

Melting Point Excellence System

MP70/MP80/MP90



METTLER TOLEDO

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1 Introduction

Thank you for choosing a METTLER TOLEDO Excellence Melting Point System. The Excellence Melting Point System is an easy-to-operate instrument for automated and accurate measurements of the following physical values:

- Melting point and melting range
- Boiling point (only MP80)
- Cloud point (only MP80)
- Slip melting point (only MP80)

About this document

This document provides you with the information you need to get started with your METTLER TOLEDO Excellence Melting Point System.



For a comprehensive description of the instrument and its functions, refer to the Operating Instructions, supplied as PDF file on the CD.

The instructions in this document refer to MP70, MP80 and MP90 instruments running firmware version 2.10 or higher.

If you have any additional questions, contact your authorized METTLER TOLEDO dealer or service representative.

► www.mt.com/contact

Conventions and symbols



Refers to an external document.

Note

for useful information about the product.

Elements of instructions

- Prerequisites
- 1 Steps
- 2 ...
 - ⇒ Intermediate results
 - ⇒ Results

2 Safety information

- Read and understand the information in this User Manual before you use the instrument.
- Keep this User Manual for future reference.
- Include this User Manual if you pass on the instrument to other parties.

If the instrument is not used according to the information in the Operating Instructions or if it is modified, the safety of the instrument may be impaired and Mettler-Toledo GmbH assumes no liability.



For a comprehensive description of the instrument and its functions, refer to the Operating Instructions, supplied as PDF file on the CD.

2.1 Definitions of signal words and warning symbols

Safety notes are marked with signal words and warning symbols. These show safety issues and warnings. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results.

Signal words

WARNING for a hazardous situation with medium risk, possibly resulting in death or severe injury if not avoided.

CAUTION for a hazardous situation with low risk, resulting in minor or moderate injury if not avoided.

NOTICE for a hazardous situation with low risk, resulting in damage to the instrument, other material damage, malfunctions and erroneous results, or loss of data.

Warning symbols



Electrical shock



Hot surface

2.2 Product-specific safety notes

Intended use

This instrument is designed to be used in laboratories by trained staff. The instrument is intended for performing measurements for determining the following physical values:

- Melting point and melting range
- Boiling point (only MP80)
- Cloud point (only MP80)
- Slip melting point (only MP80)

Any other type of use and operation beyond the limits of technical specifications without written consent from Mettler-Toledo GmbH is considered as not intended.

Responsibilities of the instrument owner

The instrument owner is the person that uses the instrument for commercial use or places the instrument at the disposal of the staff. The instrument owner is responsible for product safety and the safety of staff, users and third parties.

METTLER TOLEDO assume that the instrument owner provides the necessary protective gear, appropriate training for the daily work and for dealing with potential hazards in their laboratory.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



⚠ WARNING

Danger of death or serious injury due to electric shock!

Contact with parts that contain a live current can lead to injury and death.

- 1 Only use a METTLER TOLEDO power cable and AC adapter designed for your instrument.
- 2 Connect the power cable to a grounded power outlet.
- 3 Keep all electrical cables and connections away from liquids.
- 4 Replace damaged power cables and AC adapters immediately.



⚠ CAUTION

Danger of burns due to hot surfaces!

The oven can reach temperatures that are high enough to cause burns and heats up parts contained in the oven, the lid and the back of the instrument.

- 1 Never touch a sample you have just removed from the furnace (capillary tubes, glass tubes, slides, sample cups or crucibles).
- 2 Do not operate the instrument without the lid.
- 3 Never touch the furnace, furnace lid or the back of the device before the instrument has cooled down.



NOTICE

Danger of malfunction due to overheating of the instrument!

If the cooling is impeded, the instrument can overheat and malfunction.

- 1 Do not stack paper on top of the instrument.
- 2 Do not block the ventilation openings in the back and at the bottom of the instrument.
- 3 Respect the clearance around the instrument specified in the installation instructions.



NOTICE

Danger of damage to the instrument due to incorrect parts!

Using incorrect parts with the instrument can damage the Instrument or cause the instrument to malfunction.

- Only use parts supplied with the instrument, listed accessories and spare parts from METTLER TOLEDO.



NOTICE

Danger of damaging the touch screen with pointed or sharp objects!

Pressing on the touch screen with pointed or sharp objects may damage it.

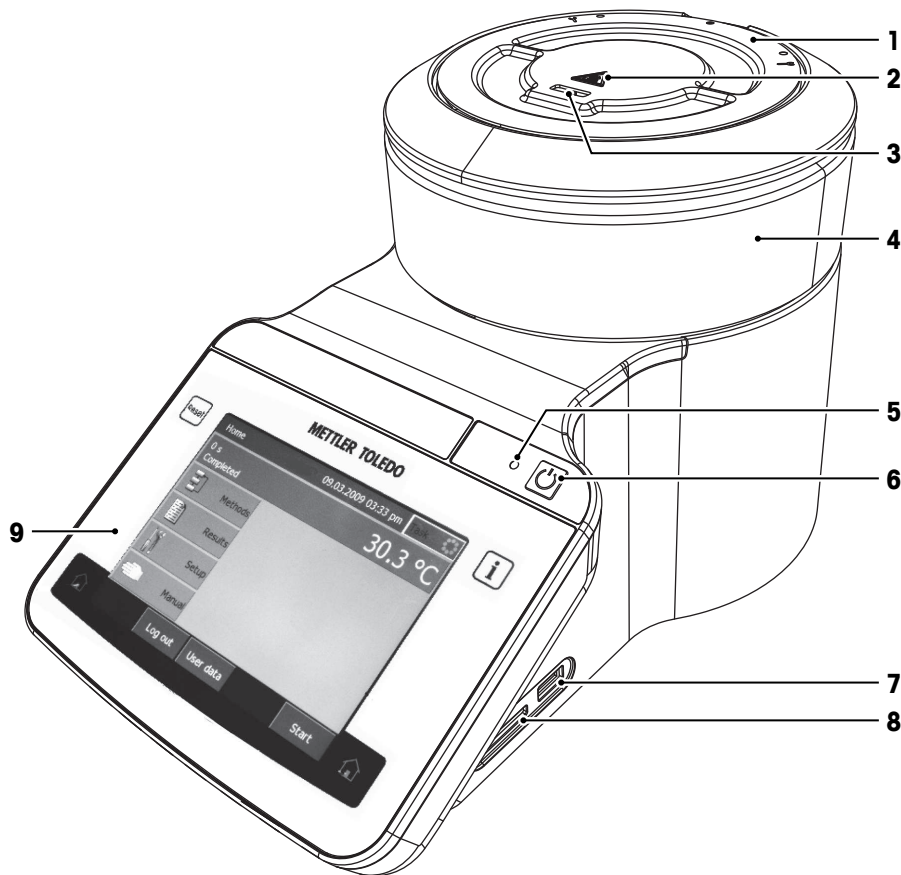
- Operate the touch screen by applying gentle pressure with the pad of your finger.

See also

📄 Instrument ► Page 44

3 Design and function

3.1 Instrument overview

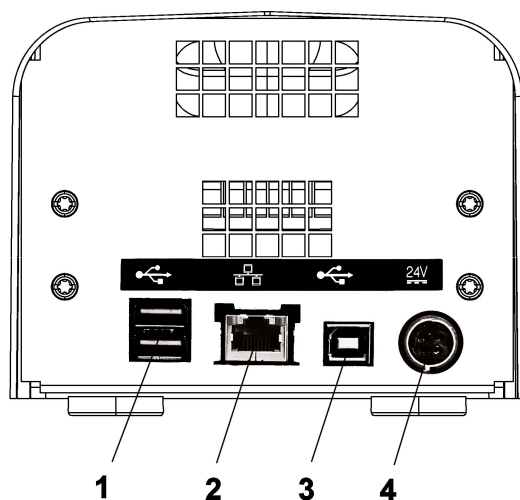


Nr.	Name	Function
1	Lid	Protects the user from hot parts and protects the furnace from dust. The lid allows access to the measuring cell for maintenance tasks.
2	Safety sign for hot surfaces	The safety sign warns that the lid can be hot enough to cause burns.
3	Slot for capillaries	Is used to insert capillaries with the sample into the measuring cell.
4	Housing	The cylindrical part of the housing contains the measuring cell and the furnace.
5	Power indicator light	Shows the status of the instrument: - Power indication light on: The instrument is on. - Power indication light off: The instrument has shut down. - Power indication light fades on and off: The instrument is on and the screen saver is active.
6	Power button	The power button has the following functions: - Start the instrument. - Shut down the instrument. - Activate the screen saver if the instrument is on. - Deactivate the screen saver.
7	USB A socket	Is used to insert a USB stick if you want to export data to the USB stick or import data from the USB stick.
8	Slot for SD cards	Is used to insert an SD card if you want to export data to the SD card.
9	Control panel	Consists of an integrated touchscreen and the four hard keys.

See also

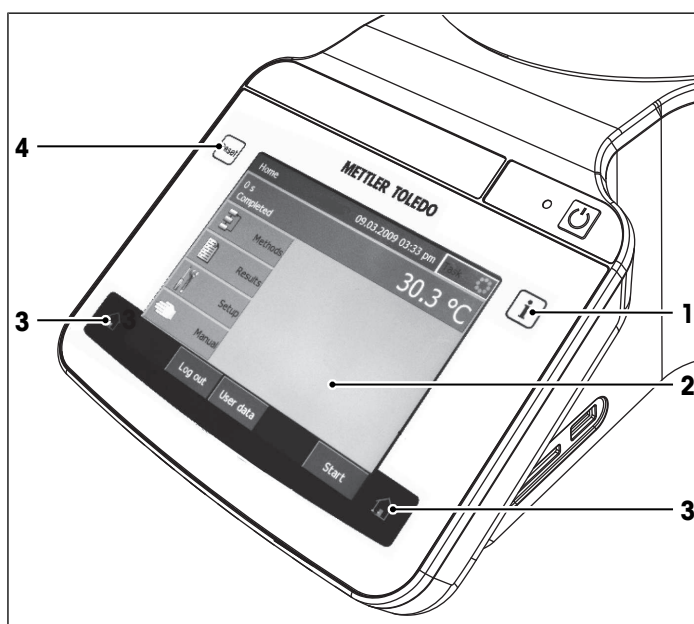
Control panel layout ► Page 7

3.2 Connections at the back of the instrument



Nr.	Name	Function
1	USB type A ports	Connection for printers, mouse, keyboards, or USB sticks
2	Ethernet connection	Connection to a network for example for a network printer, network storage or LabX.
3	USB type B port	Used for service purposes
4	Power supply connection	Socket for AC adapter

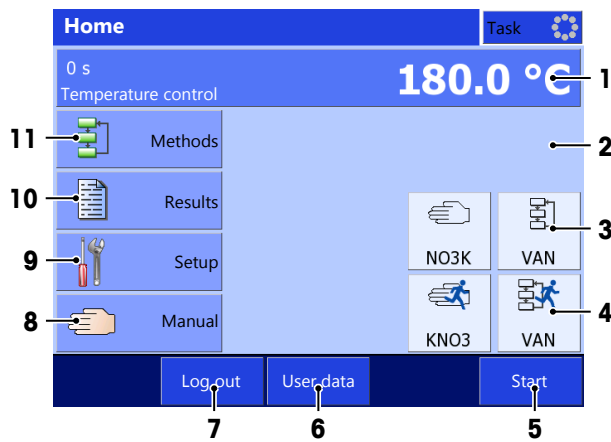
3.3 Control panel layout



Nr.	Name	Function
1	Info	The Info key opens a window with general information about the instrument.
2	Touch screen	The touch screen displays information and can be used to enter information.
3	Home	The home key opens the home screen.
4	Reset	The Reset key stops the task that is currently running.

