

## Safety vacuum drying oven for flammable solvents

A BINDER safety vacuum drying oven of the VDL series ensures maximum safety when drying organic solvents standard with TÜV/GS. The inner chamber of the VDL safety vacuum drying oven is designed according to ATEX guidelines for Zone II 3 G.



### Advantages:

- Maximum occupational safety with one-of-a-kind safety concept
- Fast, condensation-free drying processes
- Homogeneous specimen drying

### Areas of application:



Chemicals



Surface Technology



Pharmaceuticals  
Industry

Features	Customer benefits	Characteristics
APT.line™	<ul style="list-style-type: none"> <li>• Gentle drying throughout the chamber interior</li> <li>• Absolute temperature uniformity</li> <li>• Direct transfer of heat to the specimens</li> <li>• Reproducible drying results</li> </ul>	<b>APT.line™ preheating chamber technology</b> <ul style="list-style-type: none"> <li>• Thermal conducting plates for homogeneous temperature distribution</li> <li>• Condensation-free inner chamber</li> <li>• Patented, flexible positioning of the expansion racks with large contact surfaces</li> </ul>
Drying	<ul style="list-style-type: none"> <li>• Fast drying thanks to accelerated drying process</li> <li>• Light specimens (e.g. powder) are not swirled</li> </ul>	<b>BINDER Cross-Flow Principle</b> <ul style="list-style-type: none"> <li>• Even flow throughout the inner chamber from bottom to top</li> <li>• Finely adjustable valve without turbulence, individually controlled</li> </ul>
Safety concept	<ul style="list-style-type: none"> <li>• Maximum occupational safety with recognized safety concept</li> <li>• Protection for user and laboratory</li> <li>• Broad range of applications due to explosion-proof inner chamber according to ATEX II3G</li> <li>• Continuous drying saves time and costs</li> </ul>	<b>Tested security</b> <ul style="list-style-type: none"> <li>• Spring-mounted safety glass panel with shatter protection (FDA tested)</li> <li>• Standard interior flushing with inert gas</li> <li>• Electronic components are decoupled from the inner chamber</li> <li>• Flame protection gasket</li> <li>• Automatic heating activated &lt; 125 mbar</li> <li>• Over pressure capsuled instrument prevents gas penetration</li> <li>• ATEX-tested inner chamber</li> </ul>
Cleaning	<ul style="list-style-type: none"> <li>• Simple, time-saving cleaning</li> <li>• Durable materials</li> </ul>	<b>Smooth inner chamber with rounded corners</b> <ul style="list-style-type: none"> <li>• Fixtures are fully removable</li> <li>• Inner chamber made of highly corrosion resistant stainless steel V4A (1.4571)</li> </ul>
Complete system	<ul style="list-style-type: none"> <li>• Everything from one source</li> <li>• Optimal working height</li> <li>• 50% less noise</li> <li>• Pressure and temperature profiles are depicted simultaneously</li> </ul>	<b>Coordinated, modular system</b> <ul style="list-style-type: none"> <li>• Contains vacuum drying chamber, vacuum pumps, module and connection kit for various sizes</li> <li>• Application-specific vacuum pumps (standard membrane pump, speed-controlled or ATEX-protected membrane pump)</li> </ul>
Accessories and Services	<ul style="list-style-type: none"> <li>• Convenient documentation and validation</li> <li>• BINDER INDIVIDUAL for customer-specific solutions</li> <li>• Worldwide BINDER Service</li> </ul>	<b>Comprehensive product portfolio</b> <ul style="list-style-type: none"> <li>• Years of proven and recognized validation and documentation materials</li> <li>• Various options: Digital pressure indicator, object temperature indicator</li> <li>• Vacuum pump and chamber controllable using FDA-compliant software APT-COM™</li> <li>• Worldwide service network</li> </ul>

- Inner chamber is designed according to ATEX guidelines for Zone II 3G
- Electronically controlled APT.line™ preheating chamber with 2 expansion racks assuring temperature accuracy and reproducible results
- Temperature range from 15 °C above ambient temperature to 200 °C
- MP controller with 2 programs with 10 sections each or switchable to 1 program with 20 sections
- Integrated weekly program timer with real-time function
- Digital temperature setting with an accuracy of one degree
- Elapsed time indicator
- Spring-mounted safety glass panel with shatter protection
- Precision-adjustable ventilation valve
- Precision-adjustable inert gas valve with Cross-Flow-Technology
- Safety features:
  - Pressure control device for heating activated < 125 mbar
  - Over pressure capsuled instrument panel with compressed air connection and maintenance unit
  - Flame protection gasket
  - Analog pressure gauge (displays pressure difference between the inner chamber and ambient pressure)
  - Electro polished inner chamber, suction and ventilation tubes, pressure container, expansion racks, and ball valve are made of stainless steel
  - Door gasket made of tempered silicone
  - Independent adjustable temperature safety device class 2 (DIN 12880), with visual temperature alarm
  - Measuring port DN 16 in rear panel
  - RS 422 interface for use with optional GMP/GLP and FDA guideline 21 CFR Part 11 compliant APT-COM™ DataControlSystem software
- 2 patented, flexible aluminum expansion racks
- All electrical components are decoupled from the inner chamber
- Available as a complete system, with module and vacuum pump. Features:
  - Reduced sound level
  - Practical working height
  - Well balanced system
- BINDER test confirmation

