

Multiple Talents

Eppendorf Temperature Control and Mixing Instruments



»Eppendorf temperature control and mixing instruments can do more than you think.«

Eppendorf offers a wide range of high-quality, durable and dependable temperature control and mixing instruments to cover all requirements. 50 years of experience in the field of mixing and temperature control, and continuous development, have made their mark in this new generation of products.

Excellent mixing results

- > Unique ^{2D}Mix-Control technology mixes liquids in a controlled, circular movement for fast and efficient mixing in tubes and plates
- > Anti-spill technology reliably prevents lid wetting and cross-contamination
- > More information: page 11



Time-lapse photography of controlled mixing with the MixMate® shows a well filled with colored water in an Eppendorf twin.tec® PCR Plate 96, while mixing at a speed of 1,650 rpm.

Outstanding temperature management

- > Unique Eppendorf ThermoTop® prevents condensation for improved assay performance
- > Individually sensor-controlled Eppendorf SmartBlocks™ provide maximum temperature accuracy and block homogeneity
- > Dry incubation technology reduces contamination risk and increases lab hygiene
- > More information: page 8/9



Ergonomics and simplicity

- > Eppendorf QuickRelease™ technology for quick exchange of SmartBlocks
- > Low noise level for stress-free work
- > Easy to operate using predefined program keys or temperature keys



Eppendorf ThermoMixer™ C — heating/cooling/mixing

The Eppendorf ThermoMixer C combines unique mixing performance with excellent temperature control to consistently guarantee complete, dependable and reproducible test results. Improve your assay results by mixing and incubating samples at the same time.

Features/advantages

- > Excellent mixing performance due to unique ^{2D}Mix-Control technology
- > Prevent condensation and improve temperature homogeneity with the new ThermoTop
- > Ergonomic design and optimized features according to the Eppendorf PhysioCare Concept®*

Application examples

- > Plasmid/RNA/DNA purification
- > cDNA synthesis
- > Enzymatic reactions (e.g., DNA restriction digestion, Proteinase K digestion, ligation)
- > Denaturation of DNA, RNA and proteins
- > Bacterial growth
- > Lysis reactions at 100 °C

* www.eppendorf.com/physiocare



A wide variety of Eppendorf SmartBlocks are available for the Eppendorf ThermoMixer C. This new generation of exchangeable thermoblocks offers the utmost flexibility for use of all common vessel and plate formats.



Menu

- > Simple and intuitive operation
- > Save up to 20 user defined programs
- > Set heating and cooling rates, select desired time mode
- > Change device settings: key lock, signal tones, contrast, service interval and menu language

Program keys

- > Fast and simple access to the most frequently used mixing/temperature parameters
- > Freely programmable (only the ThermoMixer C)

Eppendorf QuickRelease

- > Ergonomic and simple exchange of SmartBlocks

High stability and low footprint

- > Very stable—remains stationary even at maximum mixing speed

Digital Display

- > Clearly arranged display for easy reading and precise parameter selection



Eppendorf SmartBlocks™

Flexibility has never been this easy. Eppendorf offers a wide variety of exchangeable SmartBlocks for tubes from 5 µL to 50 mL, as well as plates (MTP, DWP and PCR plates 96/384) to use with Eppendorf ThermoMixer C and ThermoStat C.

All Smartblocks are equipped with the unique Eppendorf QuickRelease system that makes the block exchange super fast and easy. Just press the lever on the front of the block and the block is exchanged in just seconds—no tools needed.

Features/advantages

- > Fast and simple block exchange due to Eppendorf QuickRelease
- > Optimized block design guarantees maximum temperature transfer to the sample
- > Individually sensor-controlled Eppendorf SmartBlocks™ allow for block-specific calibration to provide maximum temperature accuracy and homogeneity.
- > Insulated thermoblocks for ergonomic operation—you won't burn your fingers

