

# *StabNet*



## Tutorial

8.0103.8008EN / v1 / 2023-02-21





Metrohm AG  
CH-9100 Herisau  
Switzerland  
+41 71 353 85 85  
info@metrohm.com  
www.metrohm.com



2.x

**Tutorial**

This documentation is protected by copyright. All rights reserved.

This documentation has been prepared with great care. However, errors can never be entirely ruled out. Please send comments regarding possible errors to the address above.

### **Disclaimer**

Deficiencies arising from circumstances that are not the responsibility of Metrohm, such as improper storage or improper use, etc., are expressly excluded from the warranty. Unauthorized modifications to the product (e.g. conversions or attachments) exclude any liability on the part of the manufacturer for resulting damage and its consequences. Instructions and notes in the Metrohm product documentation must be strictly followed. Otherwise, Metrohm's liability is excluded.

# Table of contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Structure of the tutorial .....	1
1.2	Program description .....	1
1.3	Symbols and conventions .....	2
<b>2</b>	<b>Simple determination</b>	<b>4</b>
2.1	Configuration .....	4
2.1.1	Starting the software .....	4
2.1.2	Configuring the device .....	5
2.2	Creating a method .....	6
2.2.1	Creating a new method .....	7
2.2.2	Testing a method for plausibility .....	11
2.2.3	Saving a method .....	11
2.3	Preparing the determination .....	11
2.3.1	Mounting the measuring vessel cover .....	12
2.3.2	Preparing a sample .....	13
2.3.3	Mounting the reaction vessel cover .....	15
2.4	Carrying out a determination .....	16
2.4.1	Assigning a workplace .....	17
2.4.2	Carrying out the determination .....	18
2.4.3	Modifying sample data live .....	20
<b>3</b>	<b>Determination with advanced functions</b>	<b>22</b>
3.1	Measuring with calibrated conductivity sensors .....	22
3.1.1	Configuration .....	22
3.1.2	Creating a method .....	24
3.1.3	Assigning a workplace .....	25
3.1.4	Carrying out the determination .....	25
3.2	Using "auto" temperature correction .....	27
3.2.1	Configuration .....	28
3.2.2	Creating a method .....	29
3.2.3	Assigning a workplace .....	30
3.2.4	Carrying out the determination .....	30
<b>4</b>	<b>Editing determinations</b>	<b>33</b>
4.1	Viewing determinations .....	33
4.2	Viewing curves .....	39
4.3	Reprocessing determinations .....	42
4.4	Extrapolation .....	50
4.4.1	Extrapolating the induction time .....	50

4.5	Editing a report template .....	52
4.6	Printing a determination report .....	55
<b>Index</b>		<b>57</b>

# 1 Introduction

## 1.1 Structure of the tutorial

The present tutorial guides you through your first steps using the **StabNet** software. You will be introduced to the most important controls based on a determination of the induction time of oils and fats using an 892 Professional Rancimat or 893 Professional Biodiesel Rancimat and the determination of the stability time of PVC using an 895 Professional PVC Thermomat.

The tutorial is arranged in three parts:

- Carrying out a simple determination
- Carrying out a determination with advanced functions
- Editing a determination and printing a report

## 1.2 Program description

**StabNet** comprises the following program parts:

### Workplace



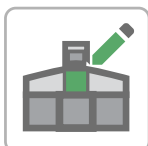
- Opening workplaces, selecting methods
- Entering sample data
- Starting single determinations and statistically linked determinations
- Displaying live curves

### Database



- Opening/closing databases
- Managing determinations
- Reprocessing determinations
- Creating reports

### Method



- Creating a new method
- Editing an existing method
- Managing methods
- Result definition






## Configuration



- Configuration of devices, sensors, temperature coefficients and accessories
- User administration
- Security settings
- Program administration
- Audit Trail

### 1.3 Symbols and conventions

The following symbols and formatting may appear in this documentation:

(5-12)	<b>Cross-reference to figure legend</b> The first number refers to the figure number, the second to the instrument part in the figure.
1	<b>Instruction step</b> Perform the steps one after the other.
Method	<b>Dialog text, parameter</b> in the software
File ► New	Menu or menu item
[Continue]	<b>Button</b> or <b>key</b>
	<b>WARNING</b> This symbol draws attention to a possible life-threatening hazard or risk of injury.
	<b>WARNING</b> This symbol draws attention to a possible hazard due to electrical current.
	<b>WARNING</b> This symbol draws attention to a possible hazard due to heat or hot instrument parts.
	<b>WARNING</b> This symbol draws attention to a possible biological hazard.
	<b>WARNING</b> Warning of optical radiation





## NOTICE

■■■■■■■ **3**

## 2 Simple determination

You will be introduced to the basics of **StabNet** in this chapter.

- Configuring the instrument
- Creating, testing and saving a method
- Preparing the determination
- Carrying out the determination
- Modifying sample data live

## 2.1 Configuration

Metrohm devices connected to the PC via a USB connector are detected automatically when the program starts.

All devices, sensors, temperature coefficients and accessories used in a method and at the workplace are defined in the **Configuration** program part. The definition of the device is enough for carrying out a simple determination. The following Metrohm instruments are detected automatically when the program starts:

- 892 Professional Rancimat
- 893 Professional Biodiesel Rancimat
- 895 Professional PVC Thermomat

Sensors (conductivity and temperature sensors), temperature coefficients (Arrhenius and  $Q_{10}$ ) and accessory parts must be created manually. However, this is necessary only if one of the advanced functions is to be used (*see chapter 3, page 22*).

### 2.1.1 Starting the software



## NOTICE

Instruments are detected automatically and can be monitored by **Stab-Net**.

Proceed as follows to start the **StabNet** program:

- 1 Click on the **StabNet** icon on the desktop.
- 2 Enter a user name and password (if defined) and click on **[OK]**.



- 3 Click on the **[Configuration]** icon.

The dialog for the **Configuration** program part opens. A total of four subwindows can be displayed:

**Devices**

Shows the automatically detected devices.

**Sensors**

Display of data for all defined conductivity and temperature sensors.

**Temperature coefficients**

Display of Arrhenius and  $Q_{10}$  temperature coefficients.

**Accessory**

Display of the detected accessories.

### 2.1.2 Configuring the device

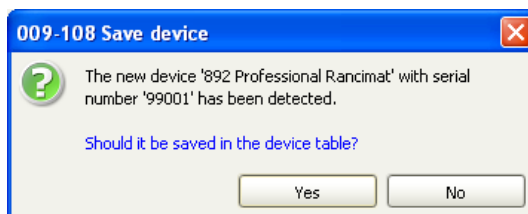
Proceed as follows if you are starting the instrument for the first time:

- 1 **Connecting the device**

Connect the device to the PC using a USB cable.

- 2 **Switching on the device**

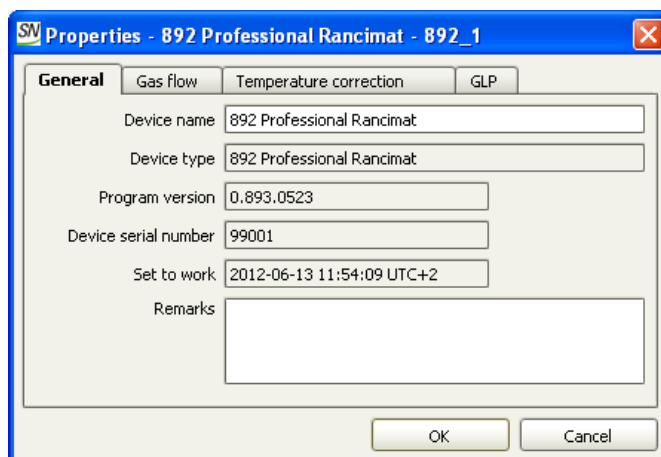
The parameters of the instrument are detected automatically.



- 3 **Saving the device in the table**

Confirm the message with **[Yes]**.

The **Properties** dialog window opens.



#### 4 Enter the instrument name

On the **General** tab in the **Device name** field, enter a name for the instrument and close the dialog window with **[OK]**.

The instrument name is used for identifying the instrument. It is also shown on the device display.

## 5 Selecting columns (optional)

- Open the **Column display** dialog window in the **Devices** sub-window using the **Edit ► Column display...** menu.
- Select a column in the **Columns available** area.
- Move the selected column to the **Columns displayed** area using the **»** button.

The column is shown in the device table.

## 2.2 Creating a method

A method comprises all parameters for carrying out and evaluating a determination. These include:

- Measuring parameters (temperature, gas flow)
- Parameters for evaluating the measurement curve and the result to be calculated

The creation of a method capable of being run using a predefined method template is described in this chapter.

### 2.2.1 Creating a new method

Proceed as follows to create a method:



1 Click on the icon of the **Method** program part.

2 Open the **New method** dialog using the **File ► New...** menu.

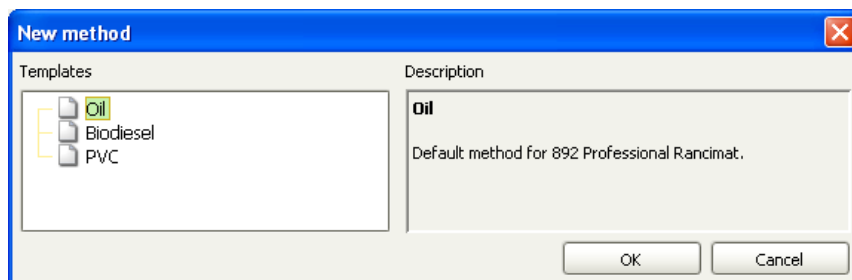


Table 1 Method template parameters

	Oil	Biodiesel	PVC
Sample temperature	120 °C	110 °C	200 °C
Temperature correction	1.6 °C	0.9 °C	0.8 °C
Gas flow	20 L/h	10 L/h	7 L/h
Stop criteria	Endpoint(s)	Endpoint(s)	Endpoint(s)
Evaluate induction time	yes	yes	no
Evaluation sensitivity	1.0	1.0	—
Evaluate stability time	No	No	Yes
Conductivity change	—	—	50 µS/cm

3 Under **Templates**, on the left part of the window, highlight the **Oil** method template and confirm with **[OK]**.

The method template opens.

- 4** If necessary, adjust the specifications of the selected method template to the application document (national and international standard, Metrohm Application Bulletin or work) accordingly in the **Measuring parameters**, **Evaluation** and **Properties** subwindows.

## Adjusting measuring parameters

The measuring parameters can be adjusted in the **Measuring parameters** subwindow.