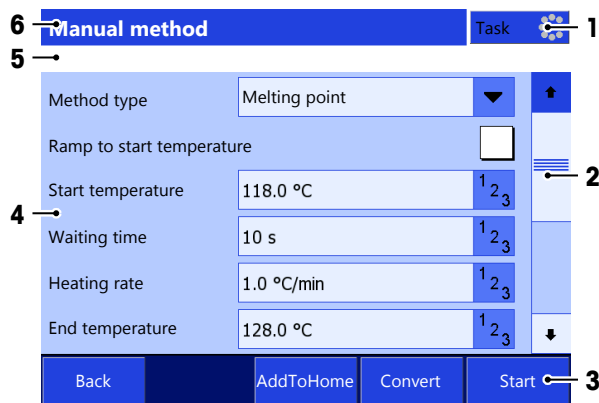
3.4 User interface

3.4.1 Home screen



Nr.	Name	Function
1	Furnace monitor area	The furnace monitor area shows the current temperature of the furnace. If you tap the furnace monitor area, you can switch to a full display of the furnace temperature.
2	Shortcut area	The shortcut area holds up to twelve shortcuts for frequently used methods.
3	Indirect shortcut	An indirect shortcut for a method opens the window Start analysis . An indirect shortcut for a manual method opens the window Manual method .
4	Direct shortcut	A direct shortcut starts the analysis directly and opens the analysis window.
5	Start	Opens the window Start analysis of the last analysis that was run.
6	User data	Opens the window User data with information about the user that is logged in.
7	Log out	Logs the current user out and opens the window Login window.
8	Manual	Opens the window Manual operations , where you can start a manual operation.
9	Setup	Opens the window Setup where you can configure the hardware and the resources.
10	Results	Opens a window with the results of the last analysis.
11	Methods	Opens the window Methods where you select an existing method or create a new the method.

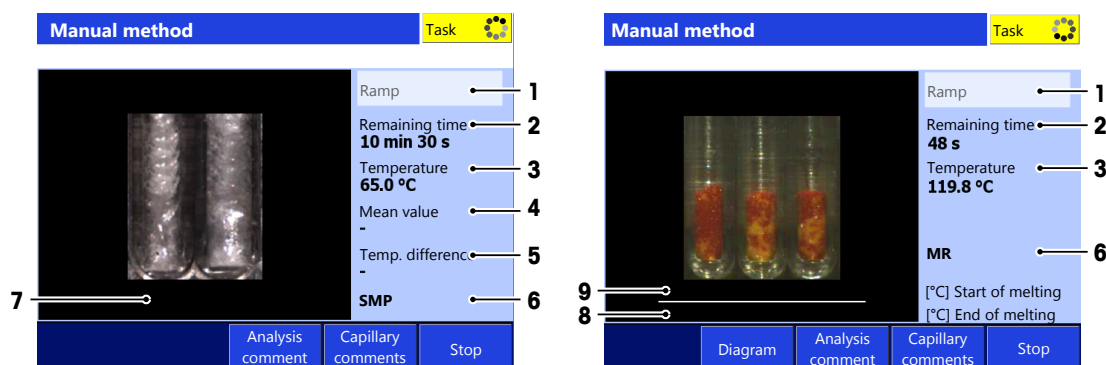
3.4.2 Basic elements of windows



Nr.	Name	Function
1	Task	The task panel shows if a task is running or not. Blue: No task is running. Yellow: A task is running. If you tap Task while a task is running, the analysis window of the running task opens.
2	Scroll bar	The scroll bar is visible if the content of the window extends beyond the viewable area. You can use either the arrows or the slider to move the viewable area of the screen up or down. To page up and down, tap the area below or above the slider.
3	Footer	Up to five buttons are located in the footer. Which buttons are visible depends on the context of the open window.
4	Body	The body of the window shows information like the video of an ongoing analyses or items like shortcuts or parameters.
5	Navigation	The navigation shows the path to the open window.
6	Title bar	The title bar shows the name of the open window.

3.4.3 Information displayed during an analysis

Information on the current analysis is displayed in the analysis window. The information is constantly updated and includes the following data.



Nr.	Name	Description
1	Analysis status bar	The analysis status bar displays the various positions reached during the analysis: Go to T(start) , T(start) reached , Waiting time , Ramp , Isothermal , Create report
2	Remaining time	Remaining time until the end of the analysis. The time indicated includes the waiting time, the duration of temperature ramp and that of the isothermal segment.

Nr.	Name	Description
3	Temperature	Current temperature reading inside the measuring cell. The temperature value displayed here is not corrected by the thermal lag, even if the parameter Temperature values is set to Thermodynamic .
4	Mean value, s Mean value	Mean value, s: current mean value of all the temperature readings of the individual capillaries and the standard deviation for the method type melting point. If the parameter Melting point criterion is set to Endpoint C , the temperature ramp has to be completed before the melting point is displayed. Mean value: current mean value of all the temperature readings of the individual capillaries for the method types slip melting point, boiling point and cloud point
5	Temp. difference	Difference of the temperatures measured for the 2 capillaries for the method types boiling point, cloud point and slip melting point
6	MP MR SMP BP CP	Method type of the running analysis MP: Melting point MR: Melting range SMP: Slip melting point BP: Boiling point CP: Cloud point
7	Temperature values [°C, °F or K]	The temperature values for the melting point, boiling point, cloud point or slip melting point of each capillary if the parameter Temperature values is set to Thermodynamic , the temperature values displayed are corrected by the thermal lag.
8	[°C] Start of melting	The temperature values for the start of melting for each capillary for the method type Melting range
9	[°C] End of melting	The temperature values for the end of melting for each capillary for the method type Melting range

3.4.4 Menu structure

Methods

The menu **Methods** has no submenus.

Results

The menu **Results** has no submenus.

Setup

The menu **Setup** has the following submenus.

Calibration substances	—	—
Hardware	Peripherals	Printer
		Network
		Network storage
	Temperature sensor	—
User settings	Language	—
	Screen	—
	Beep	—
	Shortcuts	—
	Keyboards	—

Global settings	System	Identification
		Date / Time
		Header and footer
		Data storage
	User management	User
		Account Policies
	Behavior of analyses and resources	Analysis sequence settings
		Action on expiration of adjustment data
	Pressure compensation (only MP80)	—
Adjustment	—	—
Mainten. & Service	Import / Export	—
	Reset to factory settings	—
	Update	—
	Delete data on SD card	—
	Service	—

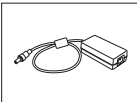
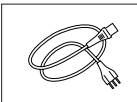
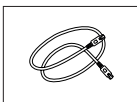
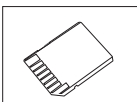
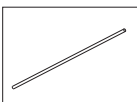
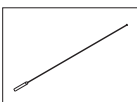
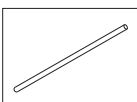
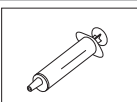
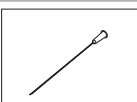
Manual

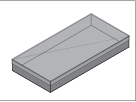
The menu **Manual** has the following submenus.

- **Manual method**
- **Furnace power off**
- **Set furnace temperature**
- **Furnace inside view**

4 Installation and commissioning

4.1 Scope of delivery

Description	Order number	MP70	MP80	MP90
 MP70 Melting Point System	—	•	—	—
 MP80 Melting Point System	—	—	•	—
 MP90 Melting Point System	—	—	—	•
 Extern. Power Supply 120 W	30298362	•	•	•
 Power cable	Country-specific	•	•	•
 Ethernet Cable RJ45	51191860	•	•	•
 SD Card 2 GB	51192017	•	•	•
 Melting Point capillaries (150 pcs)	18552	•	•	•
 Boiling Point inner capillaries (10 pcs)	18574	—	•	—
 Boiling Point outer capillaries (40 pcs)	18572	—	•	—
 Syringe 1 mL (3 pcs)	—	—	•	—
 Injection Needle 80 x 0.8 (3 pcs)	—	—	•	—

Description	Order number	MP70	MP80	MP90
 Accessory Box Complete for MP • Calibration substance Benzophenone (5 g) • Calibration substance Benzoic Acid (5 g) • Calibration substance Saccharin (5 g) • 2 sets of Melting Point Capillaries (150 pcs each) • Tweezers • Mortar and pestle • Sample Preparation Tool for MP (5 pcs) • Spatula	51142599	—	—	•
 User Documentation	—	•	•	•
 Quick Guide	—	•	—	•
 Declaration of conformity	—	•	•	•
 Test report	—	•	•	•

4.2 Unpack the instrument

- 1 Remove the instrument (and accessories) from the protective packing material.
- 2 Store the packing material for later transport over long distances.
- 3 Check whether you received all parts listed in the scope of delivery.
- 4 Remove the adhesive seal from the slot for capillaries.
- 5 Inspect the parts visually for flaws or damage.
- 6 If parts are missing or damaged, report it immediately and file a freight claim if needed.

4.3 Position the instrument

The instrument has been developed for indoor operation in a well-ventilated area. The following site requirements apply:

- The ambient conditions are within the limits specified in the technical data.
 - No powerful vibrations
 - No direct sunlight
 - No corrosive gas atmosphere
 - No explosive atmosphere
 - No powerful electric or magnetic fields
- 1 Place the instrument on a level surface.
 - 2 Make sure that there are at least 15 cm clearance in front, above and behind the instrument.
 - 3 Make sure that nothing blocks the ventilation openings at the bottom and the back of the instrument.

4.4 Connect the instrument to the power supply

The AC adapter is suitable for all supply line voltages ranging from 100...240 V AC and 50/60 Hz.



WARNING

Danger of death or serious injury due to electric shock!

Contact with parts that contain a live current can lead to injury and death.

- 1 Only use a METTLER TOLEDO power cable and AC adapter designed for your instrument.
- 2 Connect the power cable to a grounded power outlet.
- 3 Keep all electrical cables and connections away from liquids.
- 4 Replace damaged power cables and AC adapters immediately.

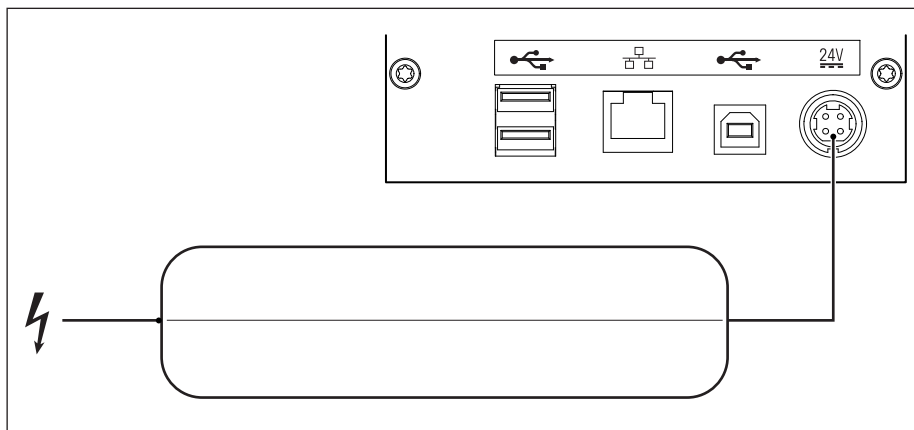


NOTICE

Danger of damage to the AC adapter due to overheating!

If the AC adapter is covered or in a container, it is not sufficiently cooled and overheats.

- 1 Do not cover the AC adapter.
- 2 Do not put the AC adapter in a container.



- 1 Install the cables in such a way that they cannot be damaged or interfere with operation.
- 2 Insert the plug of the power cable in the socket of the AC adapter.
- 3 Insert the plug of the AC adapter in the socket **24V** at the back of the instrument.
- 4 Insert the plug of the power cable in a grounded power outlet that is easily accessible.

See also

-  Start up the instrument ► Page 15
-  Log in ► Page 15

4.5 Disconnect the instrument from the power supply

- The instrument has shut down.
- 1 Pull the plug of the power cable out of the power outlet.
 - 2 Pull the plug of the AC adapter out of the socket **24V** at the back of the instrument.