SmartBlock for	Type of borehole			Limits		Can be used with	
	Ø L × W (in mm)	Depth (mm)	Bottom shape	Max. temp.	Max. rpm	Lid	ThermoTop
Reaction vessels							
0.5 mL (24x)	8.2	26.4	Conical	100 °C	2,000	■	■
1.5 mL (24x)	11.0	34.7	Conical	100 °C	2,000	■	■
2.0 mL (24x)	11.0	34.6	Round	100 °C	2,000	■	■
5.0 mL (8x)	17.0	53.0	Conical	100 °C	1,000		
15 mL (8x)	17.4	106.0	Conical	100 °C	1,000		
50 mL (4x)	29.8	102.0	Conical	100 °C	1,000		
12 mm HPLC, FACS (24x)	12.1	34.5	Conical	110 °C*	2,000		
Cryo tubes (24x)	12.7	31.7	Flat	110 °C*	2,000		
Plates							
MTP and DWP	130 × 88	–	Flat	100 °C	3,000**	■***	■
PCR 96 (0,2 mL PCR tubes and plates)	6.4	14.0	Conical	100 °C	2,000	■	■
PCR 384	3.8	8.0	Conical	100 °C	3,000	■***	■

* Only available with the ThermoStat C

** For DWP, the maximum mixing frequency is 2,000 rpm (level sensor)

*** maximum mixing frequency when using the lid is 2,000 rpm

SmartBlocks compatible with the ThermoTop feature the *condens.protect*® symbol



Eppendorf Consumables



Eppendorf Tubes® and Plates offer unique features, making your daily routine faster and easier. Intelligent product design,

Features of Eppendorf Tubes

- > Available in 0.5 mL, 1.5 mL, 2.0 mL and now also 5.0 mL
- > Maximum sample recovery
- > Precise lid sealing for lowest evaporation rates
- > Hinge Safe-Lock lid does not open during incubation

Available in the following formats:

- > Eppendorf Safe-Lock Tubes
- > DNA LoBind Tubes
- > Protein LoBind Tubes
- > Eppendorf Flex-Tube®



coupled with the highest manufacturing standards, guarantee the highest product quality for reliable results.

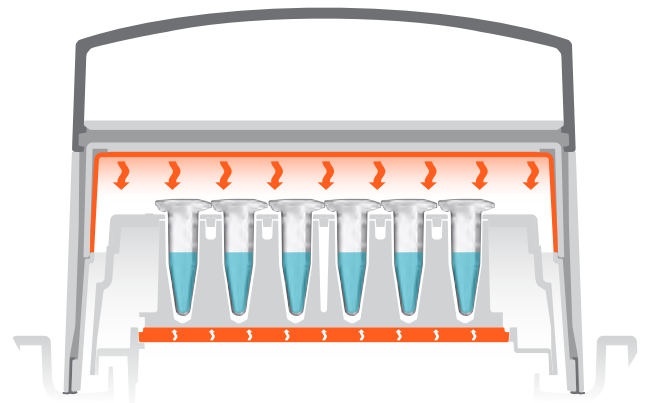
Features of Eppendorf Plates®

- > Optimized well geometry for maximum sample recovery
- > Minimal residual volumes
- > OptiTrack® labeling for easy well identification
- > Maximum well-to-well reproducibility

Available in the following formats:

- > Deepwell plates 96 and 384
- > Microplates 96 and 384 (polypropylene)
- > Eppendorf twin.tec® PCR plates 96 and 384
- > Eppendorf twin.tec® real-time PCR plates

> Additional information and catalog numbers available at: www.eppendorfna.com/tubes and www.eppendorfna.com/plates



When the ThermoTop is placed on the device, it begins heating immediately. The temperature optimally adapts to the test temperature to ensure that it does not negatively affect the sample. Condensation droplets have no opportunity to form.

Eppendorf ThermoTop®

The new ThermoTop, with unique *condens.protect* technology, reliably prevents the formation of condensate on the tube lid and tube wall. Operation is simple, intuitive and does not require an additional cable connection. When the ThermoTop is placed on the device, it begins heating immediately. The temperature optimally adapts to the test temperature to ensure that it does not negatively affect the sample: optimal sample protection with optimal reaction conditions produce optimal results.

The Eppendorf ThermoTop is compatible with the ThermoMixer C, ThermoStat C, ThermoMixer F1.5 and ThermoMixer FP. Combined with the ThermoMixer C and ThermoStat C, the ThermoTop can be used with thermoblocks for plates and lab vessels with a volume up to 2 mL. Compatible thermoblocks feature the *condens.protect* symbol.