[illegible]

The parameters critical for the end result are **Sample temperature**, **Temperature correction** and **Gas flow**. Take **Sample temperature** and **Gas flow** from the corresponding application document. *Table 2* and *Table 3* provide an overview of the relationship between **Temperature correction** and selected **Sample temperature** and **Gas flow**. The values given in the table are approximate values. More precise work is possible using the **Temperature correction "auto"** (see chapter 3.2, page 27).

The **Start options** affect the start of data recording. The **Stop criteria** define the end of data recording. Here the **Endpoint(s)** parameter relates to the **Induction time** and **Stability time** parameters defined under **Evaluation**.

The use of calibrated conductivity sensors is enabled under **Sensors** (see chapter 3.1, page 22).

Sample temperature (°C)	Temperature correction value (°C) for gas flow = 10 L/h	Temperature correction value (°C) for gas flow = 20 L/h
80	0.7	1.1
90	0.8	1.3
100	0.8	1.4
110	0.9	1.5
120	1.0	1.6
130	1.1	1.7
140	1.1	1.8
150	1.2	1.9
160	1.2	2.0

Sample temperature (°C)	Temperature correction value (°C) for gas flow = 7 L/h
160-200	0.8


The evaluation of **Induction time** and **Stability time** can be enabled in the **Parameters** area of the **Evaluation** subwindow. The evaluation contains both the evaluation of the curve with the configured parameters and the output of the **Induction time** and/or **Stability time** result to the database. Optionally, the **Standard time** can be calculated from the **Induction time** (see chapter 4.4, page 50). Additional result calculations are not normally required.





### 2.2.2 Testing a method for plausibility

Proceed as follows to test the method for plausibility before saving:

- 1 Click on the **File ► Method check** menu or the  symbol.
- 2 Confirm the message with **[OK]**.  
Correct any errors.

### 2.2.3 Saving a method

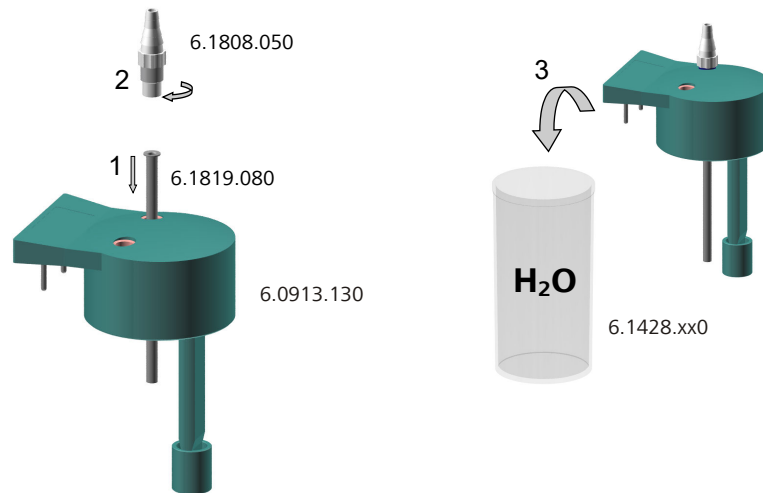
Save the method as follows:

- 1 Open the **Save method** dialog using the **File ► Save as** menu.
- 2 In the **Method name** field, enter a name for the method.
- 3 Click on **[Save]**.

## 2.3 Preparing the determination

The cleanliness of instrument and accessories parts is an indispensable prerequisite for **reliable, reproducible and correct analysis results**. Even the slightest contamination could catalytically accelerate the oxidative decomposition and lead to completely incorrect results. Therefore, always observe the instructions for use of measuring and reaction vessels in this section.

### 2.3.1 Mounting the measuring vessel cover



Proceed as follows to mount the measuring vessel cover:

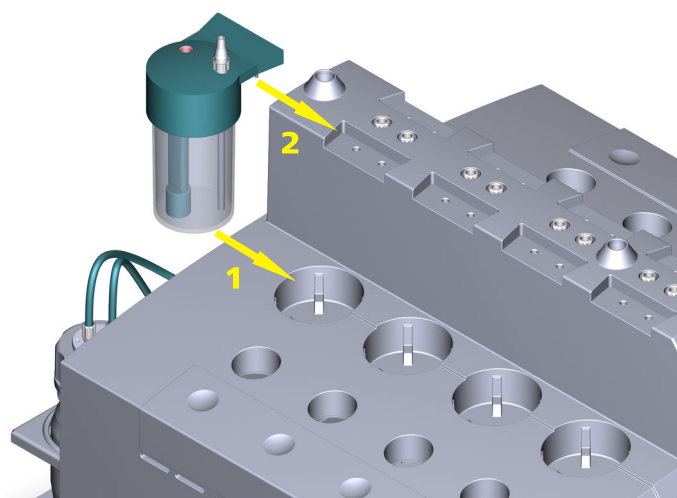
- 1 Insert the 6.1819.080 PTFE tubing from above into the **In** opening of the 6.0913.130 measuring vessel cover.
- 2 Screw the 6.1808.050 M8/olive tubing adapter into the **In** opening of the 6.0913.130 measuring vessel cover.
- 3 Place the measuring vessel cover with the built-in conductivity measuring cell on the measuring vessel filled with distilled water. The type of measuring vessel depends on the scope of delivery for your instrument.



## NOTICE

Given the chemical resistance, a 6.1428.030 measuring vessel made of clear glass has to be used instead of a 6.1428.100 measuring vessel made of polystyrene when measuring biodiesel.

4



Insert the measuring vessel into the opening (1) provided for this purpose in the instrument. While doing so, carefully guide the connector plug for the measuring vessel cover into the electrode connector (2).

## 2.3.2 Preparing a sample



### NOTICE

Use **new reaction vessels and air tubes** for each measurement. Blow the reaction vessels out with nitrogen before use. This removes particles that act as catalysts and cause undesired side reactions.

### Liquid samples (e.g. vegetable oil or biodiesel)

Prepare the sample as follows:

- 1 Place the reaction vessel on a scale using a 6.2628.000 holder for a reaction vessel.
- 2 Weigh the sample material directly in the reaction vessel. Normally, **3 g** of sample material are used for vegetable oils and **7.5 g** for bio-diesel.

### Solid, meltable samples (e.g. vegetable fat)

Prepare the sample as follows:

- 1 Place the reaction vessel on a scale using a 6.2628.000 holder for a reaction vessel.
- 2 Weigh the sample material directly in the reaction vessel and ensure that the majority of the sample is in the bottom 5 cm of the reaction vessel. Normally, **3 g** of sample material are used for vegetable fat.

### Solid samples (e.g. PVC)

Prepare the sample as follows:

- 1 Place the reaction vessel on a scale using a 6.2628.000 holder for a reaction vessel.
- 2 If necessary, break the sample material into smaller pieces and weigh it directly in the reaction vessel. Normally, **0.5 g** of sample material is used for PVC.

### Samples that cannot be measured directly

Samples containing fat, such as sausages or mayonnaise, cannot be measured directly, but the fats and oils they contain can be used as described above once they are extracted. Please refer to the application documents (Metrohm Application Bulletin or work) for the respective sample preparation.

### 2.3.3 Mounting the reaction vessel cover

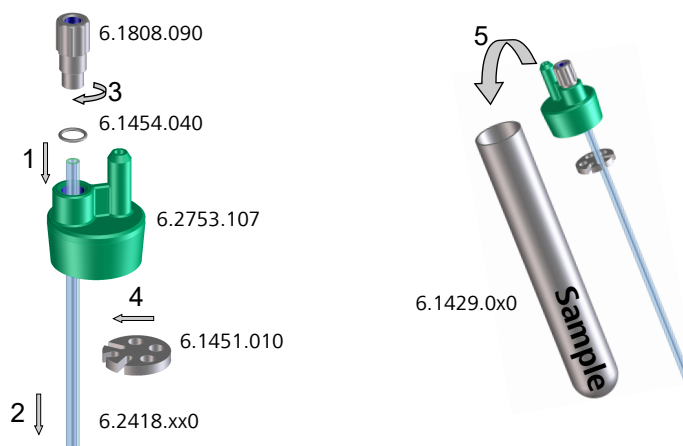


Table 4 Examples for the combination of a reaction vessel + air tube

Sample	Reaction vessel	Air tube
Vegetable oil	6.1429.040	6.2418.100
Biodiesel (according to EN 15751)	6.1429.050	6.2418.130
PVC	6.1429.040	6.2418.120

Proceed as follows to mount the reaction vessel cover:

- 1 Place the 6.1454.040 O-ring over the upper end of the air tube.
- 2 Feed the 6.2418.xx0 air tube into the connection of the 6.2753.107 reaction vessel cover from above.
- 3 Gently screw the 6.1808.090 M8/M6 thread adapter into the connection and, at the same time, press the air tube against the thread adapter. Then fix the air tube onto the reaction vessel cover by firmly tightening the thread adapter.
- 4 *Optional:* If determinations are being carried out with highly foaming samples, clamp the 6.1451.010 foam barrier onto the air tube.



## NOTICE

The foam barrier can melt if it projects too deeply into the heating block.

Ensure that the foam barrier is **at least 7 cm** above the base of the reaction vessel.

- 5** Place the reaction vessel cover on the reaction vessel.



