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Table of contents

1.4 Abbreviations used

ANSI
American National Standards Institute

DNA
Deoxyribonucleic acid (DNA)

DWP
Deepwell plate

MTP
Microplate

PCR
Polymerase Chain Reaction

RNA
Ribonucleic acid

rpm
Revolutions per minute

SLAS
Society for Laboratory Automation and Screening

1.5 Glossary

Deepwell plate Plate with 48, 96 or 384 wells with a larger volume than

2 Safety

2.1 Intended use

The Eppendorf MixMate is used to hold vessels and plates to mix samples. The Eppendorf MixMate is exclusively intended for indoor use.

All country-specific safety requirements for operating electrical equipment in laboratories must be observed.

Only use Eppendorf accessories or accessories recommended by Eppendorf.

The Eppendorf MixMate may only be operated by adequately trained and skilled personnel. The product can be used for training, routine and research laboratories in the areas of life sciences, industry or chemistry. This product is intended to be used for research purposes only. Eppendorf does not provide warranty for other applications. The product is not suitable for use in diagnostic or therapeutic applications.

2.2 User profile

The device and accessories may only be operated by trained and skilled personnel.

Before using the device, read the operating manual carefully and familiarize yourself with the device's mode of operation.

2.3 Information on product liability

In the following cases, the designated protection of the device may be affected. Liability for any resulting damage or personal injury is then transferred to the owner:

2.4 Warnings for intended use

Read the operating instructions and observe the following general safety information before using the MixMate.

WARNING! Electric shock due to damage to the device or mains/power cord.

- Only switch on the device if the device and mains/power cord are undamaged.
- Only operate devices which have been installed or repaired properly.
- In case of danger, disconnect the device from the mains/power supply voltage. Disconnect the mains/power plug from the device or the earth/ grounded socket. Use the isolating device intended for this purpose (e.g. the emergency switch in the laboratory).

WARNING! Lethal voltages inside the device.

WARNING! Injury from sample material being thrown out.
Sample material can be thrown out of open, improperly sealed or unstable tubes and plates.

- Only mix in closed tubes and closed plates.
- Observe the nationally prescribed safety environment when working with hazardous, toxic and pathogenic samples. Pay particular attention to personal protective equipment (gloves, clothing, goggles, etc.), extraction, and the biosafety level of the lab.

WARNING! Injury from improper vortex action.
Improper vortex action can destroy tubes or cause their content to be lost.

- Only vortex intact and sealed tubes.
- Never vortex tubes made of glass or other fragile material.

WARNING! Danger due to incorrect voltage supply.

- Only connect the device to voltage sources which correspond with the electrical requirements on the name plate.
- Only use earth/grounded sockets with a protective earth (PE) conductor.
- Only use the mains/power cord supplied.

NOTICE! Damage to the display due to mechanical pressure.

- Do not apply any mechanical pressure to the display.

NOTICE! Damage due to strong vibrations.
When mixing at high speeds, items located near the device may be moved by the vibrations of the work surface and, e.g., fall off the work table.

- Do not place easily movable items near the device or secure them adequately.

NOTICE! Damage to electronic components from spilled liquids.

- Make sure that the vortex mat and the cover caps are fitted properly. If the vortex mat is not fitted properly, contact your Eppendorf partner or the

NOTICE! Damage to electronic components due to condensation.
Condensate may form in the device when it has been transported from a cool environment to a warmer environment.

- After installing the device, wait for at least 3 h. Only then connect the device to the mains/power line.

NOTICE! Damage from the use of aggressive chemicals.

- Do not use any aggressive chemicals on the device or its accessories, such as strong and weak bases, strong acids, acetone, formaldehyde, halogenated hydrocarbons or phenol.
- If the device has been contaminated by aggressive chemicals, clean it immediately using a mild cleaning agent.

3 Product description

3.1 Product overview

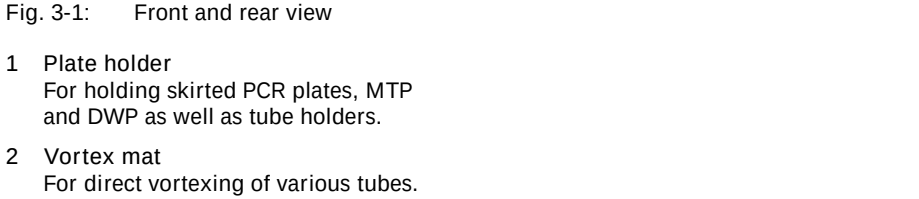

Fig. 3-1: Front and rear view

1 Plate holder
For holding skirted PCR plates, MTP and DWP as well as tube holders.

2 Vortex mat
For direct vortexing of various tubes.

Fig. 3-2: Tube holders for the MixMate

1 PCR 96 tube holder
For a PCR plate (96-well, semi-skirted or unskirted) or 96 micro test tubes (0.2 mL).

2 0.5 mL tube holder
For 24 micro test tubes (0.5 mL).

