

## Material test chambers with individual programming

With a maximum temperature of 300 °C (572 °F) and comprehensive programming options, the material test chamber of the M series from BINDER is ideally suited for material and aging testing. The high-performance fan of these material test chambers ensures fast heating.



### Advantages:

- The specialist for demanding heating profiles
- Adjustable high air exchange rate
- "Made in Germany" quality

### Areas of application:



Buildings Materials Industry



Metal Industry / Engineering



Surface Technology

Features	Customer benefits	Characteristics
APT.line™ temperature technology	<ul style="list-style-type: none"> <li>• Identical test conditions throughout the chamber interior</li> <li>• Independent of specimen size and quantity</li> </ul>	<b>APT.line for maximum precision™</b> <ul style="list-style-type: none"> <li>• Uniform circulation even under full load</li> <li>• Homogeneous temperature conditions throughout test specimens</li> </ul>
Performance characteristics	<ul style="list-style-type: none"> <li>• Broad range of applications</li> <li>• Short warm up times</li> <li>• Suitable for numerous industry standards</li> </ul>	<ul style="list-style-type: none"> <li>• High air exchange rate</li> <li>• Adjustable fan speed</li> <li>• Large power reserves</li> <li>• Programmable ventilator flap</li> <li>• Temperature range up to 300 °C (572 °F)</li> </ul>
Inner chamber concept	<ul style="list-style-type: none"> <li>• Maximum occupational safety</li> <li>• Easy loading and unloading of specimen material</li> <li>• Easy cleaning</li> </ul>	<ul style="list-style-type: none"> <li>• Inner chamber made of stainless steel</li> <li>• Very tight door closure with 2-point door latch</li> <li>• Low heat dissipation due to 60 mm (2.36 inch) insulation</li> <li>• Rack with tilt protection</li> <li>• No permanent fixtures</li> </ul>
Controller	<ul style="list-style-type: none"> <li>• Convenient HMI (Human Machine Interface)</li> <li>• Convenient documentation</li> <li>• All measured values read at a glance</li> </ul>	<ul style="list-style-type: none"> <li>• MCS screen controller with color display and 25 storable programs</li> <li>• Integrated digital continuous-line recorder for monitoring limits and alarm function</li> </ul>
Quality	<ul style="list-style-type: none"> <li>• Reliable devices with long service lives</li> <li>• Short delivery times</li> <li>• Minimal maintenance and operating costs</li> </ul>	<ul style="list-style-type: none"> <li>• Premium quality made in Germany</li> <li>• Highly automated series production</li> <li>• High-quality materials, state-of-the-art production technology</li> <li>• High standard according to DIN 12880 (27-point measurement)</li> </ul>
Accessories and Services	<ul style="list-style-type: none"> <li>• Flexible solution in terms of size, type and equipment</li> <li>• Numerous options for special applications</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>• Size 53 to 720 liters (1.9 to 25.7 cu.ft.)</li> <li>• Additional product lines: Drying ovens, safety drying ovens, vacuum drying ovens, climate chambers</li> <li>• Voltage variants and certificates (UL)</li> <li>• Various options: Door with viewing window, access ports, reinforced design for heavy loads, Data Logger Kits</li> <li>• Worldwide service network</li> </ul>

- Electronically controlled APT.line™ preheating chamber assuring temperature accuracy and reproducible results
- Temperature range from 5 °C (9 °F) above ambient temperature to 300 °C (572 °F)
- MCS controller with 25 storable programs of 100 sections each for a maximum of 500 program segments
- User-friendly LCD screen
  - Easy-to-read menu guide
  - Integrated electronic chart recorder
  - Variety of options for the graphic display of process parameters
  - Real-time clock
- Adjustable ramp function via program editor
- Program-controlled ventilation flap
- High air-exchange rate through high-performance fan
- Adjustable fan speed
- Exhaust duct Ø 50 mm (2 inch)
- Temperature safety device class 2 (DIN 12880) with visual alarm
- Printer and communication interface RS 422 for use with optional GMP/GLP and FDA guideline 21 CFR Part 11 compliant APT-COM™ DataControlSystem software
- Units up to 115 l (4.1 cu.ft.) are stackable
- 2 chrome-plated racks included
- BINDER test confirmation

## M 400

▶ Exterior dimensions	
Width (mm/inch)	1235 / 48.6
Height (incl. feet) (mm/inch)	1185 / 46.7
Depth (mm/inch)	765 / 30.1
Plus door handle and connection (mm/inch)	150 / 5.9
Wall clearance, rear (mm/inch)	100 / 3.9
Wall clearance, side (mm/inch)	160 / 6.3
Exhaust duct (outer Ø mm/inch)	52 / 2.1
Steam space volume (l/cu.ft.)	498 / 17.6
Number of doors (ea.)	2

▶ Interior dimensions	
Width (mm/inch)	1000 / 39.4
Height (mm/inch)	800 / 31.5
Depth (mm/inch)	500 / 19.7
Interior volume (l/cu.ft.)	400 / 14.3
Racks (number standard/max.)	2 / 10
Load per rack (kg/lbs.)	35 / 77
Permitted total load (kg/lbs.)	90 / 199
Weight (empty) (kg/lbs.)	173 / 382