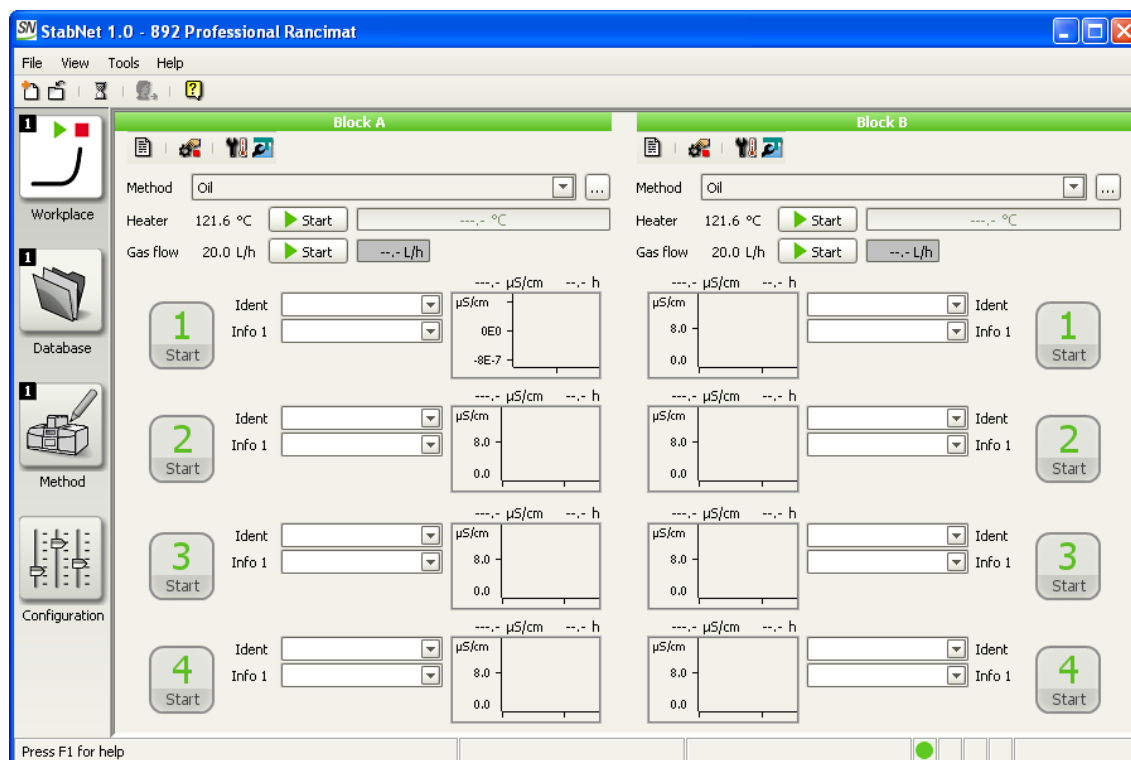
Place the prepared reaction vessel in the 6.2041.190 reaction vessel holder.

## 2.4 Carrying out a determination

You will learn the following in this chapter:

- How to assign a workplace to an instrument
- How to run a standard method
- How to change sample data in real time

These steps are performed in the **Workplace** program part.



### 2.4.1 Assigning a workplace

Proceed as follows to assign a workplace to an instrument:



- 1 Click on the **Workplace** icon.
- 2 Open the **New workplace** dialog window using the **File ► Workplace ► New...** menu.
- 3 Select the name for the instrument in the **Device name** field.
- 4 In the **Color** field, select a color for the title bar of the subwindow and the status icon of the newly opened workplace on the status bar.
- 5 Confirm with **[OK]**.

### 2.4.2 Carrying out the determination


Proceed as follows to carry out a determination at position **A1** (the procedure is the same for other positions in block **A** and block **B**):

## 1 Selecting a method

Click on the  symbol under **Block A** in the **Method** field and select a method name for block **A**.

Methods with different temperatures can be selected for Block A and Block B when measuring on both blocks.

## 2 Starting the heater

Under **Block A**, click the  button for the heater.

After the heater has been switched on, the current heating block temperature is indicated by a red progress bar.

Heating period to 120 °C: approx. 45 min.

Heating period to 200 °C: approx. 60 min.

### 3 Entering sample identification

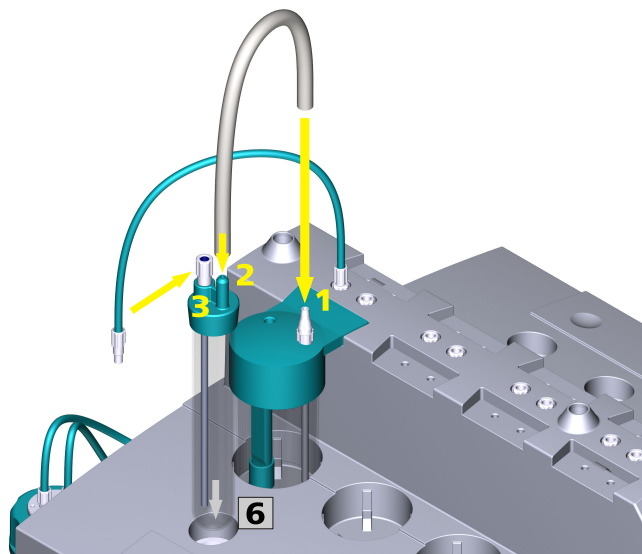
Enter the name of the sample in the **Ident** field for sample identification.

#### 4 Entering sample information (optional)

Enter additional information about the sample in the **Info #** fields.



## 5 Connecting reaction vessels



- (1) Connect the 6.1816.010 white silicone tubing (for the 892 Professional Rancimat and 895 Professional PVC Thermomat) or the 6.1839.000 black Iso-Versinic® tubing (893 Professional Bio-diesel Rancimat) to the measuring vessel cover's M8/olive tubing adapter.
- (2) Connect the white silicone tubing or the Iso-Versinic® tubing fastened to the measuring vessel cover to the reaction vessel's tubing connector.
- (3) Screw the 6.1805.080 250 mm FEP tubing fastened to the Rancimat's connector to the 6.2753.107 reaction vessel cover's M8/M6 thread adapter.

## 6 Inserting reaction vessels



### NOTICE

The temperature defined in the method has to be reached before you insert the reaction vessels, i.e. the progress bar has to be **green**.

- Seal the unused positions with stoppers or empty reaction vessels for protection against impurities.
- Insert the prepared reaction vessel in measuring position 1 of heating block **A**.

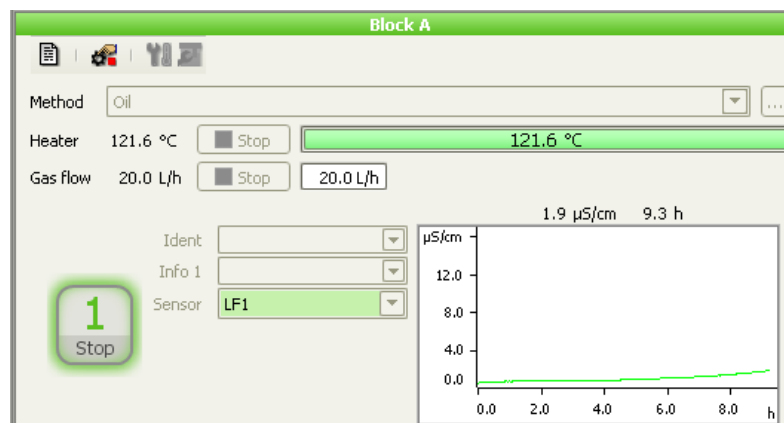
## 7 Starting the determination

Start the determination directly at the instrument or at measuring



position 1 using the  symbol.

A blinking symbol indicates an ongoing measurement. The measured value and time are shown in the live curve.



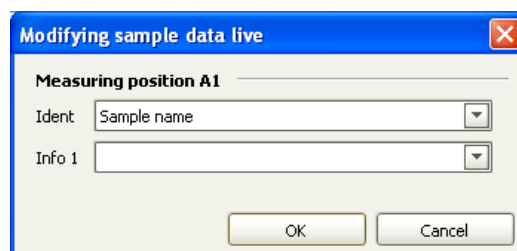
### 2.4.3 Modifying sample data live

You have the option of modifying the **Ident** and **Info #** sample data for each measuring position in real time during the determination.

Proceed as follows to modify the **Ident** of measuring position **A1**:

- 1** Right-click in the **Ident** field of measuring position **A1**.

The **Modifying sample data live** dialog opens.



- 2** Enter another sample name in the **Ident** field.

- 3** Confirm with **[OK]**.

## Tutorial



Define a conductivity sensor as follows:

## 1 Editing the sensor

Open the **Sensor** dialog window in the **Sensors** subwindow using the **Edit ► New... ► Conductivity sensor** menu.

## 2 Sensor tab

Make the following entries:

Field	Entry
<b>Sensor name</b>	Conductivity sensor name. This is used for identifying and assigning the sensor. Ensure that the name is easily recognizable and is noted on the corresponding measuring vessel cover in a permanent (non-washable) form.
<b>Sensor type</b>	entered automatically
<b>Order number</b>	optional
<b>Sensor serial number</b>	optional
<b>Comment</b>	optional



Measuring parameters	
Sample temperature	<input type="text" value="120"/> °C
Temperature correction	<input type="text" value="1.6"/> °C
Gas flow	<input type="text" value="20.0"/> L/h
<b>Start options</b>	
Statistical link	<input type="text" value="none"/>
Start delay	<input type="text" value="0"/> min
<input type="checkbox"/> Max. start conductivity	<input type="text" value="20"/> µS/cm
<b>Stop criteria</b>	
<input type="checkbox"/> Time	<input type="text" value="24.0"/> h
<input type="checkbox"/> Conductivity	<input type="text" value="400"/> µS/cm
<input checked="" type="checkbox"/> Endpoint(s)	
<input checked="" type="radio"/> Stop once one criterion has been fulfilled <input type="radio"/> Stop once all the criteria have been fulfilled	
<b>Sensors</b>	
<input checked="" type="checkbox"/> Conductivity sensor assignment	