3 1.5/2.0 mL tube holder
For 24 micro test tubes (1.5 and 2.0 mL).

4 5/15 mL tube holder
For 8 micro test tubes (5 mL) or conical

3.2 Delivery package

3.3 Features

The MixMate allows aqueous solutions and suspensions to be mixed and vortexed effectively in a wide range of micro test tubes or plates. The MixMate supports the following tube formats at a maximum mixing frequency of up to 3000 rpm:

- 0.2 mL PCR tubes up to 25 mL micro test tubes
- MTP, DWP and PCR plates up to 384 wells
- Conical tubes with 5 mL, 15 mL, 25 mL, 50 mL

The program keys facilitate rapid access to selected mixing parameters.

Potential applications include:

- Controlled mixing of PCR, restriction or other enzyme reactions.
- Controlled incubation of absorption, blocking or reaction batches.
- Resuspension of DNA, RNA, protein or cell pellets in tubes and plates.
- Vortexing in micro test tubes and in 15 mL and 50 mL screw-top tubes.

4 Installation

4.1 Preparing installation

Keep the transport carton and the packing material for subsequent safe transport or storage.

- Check the completeness of the delivery using the information on the delivery package.
- Check all parts for any transport damage.

4.2 Selecting the location

Select the device location according to the following criteria:

- Mains/power connection in accordance with the name plate
- Minimum distance to other devices and walls: 10 cm
- Resonance free table with horizontal even work surface
- The design of table is suitable for operating the device.
- Surrounding area must be well ventilated.
- The location must be protected against direct sunlight.

The mains/power switch and the disconnecting device of the mains/power line must be easily accessible during operation (e.g. a residual current circuit breaker).

4.3 Installing the instrument

1. Place the MixMate on a suitable work surface, so that the ventilation gaps on the bottom of the device are not blocked.
2. Connect the device to the mains/power line via the mains/power cord socket using the supplied mains/power cord.
3. Switch on the device, using the mains/power switch.
4. Carry out a test run at maximum speed (3000 rpm) to ensure that the grip between the device and the surface is sufficient.
   The MixMate must not move from its position.

5 Operation
5.1 Operating controls

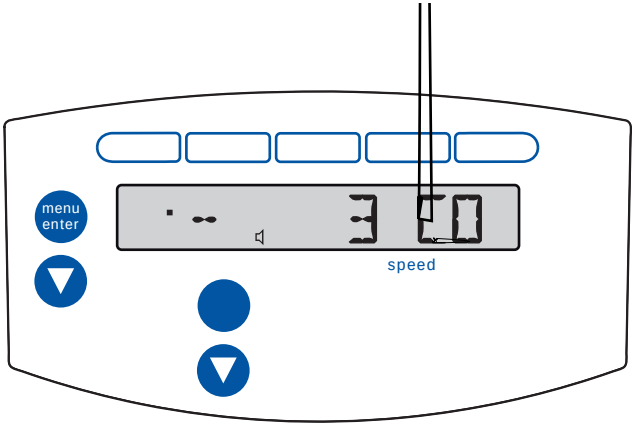

Fig. 5-1: Operating controls and display

1 Program key for MTP (384-well)
2 Program key for PCR plates (384-well)
3 Program key for MTP (96-well)
4 Program key for PCR plates (96-well) and micro test tubes (0.2 mL and 0.5 mL)
5 Program key for micro test tubes (1.5 mL and 2.0 mL)
6 Control LED to display the selected program key
7 Display
8 Start/stop mixing run
9 Set the mixing frequency (speed)
10 Set the mixing duration (time)
11 Navigating in the menu
12 Call and select the menu parameters