▶ Temperature data	
Temperature range approx. 5 °C (9 °F) above ambient temperature to (°C/°F)	300 / 572
Temperature variation	
at 70 °C (158 °F) (±K)	0.7
at 150 °C (302 °F) (±K)	1.5
at 300 °C (572 °F) (±K)	5
Temperature fluctuation (±K)	0.3
Warm-up time 1)	
to 70 °C (158 °F) (min.)	6
to 150 °C (302 °F) (min.)	18
to 250 °C (482 °F) (min.)	44
Recovery time after doors were open for 30 sec. 1)	
at 70 °C (158 °F) (min.)	1

# Specifications

at 150 °C (302 °F) (min.)	3
at 300 °C (572 °F) (min.)	5

## M 400

Ventilation data	
Ventilation	
at 70 °C (158 °F) (x/h)	51
at 150 °C (302 °F) (x/h)	54
at 300 °C (572 °F) (x/h)	48

Electrical data	
IP protection class acc. to EN 60529	IP 20
Voltage (± 10%) 50/60 Hz (V)	400 3N~
Nominal power (kW)	3.4
at 70 °C (158 °F) (W)	520
at 150 °C (302 °F) (W)	1200
at 300 °C (572 °F) (W)	2340

1) To 98% of the set value

All technical data are specified for units with standard equipment at an ambient temperature of 25 °C (77 °F) and a line voltage fluctuation of ±10%. The temperature data is determined in accordance to factory standard following DIN 12880, respecting the recommended wall clearances of 10% of the height, width and depth of the inner chamber. All data was determined at 100% of fan speed. All figures are typical average values for series devices. We reserve the right to alter technical specifications at any time.



### Access port

With silicone plugs for introducing external measuring instruments into the chamber. Access ports with 10, 30, 50 mm (0.39, 1.18, 1.97 inch) diameters.



### Reinforced interior boiler

Includes 2 reinforced shelves for high loads (max. total load 250 kg (551.2 lbs.)).



### Door lock

Prevents unauthorized access to the process sequences in the chamber.



### Calibration certificate & validation

BINDER can significantly reduce the workload in qualifying devices. Nobody knows our devices as well and has as much experience in certifications as we do.

**M 400**

Access ports with silicone plug, 10, 30, 50, 100 mm (0.39, 1.18, 1.97 inch)	<input type="radio"/>
Securing elements for additional fastening of racks (1 set of 4 pieces)	<input type="radio"/>
Anti-slip rubber pads for safe stacking (1 set of 4 pieces)	<input type="radio"/>
Keyboard lock	<input type="radio"/>
HEPA fresh-air filter, Class H 14 (according to EN 1822, min. 99.995% for 0.1-0.3 µm particles)	<input type="radio"/>
Measurement of air change rate according to ASTM D5374, with definition and protocol according to ambient temperature (measurement in factory)	<input type="radio"/>
Analog temperature output 4 - 20 mA with 6-pin DIN socket (output not adjustable)	<input type="radio"/>
Additional PT 100 temperature sensor, flexibly installed with external connection, includes LEMO connector (3-pin)	<input type="radio"/>
Additional measuring channel for digital display of specimen temperature with flexible PT 100 temperature sensor, measured data recorded via RS 422 interface	<input type="radio"/>
Temperature measurement acc. to DIN 12880 (27 measuring points) at 150 °C or at specified temperature with measuring protocol and certificate	<input type="radio"/>
Factory calibration certificate. Measurement in center of chamber at 150 °C (302 °F) or at specified testing temperature	<input type="radio"/>
Extension to factory calibration certificate. Each additional measurement at additional measuring point or temperature	<input type="radio"/>
Data Logger Kit T 350: For continuous temperature recording of 0 °C (32 °F) to 350 °C (662 °F). Kit includes 1 data logger, PT 100 sensor with 2 m (6.5 ft.) Teflon extension cable and 1 fixture for mounting to the BINDER unit	<input type="radio"/>
Data Logger converter cable RS 232 to USB 2.0	<input type="radio"/>
Data Logger Software: Configuration and evaluation software for all BINDER Data Logger Kits, incl. data cable	<input type="radio"/>
Rack, chrome-plated	<input type="radio"/>
Rack, stainless steel	<input type="radio"/>
Reinforced rack, stainless steel, with 1 set of fasteners (4 pieces), max. load 70 kg (154.3 lbs.)	<input type="radio"/>
Shelf, perforated, stainless steel	<input type="radio"/>
Locking door handle with key	<input type="radio"/>
Door gasket, FKM (Viton)	<input type="radio"/>
2 doors each with window 470 x 290 mm (18.5 x 11.4 inch) and interior lighting (30 W)	<input type="radio"/>
Reinforced inner chamber, including 2 reinforced racks (maximum total load 250 kg (551.2 lbs.), max. load per rack 70 kg (154.3 lbs.))	<input type="radio"/>