5 Operation

5.1 Start up the instrument

- The instrument is connected to the power supply
- No samples are inserted.
- 1 Press .
- ⇒ METTLER TOLEDO logo appears and the fan starts.
- ⇒ The screen darkens and the fan stops.
- ⇒ The screen **Starting up the system** appears; the red light and white light flash alternately.
- ⇒ The home screen or the window **Login** appears.
- 2 Login if the window **Login** appears.

See also

 Log in ► Page 15

5.2 Log in

Log in with user name

- The window **Login** is open.
- 1 In the text field **Name** tap  and select your user name from the list.
- 2 Tap **Login**.
- ⇒ The home screen opens.

Log in with user name and password

- The window **Login** is open.
- 1 In the text field **Name**, select your user name from the list or enter your user name.
- 2 In the text field **Password**, enter your password.
- 3 Tap **Login**.
- ⇒ The home screen opens.

5.3 Shut down the instrument



NOTICE

Danger of losing data due to wrong shut down procedure.

If you press  longer than 5 seconds, the instrument performs a forced shut down. If an analysis is running, it will be terminated prematurely and any data produced during this time will be lost.

- Do not press  for more than 5 seconds unless you need to force the instrument to shut down.

Shut down the instrument using the touch screen

- You are on the home screen.
- No task is running.
- No samples are inserted.
- 1 Press **Log out**.
- ⇒ The **Login** window opens.
- 2 Press **Shut down**.
- ⇒ The screen **Shutting down the system** appears and then the screen turns dark.
- ⇒ An acoustical signal informs you that you are logged out and the instrument has shut down.
- ⇒ The AC adapter and the control circuit for the power button are energized. The rest of the instrument is no longer energized.

Shut down the instrument using the power button

- No task is running.
- No samples are inserted.
- Press  for 1...4 seconds.
 - ⇒ The screen **Shutting down the system** appears and then the screen turns dark.
 - ⇒ An acoustical signal informs you that you are logged out and the instrument has shut down.
- ⇒ The AC adapter and the control circuit for the power button are energized. The rest of the instrument is no longer energized.

Forced shut down

The instrument should only be shut down in this way if it is absolutely necessary.

- 1 Press  for more than 5 seconds.
 - ⇒ The instrument performs a forced shut down.
 - ⇒ If an analysis is running, it is terminated prematurely and any data produced during this time is lost.
 - ⇒ The AC adapter and the control circuit for the power button are energized. The rest of the instrument is no longer energized.
- 2 Remove all samples.

Shut down of the instrument in emergency situations

- Pull the plug of the power cable out of the power outlet.

5.4 Lock and unlock the instrument

Running tasks continue when you lock the instrument but only messages for critical errors are displayed.

- Only instruments with password protection can be locked.
- Only the user that locked the instrument can unlock the instrument.

Lock the instrument

- 1 Go to **Home**.
 - 2 Tap **Lock**.
- ⇒ The window **Instrument locked** opens and displays the name of the user that is logged in.

Unlock the instrument

- 1 Enter the password.
 - 2 Tap **Login**.
- ⇒ The instrument is unlocked.

End a task on a locked instrument

- On the control panel, press the button **Reset**.
- ⇒ The task is ended but the instrument remains locked.

5.5 Determine melting points or melting ranges

5.5.1 Prepare samples

When you prepare the samples, pay attention to the rules listed below.

- The amount of substance is the same across all capillaries. Slight differences in the amounts could cause deviations in the measured melting point temperatures.
- The melted substance still covers the hole for transmission light.

We recommend using capillaries from METTLER TOLEDO for compliance with standards.

5.5.1.1 Prepare samples of solid substances

In the following procedures, a sample height of 3 mm is used. If you need to use a different height, you need to adjust the procedure.

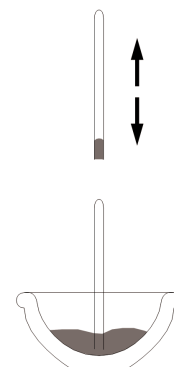
Prepare the substance

- 1 If your sample is moist, dry it in a desiccator.

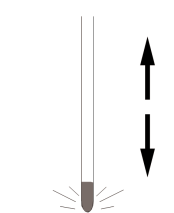
- 2 If you have a coarse crystalline substances, grind it in an agate mortar to a fine powder.

Fill the melting point capillaries without the sample preparation tool

- The substance and melting point capillaries are dry.
 - The substance is a fine powder.
- 1 Press the open end of the capillary into the substance.

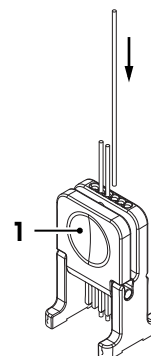


- 2 To move the substance to the bottom of the melting point capillary, turn over the melting point capillary and tap the bottom of the melting point capillary on a hard surface.
 - ⇒ The substance slides to the bottom of the capillary.
- 3 If the sample does not move to the capillary bottom, you can run the bottom of the capillary along the ribbed part of tweezers or tamp it down using a minimum amount of force with the tamping wire supplied.
- 4 To compact the substance tap the bottom of the melting point capillary several times on a hard surface.
 - ⇒ The substance is compacted.
- 5 Check the sample height with a ruler.
- 6 If the sample height is less than 3 mm, repeat the steps above.
 - ⇒ 3 mm of compacted substance fill the bottom of the melting point capillary.

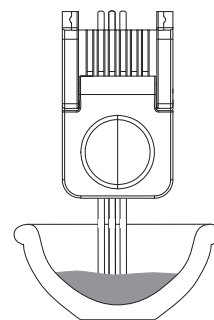


Fill the melting point capillaries with the sample preparation tool

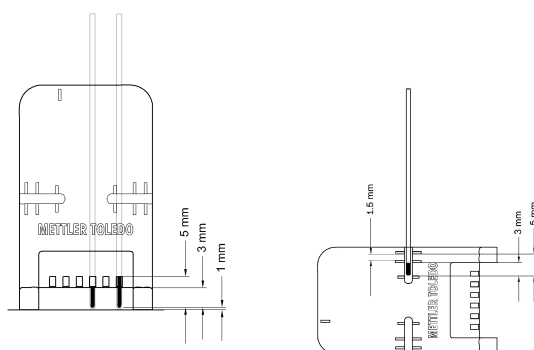
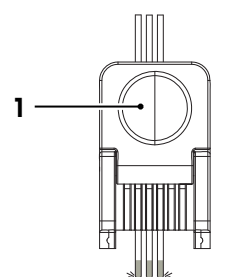
- The substance and melting point capillaries are dry.
 - The substance is a fine powder.
- 1 Press the blue (1) and the gray part together and insert the closed end of the melting point capillaries you need to fill with the same substance into the sample preparation tool.
 - 2 Make sure that the open ends of the melting point capillaries are on the same height.



- 3 Turn over the sample preparation tool and press the open ends of the capillaries into the substance.



- 4 To move the substance to the bottom of the melting point capillary, turn over sample preparation tool and hold it about 10 mm above a hard surface and press the blue (1) and the gray part together.
 - ⇒ The capillaries fall towards the hard surface and bounces up and down a few times.
 - ⇒ The substance slides to the bottom of the capillary.
- 5 Press the blue (1) and the gray part together and lower the sample preparation tool to the surface.
 - ⇒ The melting point capillaries are pushed up into the sample preparation tool.
- 6 To compact the substance, hold it about 10 mm above a hard surface and press the blue (1) and the gray part together .
 - ⇒ The capillaries fall towards the hard surface and bounces up and down a few times.
 - ⇒ The substance is compacted.
- 7 Press the blue (1) and the gray part together and lower the sample preparation tool to the surface.
 - ⇒ The melting point capillaries are pushed up into the sample preparation tool.
- 8 Check if the fill height of all capillaries is 3 mm.
- 9 If the sample height is less than 3 mm, repeat the steps above.
 - ⇒ 3 mm of compacted substance fill the bottom of the melting point capillary.



5.5.1.2 Prepare samples that decompose, sublime or vaporize

When a sealed capillary is heated, the volatile components evolved by the sample produce an over pressure that might inhibit further decomposition or sublimation.

- The melting point capillary is filled with the substance.
- 1 Make sure that the upper part of the melting point capillary is free from sample.

- 2 Seal the melting point capillary in a gas flame properly and rapidly.

5.5.2 Run an analysis using a method

The following procedure shows you how to run an analysis using an indirect shortcut. The procedure is based on an example. Some steps may differ if the method you use is configured differently.

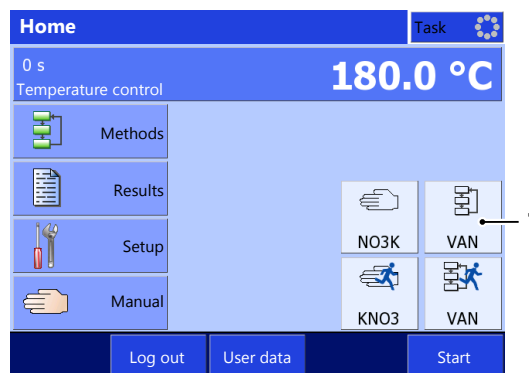
Aside from an indirect shortcut you can also start a method using a direct shortcut or the button **Methods** on the homescreen. Some differences are described after the example below.

Start an analysis using an indirect shortcut

- At least one indirect shortcut of a method is defined.
- The samples are prepared.
- An SD card is inserted.

- 1 Select the indirect shortcut (1) of the method you want to run.

⇒ The method window opens.

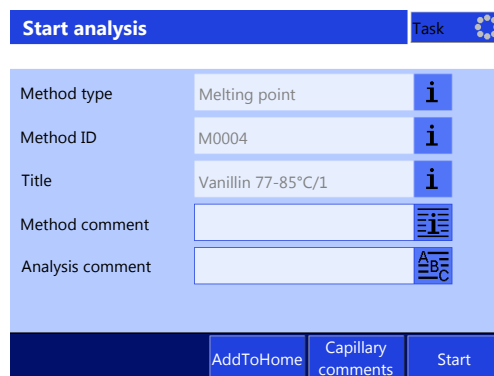


- 2 If needed, enter comments to the method.

- 3 Tap **Start**.

⇒ The window **Start analysis** opens.

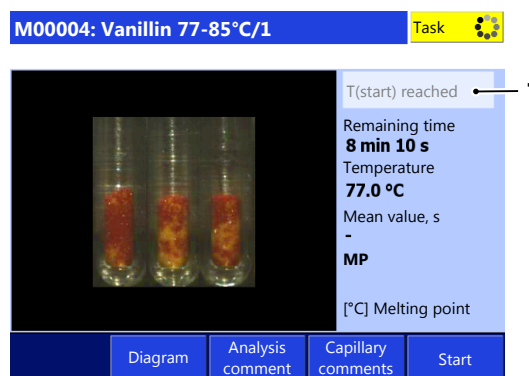
- 4 If needed, enter comments to the analysis or the samples.



- 5 Tap **Start**.

⇒ The analysis window opens.

⇒ The instrument heats up to the start temperature.



- 6 Wait until **T(start) reached** (1) is displayed.
- 7 Insert the samples.
- 8 Tap **Start**.
 - ⇒ The waiting time starts.
 - ⇒ The instrument performs the measurement.



- 9 Wait until the results are displayed.
- 10 **CAUTION Danger of burns due to hot capillaries**
Do not remove the capillaries until the instrument has cooled down or take care not to touch the tips of the capillaries you removed.
- 11 Let the samples cool down and dispose of them according to the safety data sheet of the substance that you measured.
- 12 Tap **Back**.
 - ⇒ The home screen opens.

