

Some like it hot...

**Vötsch**  
*Industrietechnik*



Heating and drying ovens VTU  
Chamber drying ovens for coating materials VTL

# Reproductive production results...

## Indispensable...

Vötsch heating and drying ovens for production and research are found in various branches of industry, including electronics, automobile production, plastics, metal working, the chemical and pharmaceutical sectors and many other areas.



# ...by innovative product ranges

## Flexible solutions ...

Vötsch Industrietechnik have proven once again that even perfected and reliable products can be further developed to reach a greater standard of perfection. The new generation of units is available in 7 model sizes and can be supplied with a working chamber of between 200 and 8000 litres and nominal temperatures of 250 °C, 300 °C and 350 °C.

These robust drying ovens are suitable for variety of heating and drying processes in production and research.

The reliable module construction and the extensive range of accessories available allow them to be employed for a variety of applications.

Modern control and monitoring systems, in conjunction with **SIMPATI\*** software specially developed for these units, offer the possibility of linking up to 32 devices, if desired, and simultaneously controlling, monitoring and documenting their production results with a PC.

## The principal advantages ...

### Process characteristics

- Short process duration due to high volume of circulating air
- Short recovery time due to automatic switch-off of heating and circulating air fan when door is opened
- Homogenous temperature distribution, thanks to directed air ductwork
- Application-orientated air ductwork, both horizontal (standard) and vertical (optional)

### Production characteristics

- Economical and environmentally friendly, thanks to the enhanced thermal insulation
- Optimum thermal separation of inner and outer casing
- Minimum loss of energy and effective operator protection when coating, thanks to the heating and circulating fan being switched off

### A high degree of safety, thanks to:

- Low external wall temperatures
- Standard temperature selection limiter (for VTL)
- "Cold" heating connection
- Service and maintenance friendly
- All heating and drying ovens naturally comply with EMC guidelines.



# Heating and drying ovens VTU ...

## The basic equipment



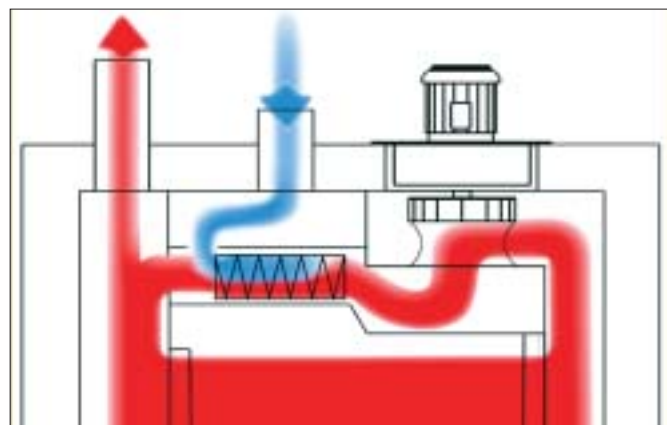
Heating and drying oven (VTU 75/100) system.  
These heating and drying ovens are suitable for all applications  
in process where **no combustible solvents** are released.

- Nominal temperatures 250/300/350 °C
- Outer casing made of galvanized sheet steel, coated with RAL shade 9002 (grey-white)
- Corrosion-resistant inner casing made of aluminised sheet steel
- Low external wall temperature and minimal loss of energy due to high-quality, generously dimensioned thermal insulation
- Grid rails in working chamber, facilitating height adjustment of wire-mesh shelves and grates
- The temperature-resistant door gasket is easily exchanged
- Door of walk-in units can be opened from inside (from model size 75/100)
- Safety temperature limiter (protects unit)
- Microprocessor-based temperature control with solid state relays ensure minimal control fluctuations
- Control panel with additional display and control elements which can be upgraded, thanks to its modular construction
- Exemplary air ducting system which enables an incredibly even temperature distribution to be achieved, even with a fresh air supply. The air in the working chamber is mixed in this system with fresh air sucked in via a heating register, mixed by the circulating air fan and conveyed once more to the working chamber.
- Air exchange via air intake and exhaust flanges.



Heating and drying oven VTU 60/60.