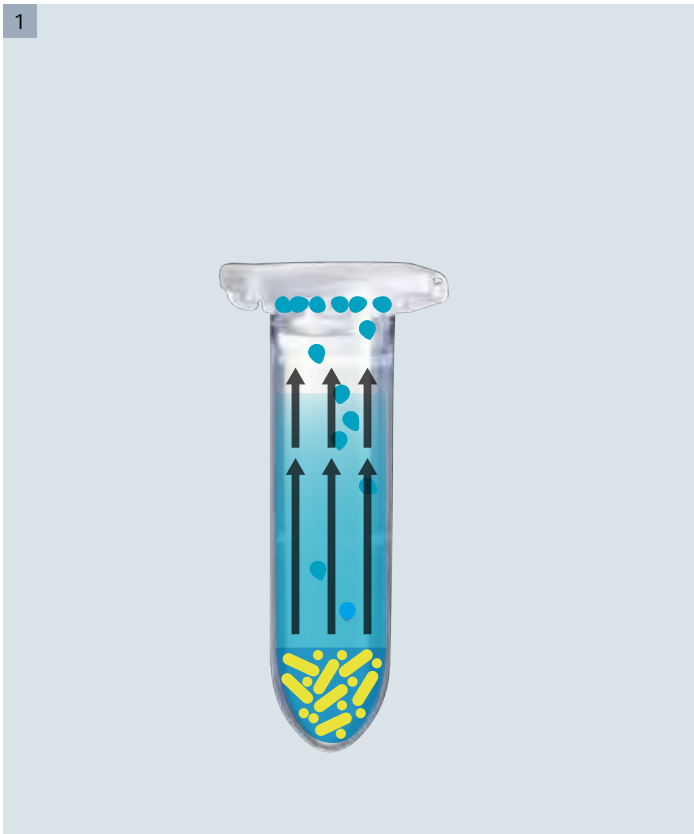
Features/advantages

- > Efficient and reliable condensation prevention on tube lid and wall
- > Guarantees constant reaction conditions for optimal enzymatic performance
- > Improves handling times, tubes don't have to be spun down at the end of the incubation
- > Simple, wireless handling with automatic recognition and operation
- > ThermoTop improves temperature homogeneity of the thermoblocks



condens.protect®

Superior temperature management



Advantages of condensation prevention during incubation

1 Evaporation of H₂O and condensation on the tube lid changes the buffer concentration in the reaction. Enzymatic reactions can no longer run under optimal conditions.

2 Use of the ThermoTop effectively prevents the formation of condensate, thus guaranteeing optimal reaction conditions. Vessels also no longer need to be spun down at the end of incubation to save you handling time.

How the condensation prevention works:

To reliably prevent condensation, the device first heats the ThermoTop up to the target temperature and then the SmartBlock.

When using the ThermoTop, the heating-up time of the block is automatically extended by several minutes depending on the target temperature and the SmartBlock used.

After insertion of the samples in a preheated SmartBlock, the actual temperature displayed may decrease slightly for a short time.

> Further information on the applications is available at:
www.eppendorfn.com/thermomixer-applications



Eppendorf ThermoStat™ C—heating/cooling

The ideal device to accurately set and maintain temperatures. The ThermoStat C features excellent temperature management. Peltier technology provides the comfortable and precise temperature control of all conventional lab vessels. The operation is easier and more intuitive than ever before. Predefined temperature keys provide quick access to five important experimental temperatures. Due to comprehensive program functions, you can also individually store 15 programs. With an extensive range of exchangeable SmartBlocks, the ThermoStat C adapts to any application.

Features/advantages

- > Excellent temperature accuracy
- > Precise temperature control from $-10\text{ }^{\circ}\text{C}$ to $110\text{ }^{\circ}\text{C}$ *
- > Prevent condensation and improve temperature homogeneity with the new ThermoTop
- > Comprehensive range of program functions

Application examples

- > Cooling buffers and samples at low temperatures
- > Preheating media
- > Biochemical reactions at low temperatures
- > Denaturation of DNA, RNA and proteins
- > cDNA synthesis
- > Immunoprecipitation

* $110\text{ }^{\circ}\text{C}$ can be set when using 12 mm and cryo SmartBlocks

- > www.eppendorfna.com/thermostat-c
- > The Isotherm-System® and PCR Cooler are available for easy sample cooling and processing. More information and catalog numbers available at: www.eppendorfna.com/isotherm



Eppendorf ThermoMixer™ F1.5 and FP—heating/mixing

To simplify your lab routines. Whether you regularly work with 1.5 mL reaction vessels or plates (MTP and DWP)—our optimized systems offer you the perfect solution for your applications.

