard from HT 32/16 upwards
- Temperature limiter for protection of goods and furnace as standard
- Furnace chamber lined with top-quality durable fibre materials
- Special roof construction, for high durability
- Resistant PtRh-Pt, B-type thermocouple
- Vapour vent in the furnace roof

Additional Features

- **Furnace chamber lined with lightweight refractory bricks**
 For melting tests in the laboratory the high-temperature furnaces can be produced with lightweight refractory brick insulation. Customer crucibles can be introduced into the furnace, e.g. to melt glass. We recommend to equip the furnaces with a fresh-air fan and automatically driven vapour vent flaps for secured evacuation of the exhaust gases arising during the melting process.

- **Cooling fan**
 For cycle time acceleration specific fans are installed. The fan speed is preselected per segment. The controller is automatically switching on and off. Hence, different speeds can applied e.g. for binder removal or cooling. Also, linear cooling can be used by setting the temperature gradient.

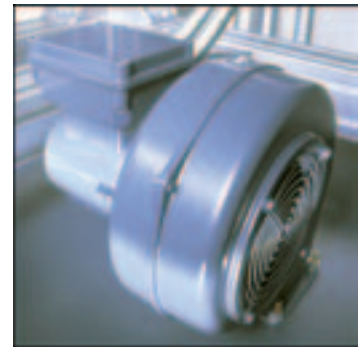
- **Air preheating**
 Air preheating can also be installed in our high-temperature furnaces (explanation see page 27). Hence, the furnace can also be used as a combi-furnace for debinding and sintering in one process without parts transfer.

- **Start-up circuit**
 Due to a special circuit in the switchgear, the characteristics of heating up too fast up to 300 °C, typical for molybdenum disilicide heating elements, is eliminated. This extra is particularly recommended when firing ceramics which are sensitive in this temperature range.

- **Automatic control of vapour vent flaps**
- **Customized furnace dimensions**
- **Stainless steel exhaust hoods**
- **Catalytic or thermal afterburning systems (see page 36)**
- **Charging devices**
- **Protective-gas connection e.g. to reduce oxygen content during exothermal debinding**



Furnace chamber lined with solid lightweight refractory brick insulation instead of fibre material for melting tests in the laboratory



Cooling fan



Automatic vapour vent flap



Optional gassing facility for argon and nitrogen e.g. for reducing oxygen content during exothermal debinding

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
		w	d	h		W	D	H			
HT 04/16	1600	150	150	150	4	610	470	1400	5	3-phase*	150
HT 08/16	1600	150	300	150	8	610	610	1400	8	3-phase*	200
HT 16/16	1600	200	300	260	16	710	650	1500	12	3-phase*	270
HT 32/16	1600	200	600	260	32	710	930	1500	18	3-phase	350
HT 40/16	1600	300	350	350	40	810	710	1610	12	3-phase	380
HT 64/16	1600	400	400	400	64	1020	840	1700	18	3-phase	550
HT128/16	1600	400	800	400	128	1020	1250	1700	26	3-phase	750
HT160/16	1600	500	550	550	160	1140	1020	1900	21	3-phase	800
HT276/16	1600	500	1000	550	276	1140	1470	1900	36	3-phase	1100
HT450/16	1600	500	1150	780	450	1140	1620	1900	64	3-phase	1500
HT 04/17	1750	150	150	150	4	610	470	1400	5	3-phase*	150
HT 08/17	1750	150	300	150	8	610	610	1400	8	3-phase*	200
HT 16/17	1750	200	300	260	16	710	650	1500	12	3-phase*	270
HT 32/17	1750	200	600	260	32	710	930	1500	18	3-phase	350
HT 40/17	1750	300	350	350	40	810	710	1610	12	3-phase	380
HT 64/17	1750	400	400	400	64	1020	840	1700	18	3-phase	550
HT128/17	1750	400	800	400	128	1020	1250	1700	26	3-phase	750
HT160/17	1750	500	550	550	160	1140	1020	1900	21	3-phase	800
HT276/17	1750	500	1000	550	276	1140	1470	1900	36	3-phase	1100
HT450/17	1750	500	1150	780	450	1140	1620	1900	64	3-phase	1500
HT 04/18	1800	150	150	150	4	610	470	1400	5	3-phase*	150
HT 08/18	1800	150	300	150	8	610	610	1400	9	3-phase*	200
HT 16/18	1800	200	300	260	16	710	650	1500	12	3-phase*	270
HT 32/18	1800	200	600	260	32	710	930	1500	18	3-phase	350
HT 40/18	1800	300	350	350	40	810	710	1610	12	3-phase	380