Air ductwork



# ... chamber drying ovens VTL



Chamber drying oven (VTL 125/200)

## Drying combustible solvents

Processes which involve drying of surface coatings, mould and impregnated resin varnishes can lead to the air being enriched by released substances (e.g. solvents), forming an explosive compound. If a source of combustion is present at the same time it can lead to an explosion.



## Play it safe at all times

The VTL series from Vötsch Industrietechnik enables you to safely control these heating and drying processes by limiting the quantity of solvent involved. The chamber drying ovens VTL comply with the extended safety requirements of EN 1539.

A circulating air fan with an improved performance ensures that a thorough mixture is achieved, thus preventing enrichment through solvent concentrations. A defined volume of hot air is continually conveyed outwards through the exhaust air fan and replaced with fresh air (dilution principle), thus preventing the formation of potentially explosive compounds.

To enable efficient operation to be achieved, the exhaust air can be reduced to 25 % by switching off the exhaust fan when the main evaporation is completed.

The circulation and exhaust air volumes are monitored. Flow monitors switch off the heating immediately and permanently in the case of malfunctions (at a level lower than the required volume flow).

All the terminal connections of the individual components are caulkwelded in the inner casing to prevent the ingress of solvents into the thermal insulation and the resulting enrichment.

The permissible quantity of combustible substances depends mainly on the field of application of the drying oven.

There are different technical safety devices. Please contact us for a proposal of the best and most favourable solution for your special application.

# Monitoring, control...

## Microprocessor-based temperature and program controller \*)

- **Jumo dTron 04.1** (Standard)  
2 point controller with PID action, digital display of rated/actual temperature values



- **Jumo Dicon 501**  
2 point controller with PID action, digital display of rated/actual temperature values, 10 programs, clear text display



- \*) program controller with the VTL with additional monitoring unit for:
- Monitoring the main evaporation time, independent of the program controller.
  - Automatic switching to a reduced volume of air after the main evaporation phase has been completed. Protective aim: safe operating method, even in cases of malfunctioning or erroneous programming.

### Operating and controlling with **MINCON/32\*** or **SIMCON/32\*-NET**

The Vötsch heating and drying ovens are equipped with the **MINCON/32\*** or **SIMCON/32\*-NET** selfmonitoring, digital measuring and control system. The input of process parameters and programs as well as the output of actual values, operating and error messages is done by means of a touch panel.



### Vötsch **SIMPATI\*** software package for PCs

The Vötsch software **SIMPATI\*** can be used for complete documentation and graphic interpretation. By installing it on an optional notebook or PC, the user can create program profiles and document all process parameters under Windows. Parallel to that, the user can use the full capacity of the PC under Windows.

### Special features

- convenient input of measuring values and program operation with graphic representation of the rated and actual values on the touch panel
- program memory for up to 100 programs with a total of 1,000 sections
- two-level password protection against unauthorized access
- integrated limit monitoring for temperature
- serial interfaces RS 232 C and RS 485
- operating and error messages are displayed on the touch panel
- special operator interface for use in production facilities (simplified starting/stopping of processes).
- Ethernet/LAN interface (10/100 Mbit) in connection with **SIMPATI\*** for integration into the network.



### Advantages of the software

- up to 32 units can be networked
- access via PC networks or your own browser
- transmitting messages via e-mail to an existing mail server (SMTP)
- uploading of programs, production data (product, operator, unit) possible through **bar codes** (optionally).



## Automatic switches

- **Daily program timer 24 h**

- Switching on and off
- Minimal switching cycle 15 min
- 150 h memory back up



- **Weekly program timer 168 h**

- Switching on and off
- Minimal switching cycle 2 h
- 150 h memory back up

- **Digital weekly program timer 168 h**

- (only with VTU)
- Switching on and off
- 5 years by lithium battery memory back up
- Digital display

## Upper temperature limit protection

- **Safety temperature limiter STB**

(not available when using TWB) switches heating off permanently if the nominal temperature is exceeded (VTU)

Protective aim:  
Operating personnel,  
surroundings and dryer

- **Temperature limit cut-out TWB**

(standard with VTL)  
Totally independent of the temperature control equipment. The limit temperature is adjustable. The heating is switched off permanently when the set temperature is reached.