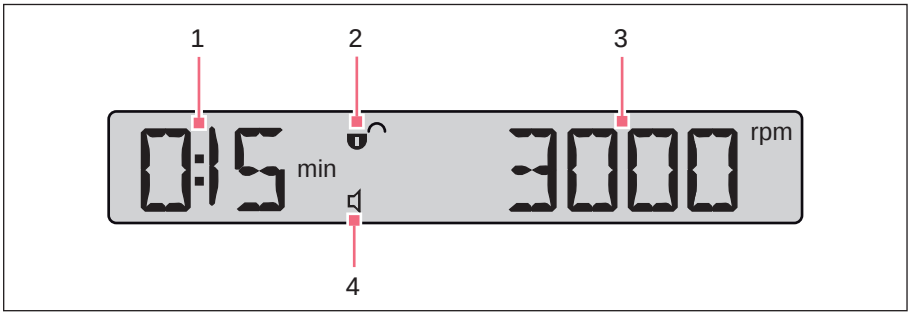

Fig. 5-2: Display

1 Mixing time
Setting:
up to 19:45 min in 15 s increments
20 min to 59 min: in 1 min increments
1.0 h to 99.5 h: in 0.5 h increments
'oo': unlimited mixing time

2 Symbol for key lock

3 Mixing frequency
Setting:
300 rpm to 3000 rpm: in 50 rpm increments

4 Symbol for signal tone setting

After switching on, the display shows the values of the last run.

5.2.1 Inserting the plate in the plate holder

1. Place the plate at the rear of the plate holder.
2. Press the plate into the plate holder. Make sure it is firmly seated.

5.2.2 Inserting the tube holder in the plate holder

1. Select the appropriate tube holder (see table above).
2. Hold the tube holder up against the back edge of the plate holder so that the stop pins fit in the holes.

3. Engage the tube holder by pressing gently on the front.

5.2.3 Removing the tube holder from the plate holder

1. Remove the tube holder by lightly pressing the Push release button.

5.2.4 Inserting the plate in the PCR 96 tube holder

1. Insert the PCR 96 tube holder in the plate holder.
2. Press semi-skirted or unskirted PCR plates into the bores of the tube holder. Make sure they are seated evenly.

5.2.5 Inserting tubes in the tube holders

1. Select the appropriate tube holder (see table above).
2. Insert the tube holder in the plate holder.
3. Push the micro test tubes fully into the bores of the tube holder.

5.3 Mixing

WARNING! Injury from sample material being thrown out.
Sample material can be thrown out of open, improperly sealed or unstable tubes and plates.

- Only mix in closed tubes and closed plates.
- Observe the nationally prescribed safety environment when working with hazardous, toxic and pathogenic samples. Pay particular attention to personal protective equipment (gloves, clothing, gog lbeonuohnalnt (gl8(uip)i 39.665od (g1(opae

5.3.1 Mixing with preset parameters

With the program keys you can select the following preset parameters (mixing frequency and mixing time). They allow a controlled and effective mixing of samples without wetting the tube lid or plate cover. The program keys are not programmable.

Tab. 5-2: Program keys for preset optimized mixing parameters

Program key	Parameter	Tubes / plates

* Share of max. working volume. Observe manufacturer's instructions.

1. Select the appropriate parameters from the table.
2. Press the program key determined from the table.
3. Adapt the preset mixing time and mixing frequency with the arrow keys time and speed, if required.
   If the parameter setting is changed, the indicator light on the program key goes out.
4. Press the start/stop key to start the mixing process.
   A signal tone sounds at the end of the mixing process.
   Parameters that have been changed are not saved. After the mixing process has been completed, the original parameters can be recalled via the program keys.

5.3.2 Mixing with free parameters

1. Use the time arrow keys to set the mixing time.
   For continuous operation, select oo below 0:15 min or above 99.5 h.
2. Use the speed arrow keys to set the mixing frequency.
3. To start the mixing process, press the start/stop key.
   The remaining mixing time and the current mixing frequency are displayed. During continuous operation, the current mixing time appears alternating with oo, and after 99.5 h only oo appears.
   You can also change the parameters during a mixing process by pressing the time and speed arrow keys. To do so, the key lock must not be active. The mixing process is then continued with the changed parameters.
   The program keys are not available during the mixing process.

5.4.1 Touch Vortex mode at 3500 rpm

5.5.3 Key lock (LOCK) activation/deactivation

The key lock prevents set parameters being modified inadvertently during a mixing process.