*2 phases connected

High-Temperature Top-Hat and Elevating Platform Furnaces



Top-hat furnace **HT 400/17 LTS**
with interchangeable table system as an option



Top-hat furnace **HT 64/17LT**
with ventilator cowling

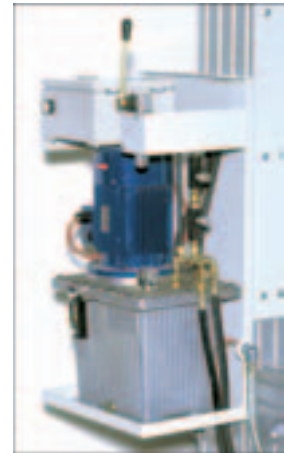
Top-hat furnaces HT 64/17 LT - HT 1440/17 LTS

In order to meet the challenging requirements of productivity and temperature distribution, the high-temperature furnaces HT 64/17 LT - HT 1440/17 LT are used. The design of the furnaces is tailored to customer's needs. For every problem we can offer a specific solution. Our product range comprises from top-hat furnaces with stationary table and interchangeable table systems up to fully automated debinding and sintering plants with afterburner system and integrated safety concepts for improving productivity and quality.

- Top-hat or elevator style
- Tmax 1750 or 1800 °C
- Furnace sizes from 4 to 440 l
- High-quality molybdenum disilicide (MoSi₂) heating elements
- Electro-hydraulic hood drive for almost vibration-free movement
- Safe and tight hood closure due to labyrinth seal and additional sand cup
- Floor reinforcement with level stacking support to protect the fibre insulation and to carry heavy charges as standard from HT 32/16 upwards
- Temperature limiter for product and furnace protection
- Furnace chamber lined with high quality durable fibre material
- Special roof construction, with high durability
- Wear-free thermocouple, PtRh-Pt, type B

Additional Features HT 64/17 LT or /LB - HT 1010/17 LT or /LB

- **Interchangeable table system**
 An interchangeable table system is particularly recommended for complex load structures which take a long time to charge. Depending on the customer's requirements a fully automated table exchange, e.g. at night or at weekend, can be programmed additionally.
- **Cooling fan**
 For cycle time acceleration specific fans are installed. The fan speed is preselected per segment. The controller is automatically switching on and off. Hence, different speeds can be applied e.g. for binder removal or cooling. Also, linear cooling can be used by setting the temperature gradient.
- **Air preheating**
 Air preheating can also be installed in our high-temperature furnaces (explanation see page 27). Hence, the furnace can also be used as a combi furnace for debinding and sintering in one process without unloading.
- **Start-up circuit**
 Due to a special circuit in the switchgear, the characteristics of heating up too fast up to 300 °C, typical for molybdenum disilicide heating elements, is eliminated. This extra is particularly recommended when firing ceramics which are sensitive in this temperature range.
- **Customized furnace dimensions**
- **Stainless steel exhaust air hoods**
- **Catalytic or thermal afterburning systems (see page 36)**
- **Process documentation by temperature plotter or PC software**
- **Protective-gas connection, e.g., to reduce oxygen content during exothermal debinding**



Electro-hydraulic hood drive as standard



Floor reinforcement for heavy loads as standard

Model	T _{max} °C	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
		w	d	h		W	D	H			
HT 64/17L.	1750	400	400	400	64	950	1100	2350	18	3-phase	480
HT 166/17L.	1750	550	550	550	166	1100	1250	2500	42	3-phase	1100
HT 276/17L.	1750	1000	500	550	276	2000	1400	2500	50	3-phase	1200
HT 400/17L.	1750	1200	600	550	400	2200	1500	2500	72	3-phase	1300



