# Комбинированные высокотемпературные печи с нагревательными элементами до 1800 °C для удаления связующего и спекания в одном процессе HT

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# Combi-High-Temperature Furnaces with Molybdenum Disilicide Heating Elements up to 1800 °C for Debinding and Sintering in One Process

For combined debinding and sintering processes with sintering temperatures up to 1750 °C, the high-temperature furnaces will be equipped with a passive safety system which ensures a safe operation by monitoring all functions relevant during debinding . In addition, fresh air is supplied to the furnace chamber in a controlled way to reliably prevent a combustible atmosphere forming inside the furnace by diluting the binder gases.

The smaller furnace models can be equipped with the DB50 laboratory debinding package, which is designed for small binder amounts and low vaporization rates. In the basic design, the DB100 debinding package is available for larger furnaces. With this debinding package, preheated fresh air is introduced so that the furnace is operated with overpressure during the debinding phase.

The DB200 debinding package is the ideal solution for high-temperature furnaces used in production processes. With this safety system, the furnace has a fresh air preheater and the preheated air is blown into the furnace horizontally through perforated air inlet tubes. During debinding, the exhaust gases are discharged from the furnace via a separate outlet with exhaust gas fan. The volume flows of fresh air and exhaust gas are controlled so that a slight negative pressure is always maintained in the furnace chamber during debinding.

High temperature chamber furnace HT 160/18 DB200-3 with safety system for debinding in air and pneumatic lift door

## Standard Design

Like high-temperature furnaces HT (see page 34), however:

- Stainless steel exhaust hood as interface to the customer's extraction system (DB200 option: separate removal of exhaust gases during debinding)
- Controller with touch operation P570 (50 programs each with 40 segments) for models HT 16.. - HT 40.., description of the controls see page 76
- From model HT 64..: HiProSystems H1700, including Siemens PLC control system and 7" touchpanel as operating interface see page 84

## Debinding Package DB50

- Laboratory option for applications with low evaporation rates for high-temperature furnaces HT 16.. - HT 40..
- Fresh air fan to introduce a defined volume of fresh air
- Exhaust gas and exhaust air discharged via one outlet with a motor-driven flap in an exhaust hood
- For more details about the DB50 debinding package see page 8

## Debinding Package DB100

- Basic design for safe debinding with small amounts of binder for high-temperature furnaces from model HT 64..
- Fresh air fan and fresh air preheater
- Exhaust gas and exhaust air discharged via one outlet with a motor-driven flap in an exhaust hood
- Performance of the debinding package customized to the process requirements
- For more details about the DB100 debinding package see page 9

High-temperature furnace HT 276/18 DB200-3 with catalytic post combustion

## Debinding Package DB200

- Professional solution for large amounts of binder and changing debinding processes
- Fresh air fan, fresh air preheater and monitoring of fresh air and exhaust gas flow rates
- Separate discharge of exhaust gases during debinding and exhaust air during cooling via separate outlets with motor-driven flaps
- Extendable with catalytic or thermal post combustion for a single furnace or alternating operation with two furnaces see page 12
- Performance of the debinding package customized to the process requirements
- For more details about the DB200 debinding package see page 9

High-temperature furnace HT 450/17 DB200-3 with catalytic post combustion

## Additional Equipment

- With debinding package DB200: Thermal and catalytic exhaust air treatment see page 12
- Redundant thermocouples to increase process reliability
- Thermocouple to control the heating with calibration certificate
- Calibration interfaces for the measuring section
- Thermocouple exchange system for temperature measurement via thermocouple types B and S with automatic removal device for more exact control during debinding (for models from HT 160/..)
- Special heating elements e.g. for zirconia applications

| Model | Tmax | Inner dimensions in mm | | | Volume | Outer dimensions[1] in mm | | | Heating power | Electrical | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | °C | w | d | h | in l | W | D | H | in kW[3] | connection* | in kg |
| HT 16/.. DB50 | 1600 or 1750 or 1800 | 200 | 300 | 260 | 16 | 810 | 645 | 1780 | 12.0 | 3-phase[2] | 280 |
| HT 29/.. DB50 | | 275 | 300 | 300 | 29 | 975 | 690 | 1910 | 9.3 | 3-phase[2] | 390 |
| HT 40/.. DB50 | | 300 | 350 | 350 | 40 | 1000 | 750 | 1910 | 12.0 | 3-phase | 430 |
| HT 64/.. DB100-1 | | 400 | 400 | 400 | 64 | 1190 | 870 | 1960 | 18.0 | 3-phase | 660 |
| HT 64/.. DB200-.. | | 400 | 400 | 400 | 64 | 1190 | 870 | 1960 | 18.0 | 3-phase | 820 |
| HT 160/.. DB100-.. | | 500 | 550 | 550 | 160 | 1240 | 995 | 2230 | 21.0 | 3-phase | 815 |
| HT 160/.. DB200-.. | | 500 | 550 | 550 | 160 | 1240 | 995 | 2230 | 21.0 | 3-phase | 880 |
| HT 276/.. DB200-.. | | 500 | 1000 | 550 | 276 | 1300 | 1500 | 2230 | 36.0 | 3-phase | 1300 |
| HT 450/.. DB200-.. | | 500 | 1150 | 780 | 450 | 1350 | 1690 | 2500 | 64.0 | 3-phase | 1450 |

[1]Outer dimensions vary depending on the scope of supply. Dimensions on request.
[2]Heating only between two phases
[3]Depending on furnace design connected load might be higher

*Please see page 80 for more information about supply voltage

Catalytic or thermal post combustion obtainable as an option

Preheated fresh air blown in via perforated ceramic tubes

Two-door design for high-temperature furnaces > HT 276/..

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