Protective aim:  
Operating personnel, surroundings,  
dryer and charging specimen



## Temperature registration

- **Single channel line recorder**



Type Jumo Logoline 500d  
– Measuring range can be freely configured  
– Paper scroll,  
100 mm recording width  
– A fixed resistance thermometer (Pt100) for recording the working chamber temperature

- **6 channel dot matrix printer**

Type Jumo Logoprint 500  
– Measuring range can be freely configured  
– Paper scroll,  
100 mm recording width  
– 6 flexible sensors (NiCr-Ni) for recording the goods temperature

- **Single connection for external temperature recording**

A fixed resistance thermometer (Pt100) for recording the working chamber temperature, installed in the switching cabinet on connection terminals

- **6 connections for external temperature recording**

6 flexible sensors (NiCr-Ni) for recording the goods temperature, connection box at rear in switching cabinet (incl. mating connector)

The components shown on pages 6 and 7 are either included in the basic equipment or are optionally available, depending on the type of unit. Further information is provided in the charts on pages 10 and 11.

# Technical specifications of VTU/VTL series...

Model size		VTU   VTL 60/60	VTU   VTL 60/90	VTU   VTL 75/100	VTU   VTL 100/150	VTU   VTL 125/200	VTU   VTL 150/200	VTU   VTL 200/200
<b>Working chamber dimensions</b>								
Width	mm	600	600	750	1000	1250	1500	2000
Height	mm	600	900	1000	1500	2000	2000	2000
Depth	mm	600	600	750	1000	1250	1500	2000
<b>Max. external dimensions</b>								
Width	mm	1000	1000	1470	1840	2090	2340	2900
Height	mm	1673	1973	1842   1900	2389   2443	2889   3029	2889   3029	2889   3029
Depth	mm	1030   1250	1030   1250	1210	1450	1700	1950	2450
<b>Volume</b>								
Working chamber volume	m <sup>3</sup>	0.216	0.324	0.562	1.5	3.125	4.500	8.000
Vapour chamber volume	m <sup>3</sup>	0.369	0.502	0.998	2.447	4.615	6.431	10.957
<b>Shelves (max. no.)</b>								
		8	10	12	15	20	–	–
<b>Weights</b>								
Weight of empty oven	kg	275   295	305   330	460   475	780   800	1100   1130	1350   1380	1720   1750
Load capacity	kg	150	150	400	400	400	on request	on request
Load (reinforced inner casing)	kg	300	300	1000	1000	1000	on request	on request
Floor load	kg	–	–	200	200	200	1000	1000
Reinforced floor load	kg	–	–	1000	1000	1000	2000	2000
Charging trolley (max.)	kg	–	–	300	300	300	on request	on request
Shelves, concentrated load	kg	10	10	10	10	10	–	–
Shelves, area load	kg	20	20	20	20	20	–	–
Grate, concentrated load	kg	50	50	50	50	50	–	–
Grate, area load	kg	200	200	200	200	200	–	–
<b>Electrical power</b>								
Heat output, standard	kW	7.2	7.2   14.4	18.0	27.0	36.0	48.0	54.0
Connected load, standard	kW	8.5	8.5   15.5	20.0	29.0	39.0	52.0	58.0
Heat output, reduced	kW	–	–	9.0	18.0	27.0	on request	on request
Heat output, increased	kW	14.4	14.4	–	36.0	45.0	on request	on request
Rated voltage	V	400	400	400	400	400	400	400
<b>Power consumption</b>								
air circulation 250 °C	kWh/h	2.3	2.5	4.0	6.8	8.5	9.5	13.0
exhaust air at 250 °C	kWh/h	3.8	4.0	7.0	11.2	18.2	19.4	23.5
<b>Degree of protection</b>								
		IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54
<b>Temperature</b>								
Nominal temperature 250 °C	K	●   ●	●   ●	●   ●	●   ●	●   ●	●   ●	●   ●
Nominal temperature 300 °C	K	○   ○	○   ○	○   ○	○   ○	○   ○	○   ○	○   ○
Nominal temperature 350 °C	K	○   –	○   –	○   –	○   –	○   –	○   –	○   –
<b>Temperature distribution, spatial</b>								
at 250 °C (circulating air)	K	±1.8	±2.0	±1.5	±2.6	±3.5	±4.5	±6.0
at 300 °C (circulating air)	K	±2.0	±2.0	±2.0	±3.1	±4.6	±5.0	±6.7
at 350 °C (circulating air)	K	±3.0	±2.5	±3.0	±3.5	±5.5	±6.2	±8.0
at 250 °C (fresh air)*	K	±3.5	±4.0	±2.0	±3.0	±4.5	±5.5	±7.0
at 300 °C (fresh air)*	K	±4.0	±4.5	±2.5	±3.6	±5.5	±6.5	±8.0
<b>Time</b>								
Rise Time, circulating air to 250 °C	min.	20	24   20	30	30	25	35	35
to 300 °C	min.	30	30   22	35	35	32	43	43
Cooling rate to 60 °C* from 250 °C	min.	55	44	40	48	60	80	95
from 300 °C	min.	75	52	52	61	70	95	115
Recovery time to 250 °C after 30 sec.	min.	2.5	2.0	2.5	2.5	3.0	3.5	3.5
after 60 sec.	min.	3.0	2.0	3.0	3.0	3.5	4.0	4.0
<b>Quantity of solvent max.</b>								
at 250 °C	g	11	15	26	46	71	86	117
at 300 °C	g	9	12	21	37	61	72	101
<b>Air flow (horizontal)</b>								
Air velocity	m/s	0.9	0.6	0.9	0.6	0.6	0.55	0.6
Circulating air (fan output)	m <sup>3</sup> /h	1200	1200	2400	3400	5400	6000	9000
Exhaust air for VTU   VTL	m <sup>3</sup> /h	30   102	30   138	60   240	60   360	60   480	60   480	60   480
Air changes for VTU   VTL	min <sup>-1</sup>	0.8   4.6	0.6   3.4	1   4	0.4   2.5	0.2   1.7	0.16   1.25	0.13   1.0
<b>Noise level</b>								
	dB (A)				< 70			