Dividable high-temperature furnace **HT 1000/17S** for sintering quartz glass tubes



Combined process facility composed up of elevating table sintering furnace **HT 166/17LBS**, debinding furnace **N 200/H** and integrated catalytic exhaust air cleaning



LHTG 60-80

High-Temperature Furnaces for Vacuum and Defined Atmospheres

Retort furnaces / toplayer LHTW 60-80, LHTG 60-80 - LHTG 200-300

The LHTG series is optimally suited for laboratory trials in defined atmosphere and under vacuum as a cost efficient solution. Due to their compact exterior dimensions and diverse application profile up to 2000 °C (W) or 3000 °C (G) these furnaces are true all-rounders for ceramic processes.

- Graphite (LHTG) or tungsten insulation and heating elements
- Vacuum container with lid lock
- Lid and housing water-cooled
- Thermocouple, type C up to 2000 °C or pyrometer up to 3000 °C
- Gas supply for one gas (Ar) including rotameter and valves
- Vacuum pump for evacuation including pressure supply, pumping speed 4 m³/h, final pressure 0.1 mbar



Graphite heating chamber



Molybdenum/Tungsten heating chamber

Model	T _{max} °C	usable space ² in mm		Volume ²	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
		Ø	h		W	D	H			
LHTW 60-80	2000	60	80	0,22	800	1500	1800	12	3phasig*	500
LHTG 60-80	3000	60	80	0,22	800	1500	1800	20	3phasig*	500
LHTG 100-200	3000	100	200	1,57	850	1500	1800	40	3phasig*	650
LHTG 200-300	3000	200	300	9,42	950	1600	1800	60	3phasig*	750

² further dimensions available on request

*only 2 phases connected

High-Temperature Furnaces for Vacuum and Defined Atmospheres

Chamber furnaces HTK 8 - HTK 600 for vacuum and protective gas operation

The HTK series is a modular system of high-temperature chamber furnaces for covering most applications in which vacuum or defined atmospheres are required. All models have a housing of double walled stainless steel with water cooling over the entire chamber. Due to the rectangular design and the compact size large quantities can be charged. The dimensions, the heating system, gas supply and vacuum area as well as accessories are tailored to the customer's specific requirements.

The following heat conducting materials are used:

- Graphite
- Molybdenum/Tungsten
- MoSi₂
- CrFeAl

Standard Version

- Housing, heating module and controller are located in a housing (HTK 8 rolling cabinet frame)
- Gas supply, pump stand, measuring devices, PC, visualisation etc. are also integrated in the housing
- Temperature control up to 1800 °C via thermocouples (type K, S and B), above 1800 °C via radiation pyrometers
- Control through HiProSystems-Control with touch panel operation



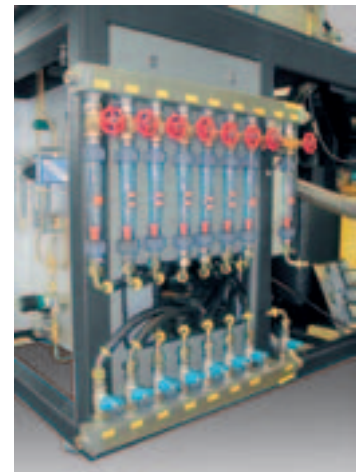
HTK 8



HTK 400

Additional Features

- Gas supply
 - Components for protective and reaction gases (e.g. N₂, Ar, H₂) as well as oxygen and air
 - Mass flow controller or rotameter
 - Automatically or manually activated valves
 - Safety equipment for operation with flammable gases in line with DIN EN 746-3
- Vacuum pump stand
 - Complete pump stands
 - Rotary valve, membrane, turbo, oil diffusion, cryo pumps
 - Vacuum or rotary valves manually or electro-pneumatically operated
 - Dust filters, adsorption and cooling traps
 - Pressure measurement with piezo ceramic pressure sensors, Penning, Pirani etc. or pressure ranges from 1600 to 10⁻¹⁰ mbar
 - Pressure control
- Measurement equipment
 - Pressure sensors (see above)
 - Humidity sensors
 - O₂ partial pressure probes (direct, also in vacuum)
- Graphite and molybdenum retorts
- Thermal or catalytic afterburners
- Oil tempering devices
- Cooling devices
- Gas leakage alarm devices
- Safety pressure tank for purging the vacuum chamber



