

The Future ...

**Vötsch**  
Industrietechnik

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... Microwaves Revolutionise Industrial  
Thermal Engineering

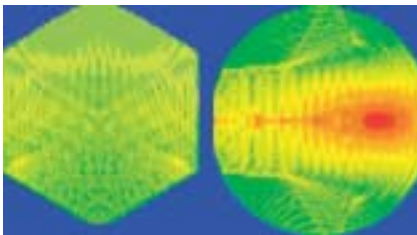
Microwave Heating and Drying Cabinets VHM HEPHAISTOS

# Microwaves Revolutionise Industrial Thermal Engineering ...

## The Product

The newly developed VHM HEPHAISTOS is an internationally patented system and characterised by a very high field homogeneity. For the first time, the advantages of microwave technology have been developed successfully to an industrially mature high technology.

The high field homogeneity allows for the manufacture of high-quality CFC aircraft structures, for instance. Conventional production systems (e. g. metal tools) may be kept.



Comparison of field distributions of a hexagonal and a cylindrical applicator.

The fibre composites are of a high lightweight construction potential and, hence, comply with the strict cost and weight requirements of aircraft industry. The advantages of the HEPHAISTOS system may also be used in other applications, for instance in the automobile industry.

Microwaves are the only physical heating method for the specific, volumetric heating of a product. The furnace chamber itself remains cold.

## Your Advantages

- **Reduced production costs**
  - Shorter heating, process, and cooling times compared to conventional methods, as a result of which energy is saved.
  - The products only are heated by the microwave.
  - The furnace chamber itself is not heated and does not have to be cooled down.
- **Use of metal parts, e. g. conventional metal tools and feeding systems, in the microwave field**  
(no transparent materials are required, but can be applied of course).
- **Specific, volumetric heating of products**  
Microwaves penetrate into the material directly and heat the product. As a result, heating rates and throughput can be increased considerably.
- **High product quality by sufficient homogeneity of the microwave fields**  
Thanks to the use of thermo-electric foils additional positive effects and material characteristics are achieved.
- **Modular design**  
The systems designed extend from the laboratory up to the large scale that is needed in e. g. aircraft industry.

### Broad spectrum of use

## Our Partners ...

... cooperate in an optimum manner, as our expert competencies complement each other.



The microwave systems are named after HEPHAISTOS, the Greek god of the craft and fire (*High Electromagnetic Power Heating Automated Injected Structures Oven System*).



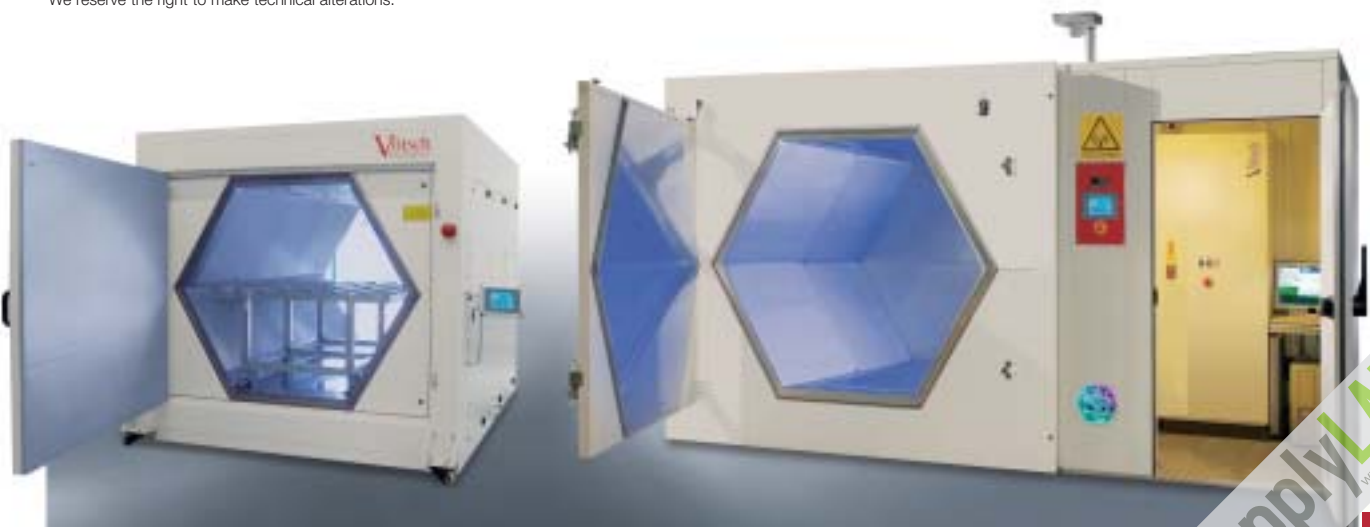
... when used in Research, Development and Production



### Technical Data of the HEPHAISTOS VHM

Model		VHM 100/100	VHM 180/200	VHM 180/300
Nominal temperature	°C	400	400	400
Usable volume	ltr	750	4200	7000
Inner dimensions				
Hexagon diameter	mm	1050	1800	1800
Width x height x depth	mm	1050 x 910 x 1050	1800 x 1560 x 2000	1800 x 1550 x 3300
Outer dimensions				
Width x height x depth	mm	1500 x 1800 x 1470	4200 x 2900 x 2200	2600 x 2550 x 3500
Weight, about	kg	850	1800	3000
Nominal voltage	V, Hz	400 V, 50/60 Hz	400 V, 50/60 Hz	400 V, 50/60 Hz
Microwave power	kW	about 10–14	about 20–30	about 31
Energy consumption	kW	about 22.4	about 65	about 68
Magnetron frequency	GHz	2.45	2.45	2.45
Type of heating		Microwave	Microwave	Microwave
Material of inner tank		Stainless steel 1.4301	Stainless steel 1.4301	Stainless steel 1.4301
Control and monitoring system		SIMCON/32*-NET	SIMCON/32*-NET	SIMCON/32*-NET

We reserve the right to make technical alterations.



## Accessories and Alternatives ...



Recirculation air tempering oven with mobile rotating frame for CFRP helicopter cockpits



Vacuum heating and drying oven – Microwave-heated design available as option

Standard and customised solutions to your special applications ...

- Heating and drying cabinets
- Drying chamber for coating materials
- Vacuum, heating and drying ovens
- Clean air, heating and drying ovens
- Explosion-proof drying ovens
- Tempering ovens up to 750 °C
- Chest ovens for easy top loading
- Drawer-type ovens
- Walk-in ovens and systems for continuous heating processes
- Hot air sterilisers (for normal and clean air conditions)
- Charging systems e.g. charging trolleys, transport trolleys and wire-meshed shelves
- Heating options  
Electrical, gas, infrared, microwave, warm water, steam, thermal oil
- For process documentation as per EN ISO 9001 we offer a variety of accessories and software for controlling, monitoring and documenting. Networking of up to 99 systems via one PC station.

Competence and dedication to customers ...

- Individual consultation
- Engineering and development
- Production and assembly
- Commissioning and briefing
- Calibration in own laboratory
- Maintenance, spare parts service, repairs
- Recycling of redundant units
- Training and workshops

Further information and representatives world-wide see [www.voetsch.info](http://www.voetsch.info)

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