\* with air outlet blower

# ... and additional equipment

## Pushthrough design

(from model size 75/100 on)  
The unit is fitted with doors at the front and rear. The dryer can thus be built into a wall or integrated into an assembly line.

## Vertical air flow

The dryer can also be delivered with vertical circulating air flow from below to above in the working chamber instead of the standard horizontal air flow, thus enabling the air flow inside the dryer to be adapted to suit the product requirements.

## Shutter wall

(from model size 75/100 on)  
This enables the air flow conditions to be adapted to the individual types of load (e.g. in the case of an uneven load).

## Fresh air filter

Different filter systems are available for processes with an increased cleanliness requirements:

- Filter category F5, with 95 % filtration efficiency
- Filter category H14 (HOSCH), with 99.99 % filtration efficiency in the case of a reference particle size of 0.5 µm



Exhaust air fan and fresh air fan (F5)

## Circulating air filter

Filter category G4, in the diameter of the air inlet in the working chamber, 93 % filtration efficiency

## Exhaust air fan

(standard with VTL)  
Advantages of exhaust air ventilator:  
Accelerates drying process, thanks to an increased air exchange rate and quicker cooling  
A slight vacuum is created in the working chamber.  
This prevents vapour from escaping (e.g. during tempering).

## Door window

Safety glass door window.  
An additional door acts as protection against contact.

## Electrical door lock

(only with VTU)  
For greater quality and safety.  
Prevents interruption of heat treatment caused by unauthorised or unintentional opening of door.

## Caulk-welded inner casing

(standard with VTL)  
Prevents the ingress of vapour or moisture into the thermal insulation layer.

## Recessed floor rails

Facilitates the ground level insertion of a charging trolley into the working chamber (available from model size 75/100 on)



## Folding ramp

(from model size 75/100 on)  
For inserting a charging trolley (e.g. for processes involving an inert gas atmosphere).



## Flashing alarm light

Flashing lamp, signalling unit malfunction (red) or the end of a process (yellow) in connection with a program controller.

## Tubular leadthroughs

Sealable, with diameters of 24 and 40 mm for inserting measuring lines.