Cooling water supply

Heating	Insulating	T _{max}	Atmosphere*
Graphite Type GR	Graphite fiber	3000 °C	Ar, N ₂ , CO Vakuum (10 ⁻⁴ mbar)
MoSi ₂ Type KE	Ceramic fiber (Al ₂ O ₃ /SiO ₂)	1800 °C 1400 °C 1250 °C	Luft, N ₂ , Ar, He, O ₂ Vakuum (0,1 mbar) H ₂
Molybdenum/Tungsten Type M or W	Molybdenum/Tungsten radiation sheets	2500 °C	Ar, H ₂ Hight vakuum (10 ⁻⁵ mbar)

*other protective and reactive gases on request

Model	Inner dimensions in mm			Volume in L	Outer dimensions in mm			Connecting power/kW	Connecting voltage	Weight in kg
	w	d	h		W	D	H			
HTK 8	150	150	200	5	700	900*	2000	25	1-phase	500
HTK 25	250	400	250	25	1500	1400	2050	60	3-phase	1500
HTK 80	400	500	400	80	1900	2100	2100	100	3-phase	2000
HTK 220	600	600	600	220	2250	2100	2400	160	3-phase	4000
HTK 400	800	800	600	400	2300	2500	2450	250	3-phase	5000
HTK 600	800	1200	600	600	2300	2500	2450	250	3-phase	5000

*Depending on the equipment plus separate switch board 700 x 900 x 2000 mm (WxDxH)



Laboratory Furnaces

Beyond product ranges and concepts presented for glass production, Nabertherm also markets a wide range of standard furnaces for the laboratory. With respect to delivery times we set benchmarks. Please ask for our special laboratory catalog to look for additional information for the model you are interested in.



L 5/11/B170

Muffle furnaces

Select the most suitable furnace for your application from the wide range of furnace with respect to size, application temperature etc.. From the simple muffle furnace to a special furnace with integrated weighing features to assess the ashing loss up to an incineration furnace with fully automated process control and documentation; we can supply whatever you need. Most furnaces can be shipped out of stock.



R 60/750/13

Compact tube furnaces

Our range of high-quality compact tube furnaces covers a wide range of laboratory processes requiring a tube furnace. The standard range offers solutions with varying tube lengths and diameters and single or 3-zone temperature control.



Tube furnace with optional vacuum flange

Special tube furnaces

Apart from the above-mentioned compact tube furnaces, we also offer modular tube furnaces for various laboratory processes tailor-made for different applications. Equipped with respective features processes can be carried out in gastight atmospheres. The tube furnaces can also be integrated into appliances or machines. Ask for our special solutions, e.g. for rotating tube furnaces.

Muffle furnaces with brick insulation

We recommend our N 7/H ff. box-type furnace for particularly heavy duty laboratory applications. As opposed to standard box-type furnaces, the chamber of this furnace is lined with resistant refractory bricks in order to cope with the more demanding process conditions. These furnaces can also be used with gassing boxes and are hence ideal for retrofitting for use as price-effective protective box-type furnaces.



N 7/H

Box furnaces with brick insulation

Our LH 15/.. ff. chamber furnaces are ideally suitable for simulating processes normally carried out in large chamber furnaces, e.g., cooling processes in production. These furnaces are available in various sizes for maximum temperatures of between 1200 and 1400 °C.