1. Press the menu/enter key to call up the menu.
2. Press the menu arrow key once.
3. Press the menu/enter key to open the key lock menu.
4. Select sub-item M – 2 ON with the menu arrow key to activate the key lock, or ***M – 2 OFF*** to deactivate the key lock.
5. Press the menu/enter key to confirm the selected setting.
   You will then exit menu level 2.
   Press the menu/enter key again to exit the menu completely.

With the key lock activated, all keys apart from menu/enter are inactive during the mixing process. When the mixer is at rest, all the keys are released.

You can tell from the ⌒ symbol in the display that the key lock is active and from the symbol that the key lock is deactivated.

5.5.4 Adjusting the signal tone-volume (VOL)

The MixMate announces that a mixing process is complete by means of a signal tone. You can set the volume of this signal tone in the device menu as follows:

1. Press the menu/enter key to call up the menu.
2. Press the menu arrow key twice.
3. Press the menu/enter key to open the menu for the signal tone volume.
4. Use the menu arrow key to select the desired setting from ***OFF***, ***VOL1*** to ***VOL3***. With ***OFF*** the signal tone is switched off, with ***VOL3*** the signal tone sounds at maximum volume.
   The selected volume is played.
5. Press the menu/enter key to confirm the selected setting.
   You will then exit menu level 2.
   Press the menu/enter key again to exit the menu completely.
6. Press ***M – 2 BACK*** to leave this menu level.

6 Troubleshooting

If you cannot remedy an error with the recommended measures, please contact your local Eppendorf partner. The contact addresses can be found on the Internet at www.eppendorf.com.

6.1 General errors

Problem	Cause	Solution
No display	Power supply is interrupted.	▶ Check the mains connection and the power supply to the lab.
Too fast	Mixing load is too heavy for the selected mixing frequency.	▶ Reduce the mixing frequency or the weight of the mixing load.
Too fast	Mixing load not properly positioned in the plate holder.	▶ Check that the mixing load is fixed in position.
Too fast	Continuous vortexing at frequencies > 2000 rpm.	▶ Reduce the continuous vortexing frequency to ≤ 2000 rpm.
ERR00 – ERR03/ ERR06 – ERR11	Electronics error	▶

7 Maintenance

7.1 Cleaning

7.1.1 Cleaning the device and accessories

Clean the housing of the MixMate, the vortex mat, the plate holder and the tube holders regularly.

DANGER! Electric shock due to the ingress of liquid.

- Switch off the device and disconnect it from the mains/power supply before starting cleaning or disinfecting.
- Do not allow any liquids to penetrate the inside of the housing.
- Do not perform a spray clean/spray disinfection on the housing.
- Wait until the device is completely dry before reconnecting it to the mains/ power supply.

WARNING! Risk of a device catching fire as a result of liquid ingress.
Liquid ingress can cause a fire due to a short circuit in the device.

- Do not allow any liquids to penetrate the inside of the housing.
- Only mix in sealed tubes and plates.
- If there was an ingress of liquid: switch off the device, pull the mains/power plug, and have the device cleaned by service technicians who have been authorized by Eppendorf.

NOTICE! Damage from the use of aggressive chemicals.

- Do not use any aggressive chemicals on the device or its accessories, such as strong and weak bases, strong acids, acetone, formaldehyde, halogenated hydrocarbons or phenol.
- If the device has been contaminated by aggressive chemicals, clean it immediately using a mild cleaning agent.

NOTICE! Corrosion due to aggressive cleaning agents and disinfectants.

- Do not use any corrosive cleaning agents, aggressive solvents or abrasive polishes.
- Do not incubate the accessories in aggressive cleaning agents D io1 Tf 0.0015 7euc37eu .

NOTICE! Damage to electronic components from spilled liquids.

- Make sure that the vortex mat and the cover caps are fitted properly. If the vortex mat is not fitted properly, contact your Eppendorf partner or the authorized Technical Service.
- If liquid has been spilled: Switch off the device, disconnect the mains/power plug and arrange for it to be cleaned by service personnel authorized by Eppendorf.

Required equipment

- Mild, soap-based household cleaning agent

1. Switch off the MixMate and isolate it from the mains/power supply.
2. Clean the housing, plate holder, vortex mat and tube holder.
   The housing may only be wiped with a damp cloth. Do not perform a spray clean/spray disinfection on the housing.
3. Dry all cleaned parts.
4. Perform a function test.