ThermoMixer F1.5 features/advantages

- > Customized for 1.5 mL reaction vessels
- > Efficient mixing up to 1,500 rpm thanks to ^{2D}Mix-Control and anti-spill technology
- > Simple and intuitive operation using predefined temperature keys (37 °C, 42 °C, 56 °C and 95 °C)
- > Improved temperature homogeneity with the new ThermoTop

Application examples

- > Bacterial growth
- > Enzyme reactions
- > Denaturation of DNA, RNA and proteins
- > Lysis reactions at 100 °C
- > Labeling of nucleic acids and proteins
- > Proteinase K digestion of cells and tissues

From 4 °C above RT to 100 °C, there are no limits to the application possibilities.

ThermoMixer FP features/advantages

- > Customized for plates
- > Efficient mixing up to 2,000 rpm thanks to ^{2D}Mix-Control and anti-spill technology
- > Simple and intuitive operation using predefined temperature keys (37 °C, 42 °C, 56 °C and 95 °C)
- > Improved temperature homogeneity with the new ThermoTop

Application examples

- > Enzyme reactions
- > Bacterial growth
- > Resuspending of pellets
- > Lysis reactions at 100 °C
- > Mixing of protein quantification assays
- > ELISA assay



The MixMate comes standard with tube holders for 0.5 mL, 1.5/2 mL, and 0.2ml/96-well semiskirted PCR plates for maximum flexibility with all common lab vessels.

MixMate® — mixing

Mix your samples in seconds, fully and reliably. Whether in plates (96 or 384-wells) or reaction tubes, your samples will be optimally processed in each and every vessel. With the additional ergonomic vortexing function, the MixMate will become your perfect lab assistant.

Features/advantages

- > Excellent mixing results
- > ^{2D}Mix-Control for controlled mixing and reproducible results in seconds
- > Anti-spill technology prevents lid wetting and cross-contamination

Application examples

- > Resuspending of pellets
- > Mixing restriction digestions, PCR setups and colorimetric assays
- > Mixing viscous liquids and suspensions (including beads)
- > Immunoassays
- > Vortexing various vessel formats

Excellent mixing results

Comparing the mixing performance in 96 and 384-well plates

The unique ^{2D}Mix-Control technology mixes liquids in a controlled, circular movement. To compare the Eppendorf MixMate and ThermoMixer C's mixing capacity with competitor devices, various samples were mixed in 96-well and 384-well plates.



The mixing time and mixing efficiency were recorded and listed in the chart below. Both the MixMate and ThermoMixer C provide quick and efficient mixing while guaranteeing optimal reproducibility of results.

96-well plates	MixMate®	Eppendorf ThermoMixer C	Competitor A	Competitor C	Competitor D	Competitor F
Restriction digestion (without detergent)	■ 30 s (2,100 rpm)	■ 1 min (2,000 rpm)	■ not mixed	■ not mixed	■ 3 min	■ not mixed
Restriction digestion (with detergent)	■ 15 s (1,800 rpm)	■ 30 s (1,800 rpm)	■ 1 min	■ not mixed	■ 45 s	■ not mixed
Mixing of genomic-DNA	■ 30 s (2,000 rpm)	■ 30 s (2,000 rpm)	■ 5 min	■ not mixed	■ 3 min	■ not mixed
Mixing of buffers with high salt concentration	■ 5 s (1,400 rpm)	■ 5 s (1,400 rpm)	■ not mixed	■ not mixed	■ 1 min	■ not mixed
Mixing of DMSO-containing solutions	■ 5 s (1,100 rpm)	■ 5 s (1,100 rpm)	■ 3 min	■ not mixed	■ 15 s	■ 30 s
Resuspension of bacteria pellets	■ 30 s (2,000 rpm)	■ 30 s (2,000 rpm)	■ not mixed	■ not mixed	■ 3 min	■ not mixed
384-well plates	MixMate®	Eppendorf ThermoMixer C	Competitor A	Competitor C	Competitor D	Competitor F
Restriction digestion (without detergent)	■ 30 s (3,000 rpm)	■ 30 s (3,000 rpm)	■ not mixed	■ not mixed	■ not mixed	■ not mixed
Restriction digestion (with detergent)	■ 45 s (2,800 rpm)	■ 30 s (2,800 rpm)	■ not mixed	■ not mixed	■ 5 min	■ not mixed
Mixing of genomic-DNA	■ 45 s (3,000 rpm)	■ 1 min (3,000 rpm)	■ not mixed	■ not mixed	■ 5 min	■ not mixed
Mixing of buffers with high salt concentration	■ 1 min (2,000 rpm)	■ 30 s (2,000 rpm)	■ not mixed	■ not mixed	■ not mixed	■ not mixed
Mixing of DMSO-containing solutions	■ 5 s (2,200 rpm)	■ 5 s (2,000 rpm)	■ not mixed	■ not mixed	■ 3 min	■ not mixed
Resuspension of bacteria pellets	■ 3 min (2,000 rpm)	■ 2 min (2,000 rpm)	■ not mixed	■ not mixed	■ 5 min	■ not mixed