### 3.1.2.3 Testing a method for plausibility

See Chap. 2.2.2, page 11

### 3.1.2.4 Saving a method

*See Chap. 2.2.3, page 11*

### 3.1.3 Assigning a workplace

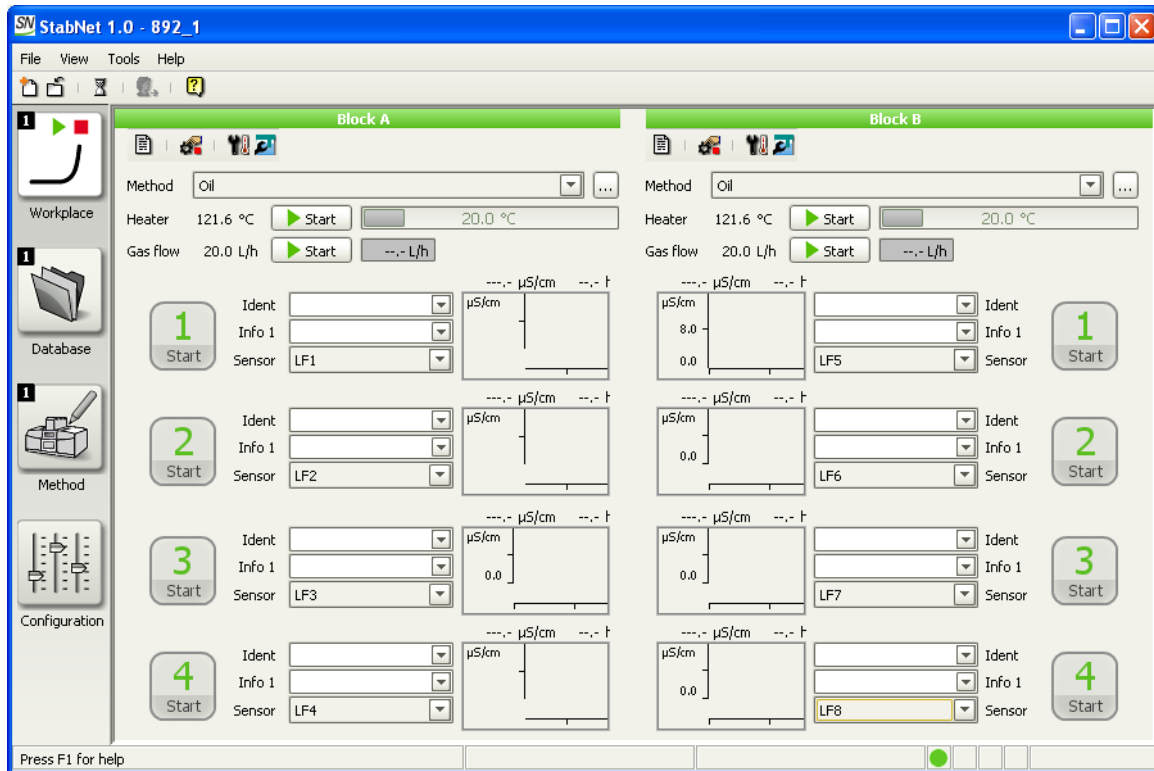
See Chap. 2.4.1, page 17

### 3.1.4 Carrying out the determination

You will learn the following in this chapter:

- How to determine a cell constant (using a wizard)
- How to carry out a determination using a conductivity sensor

These steps are performed in the **Workplace** program part.



Because the **Conductivity sensor assignment** parameter is enabled for this method, the **Sensor** field also appears for each measuring position. The conductivity sensor used for the respective position has to be selected in this field. All of the conductivity sensors defined in the configuration are available for selection.

#### 3.1.4.1 Determining the cell constant

The cell constant is determined using a wizard. Proceed as follows:

- 1 Prepare the measuring cell in accordance with *Chap. 2.3.1* but using the 6.2324.010 conductivity standard (100  $\mu\text{S}/\text{cm}$ ) instead of distilled water in the process.
- 2 Start the wizard using the **Tools ► Determine cell constant... ► Block A** menu.
- 3 Follow the instructions in the wizard step by step.

The newly determined cell constant is entered in the sensor table and on the **Calibration data** tab in the **Configuration** program and saved after pressing **[Save]**.



### 3.1.4.2 Preparing the determination

*See Chap. 2.3, page 11*

### 3.1.4.3 Carrying out the determination

*See Chap. 2.4.2, page 18*

In addition to the steps listed in *Chap. 2.4.2*, the following step must be performed before starting the determination:

#### 1 Selecting a sensor

Click on the ▼ symbol for measuring position **A1** in the **Sensor** field and select a conductivity sensor.

## 3.2 Using "auto" temperature correction

The **Temperature correction** parameter is used for compensating for temperature loss. Temperature loss occurs due to the heat transfer from the heating block to the sample and gas flow, which cools the sample. The value for temperature correction depends on the heating block, the sample temperature and the gas flow rate. Correctly determining temperature correction ensures that the sample temperature configured in the method is achieved in the sample.

The **"auto"** temperature correction allows the same method to be used on different heating blocks and an individualized temperature correction to be taken into account for each heating block. The value for the temperature correction is determined using a wizard (*see chapter 3.2.4.1, page 31*) and is saved in the instrument on the **Temperature correction** tab. You need the 6.5616.100 equipment for determining the temperature correction (for 892 Professional Rancimat and 895 Professional PVC Thermomat) or 6.5616.110 (for 893 Professional Biodiesel Rancimat).

You will learn the following in this chapter:

- How to define a temperature sensor
- How to create a method with automatic temperature correction
- How to carry out a temperature correction determination using the wizard

### 3.2.1 Configuration

### 3.2.1.1 Starting the software

*See Chap. 2.1.1, page 4*

### 3.2.1.2 Configuring the instrument

See Chap. 2.1.2, page 5

### 3.2.1.3 Defining the temperature sensor

Define a temperature sensor as follows:

## 1 Editing the sensor

Open the **Sensor** dialog window in the **Sensors** subwindow using the **Edit ► New... ► Temperature sensor** menu.

**Sensor - Temperatursensor 1**

**Sensor** Calibration data

Sensor name

Sensor type

Order number

Sensor serial number

Comment

Set to work  ...

☐ **Sensor monitoring**

Working life  days

Expiry date  ...

**Message**

☐ Message by e-mail

☐ Acoustic signal

**Action**

☐ Document message only


☒ Display and document message

☐ Do not start the determination

## 2 Sensor tab

Make the following entries:

Field	Entry
Sensor name	name for the temperature sensor
Sensor type	entered automatically

<b>Order number</b>	optional
<b>Sensor serial number</b>	optional
<b>Comment</b>	optional
<b>Set to work</b>	current date is entered automatically or can be selected with 
<b>Sensor monitoring</b>	optional

### 3 Calibration data tab

Enter the calibration data for the Pt100 temperature sensor (refer to the sensor's certificate for the values).

**Sensor - Temperatursensor 1**

**Sensor** **Calibration data**

	Temperature	Resistance
Calibration point 1	0.0 °C	10 Ohm
Calibration point 2	100.0 °C	50 Ohm
Calibration point 3	200.0 °C	100 Ohm

User: ek

OK Cancel

### 3.2.2 Creating a method

The value of the temperature correction is affected by the respective heating block, the sample temperature and the gas flow rate. Therefore, it should be determined individually for each heating block, temperature and gas flow rate combination.

Instead of creating a new method, a method that already exists can also be modified accordingly.

### 3.2.2.1 Creating a new method

*See Chap. 2.2.1, page 7*

#### 3.2.2.2 Defining measuring parameters

Proceed as follows to activate the **auto** temperature correction:

- 1 Select the **auto** value for **Temperature correction** in the **Measuring parameters** subwindow.



Measuring parameters	
Sample temperature	<input type="text" value="120"/> °C
Temperature correction	<input type="text" value="auto"/> °C
Gas flow	<input type="text" value="20.0"/> L/h
<b>Start options</b>	
Statistical link	<input type="text" value="none"/>
Start delay	<input type="text" value="0"/> min
<input type="checkbox"/> Max. start conductivity	<input type="text" value="20"/> µS/cm
<b>Stop criteria</b>	
<input type="checkbox"/> Time	<input type="text" value="24.0"/> h
<input type="checkbox"/> Conductivity	<input type="text" value="400"/> µS/cm
<input checked="" type="checkbox"/> Endpoint(s)	
<input checked="" type="radio"/> Stop once one criterion has been fulfilled <input type="radio"/> Stop once all the criteria have been fulfilled	
<b>Sensors</b>	
<input type="checkbox"/> Conductivity sensor assignment	

### 3.2.2.3 Testing a method for plausibility

See Chap. 2.2.2, page 11

### 3.2.2.4 Saving a method

*See Chap. 2.2.3, page 11*

### 3.2.3 Assigning a workplace

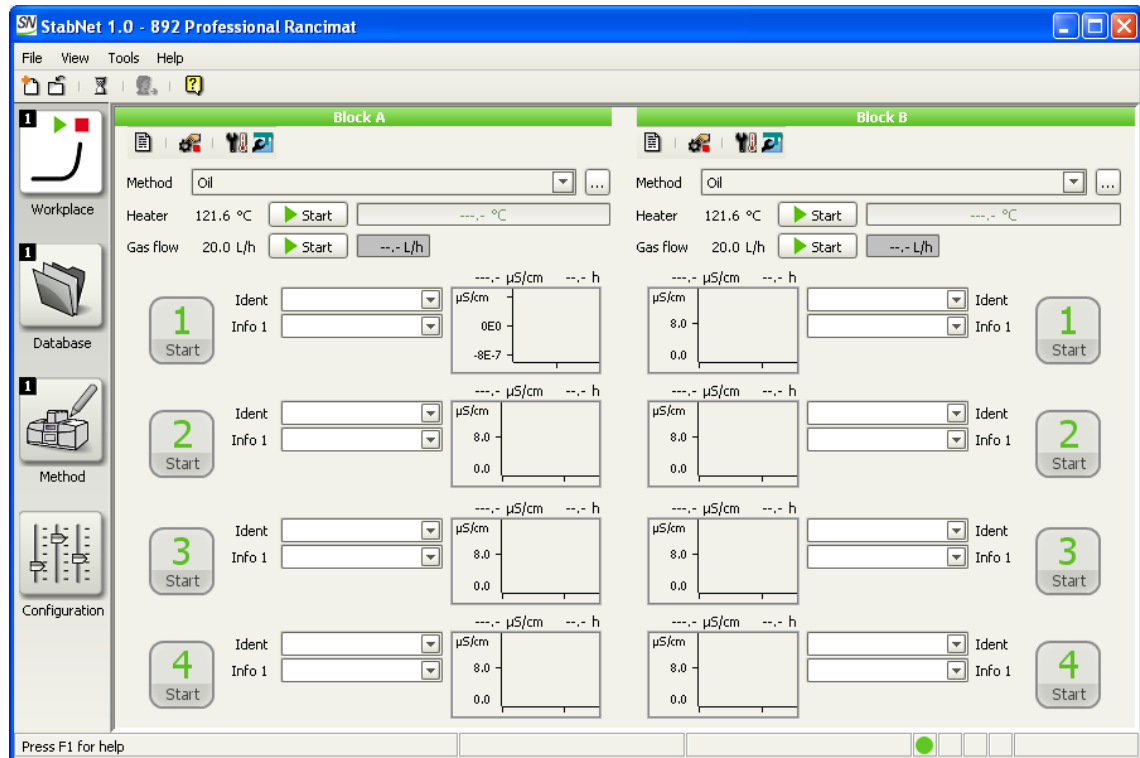
*See Chap. 2.4.1, page 17*

### 3.2.4 Carrying out the determination

You will learn the following in this chapter:

- How to determine the temperature correction (using a wizard)
- How to carry out a determination using automatic temperature correction

These steps are performed in the **Workplace** program part.