LH 15/13

Test furnace N 40/14 for fireproof glass

The N 40/14 chamber furnace is designed for testing different types of glass plates based on the standard temperature curve (ETW), e.g. for fireproof glass. In addition to the furnace door, a second frame can be placed in front of the inner chamber, into which the test pane can be inserted. This frame is fixed in place by a special mechanism. The furnace chamber with low depth is heated by heating elements mounted on ceramic support tubes, mounted only in the rear wall of the furnace, so that the heat radiates directly onto the glass surface. The furnace achieves exceptionally short cycle times due to the reduced chamber volume and a high power input.



N 40/14

High-temperature table-top models LHT and HTC

Nabertherm markets a wide range of laboratory table top high-temperature furnaces in various sizes for different maximum temperatures. The range includes box-type furnaces with SiC rod heating and a maximum temperature of between 1400 and 1600 °C. For temperatures of between 1600 and 1800°C we equip the furnace with molybdenum disilicide heating elements.



LHT 04/17

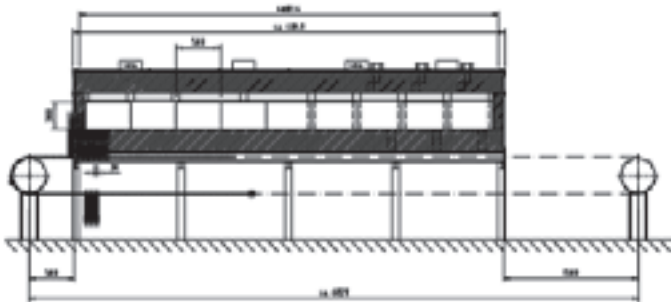
Ask for our „Laboratory“ brochure!

Plant Concepts including Catalytic and Thermal Afterburners, Continuous Furnaces

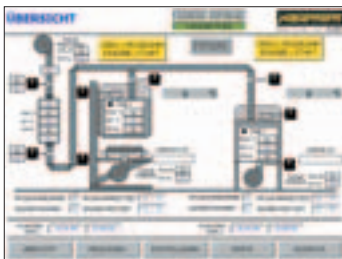
In addition to the furnace concepts described in this catalogue, Nabertherm offers process and manufacturing technology solutions for productivity improvements and the creation and expansion of production capacity over and above the mere delivery of the furnaces.

Our experienced engineers provide for advice, e.g.:

- Planning and designing furnace and exhaust systems
- Assembly and commissioning of the entire plant including construction of ductwork
- Accompanying emission measurements required by public institutions
- Material flow solutions for integrating upstream and downstream process steps
- Detailed visualisation of process monitoring and documentation to provide for quality relevant production data



Continuous furnace for e.g. tempering of special light bulbs



Flow diagram for furnace plant with catalytic afterburners (KNV)

High-temperature combi furnace plant **HT 166/17 LBS** equipped with thermal afterburner (TNV) and nitrogen emergency flushing.