# Basic design, additional equipment...

## Charging trolley/ Platform trolley

For the preparation and insertion of complete charges in the working chamber and for transportation within the company.



Charging trolley with shelves

## Charging trolley with folding shelves

Specially designed for placing large surfaced, thin plates. Shelves are folding and distance pieces are provided.

## Shelves, grates, charging trays

For locating different workpieces. The choice depends on the dimensions and weight of the piece involved.

Unit series (model size)	60/60	60/90	75/100	100/150	125/200	150/200	200/200
<b>Basic design</b>							
*Nominal temperature 250 °C	●	●	●	●	●	●	●
*Nominal temperature 300 °C	○	○	○	○	○	–	–
*Nominal temperature 350 °C (only with VTU)	○	○	○	○	○	–	–
*Pushthrough design	–	–	○	○	○	–	–
<b>Outer casing</b>							
*Lacquered according to RAL 9002	●	●	●	●	●	●	●
*Special lacquer (specify when placing order)	○	○	○	○	○	○	○
<b>Inner casing</b>							
*Aluminised sheet steel	●	●	●	●	●	●	●
*Reinforced	○	○	○	○	○	○	○
*Caulk welded (standard with VTL)	○	○	○	○	○	○	○
*Caulk welded and reinforced	○	○	○	○	○	○	○
*Stainless steel 1.4301	○	○	○	○	○	○	○
*Reinforced	○	○	○	○	○	○	○
*Caulk welded	○	○	○	○	○	○	○
*Reinforced and caulk-welded	○	○	○	○	○	○	○
<b>Electrical design</b>							
*400 V 3Ph, PE AC, 50/60 Hz	●	●	●	●	●	●	●
*230 V 3Ph, PE AC, 50/60 Hz	○	○	○	○	○	–	–
<b>Additional equipment</b>							
<b>Electrical design</b>							
*Reduced heating output	–	–	○	○	○	○	○
*Increased heating output	–	–	–	○	○	○	○
*Switchbox mounted on left	–	–	○	○	○	○	○
*Switchbox cabinet mounted on wall	○	○	○	○	○	○	○
<b>Temperature controller</b>							
*Jumo dTron 04.1	●	●	●	●	●	●	●
*Jumo dTron 04.1 preliminary contact & time lag relay	○	○	○	○	○	○	○
*Jumo Dicon 501	○	○	○	○	○	○	○
*MINCON/32*	○	○	○	○	○	○	○
*SIMCON/32*-NET	○	○	○	○	○	○	○
*SIMPATI*	○	○	○	○	○	○	○
<b>Temperature safeguard</b>							
*Temperature limiter (TB)	●	●	●	●	●	●	●
*Temperature limit cut-out (TWB)	○	○	○	○	○	○	○
*TWB with alarm signal (standard with VTL)	○	○	○	○	○	○	○
*TWB with connection to central malfunction alarm	○	○	○	○	○	○	○
<b>Timers</b>							
*24 h daily program timer	○	○	○	○	○	○	○
*168 h weekly program timer	○	○	○	○	○	○	○
*168 h digital weekly program timer (only VTU)	○	○	○	○	○	○	○
<b>Temperature recording</b>							
*NiCr-Ni connection (1x) for external recorder	○	○	○	○	○	○	○
*NiCr-Ni connection (6x) for external recorder	○	○	○	○	○	○	○
*1 channel recorder (144 x 144 lines)	○	○	○	○	○	○	○
*6 channel dot matrix printer (144 x 144)	○	○	○	○	○	○	○
*Preparation for recorder (144 x 144)	○	○	○	○	○	○	○
<b>Door design</b>							
1 door window each leaf	○	○	○	○	○	○	○
Electrical lock (only VTU)	○	○	○	○	○	○	○
<b>Working chamber floor</b>							
*Working chamber floor with recessed rails	–	–	○	○	○	●	●
*Working chamber floor reinforced	–	–	○	○	○	○	○
*Working chamber floor with folding ramp	–	–	○	○	○	○	○
<b>Air supply/Exhaust air</b>							
*Fresh air filter category F5 attached	○	○	○	○	○	○	○
*HOSCH fresh air filter (category S)	○	○	○	○	○	○	○
*Circulating air filter category G4	○	○	○	○	○	○	○
<b>Exhaust air blower</b>							
*Exhaust air blower <sup>1)</sup>	○	○	○	○	○	○	○
*Exhaust air blower with electrically adjustable regulating flap (only VTU)	○	○	○	○	○	○	○