### 3.2.4.1 Determining the temperature correction

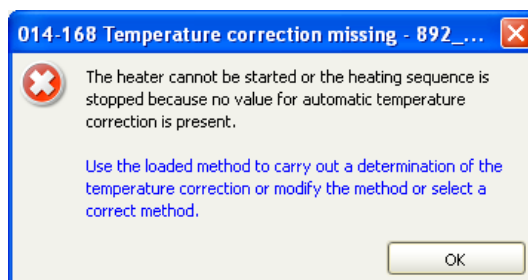


#### NOTICE

You can find details for preparing the temperature sensor in the manuals for the 892 Professional Rancimat, 893 Professional Biodiesel Rancimat and 895 Professional PVC Thermomat devices.

Temperature correction is determined using a wizard. Proceed as follows to do this.

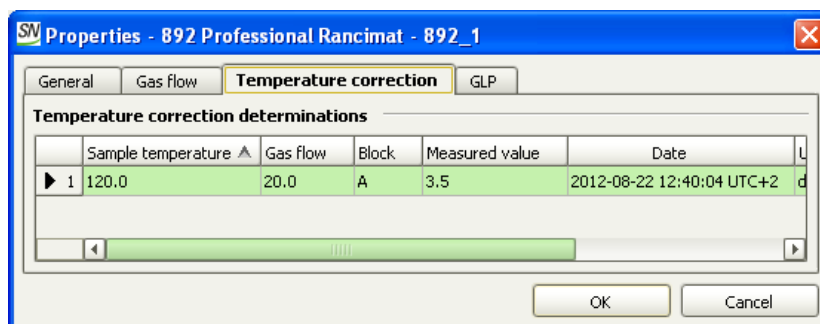
- 1 Load the method for block **A**.
- 2 If a **014-168** message appears, confirm it. The message only occurs if there is no value for temperature correction in the configuration for this heating block, sample temperature and gas flow rate.



**3** Start the wizard using the **Tools ► Determine temperature correction... ► Block A** menu.

**4** Follow the instructions in the wizard step by step.

The value of the temperature correction is written to the instrument's properties in the **Configuration** program part and saved after pressing **[Save]**.



**5** If you intend to determine the temperature correction also at block **B** using the same method, repeat steps **1** through **4** for block **B**.

### 3.2.4.2 Preparing the determination

*See Chap. 2.3, page 11*

### 3.2.4.3 Carrying out the determination

*See Chap. 2.4.2, page 18*

## 4 Editing determinations

### 4.1 Viewing determinations

You have multiple options for selecting and viewing your determinations in the **Database** program part:

- Open the determination overview
- Format the table with determinations
- Sorting according to column
- Finding via a quick filter
- Finding with a special filter
- Use the **Search...** menu
- Select via a batch (user-defined filter)

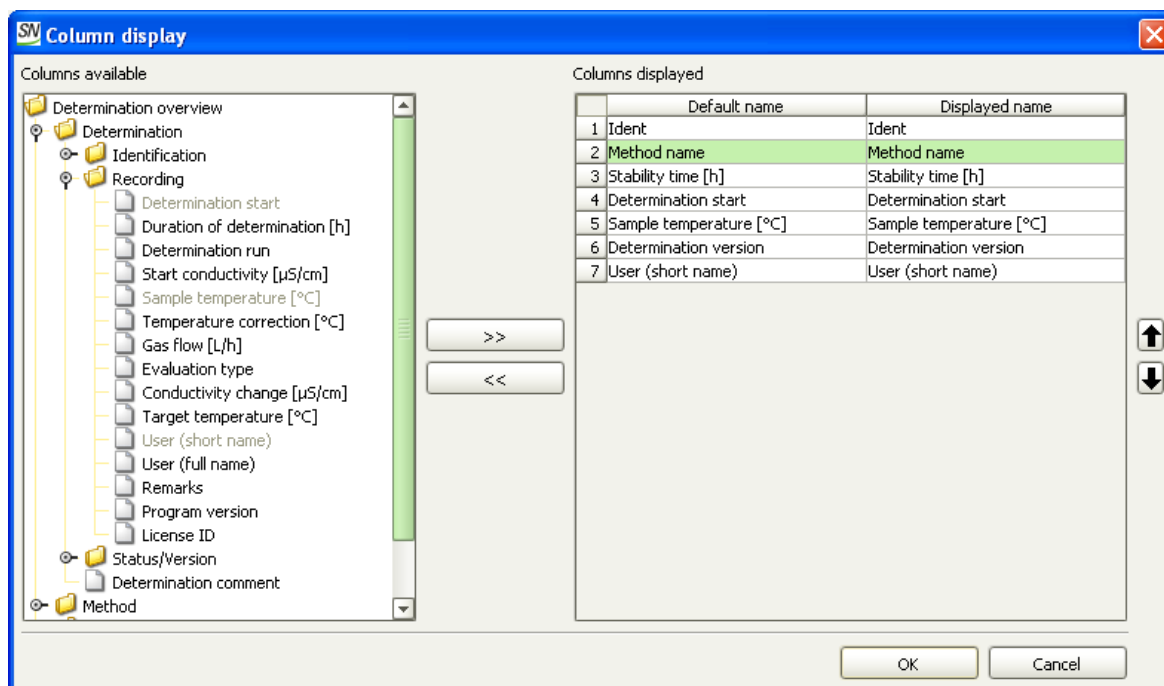


#### Opening the determination overview

- 1 Click on the icon for the **Database** program part.
- 2 Open the **Open database** dialog using the **File ► Open...** menu.
- 3 Select a database and click on **[Open]**.  
The database is opened.

#### Formatting the determination overview

- 1 **Selecting columns**
  - Open the **Column display** dialog window using the **View ► Properties ► Column display...** menu.  
Only the fields listed in the right column under **Columns displayed** are shown in the determination overview.



- In the **Columns available** column, select a parameter to be displayed in the determination overview.
- Click on the **>>** button.
- In the **Columns displayed** column, select a parameter **not** to be displayed in the determination overview.
- Click on the **<<** button.
- Change the order of the displayed columns using **▲** or **▼** by moving the selected column up or down.
- Click on **[OK]**.

## 2 Adjusting the column width

- Position the cursor on the table's title bar between the 2 columns. The cursor assumes the following form: **⊕**
- Drag the column width to the required size keeping the left mouse button pressed down.

## Sorting the determination overview

- 1 First click in the table with all the data sets on the column heading according to which the table is to be sorted.

The table is sorted according to the selected column in ascending order.

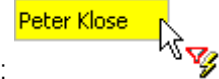


- 2 Click again on the same column title.

The table is sorted according to the selected column in descending order.

### Quick filter

- 1 Click on the **Determinations ► Filter ► Quick filter** menu or the  icon.




The cursor turns into a special filter symbol:

When navigating within the table, the cells in which the cursor is located will have a yellow background.

- 2 Place the cursor in a cell serving as a filter criterion and double-click with the left mouse button.


The data sets are filtered according to the content of the selected table field. The quick filter can be applied again within the filtered table.

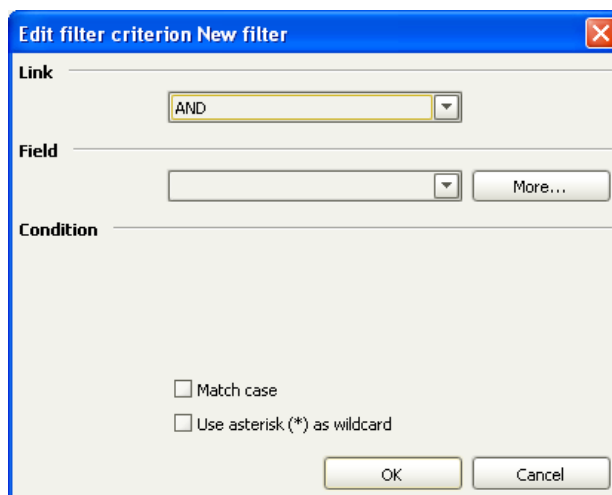
- 3 **Removing the applied filter**

The currently applied quick filter is removed using the **Determinations ► Filter ► Remove filter** menu or the  icon. All data sets are displayed again.

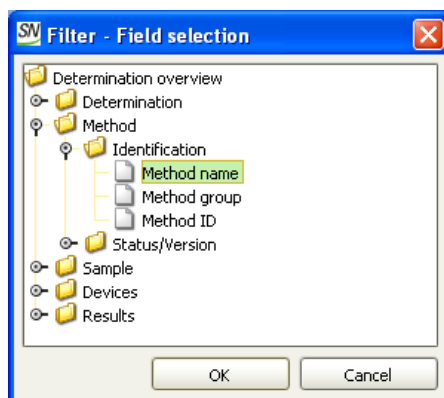
### Special filter

The special filter allows you to specify the filter conditions in detail.

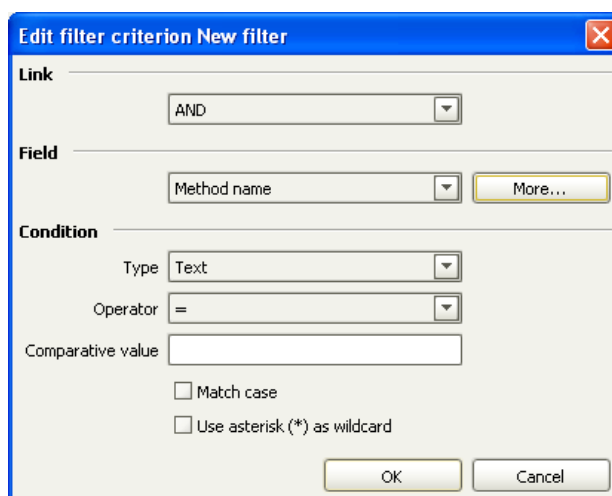
- 1 Open the corresponding dialog window using the **Determinations ► Filter ► Special filter...** menu or the  icon.
- 2 Open the **Edit filter criterion 'New filter'** dialog window using the **Edit ► Edit line** menu.



- Click on the **More...** button in the **Field** section.  
The **Filter - Field selection** dialog window opens.



- 4** In the **Filter - Field selection** dialog window, select an option such as the **Method name** field and click on **[OK]**.




5 In the **Comparative value** field, enter a method name such as **Oil method** and click on **[OK]**.

6 Click on the **[Apply filter]** button in the **Special filter - 'Database name' database** dialog window and close the window.

A table containing all of the data sets for the **Oil method** method appears in the **Determination overview** subwindow.

## 7 Removing the applied filter

The currently applied special filter is removed using the **Determinations ► Filter ► Remove filter** menu or the  icon. All data sets are displayed again.