Results			Task
Cap.	Melting point	Status	
1	118.0 °C	included	
2	118.0 °C	included	
3	118.0 °C	included	
Back	Print	Select analysis	Data Statistics

Start the analysis using the button Methods

- 1 Go to **Home > Methods** and select the method you want to run.
 - ⇒ The method window opens.
- 2 Continue with step 2 of the procedure for an indirect shortcut.

Start the analysis using a direct shortcut

- 1 Go to **Home** and select the direct shortcut of the method you want to run.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.
- 2 Continue with step 6 of the procedure for an indirect shortcut.

Manual determination of the melting point

- The method is configured for manual determination of the melting point.
 - You have started an analysis as described above.
 - The analysis window is open.
- 1 When the substance in a capillary has melted, press the button **Set** of the capillary.
 - ⇒ The temperature for the melting point is displayed below the capillary.
 - 2 Finish the analysis as described in the procedure for an indirect shortcut.

See also

📄 Prepare samples ▶ Page 16

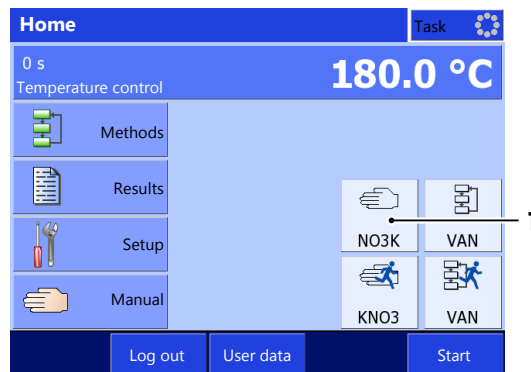
A0004: Vanillin 77-85°C/1			Task
			Ramp Remaining time 8 min 10 s Temperature 77.0 °C Mean value, s - MP [°C] Melting point
Diagram	Analysis comment	Capillary comments	Stop

5.5.3 Run an analysis using a manual method

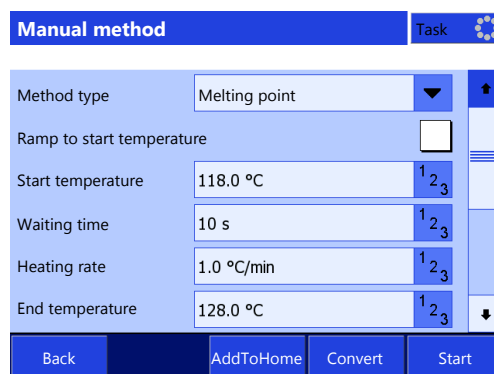
The following procedure shows you how to run an analysis using an indirect shortcut. The procedure is based on an example. Some steps may differ if the manual method you use is configured differently. Aside of an indirect shortcut you can also start a manual method using a direct shortcut or the button **Manual method**. Some differences are described after the example below.

Start an analysis using an indirect shortcut

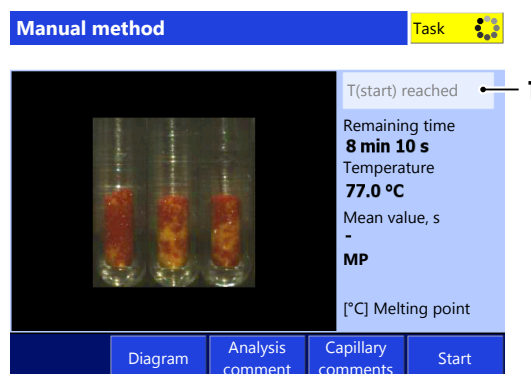
- At least one indirect shortcut of a manual method is defined.
 - The samples are prepared.
 - An SD card is inserted.
- 1 Select the indirect shortcut (1) of the manual method you want to run.
 - ⇒ The window **Manual method** opens.



- 2 If needed, enter comments to the method.
- 3 Tap **Start**.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.



- 4 If needed, enter comments to the analysis or the samples.
- 5 Wait until **T(start) reached** (1) is displayed.



- 6 Insert the samples.
- 7 Tap **Start**.
 - ⇒ The waiting time starts.
 - ⇒ The instrument performs the measurement.



- 8 Wait until the results are displayed.
- 9 **CAUTION Danger of burns due to hot capillaries**
Do not remove the capillaries until the instruments has cooled down or take care not to touch the tips of the capillaries you removed.
- 10 Let the samples cool down and dispose of them according to the safety data sheet of the substance that you measured.
- 11 Tap **Back**.
⇒ The home screen opens.

Results			Task
Cap.	Melting point	Status	
1	118.0 °C	included	
2	118.0 °C	included	
3	118.0 °C	included	
Back	Print	Select analysis	Data Statistics

Start the analysis using the button Manual method

- 1 Go to **Home** > **Manual** > **Manual method**.
⇒ The window **Manual method** opens with the setting of the last manual method you started with the button **Manual method**.
- 2 Continue with step 2 of the procedure for an indirect shortcut.

Start the analysis using a direct shortcut

- 1 Go to **Home** and select the direct shortcut of the manual method you want to run.
⇒ The analysis window opens.
⇒ The instrument heats up to the start temperature.
- 2 Continue with step 4 of the procedure for an indirect shortcut.

See also

📄 Prepare samples ▶ Page 16

5.6 Determine boiling points (MP80 only)

Note

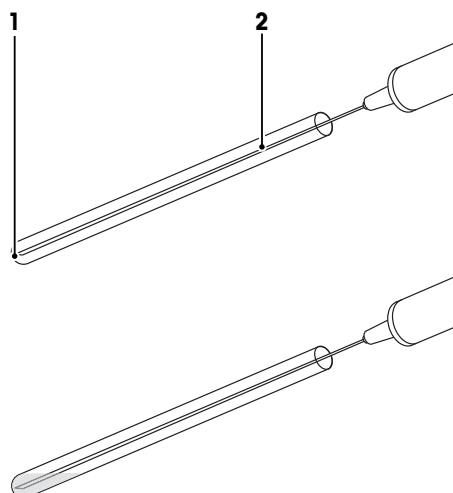
- By default the MP80 instrument measures the atmospheric pressure during an analysis and uses this value to correct the boiling point.

5.6.1 Prepare samples

The sample needs to have a volume of at least 20 µL. METTLER TOLEDO recommends a volume of 100 µL. To fill the boiling point outer capillary, you can either use the supplied syringe or a pipette. Both procedures are described in this chapter.

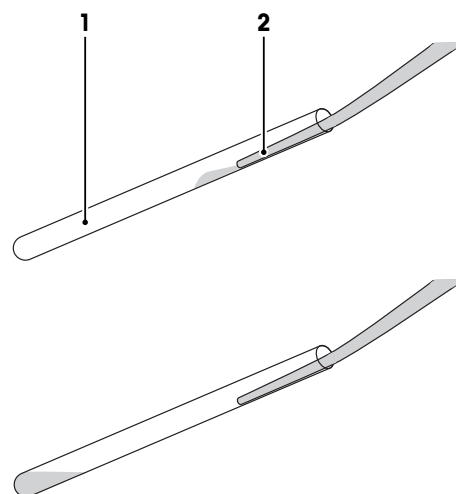
Fill the boiling point outer capillary using a syringe

- The solution used in the analysis is prepared.
 - The volume needed for the analysis is defined.
- 1 Fill the syringe with the defined volume of the solution.
 - 2 Insert the needle of the syringe (2) into the boiling point outer capillary so that it reaches all the way to the tip of the outer boiling point capillary (1).
 - 3 Inject the solution into the boiling point outer capillary.



Fill the boiling point outer capillary using a pipette

- The solution used in the analysis is prepared.
 - The volume needed for the analysis is defined.
 - A Pipet-Lite Pipette and a Tips GelWell pipette tip are available.
- 1 Fill the pipette tip with the defined volume of the solution.
 - 2 Insert the tip of the pipette (2) into the boiling point outer capillary (1) so that it touches the inner surface of the capillary.
 - 3 Slowly push one drop of the solution into the outer boiling point capillary and let it slide down to the bottom of the capillary.
 - ⇒ The inner surface of the capillary is coated with the solution, thus allowing for easier filling of the capillary and also minimizing the chance of air being trapped at the bottom of the capillary.
 - 4 Pipette the remaining solution into the boiling point outer capillary and let it slide down to the bottom of the capillary.



Insert the boiling point inner capillary into the boiling point outer capillary

Note

- Always use a new boiling point inner capillary to ensure that the bubbles are generated properly and to reduce the risk of superheating.
- 1 Insert a new boiling point inner capillary (1) into the boiling point outer capillary.
 - 2 Carefully push the boiling point inner capillary down until it touches the bottom of the boiling point outer capillary.
 - ⇒ The boiling point inner capillary is filled with air (2).



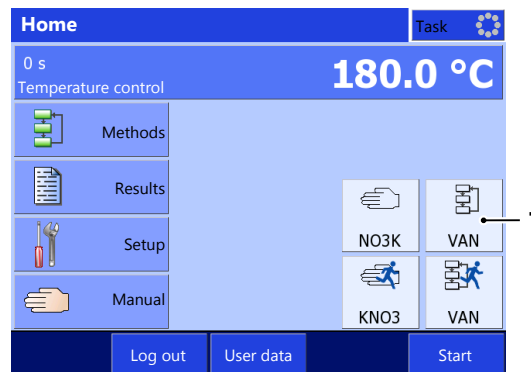
5.6.2 Run an analysis using a method

The following procedure shows you how to run an analysis using an indirect shortcut. The procedure is based on an example. Some steps may differ if the method you use is configured differently.

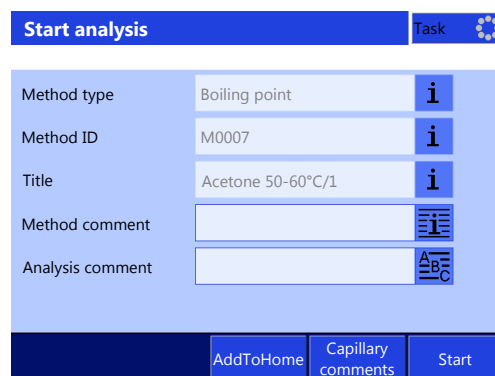
Aside from an indirect shortcut you can also start a method using a direct shortcut or the button **Methods** on the homescreen. Some differences are described after the example below.

Start an analysis using an indirect shortcut

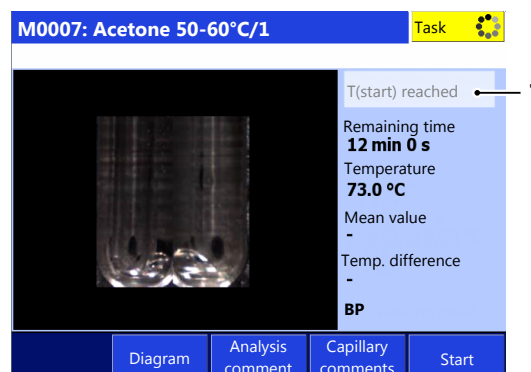
- At least one indirect shortcut of a method is defined.
 - The samples are prepared.
 - An SD card is inserted.
- 1 Select the indirect shortcut (1) of the method you want to run.
 - ⇒ The method window opens.



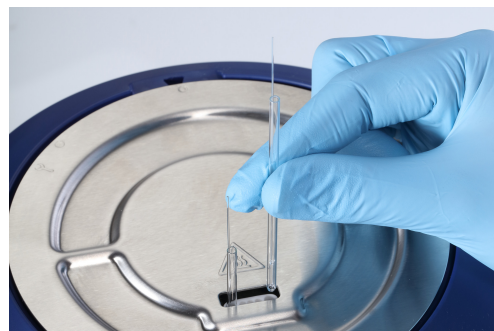
- 2 If needed, enter comments to the method.
- 3 Tap **Start**.
 - ⇒ The window **Start analysis** opens.
- 4 If needed, enter comments to the analysis or the samples.



- 5 Tap **Start**.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.
- 6 Wait until **T(start) reached** (1) is displayed.