■ efficient mixing in less than 1 min
 ■ mixed within 1 min–5 min
 ■ not completely mixed within 5 min

> Detailed information on the results can be found in Application Note 130,
www.eppendorfna.com/thermomixer-applications

> Competitors A and C are microplate shakers; competitors D and F are vortexers with microplate adapters

Feature	ThermoMixer C	ThermoStat C
		
Basic application	Heating/cooling/mixing	Heating/cooling
Temperature control range	min: 15 °C ¹⁾ below RT, max: 100 °C	min: 30 °C ¹⁾ below RT, max: 110 °C
Lowest and highest settings	1 °C/100 °C	-10 °C/110 °C (110 °C can be set when using 12 mm and cryo)
Maximum temperature accuracy	± 0.5 °C at 20–45 °C	± 0.5 °C at 20–45 °C
Temperature homogeneity	Max. ± 0.5 °C at 20–45 °C (across all positions on all SmartBlocks)	Max. ± 0.5 °C at 20–45 °C (across all positions on all SmartBlocks)
Maximum heating rate	6 °C/min	5.5 °C/min
Maximum cooling rate	2.5 °C/min between 100 °C and RT	5 °C/min between 110 °C and RT
Mixing frequency	300–3,000 rpm (depends on SmartBlock used)	/
Mixing stroke in Ø	3 mm	/
Timer	15 sec to 99:30h, continuous	15 sec to 99:30h, continuous
Accessories	> Exchangeable SmartBlocks (automatic block recognition) > ThermoTop with <i>condens.protect</i> [®] technology	> Exchangeable SmartBlocks (automatic block recognition) > ThermoTop with <i>condens.protect</i> [®] technology
Programs	> 20 program slots available > 5 program keys (pre-defined, rewritable) > Programmable: up to 4 program levels	> 15 program slots available > 5 temperature keys (pre-defined at 4 °C, 16 °C, 37 °C, 56 °C and 95 °C) > Programmable: up to 4 program levels
Additional functions	> ^{2D} Mix-Control > Anti-spill technology > Short Mix > Interval Mix > Time/temp mode > Pause function > USB interface*	> Pause function > USB interface* > Time/temp mode
Mains/power connection	100 V–130 V ±10 %, 50 Hz–60 Hz 220 V–240 V ±10 %, 50 Hz–60 Hz	100 V–130 V ±10 %, 50 Hz–60 Hz 220 V–240 V ±10 %, 50 Hz–60 Hz
Output	200 W (max.)	200 W (max.)
Dimensions (W × D × H)	20.6 × 30.4 × 13.1 cm / 8.1 × 12.0 × 5.2 in	20.6 × 30.4 × 13.1 cm / 8.1 × 12.0 × 5.2 in
Weight	6.2 kg / 13.7 lb	4.3 kg / 9.5 lb

* Only for Eppendorf Service

¹⁾ ± 2 °C

ThermoMixer F1.5



ThermoMixer FP



MixMate®



Heating/mixing

min: 4 °C above RT, max: 100 °C

1 °C/100 °C

± 0.5 °C at 20–45 °C

Max. ± 0.5 °C at 20–45 °C
(all SmartBlock positions)

11 °C/min

/

300–1,500 rpm

3 mm

/

> ThermoTop with
condens.protect® technology> 5 temperature keys (pre-defined at 37 °C,
42 °C, 56 °C, 95 °C and temp off)> ^{2D}Mix-Control

> Anti-spill technology

> USB interface*

> Short Mix

100 V–130 V ±10 %, 50 Hz–60 Hz

220 V–240 V ±10 %, 50 Hz–60 Hz

200 W (max.)

20.6 × 30.4 × 13.1 cm / 8.1 × 12.0 × 5.2 in

6.0 kg / 13.2 lb

Heating/mixing

min: 4 °C above RT, max: 100 °C

1 °C/100 °C

± 1 °C at 20–45 °C

Max. ± 0.5 °C at 20–45 °C
(all SmartBlock positions)

