

## Material test chamber with individual programming

With a maximum temperature of 300 °C and comprehensive programming options, the M series from BINDER is ideally suited for material and aging testing. The high-performance fan 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</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 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</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 above ambient temperature to 300 °C
- 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
- 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 liters are stackable
- 2 chrome-plated racks included
- BINDER test confirmation

## M 400

▶ Exterior dimensions	
Width (mm)	1235
Height (incl. feet) (mm)	1185
Depth (mm)	765
Plus door handle and connection (mm)	150
Wall clearance, rear (mm)	100
Wall clearance, side (mm)	160
Exhaust duct (outer Ø mm)	52
Steam space volume (l)	498
Number of doors (ea.)	2

▶ Interior dimensions	
Width (mm)	1000
Height (mm)	800
Depth (mm)	500
Interior volume (l)	400
Racks (number standard/max.)	2 / 10
Load per rack (kg)	35
Permitted total load (kg)	90
Weight (empty) (kg)	173

▶ Temperature data	
Temperature range approx. 5 °C above ambient temperature to (°C)	300
Temperature variation	
at 70 °C (± K)	0,7
at 150 °C (± K)	1,5
at 300 °C (± K)	5
Temperature fluctuation (± K)	0,3
Warm-up time 1)	
to 70 °C (min.)	6
to 150 °C (min.)	18
to 250 °C (min.)	44
Recovery time after doors were open for 30 sec. 1)	
at 70 °C (min.)	1

at 150 °C (min.)	3
at 300 °C (min.)	5

**M 400**

▶	Ventilation data	
	Ventilation	
	at 70 °C (x/h)	51
	at 150 °C (x/h)	54
	at 300 °C (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 (W)	520
	at 150 °C (W)	1200
	at 300 °C (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 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 diameters.

**Reinforced interior boiler**

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

**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	<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 to 350 °C. Kit includes 1 data logger, PT 100 sensor with 2 m 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	<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 and interior lighting (30 W)	<input type="radio"/>
Reinforced inner chamber, including 2 reinforced racks (maximum total load 250 kg, max. load per rack 70 kg)	<input type="radio"/>