- 7 Insert the samples.
- 8 Tap **Start**.
 - ⇒ The waiting time starts. Bubbles may form in the boiling point capillary.
 - ⇒ During the last 20 s of the waiting time the instrument runs an automatic adjustment of the brightness. During this time the video is frozen.
 - ⇒ The instrument performs the measurement.



- 9 Wait until the results are displayed.
 - 10 **CAUTION Danger of burns due to hot capillaries**
Do not remove the capillaries until the instruments has cooled down or take care not to touch the tips of the capillaries you removed.
 - 11 Let the samples cool down and dispose of them according to the safety data sheet of the substance that you measured.
 - 12 Tap **Back**.
- ⇒ The home screen opens.

Results			Task
Cap.	Boiling point	Status	
1	78.3 °C	included	
2	78.1 °C	included	
Mean value		78.2 °C	
Difference		0.2 °C	
Back	Print	Select analysis	Data Define outliers

Start the analysis using the button Methods

- 1 Go to **Home** > **Methods** and select the method you want to run.
⇒ The method window opens.
- 2 Continue with step 2 of the procedure for an indirect shortcut.

Start the analysis using a direct shortcut

- 1 Go to **Home** and select the direct shortcut of the method you want to run.
⇒ The analysis window opens.
⇒ The instrument heats up to the start temperature.
- 2 Continue with step 6 of the procedure for an indirect shortcut.

Determine the boiling point manually

- The method is configured for manual determination of the boiling point.
 - You have started an analysis as described above.
 - The analysis window is open.
- 1 When the frequency in a capillary has reached the desired value, tap the button **Set** of the capillary.
⇒ The temperature for the boiling point is displayed below the capillary.
 - 2 Finish the analysis as described in the procedure for an indirect shortcut.

See also

- 📄 Prepare samples ▶ Page 22
- 📄 Stop an analysis ▶ Page 36

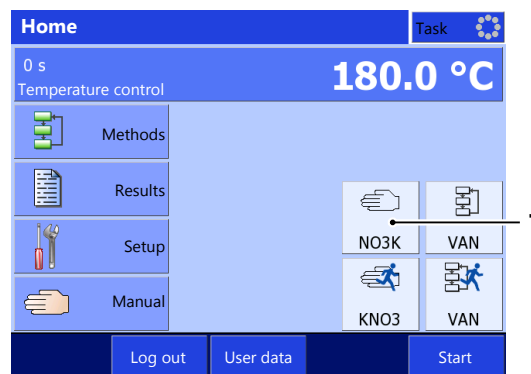
A0007: Ethanol 73-83°C/1			Task
Set Set 		Ramp Remaining time 12 min 0 s Temperature 73.0 °C Mean value - Temp. difference - BP	
Diagram	Analysis comment	Capillary comments	Stop

5.6.3 Run an analysis using a manual method

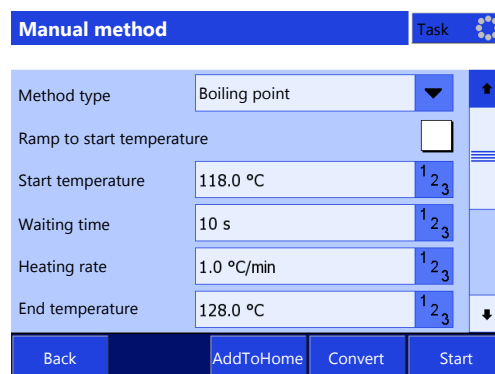
The following procedure shows you how to run an analysis using an indirect shortcut. The procedure is based on an example. Some steps may differ if the manual method you use is configured differently. Aside of an indirect shortcut you can also start a manual method using a direct shortcut or the button **Manual method**. Some differences are described after the example below.

Start the analysis using an indirect shortcut

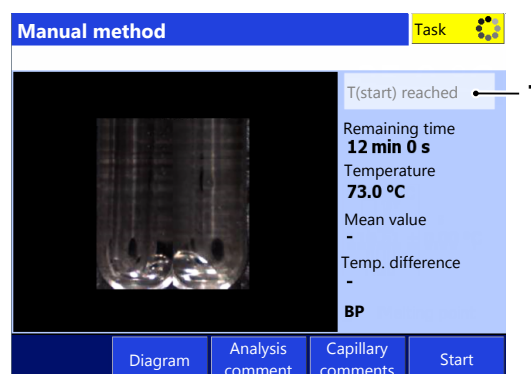
- At least one indirect shortcut of a manual method is defined.
 - The samples are prepared.
 - An SD card is inserted.
- 1 Select the indirect shortcut (1) of the manual method you want to run.
 - ⇒ The window **Manual method** opens.



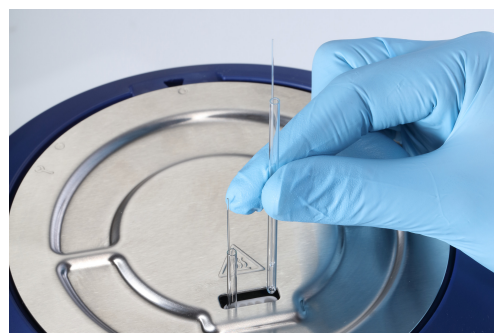
- 2 If needed, enter comments to the method.
- 3 Tap **Start**.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.



- 4 If needed, enter comments to the analysis or the samples.
- 5 Wait until **T(start) reached** (1) is displayed.



- 6 Insert the samples.
- 7 Tap **Start**.
 - ⇒ The waiting time starts. Bubbles may form in the boiling point capillary.
 - ⇒ During the last 20 s of the waiting time the instrument runs an automatic adjustment of the brightness. During this time the video is frozen.
 - ⇒ The instrument performs the measurement.



- 8 Wait until the results are displayed.
 - 9 **CAUTION Danger of burns due to hot capillaries**
Do not remove the capillaries until the instruments has cooled down or take care not to touch the tips of the capillaries you removed.
 - 10 Let the samples cool down and dispose of them according to the safety data sheet of the substance that you measured.
 - 11 Tap **Back**.
- ⇒ The home screen opens.

See also

📄 Prepare samples ▶ Page 22

Results			Task
Cap.	Boiling point	Status	
1	78.3 °C	included	
2	78.1 °C	included	
Mean value		78.2 °C	
Difference		0.2 °C	
Back	Print	Select analysis	Data Define outliers

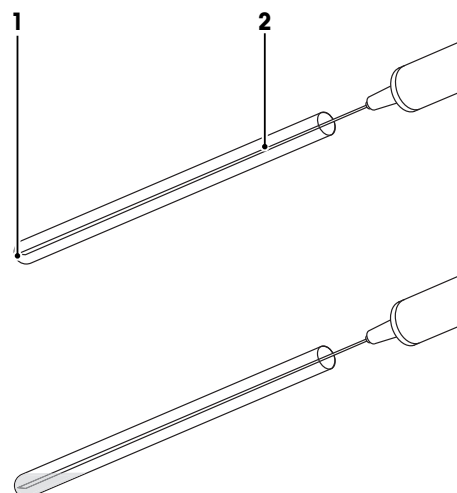
5.7 Determine cloud point (MP80 only)

5.7.1 Prepare samples

The sample needs to have a volume of at least 20 µL. METTLER TOLEDO recommends a volume of 100 µL. To fill the boiling point outer capillary, you can either use the supplied syringe or a pipette. Both procedures are described in this chapter.

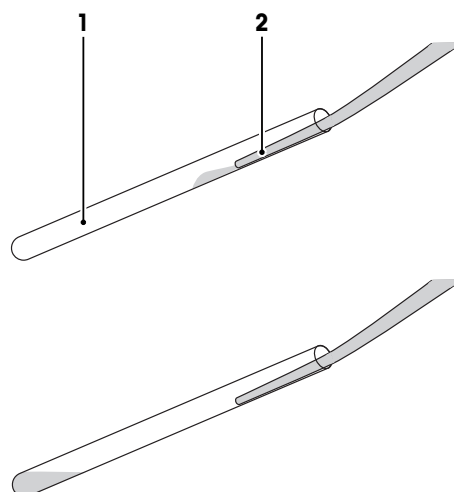
Fill the boiling point outer capillary using a syringe

- The solution used in the analysis is prepared.
 - The volume needed for the analysis is defined.
- 1 Fill the syringe with the defined volume of the solution.
 - 2 Insert the needle of the syringe (2) into the boiling point outer capillary so that it reaches all the way to the tip of the outer boiling point capillary (1).
 - 3 Inject the solution into the boiling point outer capillary.



Fill the boiling point outer capillary using a pipette

- The solution used in the analysis is prepared.
 - The volume needed for the analysis is defined.
 - A Pipet-Lite Pipette and a Tips GelWell pipette tip are available.
- 1 Fill the pipette tip with the defined volume of the solution.
 - 2 Insert the tip of the pipette (2) into the boiling point outer capillary (1) so that it touches the inner surface of the capillary.
 - 3 Slowly push one drop of the solution into the outer boiling point capillary and let it slide down to the bottom of the capillary.
 - ⇒ The inner surface of the capillary is coated with the solution, thus allowing for easier filling of the capillary and also minimizing the chance of air being trapped at the bottom of the capillary.
 - 4 Pipette the remaining solution into the boiling point outer capillary and let it slide down to the bottom of the capillary.



5.7.2 Run an analysis using a method

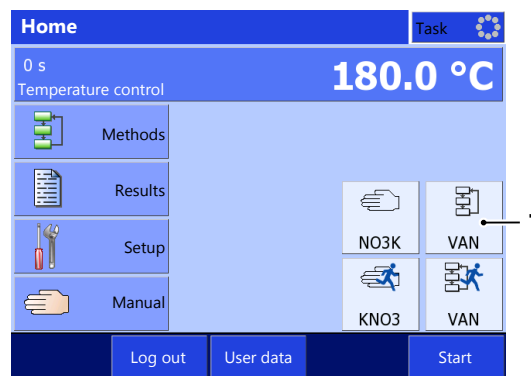
The following procedure shows you how to run an analysis using an indirect shortcut. The procedure is based on an example. Some steps may differ if the method you use is configured differently.

Aside from an indirect shortcut you can also start a method using a direct shortcut or the button **Methods** on the homescreen. Some differences are described after the example below.

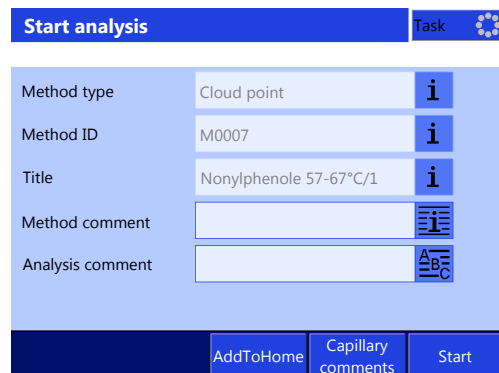
Start an analysis using an indirect shortcut

- At least one indirect shortcut of a method is defined.
- The samples are prepared.
- An SD card is inserted.

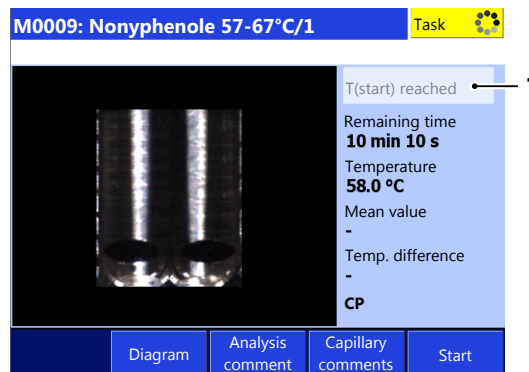
- 1 Select the indirect shortcut (1) of the method you want to run.
 - ⇒ The method window opens.



- 2 If needed, enter comments to the method.
- 3 Tap **Start**.
 - ⇒ The window **Start analysis** opens.
- 4 If needed, enter comments to the analysis or the samples.