## Searching

1 Open the **Search - 'StabNet' database** dialog window using the **Determinations ► Search...** menu.

2 Open the **Search - Field selection** dialog window using the **[More...]** button in the **Search in** selection list.

3 Highlight the **User (short name)** entry under **Determination overview ► Determination ► Recording**.

4 Enter your short name in the **Search word** field.

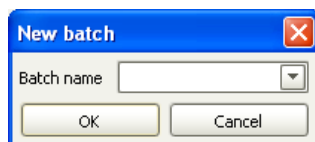
5 Click on **[Search next]**.

The first line corresponding to the search term is highlighted.

## Batch (user-defined filter)

### 1 Creating a batch

- Open the **New batch** dialog window using the **Determinations ► Batch ► New batch...** menu.

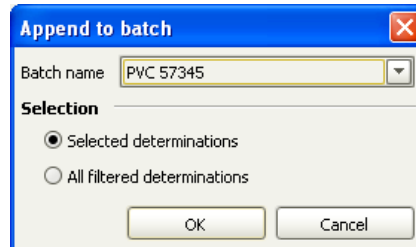


- Enter the name **Oil method** in the **Batch name** field.

- Click on **[OK]**.

## 2 Adding determinations to batch

- Highlight the data sets in the table which are to be added to the batch.
- Open the **Append to batch** dialog window using the **Determinations ► Batch ► Append to batch...** menu.

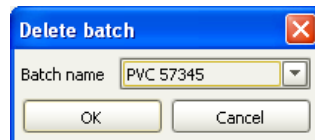


- Select the name **Oil method** in the **Batch name** list box.
- Mark the **Selected determinations** option.
- Click on **[OK]**.

The data sets selected in the determination overview are added to the batch. If this batch is selected in the **Determination overview**, the associated determinations are displayed.

### 3 Deleting a batch

- Open the **Delete batch** dialog window using the **Determinations ► Batch ► Delete batch...** menu.



- Select the name **Oil method** in the **Batch name** list box.
- Click on **[OK]**.

The batch is deleted from the database.

## 4.2 Viewing curves

### Zoom using the mouse

Individual areas on a curve can be displayed in magnified form using the zoom function.

- 1 Highlight a data set in the overview table.

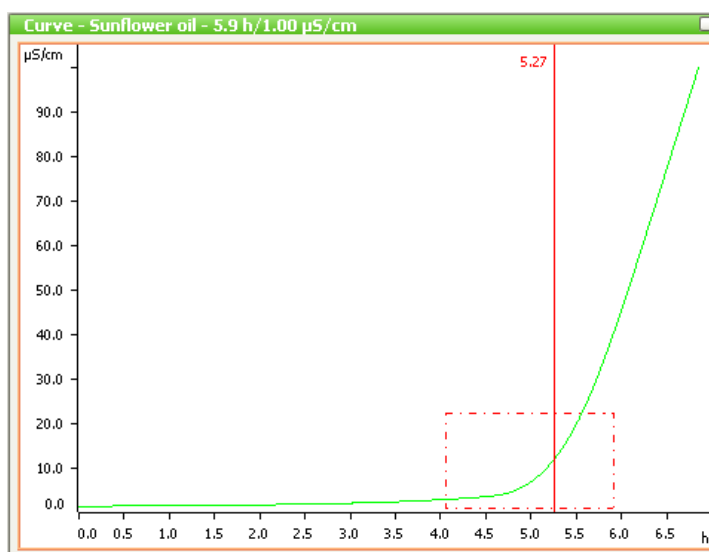
The associated curve is shown in the **Curve** subwindow.

- 2 **Dragging a zoom square**

- Place the cursor on the upper left corner of the sector to be magnified.
- Keeping the left mouse button pressed down, drag the cursor to the lower right corner of the sector.

- 3 **Releasing the mouse button**

- Release the mouse button in order to magnify the selected area to the full size of the window.



- 4 **Switching zoom off again**

- Right-click in the graphics window.  
The context-sensitive menu for graphs appears.
- Click on the **Unzoom** menu item.

Or



## Changing the display of the curve

You have the option to edit the properties of a curve. You can change the display of the curve, the axis labeling or the labeling in the curve. Below you will change the labeling for the axes in the curve. Proceed as follows:

### 1 Changing the axis label

- Right-click on the curve.
- Select the **Properties...** menu item.
- Select the **Axes** tab in the **Properties - Graphics** dialog window.
- In the **x axis** area, click in the **Axis label** field and enter **Induction time**.
- In the **y1 Axis** area, click in the **Axis label** field and enter **Conductivity**.
- Click on **[OK]**.

### 2 Displaying the curve of the 2nd derivative


- Right-click on the curve.
- Click on **Properties...** in the context menu.
- On the **Axes** tab, activate the **Display the curve of the 2nd derivative** check box.
- Select a color and a line thickness on the **Display** tab.
- Click on **[OK]**.

### 3 Displaying evaluation sensitivity

- Right-click on the curve.
- Click on **Properties...** in the context menu.
- On the **Display** tab, activate the **Evaluation sensitivity** check box.
- Select a color and the line thickness.
- Click on **[OK]**.

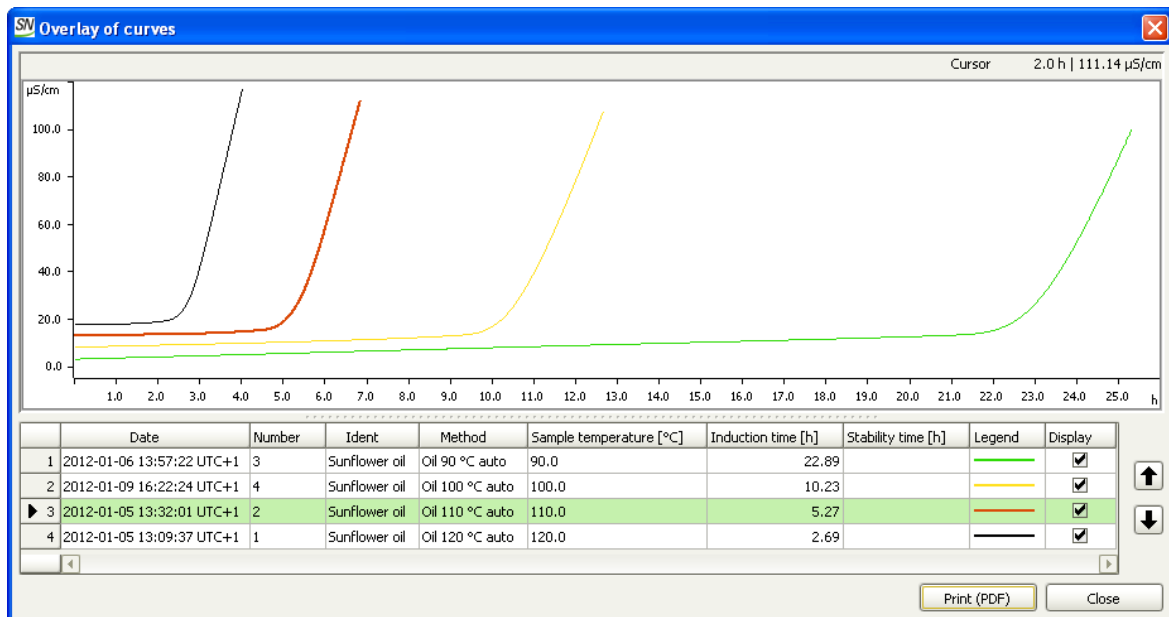
## Overlaying curves

Proceed as follows to overlay the curves from selected determinations:

- 1 In the determination overview, select the curves to be overlaid. You can select non-adjacent determinations by holding down the Ctrl key.
- 2 Open the **Overlay curves** dialog window using the **Determinations ► Overlay curves...** menu or the  icon.

- 3 Select the **Selected determinations** option and click on **[OK]**.

The **Overlay of curves** window opens.



## 4.3 Reprocessing determinations

When reprocessing determinations, sample data, evaluation parameters and the curve evaluation can be changed and the results recalculated.


You have the following options for reevaluating curves:

- Moving the induction time
- Setting tangents manually
- Deleting manually set tangents
- Changing evaluation sensitivity for the induction time
- Determining the stability time
- Resetting all reevaluations

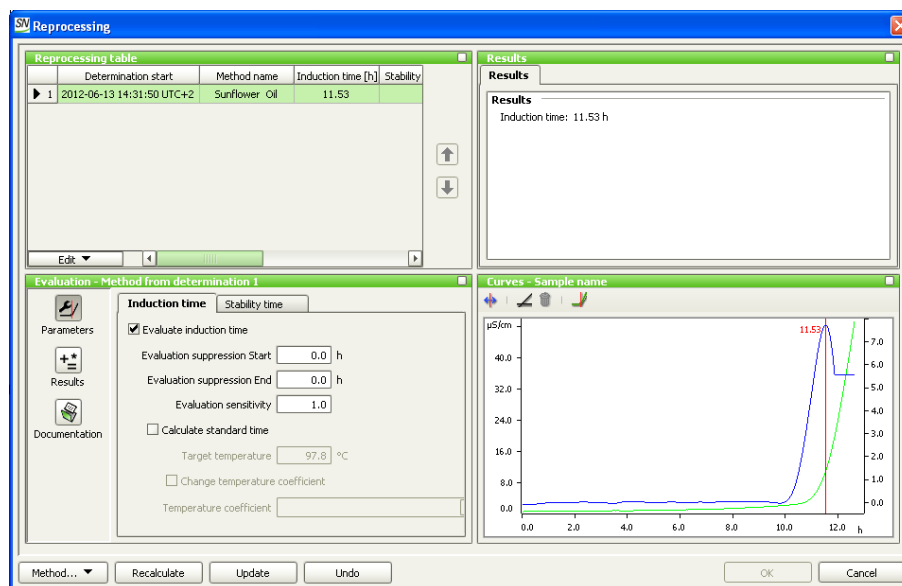
### Moving the induction time

Proceed as follows to move the induction time of a determination after the fact:



#### 1 Opening the dialog

- Highlight the determination(s) in the **Determination overview** subwindow.
- Open the **Reprocessing** dialog using the **Determinations ► Reprocess...** menu or the  icon.