**VDL 53**

▶ Exterior dimensions	
Width (mm)	635
Height (incl. feet) (mm)	775
Height with optional vacuum module (mm)	625
Total Height with optional vacuum module (mm)	1400
Depth (mm)	550
Plus door handle, connection (mm)	100
Wall clearance, rear (mm)	100
Wall clearance, side (mm)	135

▶ Interior dimensions	
Width (mm)	400
Height (mm)	400
Depth (mm)	340
Interior volume (l)	53
Expansion racks (aluminum) (number standard/max.)	2 / 5
Distance between the racks (mm)	62
Usable space per rack (width x depth) (mm)	349 x 320
Load per shelf (kg)	20
Permitted total load (kg)	45
Weight (empty) (kg)	95

▶ Temperature data	
Temperature range approx. 15 °C above ambient temperature to (°C)	200
Temperature variation 1)	
at 100 °C (± K)	2
at 200 °C (± K)	4,5
Temperature fluctuation (± K) 1)	0,1
Heating up time 1), 2)	
to 100 °C (min.)	80
to 200 °C (min.)	115

**VDL 53**

▶ Vacuum data	
Vacuum connection with small flange (DN mm)	16
Measuring access port with small flange (DN mm)	16
Inert gas connection with flow limiter thread (RP)	3 / 8
Air pressure connection for pressurized apparatus (tube clip Ø / mm)	8
Permitted end vacuum (mbar)	0,01
Leak rate (max. bar 1/h)	0,01
▶ Electrical data	
IP protection class acc. to EN 60529	IP 54
Voltage (± 10%) 50 / 60 Hz	230
Nominal power (kW)	1,2
Energy consumption	
at 100 °C (W)	150
at 200 °C (W)	445

- 1) Value with aluminum racks  
 2) To 98% of the set value

All technical data are specified for units with standard equipment at an ambient temperature of 25 °C and a line voltage fluctuation of ±10%. These average values have been determined according to the BINDER factory standard, respecting the recommended wall clearances of 10% of the height, width and depth of the inner chamber. Differing ambient temperatures and production-related device-specific variances can lead to varying technical data.

Therefore, we recommend individual customer-specific calibration or validation for applications on the limit of the permitted ambient temperature range.

**Measuring port**

Vacuum-tight access port into the device for measuring lines (9-pin).

**Specimen temperature display**

Uses PT 100 sensor and digital temperature display.

**Calibration certificate**

Measurement in center at predefined test value. Expandable with additional measuring points or test values based on your requirements.

**VDL 53**

ATEX connection kit VP 4, consists of: clamping rings, aluminum universal centering ring, transition piece adapter, anti-static vacuum hose, union nut, elbow	<input type="radio"/>
ATEX connection kit VP 5, consists of: clamping rings, aluminum, universal centering ring, outer centering ring, transition piece adapter, union nut, anti-static vacuum hose, elbow	<input type="radio"/>
Measuring port for vacuum-tight access port of measuring lines into the device (9-pin)	<input type="radio"/>
Temperature measurement of the specimen via flexible PT 100 sensor (EX-proof via measurement current access port) and digital temperature display	<input type="radio"/>
Factory calibration certificate, measurement in center of chamber at 100 °C or at specified testing temperature	<input type="radio"/>
Extension to factory calibration certificate. Each additional measurement at additional measuring point or testing temperature	<input type="radio"/>
VP 4 chemical membrane pump (nominal air flow 1.9 m <sup>3</sup> /hour, final pressure 12 mbar), with separator and emission condenser 230 V 1N ~ 50 Hz	<input type="radio"/>
Expansion racks, aluminum	<input type="radio"/>
Expansion racks, stainless steel	<input type="radio"/>
Exchange and calibration to stainless steel expansion racks, standard equipment aluminum expansion racks are replaced	<input type="radio"/>
Door gasket, FKM (Viton)	<input type="radio"/>
Vacuum module (empty) for installation of vacuum pumps	<input type="radio"/>
Vacuum module with membrane pump VP 4, mechanical and electrical membrane pump components EX-proof, ATEX approved (nominal air flow 1.9 m <sup>3</sup> / hour, final pressure 12 mbar), with separator and emission condenser, including all necessary vacuum connection parts	<input type="radio"/>