- 5 Tap **Start**.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.
- 6 Wait until **T(start) reached** (1) is displayed.



- 7 Insert the samples.
- 8 Tap **Start**.
 - ⇒ The waiting time starts.
 - ⇒ The instrument performs the measurement.



- 9 Wait until the results are displayed.
- 10 **CAUTION Danger of burns due to hot capillaries**
Do not remove the capillaries until the instruments has cooled down or take care not to touch the tips of the capillaries you removed.
- 11 Let the samples cool down and dispose of them according to the safety data sheet of the substance that you measured.
- 12 Tap **Back**.
 - ⇒ The home screen opens.

Results			Task
Cap.	Cloud point	Status	
1	65.1 °C	included	
2	65.3 °C	included	
Mean value		65.2 °C	
Difference		0.2 °C	
Back	Print	Select analysis	Data Define outliers

Start the analysis using the button Methods

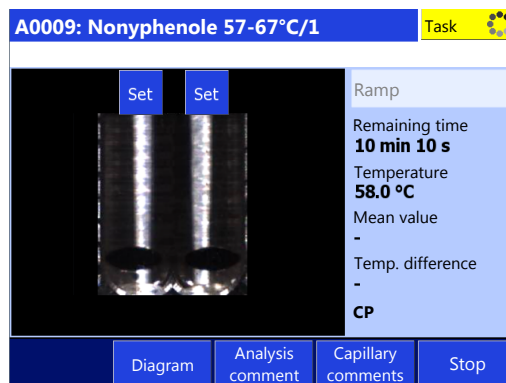
- 1 Go to **Home** > **Methods** and select the method you want to run.
 - ⇒ The method window opens.
- 2 Continue with step 2 of the procedure for an indirect shortcut.

Start the analysis using a direct shortcut

- 1 Go to **Home** and select the direct shortcut of the method you want to run.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.
- 2 Continue with step 6 of the procedure for an indirect shortcut.

Determine the cloud point manually

- The method is configured for manual determination of the cloud point.
 - You have started an analysis as described above.
 - The analysis window is open.
- 1 When the turbidity in a capillary has reached the desired value, tap the button **Set** of the capillary.
 - ⇒ The temperature for the cloud point is displayed below the capillary.
 - 2 Finish the analysis as described in the procedure for an indirect shortcut.



See also

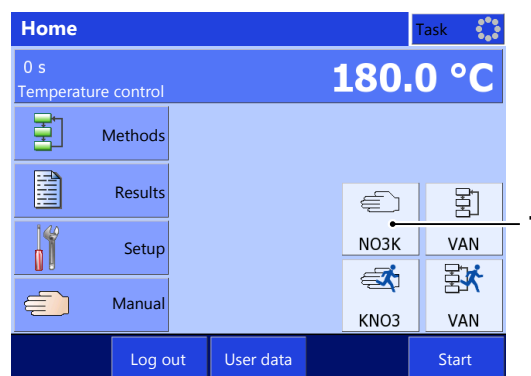
- 📄 Prepare samples ▶ Page 27
- 📄 Stop an analysis ▶ Page 36

5.7.3 Run an analysis using a manual method

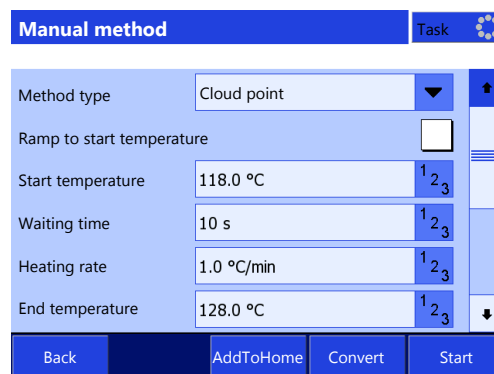
The following procedure shows you how to run an analysis using an indirect shortcut. The procedure is based on an example. Some steps may differ if the manual method you use is configured differently. Aside of an indirect shortcut you can also start a manual method using a direct shortcut or the button **Manual method**. Some differences are described after the example below.

Start the analysis using an indirect shortcut

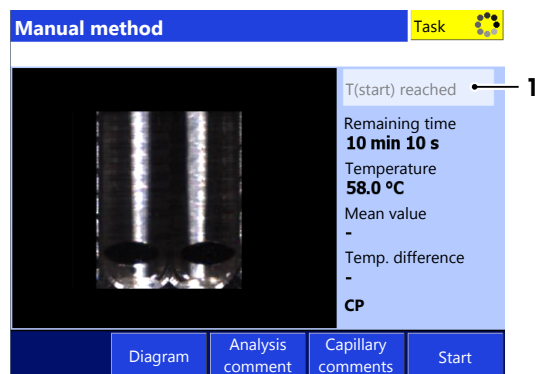
- At least one indirect shortcut of a manual method is defined.
 - The samples are prepared.
 - An SD card is inserted.
- 1 Select the indirect shortcut (1) of the manual method you want to run.
 - ⇒ The window **Manual method** opens.



- 2 If needed, enter comments to the method.
- 3 Tap **Start**.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.



- 4 If needed, enter comments to the analysis or the samples.
- 5 Wait until **T(start) reached** (1) is displayed.



- 6 Insert the samples.
- 7 Tap **Start**.
 - ⇒ The waiting time starts.
 - ⇒ The instrument performs the measurement.



- 8 Wait until the results are displayed.
- 9 **CAUTION Danger of burns due to hot capillaries**
Do not remove the capillaries until the instrument has cooled down or take care not to touch the tips of the capillaries you removed.
- 10 Let the samples cool down and dispose of them according to the safety data sheet of the substance that you measured.
- 11 Tap **Back**.
 - ⇒ The home screen opens.

Results			Task
Cap.	Cloud point	Status	
1	65.1 °C	included	
2	65.3 °C	included	
Mean value		65.2 °C	
Difference		0.2 °C	
Back	Print	Select analysis	Data Define outliers

Start the analysis using the button Manual method

- 1 Go to **Home** > **Manual** > **Manual method**.
 - ⇒ The window **Manual method** opens with the setting of the last manual method you started with the button **Manual method**.
- 2 Continue with step 2 of the procedure for an indirect shortcut.

Start the analysis using a direct shortcut

- 1 Go to **Home** and select the direct shortcut of the manual method you want to run.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.
- 2 Continue with step 4 of the procedure for an indirect shortcut.

See also

📄 Prepare samples ► Page 27

5.8 Determine slip melting points (MP80 only)

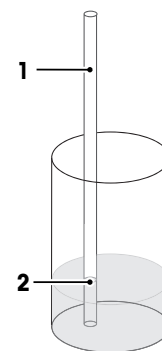
5.8.1 Prepare samples

The height of the sample influences the slip melting point. For this reason the sample height needs to be defined and constant. Most norms and standards require a height of 10 mm.

To fill the boiling point outer capillary, you can either use the supplied syringe or a pipette. Both procedures are described in this chapter.

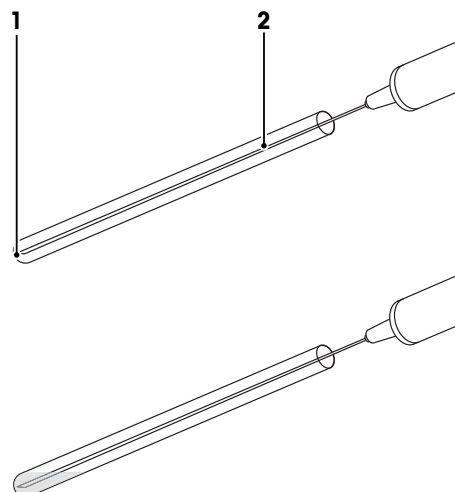
Fill the slip melting point inner capillary

- The substance used in the analysis can be melted.
 - The height of the sample needed for the analysis is defined.
- 1 Fill at least 10 mm of the substance that you want to analyse into an appropriate container.
 - 2 Heat the substance until it is melted.
 - 3 Insert the slip melting point inner capillary (1) into the substance until it reaches the mark indicating 10 mm (2) on the slip melting point inner capillary.
 - 4 Pull the slip melting point inner capillary out and let it cool down.
 - 5 When the substance has cooled down, check that the substance height is close to the mark indicating 10 mm (2) on the slip melting point inner capillary.



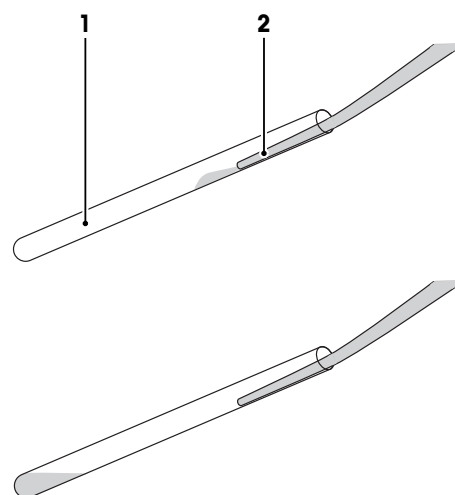
Fill the boiling point outer capillary using a syringe

- The solution used in the analysis is prepared.
 - The volume needed for the analysis is defined.
- 1 Fill the syringe with the defined volume of the solution.
 - 2 Insert the needle of the syringe (2) into the boiling point outer capillary so that it reaches all the way to the tip of the outer boiling point capillary (1).
 - 3 Inject the solution into the boiling point outer capillary.



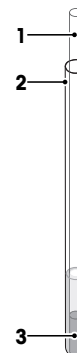
Fill the boiling point outer capillary using a pipette

- The solution used in the analysis is prepared.
 - The volume needed for the analysis is defined.
 - A Pipet-Lite Pipette and a Tips GelWell pipette tip are available.
- 1 Fill the pipette tip with the defined volume of the solution.
 - 2 Insert the tip of the pipette (2) into the boiling point outer capillary (1) so that it touches the inner surface of the capillary.
 - 3 Slowly push one drop of the solution into the outer boiling point capillary and let it slide down to the bottom of the capillary.
 - ⇒ The inner surface of the capillary is coated with the solution, thus allowing for easier filling of the capillary and also minimizing the chance of air being trapped at the bottom of the capillary.
 - 4 Pipette the remaining solution into the boiling point outer capillary and let it slide down to the bottom of the capillary.



Insert the slip melting point inner capillary into the boiling point outer capillary

- The slip melting point inner capillary is prepared.
 - The boiling point outer capillary is filled.
- 1 Insert the slip melting point inner capillary (1) with the sample (3) into the boiling point outer capillary (2).
 - 2 Carefully push the slip melting point inner capillary (1) down until it touches the bottom of the boiling point outer capillary.
 - ⇒ The level of the solution in the boiling point outer capillary is higher than the height of the sample (3).



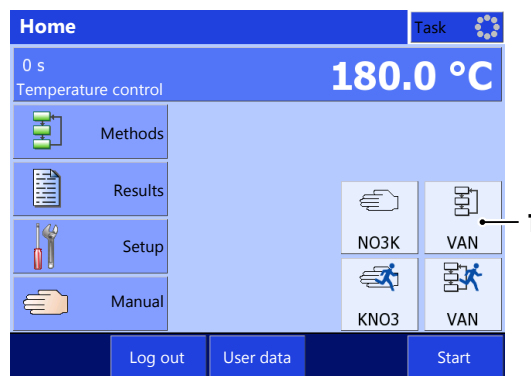
5.8.2 Run an analysis using a method

The following procedure shows you how to run an analysis using an indirect shortcut. The procedure is based on an example. Some steps may differ if the method you use is configured differently.