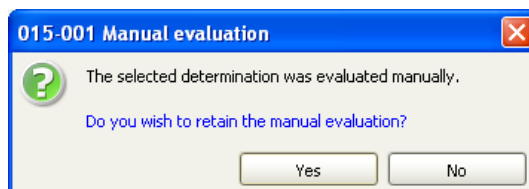
## 2 Moving the induction time

- Click on the  symbol in the **Curves** subwindow.
- Place the cursor on the line for the induction time. It assumes the following form while doing so: 
- Drag the line for the induction time to the desired position with the left mouse button held down.

The new value for the induction time is shown in the upper left next to the red line.

## 3 Recalculating the result

- Press the **[Recalculate]** button in the **Evaluation** subwindow.



- Confirm the message with **[Yes]**.

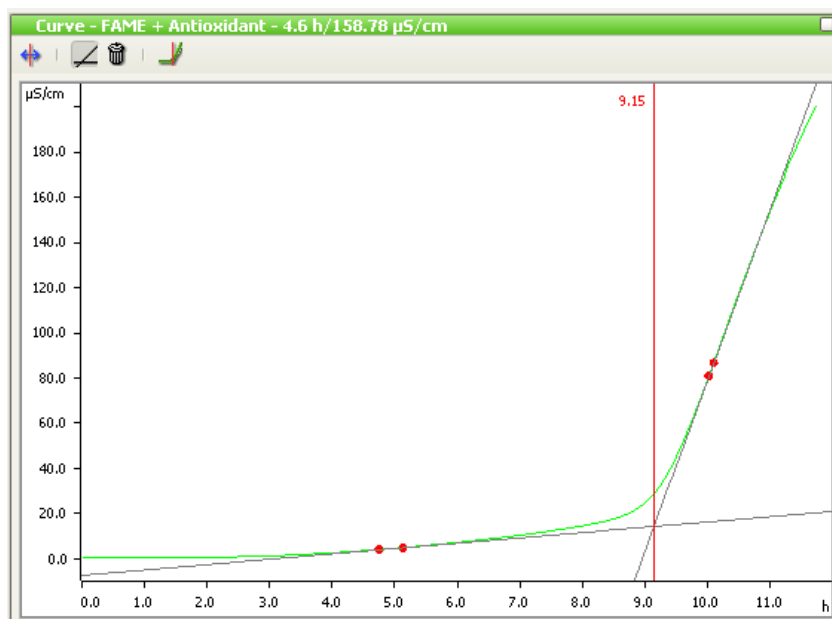
The new value for the induction time is displayed in the **Results** subwindow and in the reprocessing table.

## 4 Saving changes

- Close the **Reprocessing** dialog window using **[OK]**.

The new results are saved and displayed in the database in the **Determination overview** subwindow.





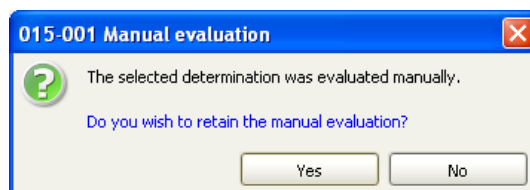
#### 4 Adjusting tangents

- Hover the cursor over one of the four red points that define the tangents. The cursor changes to a +.
- Click the left mouse button to select a point. The selected point turns blue.
- Move the cursor until the selected point is at the desired position on the curve.
- Fix it in place at this position by clicking the left mouse button again.

The intersection point of both tangents, and thus the induction time, is recalculated automatically and displayed in the **Curve** subwindow.

#### 5 Recalculating the result

- Press the **[Recalculate]** button in the **Evaluation** subwindow.



- Confirm the message with **[Yes]**.

The new value for the induction time is displayed in the **Results** subwindow and in the reprocessing table.


#### 6 Saving changes

- Close the **Reprocessing** dialog window using **[OK]**.

The new results are saved and displayed in the database in the **Determination overview** subwindow.


## Deleting tangents

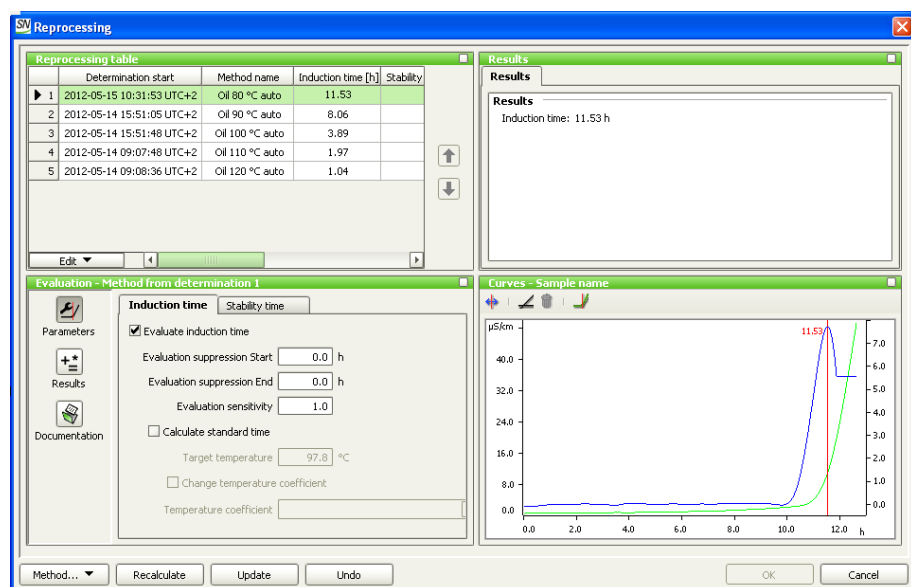
Proceed as follows to delete the previously set tangents:

- 1** Click on the  icon.

## Modifying evaluation sensitivity

Proceed as follows to modify the evaluation sensitivity for multiple determinations:

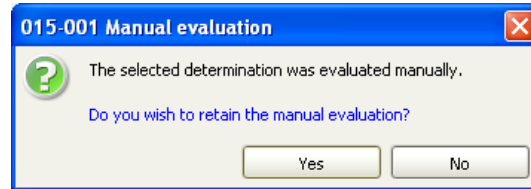
- ## 1 Opening the dialog
- Ensure that both the 2nd derivative and the line for evaluation sensitivity are displayed in the curve (see *"Changing the display of the curve"*, page 41).
  - Highlight the determinations in the **Determination overview** subwindow.
  - Open the **Reprocessing** dialog using the **Determinations ► Reprocess...** menu or the  icon.



- ## 2 Modifying evaluation sensitivity
- Activate the **Evaluate induction time** check box on the **Induction time** tab in the **Evaluation** subwindow.
  - Enter a value in the **Evaluation sensitivity** field.

### 3 Updating results

- Press the **[Update]** button in the **Evaluation** subwindow.
- If the determination has already been evaluated manually before, the following message appears:



The determination can either be evaluated manually or the evaluation sensitivity can be changed. It is not possible to evaluate the determination manually and change the evaluation sensitivity.

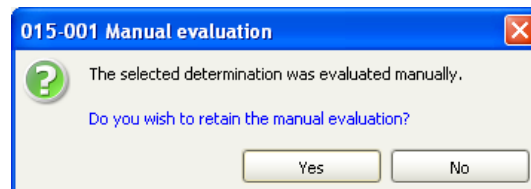
To reject the changed evaluation sensitivity and retain the manual evaluation of the curve, confirm the message with **[Yes]**.

To apply the changed evaluation sensitivity and discard the manual evaluation of the curve, reject the message with **[No]**.

The focused determination is recalculated and the result is displayed in the **Results** subwindow and in the reprocessing table.

### 4 Recalculating results

- Press the **[Recalculate]** button in the **Evaluation** subwindow.
- If the determination has already been evaluated manually before, the following message appears:



The determination can either be evaluated manually or the evaluation sensitivity can be changed. It is not possible to evaluate the determination manually and change the evaluation sensitivity.

To reject the changed evaluation sensitivity and retain the manual evaluation of the curve, confirm the message with **[Yes]**.

To apply the changed evaluation sensitivity and discard the manual evaluation of the curve, reject the message with **[No]**.

All of the determinations in the reprocessing table are recalculated with the parameters of the focused determination and the results are displayed in the **Results** subwindow and in the reprocessing table.

### 5 Saving changes


- Close the **Reprocessing** dialog window using **[OK]**.

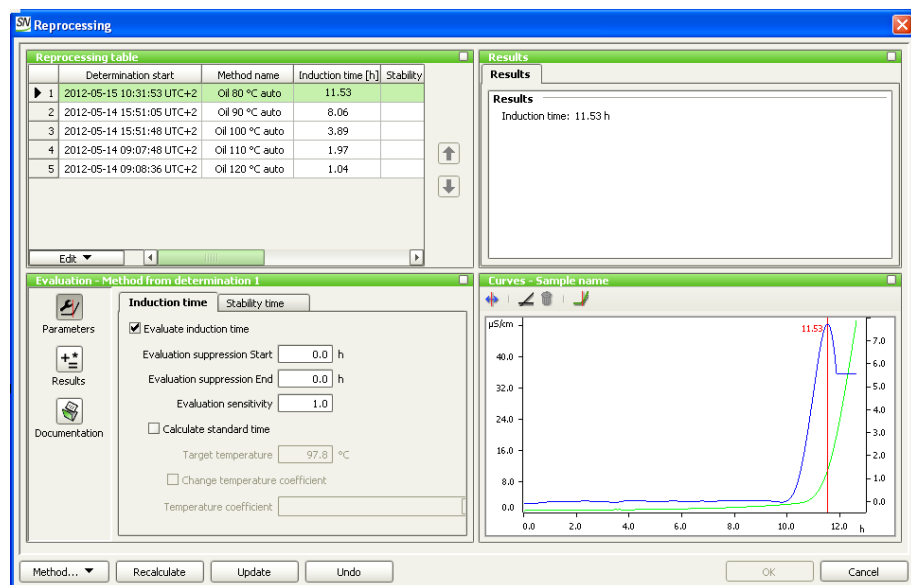
The new results are saved and displayed in the database in the **Determination overview** subwindow.

## Determining stability time

By default only **Induction time** is activated in the **Oil** and **Biodiesel** method templates. However, you have the option of calculating the stability time after the fact. Proceed as follows:

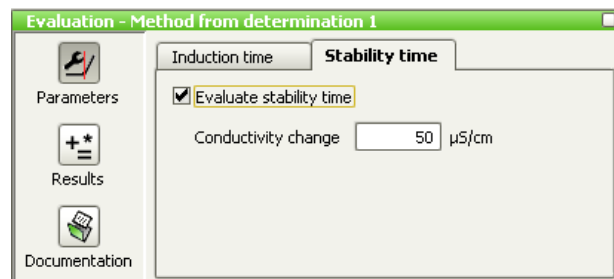
## 1 Opening the dialog

- Highlight the determinations in the **Determination overview** subwindow.
- Open the **Reprocessing** dialog using the **Determinations ► Reprocess...** menu or the  icon.