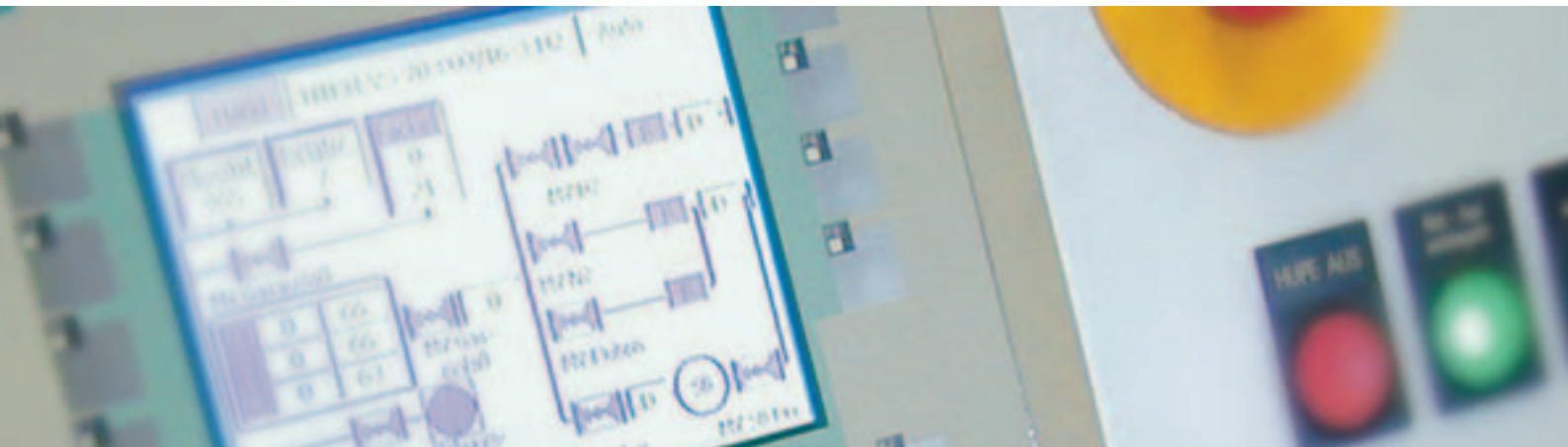


Tube furnace with heated length of 2500 mm for integration into a continuous plant for production of quartz glass. A quartz glass reactor is placed inside the furnace.



Roller conveyor in front of and inside two air circulation furnaces to convey the glass from one furnace to the other. Optional process automation is also available.

Process Control and Documentation



Based on more than 50 years of experience in design and construction of tailor-made switchgear and control systems taking care of handling, documentation and complex requirements, Nabertherm can also provide an individual solution tailored to your needs. Our standard solutions take care of most problems already at a fair price. Of course, we can accommodate your specific requirements.

Standard controllers

Many customer requirements are already covered by our wide range of standard controllers. Adapted to the specific furnace model the controller reliably monitors your firing cycle. The standard controllers are developed and produced within the Nabertherm Group. When designing the controllers easy handling has top-priority. Technically, the units are tailored to the respective furnace models. From a simple controller with adjustable temperature up to a control unit with freely programmable parameters, storable programs and interface to a computer - we can meet your requirements.

Software for monitoring, documentation and control

Documentation and reproducibility are gaining more and more importance for the quality assurance in the glass area. Here, the powerful **Software Controltherm** developed by us provides you with the optimum solution.

Features

- Usable for Nabertherm Controllers/Controltherm with digital interface
- Parallel operation/monitoring and documentation of up to 16 furnaces
- Setting of programs
- Archiving and printing of programs and graphics
- Documentation of relevant operation data
- Free input of texts (batch data)
- Facilities for data evaluation
- Start/stop of the Controller from the PC
- Data convertible into Excel format



Controller **C 250** as basic controller for many chamber furnaces



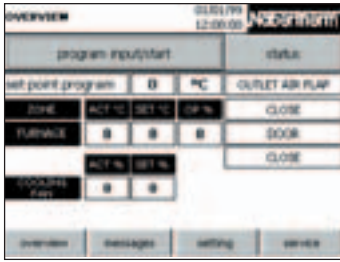
Controller **C 290** as basic controller for fusing furnaces



Controller **C 42** with two programmable extra-functions



Software Controltherm



H 1700 with monochrome presentation of data in table format



H 3700 with coloured graphic presentation of data



Control Center NCC user interface with display on PC



Data recording station with data diskette storage and graphic process display

HiProSystems-Control

This professional control system for single and multi-zone furnaces is based on Siemens hardware and can be upgraded extensively. This sophisticated control system is used for example when more than two functions such as vapour vent flaps, cooling fans, automatic movements etc. are required and/or furnaces with more than one zone have to be controlled and/or special documentation is required and/or maintenance/service work e.g. telediagnostic service is necessary. The HiProSystems-Control is also perfectly suited for controlling several furnaces or furnace groups. This central control unit is reducing the average investment per furnace accordingly.

Alternative user interfaces

Touchpanel H 700

The basic panel for easy handling and monitoring.

Touchpanel H 1700

Firing cycle data and the extra functions activated are clearly displayed in a chart.

Touchpanel H 3700

All functions and process data are stored and displayed in clear-cut charts. The data can be read out through various interfaces (RS 232, RS 422/485, USB, Ethernet TCP/IP, MPI, Profibus) via PC or other programs used by the customer and can be further processed. There is the opportunity to store plan and actual values on a CF card to be read via an appropriate card reader.