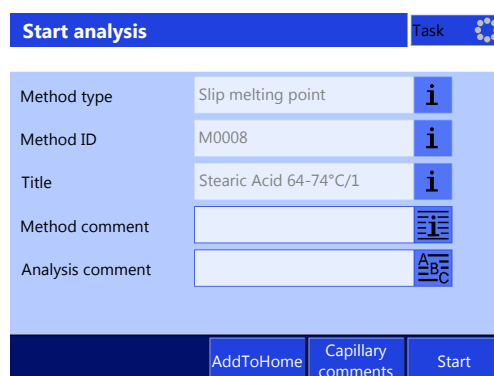
Aside from an indirect shortcut you can also start a method using a direct shortcut or the button **Methods** on the homescreen. Some differences are described after the example below.

Start an analysis using an indirect shortcut

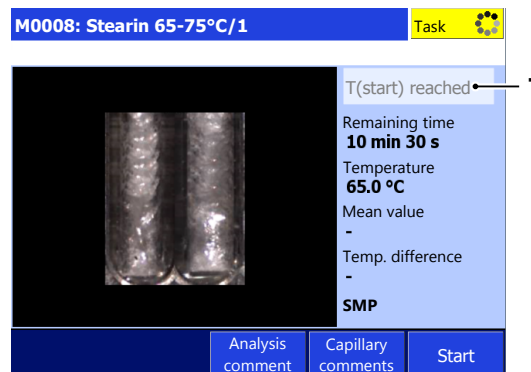
- At least one indirect shortcut of a method is defined.
 - The samples are prepared.
 - An SD card is inserted.
- 1 Select the indirect shortcut (1) of the method you want to run.
 - ⇒ The method window opens.



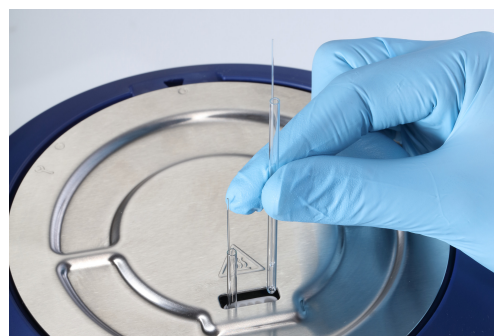
- 2 If needed, enter comments to the method.
- 3 Tap **Start**.
 - ⇒ The window **Start analysis** opens.
- 4 If needed, enter comments to the analysis or the samples.



- 5 Tap **Start**.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.
- 6 Wait until **T(start) reached** (1) is displayed.



- 7 Insert the samples.
- 8 Tap **Start**.
 - ⇒ The waiting time starts.
 - ⇒ The instrument performs the measurement.



- 9 Wait until the results are displayed.
- 10 **CAUTION Danger of burns due to hot capillaries**
Do not remove the capillaries until the instruments has cooled down or take care not to touch the tips of the capillaries you removed.
- 11 Let the samples cool down and dispose of them according to the safety data sheet of the substance that you measured.
- 12 Tap **Back**.
 - ⇒ The home screen opens.

Results			Task
Cap.	Slip melting point	Status	
1	70.1 °C	included	
2	70.3 °C	included	
Mean value		70.2 °C	
Difference		0.2 °C	
Back	Print	Select analysis	Data Define outliers

Start the analysis using the button Methods

- 1 Go to **Home > Methods** and select the method you want to run.
 - ⇒ The method window opens.
- 2 Continue with step 2 of the procedure for an indirect shortcut.

Start the analysis using a direct shortcut

- 1 Go to **Home** and select the direct shortcut of the method you want to run.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.
- 2 Continue with step 6 of the procedure for an indirect shortcut.

Manual determination of the slip melting point

- The method is configured for manual determination of the slip melting point.
 - You have started an analysis as described above.
 - The analysis window is open.
- 1 When the substance in a capillary starts to move, tap the **Set** button of the capillary.
 - ⇒ The temperature for the slip melting point is displayed below the capillary.
 - 2 Finish the analysis as described in the procedure for an indirect shortcut.

See also

- 📄 Prepare samples ▶ Page 31
- 📄 Stop an analysis ▶ Page 36



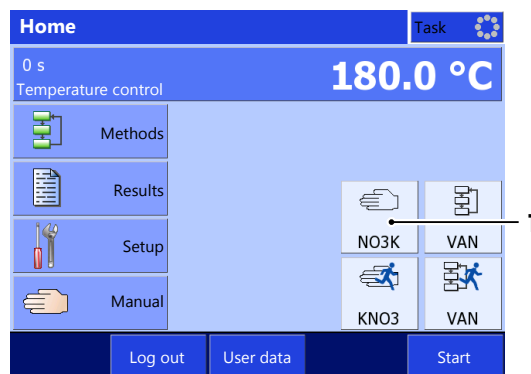
5.8.3 Run an analysis using a manual method

The following procedure shows you how to run an analysis using an indirect shortcut. The procedure is based on an example. Some steps may differ if the manual method you use is configured differently.

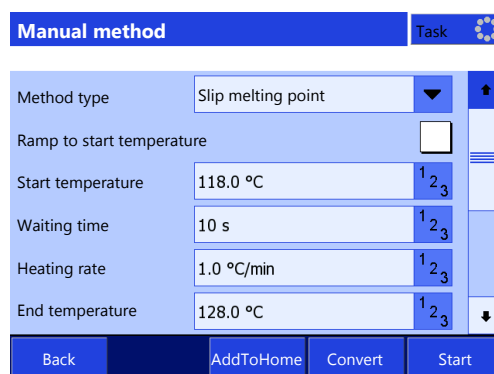
Aside of an indirect shortcut you can also start a manual method using a direct shortcut or the button **Manual method**. Some differences are described after the example below.

Start the analysis using an indirect shortcut

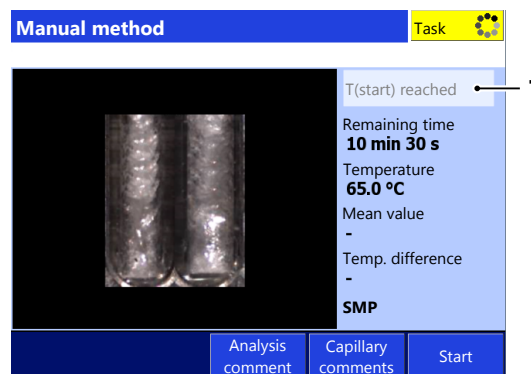
- At least one indirect shortcut of a manual method is defined.
 - The samples are prepared.
 - An SD card is inserted.
- 1 Select the indirect shortcut (1) of the manual method you want to run.
 - ⇒ The window **Manual method** opens.



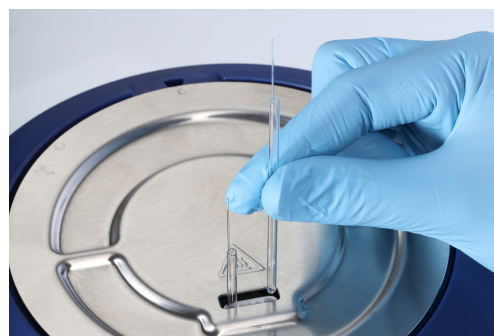
- 2 If needed, enter comments to the method.
- 3 Tap **Start**.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.



- 4 If needed, enter comments to the analysis or the samples.
- 5 Wait until **T(start) reached** (1) is displayed.



- 6 Insert the samples.
- 7 Tap **Start**.
 - ⇒ The waiting time starts.
 - ⇒ The instrument performs the measurement.



- 8 Wait until the results are displayed.
- 9 **CAUTION Danger of burns due to hot capillaries**
Do not remove the capillaries until the instruments has cooled down or take care not to touch the tips of the capillaries you removed.
- 10 Let the samples cool down and dispose of them according to the safety data sheet of the substance that you measured.
- 11 Tap **Back**.
 - ⇒ The home screen opens.

Results			Task
Cap.	Slip melting point	Status	
1	70.1 °C	included	
2	70.3 °C	included	
Mean value		70.2 °C	
Difference		0.2 °C	
Back	Print	Select analysis	Data Define outliers

Start the analysis using the button Manual method

- 1 Go to **Home > Manual > Manual method**.
 - ⇒ The window **Manual method** opens with the setting of the last manual method you started with the button **Manual method**.
- 2 Continue with step 2 of the procedure for an indirect shortcut.

Start the analysis using a direct shortcut

- 1 Go to **Home** and select the direct shortcut of the manual method you want to run.
 - ⇒ The analysis window opens.
 - ⇒ The instrument heats up to the start temperature.
- 2 Continue with step 4 of the procedure for an indirect shortcut.

See also

📄 Prepare samples ► Page 31

5.9 Stop an analysis

If you stop a running analysis, you still have the opportunity to save the results up to the point of interruption.

- An analysis is running in the analysis window.
- 1 Tap **Stop** or press the key **Reset**.
 - ⇒ The analysis is interrupted.
 - ⇒ The message **Do you want to stop the analysis?** is displayed.
- 2 To stop the analysis, tap **Yes**.
 - ⇒ The analysis is stopped.
 - ⇒ The message **Do you want to save the results?** is displayed.
- 3 To save and print the results, tap **Yes**.
 - ⇒ The results are save and printed according to you setting.
- 4 If you do not want to save the results, tap **No**.
 - ⇒ The homescreen opens.

6 Maintenance

In this chapter you find descriptions of the maintenance tasks you should perform on your instrument. Any other maintenance tasks need to be performed by a service technician that has been qualified by METTLER TOLEDO.

Do not open the housing of the instrument; it does not contain any parts that can be maintained, repaired or replaced by the user. If you experience problems with your instrument, contact your authorized METTLER TOLEDO dealer or service representative.

METTLER TOLEDO recommends that a preventive maintenance and calibration certification is done at least once a year through your authorized METTLER TOLEDO dealer or service representative.

► www.mt.com/contact

6.1 Maintenance schedule

Note

If the standard operating procedures of your company require other maintenance intervals, use the intervals of the standard operating procedures.

Frequency	Task	Link
Daily	Switch the furnace off at the end of the work day	[Switch the furnace power off ► Page 41]
Weekly	Clean housing and control panel	[Clean the housing and control panel ► Page 39]
	Check transmitted light holes	[View the inside of the furnace ► Page 42]
Monthly	Check the temperature accuracy of the instrument	[Check the temperature accuracy of the instrument ► Page 41]

6.2 Clean the instrument



CAUTION

Danger of injuries due to hot surfaces

If the instrument is accidentally turned on during the cleaning, hot surfaces can cause burns.

- 1 Before you clean the instrument, shut down the instrument and disconnect the power cable.
- 2 Before you clean the instrument, make sure the instrument has cooled off to room temperature.



NOTICE

Danger of damage to the instrument due to inappropriate cleaning methods!

Attempts to remove debris from the camera lens can damage the camera lens.

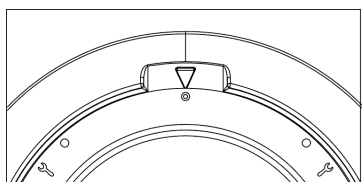
- If debris is on the camera lens, contact your authorized METTLER TOLEDO dealer or service representative.

Markings on the lid

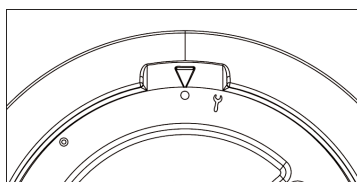
The metal lid has 3 different markings on it. Each marking indicates the possibility of specific operations.

- **Filled circle:** You can insert capillaries into the capillary guide.
- **Open circle:** The furnace is protected and you cannot insert capillaries into the capillary guide.
- **Wrench:** The metal lid can be removed for cleaning and servicing.

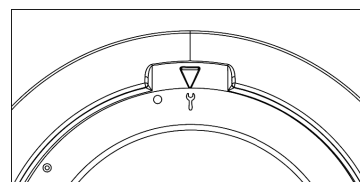
Lid markings and positions



Filled circle position



Open circle position



Wrench position

6.2.1 Clean the housing and control panel

To keep the instrument looking good and functioning properly, clean the housing and control panel as needed.