7.1.2 Performing a function test

1. Use the mains/power cord to connect the MixMate to the mains/power supply.
2. Switch on the device, using the mains/power switch.
3. Check the Touch Vortex function using a suitable tube.

7.2 Disinfection/decontamination

DANGER! Electric shock due to the ingress of liquid.

- Switch off the device and disconnect it from the mains/power line before starting cleaning or disinfection.
- Do not allow any liquids to penetrate the inside of the housing.
- Do not perform a spray clean/spray disinfection on the housing.
- Only reconnect the device to the mains/power line when it is completely dry, both inside and outside.

WARNING! Risk of a device catching fire as a result of liquid ingress.
Liquid ingress can cause a fire due to a short circuit in the device.

- Do not allow any liquids to penetrate the inside of the housing.
- Only mix in sealed tubes and plates.
- If there was an ingress of liquid: switch off the device, pull the mains/power plug, and have the device cleaned by service technicians who have been authorized by Eppendorf.

NOTICE! Damage from UV and other high-energy radiation.

- Do not use UV, beta, gamma, or any other high-energy radiation for disinfection.
- Avoid storage in areas with strong UV radiation.

Required equipment

- Alcohol (ethanol, isopropanol) or disinfectants containing alcohol
- Mild, soap-based household cleaning agent

Proceed as follows:

1. Choose the disinfection method which corresponds to the legal regulations and guidelines in place for your range of application.
2. Switch off the device and disconnect it from the mains/power line.
3. Wipe down all parts of the device and accessories, including the connecting cable, with the disinfectant.
4. Clean the device with a mild soap-based household cleaning agent.

7.3 Decontamination before shipment

If you are shipping the device to the authorized Technical Service for repairs or to your authorized dealer for disposal please note the following:

WARNING! Risk to health from contaminated device.

1. Observe the information in the decontamination certificate. It is available as a

8 Transport, storage and disposal

8.1 Transport

▸ Only transport the device in the original packaging.

	Air temperature	Max. rel. humidity	Air pressure
General transportation	-20 to 60 °C	10 to 95 %	30 to 106 kPa
Air freight	-20 to 55 °C	10 to 95 %	30 to 106 kPa

8.2 Storage

	Air temperature	Max. rel. humidity	Air pressure
in transport packaging	-20 to 55 °C	10 to 95 %	70 to 106 kPa
without transport packaging	-5 to 45 °C	10 to 95 %	70 to 106 kPa

8.3 Disposal

If the product needs to be disposed of, the relevant legal regulations must be observed.

Information on the disposal of electrical and electronic devices in the European Community:

Within the European Community, the disposal of electrical devices is regulated by national regulations based on EU Directive 2012/19/EU pertaining to waste electrical and electronic equipment (WEEE).

According to these regulations, any devices supplied after August 13, 2005, in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. To document this, they have been marked with the following marking:

Because disposal regulations may differ from one country to another within the EU, please contact your supplier if necessary.

9 Technical data

9.1 Power supply

Mains power connection:	220 to 240 V ±10 %, 50 to 60 Hz 110 to 120 V ±10 %, 50 to 60 Hz
Power consumption:	40 W
Overvoltage category:	II

9.2 Ambient conditions

Environment	Use only indoors
Ambient temperature	2 °C – 40 °C
Relative humidity	10 % – 75 %
Atmospheric pressure	Use up to an altitude of 2000 m above MSL.
Degree of contamination	2

9.3 Weight/dimensions

Dimensions	Width: 170 mm Depth: 230 mm Height: 130 mm
Weight	4.15 kg
Noise level	< 50 dB(A)

9.4 Application parameters

Max. load	300 g
Mixing frequencies	
under load up to 80 g	300 to 3000 rpm, in 50 rpm increments
under load greater than 80 g	300 to max. 2000 rpm, in 50 rpm increments
for PCR 96 tube holder, 0.5 mL, 1.5/ 2.0 mL and DWP	up to max. 2000 rpm
for tube holder 5/15 mL, 25/50 mL and DWP	up to max. 1000 rpm
Adjustable mixing time	Up to 19:45 min in 15 s increments, from 20 min to 59 min in 1 min increments, from 1.0 h to 99.5 h in 0.5 h increments and unlimited mixing time.
Touch Vortex frequency	3500 rpm
Mixing and vortex radius	1.5 mm (3 mm mixing stroke)

*

*) Sample measurement for this device only.

Evaluate Your Manual

Give us your feedback.
www.eppendorf.com/manualfeedback

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