18 °C/min

/

300–2,000 rpm

3 mm

/

> ThermoTop with
condens.protect® technology> 5 temperature keys (pre-defined at 37 °C,
42 °C, 56 °C, 95 °C and temp off)> ^{2D}Mix-Control

> Anti-spill technology

> USB interface*

> Short Mix

100 V–130 V ±10 %, 50 Hz–60 Hz

220 V–240 V ±10 %, 50 Hz–60 Hz

200 W (max.)

20.6 × 30.4 × 13.1 cm / 8.1 × 12.0 × 5.2 in

5.8 kg / 12.8 lb

Mixing

/

/

/

/

/

/

300–3,000 rpm
3,500 rpm (vortexing)

3 mm

15 sec to 99:30 h, continuous

> 3 tube holders (0.5 mL, 1.5/2 mL, PCR96)

> 5 softkeys (pre-defined, most common
mixing parameters)> ^{2D}Mix-Control

> Anti-spill technology

> Touch vortexing

100 V–130 V ±10 %, 50 Hz–60 Hz

220 V–240 V ±10 %, 50 Hz–60 Hz

40 W (max.)

13 cm / 6.7 × 9.1 × 5.1 in

4.2 kg / 9.25 lb

Ordering information

Description	Catalog No.
Eppendorf ThermoMixer™ C, basic device without Eppendorf SmartBlock™, 100 V–130 V	5382000023
Eppendorf ThermoMixer™ F1.5, with Eppendorf SmartBlock™ for 24 reaction vessels 1.5 mL, 100 V–130 V	5384000020
Eppendorf ThermoMixer™ FP, with Eppendorf SmartBlock™ for microplates and deepwell plates, including lid, 100 V–130 V	5385000024
MixMate®, incl. 3 tube holders: PCR 96, 0.5 mL, 1.5/2.0 mL, 100 V–130 V	022674200
ThermoStat C, basic device without Eppendorf SmartBlock™, 100 V–130 V	5383000027
Eppendorf ThermoTop®, with <i>condens.protect</i> ® technology	5308000003
Lid, for Eppendorf ThermoMixer™ F1.5 and FP, for Eppendorf SmartBlocks™ 0.5–2.0 mL, plates, PCR 96 and 384	5363000233
Eppendorf SmartBlock™ 0.5 mL, thermoblock for 24 × 0.5 mL tubes	5361000031
Eppendorf SmartBlock™ 1.5 mL, thermoblock for 24 × 1.5 mL tubes	5360000038
Eppendorf SmartBlock™ 2.0 mL, thermoblock for 24 × 2.0 mL tubes	5362000035
Eppendorf SmartBlock™ 5.0 mL, thermoblock for 8 × Eppendorf Tubes® 5.0mL	5309000007
Eppendorf SmartBlock™ 15 mL, thermoblock for 8 × 15 mL conical tubes	5366000021
Eppendorf SmartBlock™ 50 mL, thermoblock for 4 × 50 mL conical tubes	5365000028
Eppendorf SmartBlock™ 12 mm, thermoblock for 24 reaction tubes, diameter up to 12 mm	5364000024
Eppendorf SmartBlock™ cryo, thermoblock for 24 cryo tubes, 1.5–2.0 mL, all base shapes	5367000025
Eppendorf SmartBlock™ plates, thermoblock for microplates and deepwell plates, incl. lid	5363000039
Eppendorf SmartBlock™ PCR 96, thermoblock for PCR plates 96, including lid	5306000006
Eppendorf SmartBlock™ PCR 384, thermoblock for PCR plates 384, including lid	5307000000

In addition to the ThermoMixer and ThermoStat, Eppendorf offers a comprehensive line of New Brunswick high-performance shakers for orbital shaking and growing bacteria, yeast cultures and mammalian cells.



Open-air shakers
For shaking in ambient conditions on the bench, in an incubator or in a warm or cold room



Water bath shakers
Automated water bath shaker is ideal for culturing a wide range of cell types up to 80°C



Incubated shakers
Benchtop incubated or with added refrigeration create a stable cell growth environment



Incubated shakers
Large capacity shakers provide space-saving design with stacking capabilities



Shakers—CO₂ control
Advanced CO₂ incubator with built-in shaker for non-adherent cell culture applications

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