- The instrument is switched off and disconnected from the power supply.
 - The instrument has cooled off to room temperature.
 - All samples have been removed.
- 1 Remove any loose particles from the housing and control panel with a fine brush.
 - 2 Turn the metal lid to the ○ position.
 - ⇒ No cleaning agent can enter the instrument.
 - 3 Moisten a soft cloth with water and a mild detergent.
 - 4 Clean the housing with the soft, slightly moist cloth.
 - 5 Dry off any residual moisture.
 - 6 Turn the metal lid to the ● position.
 - 7 Reconnect the instrument to the power supply and switch on the instrument.
- ⇒ The instrument housing is clean and the instrument ready for your next analyses.

6.2.2 Clean the insulation glass, the capillary guide and the transmitted light holes

To prevent false readings, the insulation glass should be checked regularly and cleaned as needed. Particles and smudges on the insulation glass can block the light, cause bothersome spots in the pictures or cause false readings.

Clean the insulation glass, if the light does not appear homogeneous and bright for all holes.

Occasionally, tiny particles can fall into the capillary guide or glass splitters of broken capillaries can remain in the capillary guide. This debris can either result in black spots in the videos or prevent adequate light exposure for the substances under investigation. In most cases, you can remove this debris.

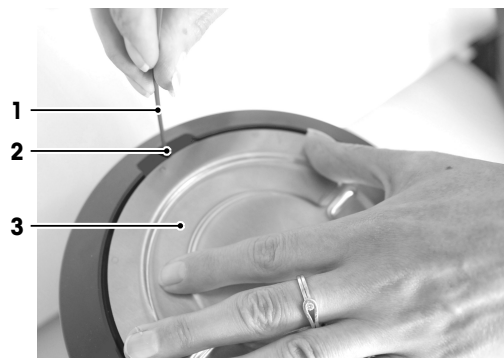
The following chapters describe how to remove and reinstall the insulation glass and the capillary guide and how to clean the parts.

See also

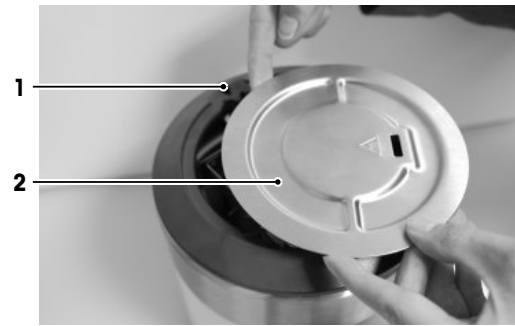
📖 View the inside of the furnace ► Page 42

6.2.2.1 Remove insulation glass and capillary guide

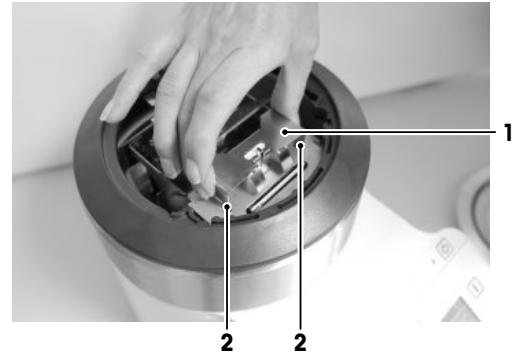
- The instrument has shut down and is disconnected from the power supply.
 - The instrument has cooled off to room temperature.
 - All whole capillaries are removed.
- 1 Gently press the release latch inside the opening (2) with a long object (1) such as a screw driver and turn the lid (3) to ☞.
- ⇒ The lid pops up slightly.



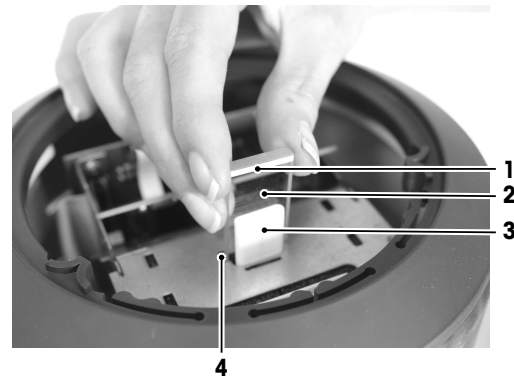
- 2 Lift out the screw driver and insert your finger in the recess (1) at the top of the measuring cell and lift off the lid (2) with two hands.



- 3 Gently press the clamping plate (1) between your thumb and fingers.
⇒ This loosens the 4 small hooks (2) on either side of the clamping plate.
- 4 Lift off the clamping plate.



- 5 Lift the insulation glass (2) carefully out of the recess (4).
- 6 Lift the capillary guide (3) carefully out of its recess.



6.2.2.2 Clean the insulation glass

- The insulation glass has been removed.
- 1 Moisten a soft cloth with water and a mild detergent.
- 2 Clean the insulation glass with the soft, slightly moist cloth.
- 3 Dry the insulation glass so that no humidity enters the instrument.

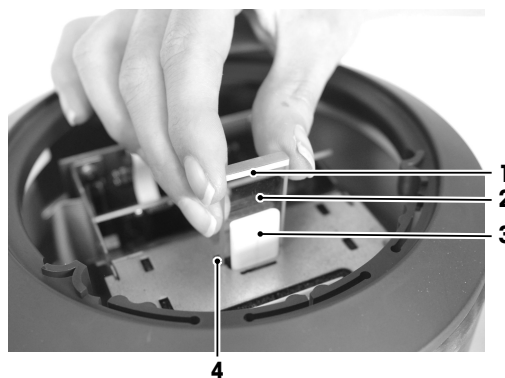
6.2.2.3 Clean the capillary guide and transmitted light holes

- The insulation glass and the capillary guide have been removed.
- You can dislodge and remove debris or broken capillaries from the transmitted light holes in several ways:
 - Turn the instrument upside down and gently shake out the particles.
 - Use a very thin cleaning wire to lift out the particles.
 - Use a syringe with a needle to crush the particles and aspirate them into the syringe.

6.2.2.4 Reinstall insulation glass and capillary guide

- The instrument is switched off and the power cable is disconnected.
- The instrument has cooled off to room temperature.

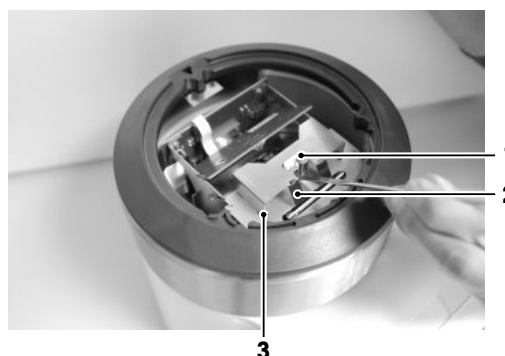
- 1 Carefully place the capillary guide (3) into its recess.
- 2 Orient the insulation glass so that the white bar (1) faces toward the capillary guide (3).
- 3 Carefully place the insulation glass (2) into the recess (4) behind the capillary guide (3).



- 4 Orient the clamping plate so that the two tongues (2) look towards the control panel.
- 5 Lower the clamping plate and make sure that the slot fits (1) over the capillary guide.
- 6 **NOTICE Danger of damage to the instrument due to improperly inserted clamping plate**
Push the clamping plate down, making sure the 4 small metal hooks fit back into the respective openings (3).

- 7 Replace the metal lid and turn it to ○ or to ⊗.
- 8 Reconnect the power cable and switch on the instrument.

⇒ The instrument is ready for your next analyses.



6.3 Switch the furnace power off

- No analysis is running.
- The furnace temperature control is switched on.

- 1 Go to **Home > Manual**.

- 2 Tap **Furnace power off**.

⇒ The furnace power is switched off.

⇒ The button **Furnace power off** becomes inactive.

⇒ The measuring cell cools down to room temperature without an active fan.

6.4 Check the temperature accuracy of the instrument

To check if the temperature accuracy of your instrument is still within the specified tolerance limits, you need to perform a calibration. To perform a calibration, you run a melting point method for a reference substance and compare the results with the values on the Certificate of Analysis of the reference substance.

Perform the calibration

- A calibration method for the relevant reference substance is available.

- 1 Run an analysis using the appropriate calibration method.

⇒ A message is displayed at the end of the analysis informing you whether or not the calibration results are within the tolerance limits specified for the particular calibration substance.

- 2 Tap **OK** to confirm the message.

- 3 If the calibration results are not within the tolerance limits, inform the person responsible for the adjustment of the instrument.

See also

- 📖 Run an analysis using a method ► Page 19

6.5 View the inside of the furnace

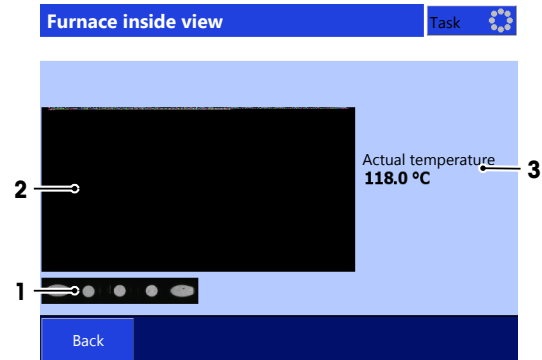
You can view a live video of the inside of the furnace to check the currently reflected light (2) and transmitted light (1). If any of the holes for the transmitted light are clogged, this is noticeable in the lower image (1). In this case you must clean the holes.

- No analysis is running.

1 Go to **Home > Manual**.

2 Tap **Furnace inside view**.

⇒ The window shows the transmitted light (1), the reflected light (2) and the furnace temperature (3).



See also

📖 Clean the insulation glass, the capillary guide and the transmitted light holes ► Page 39

6.6 Prepare the instrument for storage

If you do not use the instrument for a longer period of time, you should do the following:

- 1 Remove all samples.
- 2 Shut down the instrument.
- 3 Disconnect the instrument from the power supply.
- 4 Turn the lid to the ○ position to protect the instrument.
- 5 Clean the instrument.

6.7 Transport the instrument

If you have questions about transporting your instrument, contact your authorized METTLER TOLEDO dealer or service representative.

► www.mt.com/contact

Note

When you send or transport the instrument over long distances, please use all of the original packing material and shipping carton.

- 1 Remove all samples.
- 2 Shut down the instrument.
- 3 Disconnect the instrument from the power supply.
- 4 Disconnect any accessories like keyboard and mouse.
- 5 To prevent the capillary guide from falling out of the instrument, turn the metal lid to ○.
- 6 Clean the instrument.
- 7 Move the instrument to the new location.

See also

📖 Clean the instrument ► Page 38

6.8 Dispose of the instrument

In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.



7 Technical data

7.1 Instrument

Characteristic		Value
Power rating instrument	Input values	24 V DC $\pm 5\%$, 5 A
	Connector type	4-pin, power Mini-DIN female
Power rating AC adapter	Input values	100...240 V AC, 1.8 A $\pm 10\%$
	Input frequency	50 - 60 Hz
	Output values	24 V DC, 5 A
Dimensions	Width	180 mm
	Depth	350 mm
	Height	190 mm
	Weight	4000 g
Display	Technology	VGA color with touch screen
	Size	5.7" VGA
Materials	Housing	Crastin® PBT
	Measuring cell	Stainless steel
	Chassis	Stainless steel
	Protective film (touch screen)	PET
Ambient conditions	Ambient temperature	10...35 °C
	Relative humidity	Noncondensing, max. 80 % for temperatures up to 31 °C, decreasing linearly to 50 % at 40 °C
	Altitude	Up to 2000 m above sea level
	Use	Interior spaces
	Pollution degree	2
	Overvoltage category	II

Directives and standards

Directives and standards complied with are listed on the declaration of conformity and on the internet <http://www.mt.com/mpdp-norms>.

To protect your product's future:

METTLER TOLEDO Service assures the quality, measuring accuracy and preservation of value of this product for years to come.

Please request full details about our attractive terms of service.

www.mt.com/mpdp

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