Control-Center NCC (PC-based)

The upgrading of the HiProSystems-Control into the NCC provides for additional interfaces, operating and service benefits such as:

- Charge data can be read in via barcodes
- Interface for connection to existing PPS systems
- Internet connection for external operation and monitoring
- Connection to mobile phone network for alarm via SMS, e.g. in case of break-down
- Operation from various PC locations
- Documentation according to DIN ISO 9000 ff.
- Maximum operator convenience, mouse operation, large screen

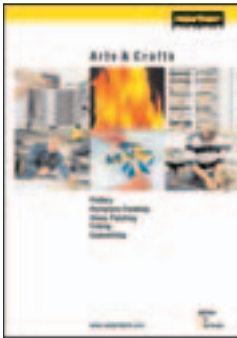
Documentation alternatives

- record of temperature/time profile according to DIN ISO 9000 ff. with a temperature recorder or with a data acquisition system
- record of temperature/time profile via a PC with the Nabertherm Software Controltherm MV.



Switchgear with HiProSystems-Control

The Nabertherm Product Range



Arts & Crafts

No matter if for pottery, glass or porcelain painting, fusing or for enameling we have the right kiln for your needs.

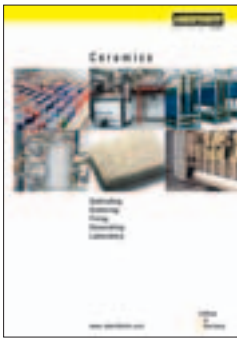
www.nabertherm.com/Products/Ceramics/Arts & Crafts



Plastics, Rubber & Surface Technology

Whether you need a furnace or oven for annealing, tempering, preheating, curing, sintering, vulcanizing, gelling or heat treatment, we definitely have the right solution. We also have a wide range of products for surface treatment like drying, coating, dipping, and lacquering. For mould manufacturing we offer, of course, various alternatives for annealing, hardening, and de-waxing.

www.nabertherm.com/Products



Ceramics

Starting from a small laboratory furnace and ending-up at fully automatic high-temperature furnace plants with afterburning systems of exhaust gases, our product range covers all needs.

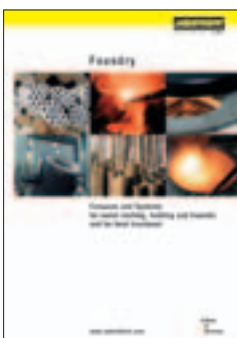
www.nabertherm.com/Products/Ceramics/Ceramic Industry



Heat Treatment of Metals

Tempering, Ageing, Annealing, Hardening, Nitriding, Brazing under protective gas, Tempering, Drying, Quenching and Tempering – these are only a few of the applications that can be realised by our full range of furnaces and plants for heat treatment of metals.

www.nabertherm.com/Products/Heat Treatment of Metals



Foundry

Starting from electrically or gas-heated melting furnaces and ending-up at fully automatic annealing plants for aluminium parts we provide solutions for the foundry industry in the most professional manner.

www.nabertherm.com/Products/Foundry

The whole world of Nabertherm: www.nabertherm.com

All you need to know about us you find under:

www.nabertherm.com.

Beside any news about exhibitions etc. there is a link to get in touch directly with your respective key-account manager at our headquarters or local dealer in charge of you.

Professional Solutions for:

- Arts & Crafts
- Ceramics
- Plastics, Rubber & Surface Technology
- Laboratory/Dental
- Heat Treatment of Metals
- Foundry

Subsidiaries:

GERO 
HERMES  



Distribution Companies:

Nabertherm Shanghai, China
Nabertherm S.A.S., France
Nabertherm Schweiz AG, Switzerland
Nabertherm Ibérica, S.L., Spain
Nabertherm Ltd., UK
Nabertherm Inc., USA

info@nabertherm-cn.com
info@nabertherm.fr
info@nabertherm.ch
info@nabertherm.es
contact@nabertherm.co.uk
contact@nabertherm-usa.com

For all other countries see worldwide sales.



References