# ... and accessories for VTU and VTL

Accessories	60/60	60/90	75/100	100/150	125/200	150/200	200/200
<b>Miscellaneous modules</b>							
Elapsed-time meter	○	○	○	○	○	○	○
signal for malfunction alarm	○	○	○	○	○	○	○
signal for end of process	○	○	○	○	○	○	○
*shutter wall, adjustable, aluminised sheet steel	–	–	○	○	○	○	○
*shutter wall, adjustable, stainless steel 1.4301	–	–	○	○	○	○	○
<b>Inserts</b>							
Wire-mesh shelf, chrome-plated or stainless steel 1.4541	○	○	○	○	○	–	–
Shelf support, steel stainless 1.4301	○	○	○	○	○	–	–
Grate, steel (hot-dip galvanized) or stainless steel 1.4541	○	○	○	○	○	–	–
Charging tray, aluminised sheet steel, 25 mm rim height, 1/1 or 1/2 size	○	○	○	○	○	–	–
Charging tray stainless steel 1.4301 25 mm rim height, 1/1 size	○	○	○	○	○	–	–
<b>Charging trolley</b>							
aluminised sheet steel or stainless steel 1.4301 excl. shelves and support	–	–	○	○	○	○	○
<b>Accessories for charging trolley, coated sheet steel or stainless steel</b>							
Wire-mesh shelves	–	–	○	○	○	○	○
Grate (steel)	–	–	○	○	○	○	○
Support	–	–	○	○	○	○	○
Charging tray, 25 mm rim height, 1/1 or 1/2 size	–	–	○	○	○	○	○
Aluminised sheet steel with chrome-plated folding shelves	–	–	○	○	○	○	○
<b>Platform trolley</b>							
–	–	–	○	○	○	○	○
<b>Leadthrough</b>							
Tubular leadthrough 24 mm or 40 mm, position must be specified when placing order	○	○	○	○	○	○	○
<b>Door lock</b>							
○	○	○	○	○	○	○	○
<b>Fixing mechanism for anchoring in floor</b>							
○	○	○	○	○	○	○	○

- Basic equipment
- Optional
- \* only one choice available
- <sup>1)</sup> exhaust air blower standard with VTL

It's your choice...

Owing to their modular construction, these series of drying ovens offer a great variety of accessories to choose from. You can put together your oven suit your applications.

Have you thought of everything?

- For what application is the drying oven required?
- Is combustible solvent vapour released during the heating/drying process? In what quantities? (unit selection: VTL)
- Which model size is required (working chamber size W x H x D)
- Type of coating?
- How many shelves, grates, trays are required?
- Should a temperature/time program be run?
- How many programs are to be saved?
- Should temperatures be registered/documented?
- Are several units to be networked with a PC?
- Are tubular leadthroughs required for other measuring purposes?
- Should the process in the working chamber be visible?
- Should unauthorised opening of the door during the process be prevented?
- Is the standard fresh air/exhaust air volume sufficient?
- Should the fresh air be filtered?
- Is aggressive vapour released during the process?
- Should the unit have reached operating temperature at the start of the shift?



# Heating technology for each application...

## Standard and customised solutions

- Heating and drying ovens
- Vacuum, heating and drying ovens
- Clean air, heating and drying ovens
- Explosion-proof ovens
- Heating and 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, i.e. charging trolleys, transport trolleys and wire-mesh grates
- Heating options, such as electric heating, gas, infra red, microwave, warm water, steam, thermal oil
- Accessories and software for process documentation as stipulated in EN ISO 9001 in order to ensure controlling, monitoring and documenting as well as networking of up to 32 units.



Continuous Oven Type VTUD 125/40/200 with cooling zone

## Competence and dedication to the customer's needs...

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

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

**Vötsch**  
Industrietechnik

**Vötsch Industrietechnik GmbH**  
Umweltsimulation · Wärmetechnik

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