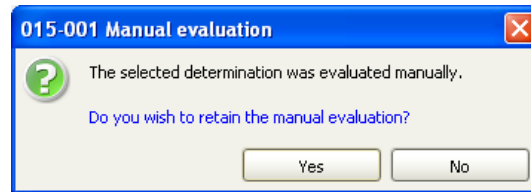
## 2 Enabling the stability time calculation

Activate the **Evaluate stability time** check box in the **Evaluation** subwindow on the **Stability time** tab.



### 3 Updating results

- Press the **[Update]** button in the **Evaluation** subwindow.

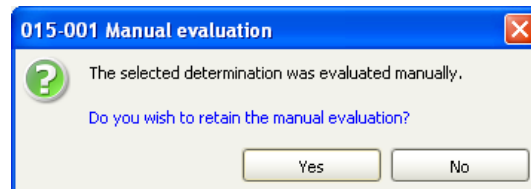


- Confirm the message with **[Yes]**.

The focused determination is recalculated and the result is displayed in the **Results** subwindow and in the reprocessing table.

### 4 Recalculating results

- Press the **[Recalculate]** button in the **Evaluation** subwindow.



- Confirm the message with **[Yes]**.

All of the determinations in the reprocessing table are recalculated with the parameters of the focused determination and the results are displayed in the **Results** subwindow and in the reprocessing table.

### 5 Saving changes

- Close the **Reprocessing** dialog window using **[OK]**.

The new results are saved and displayed in the database in the **Determination overview** subwindow.

## 4.4 Extrapolation

The relationship between the induction time or stability time and sample temperature is displayed using extrapolation. It can be used for extrapolating the measured results to another temperature. In addition, the factor for converting the induction time to standard time can also be determined.

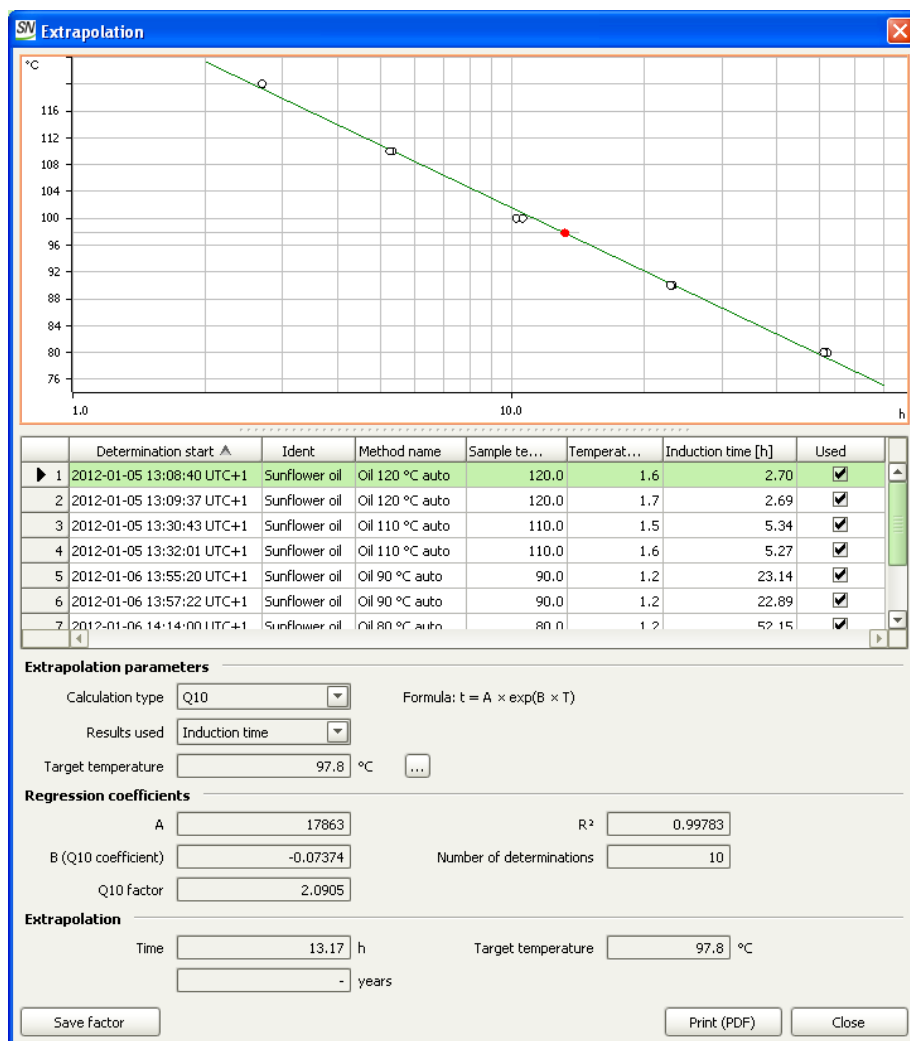
Extrapolation requires that a sample has been measured at at least two different temperatures, but three or more temperatures would be better.

#### 4.4.1 Extrapolating the induction time


Proceed as follows to calculate the induction time for a specific temperature:

- 1 In the **Determination overview** subwindow, select determinations for a sample that have been carried out at different temperatures.
- 2 Open the **Extrapolating determinations** dialog using the **Determinations ► Extrapolation...** menu.
- 3 Select the **Selected determinations** option and click on **[OK]**.  
The **Extrapolation** dialog opens.





4 Select the desired options for the **Calculation type** and **Results used** extrapolation parameters.

5 Click on the  symbol and enter the desired **Target temperature** and click on **[OK]**.

In the **Time** field, the result of the extrapolation for the specified temperature is displayed in hours and even in years if it is more than 100 hours.


Refer to Online Help under "Extrapolation - Calculation" for the theory of extrapolation.

## 4.5 Editing a report template

**StabNet** contains examples of report templates. These report templates can be adapted as needed. Modules can be added or removed and their properties can be modified. Only the **Fixed report** module cannot be edited. Below you will replace an image in the provided **EN Report short** report template and add a new fixed report.

## Opening a report template

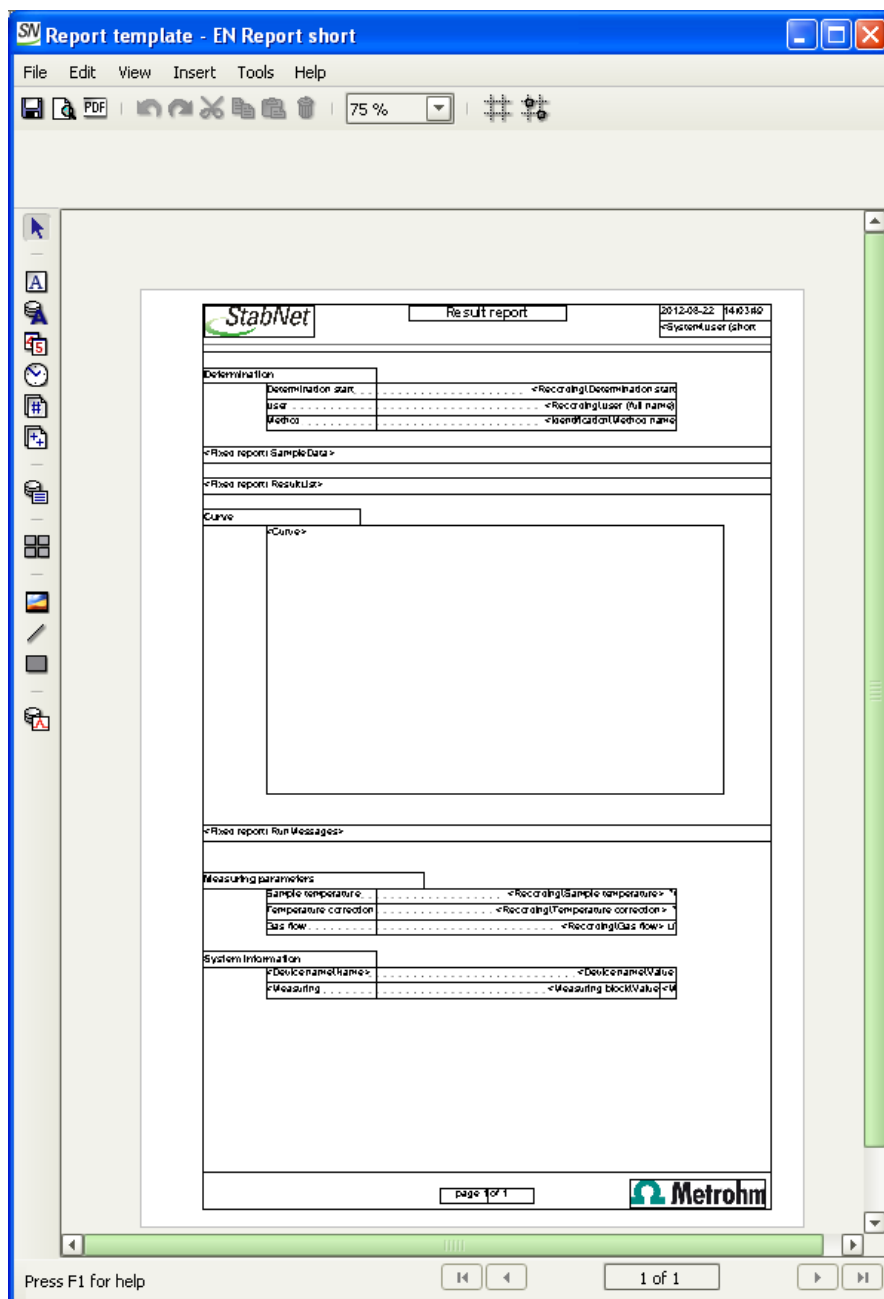
Proceed as follows to edit the **EN Report short** report template:

- 1 Select the **Database** program part.
- 2 Open the desired database.
- 3 Select one or more determinations in the determination overview.
- 4 Click on the  icon or the **Tools ► Report templates ► Open...** menu item.


The **Open report template** program window opens.

- 5 Select the **EN Report short** report template.
- 6 Click on **[Open]**.


The program window with the selected report template opens.




## Replacing an image

- 1 Select the  icon on the module bar and double-click on the Metrohm logo in the bottom right corner of the report.  
The properties window for the graphics field opens automatically.

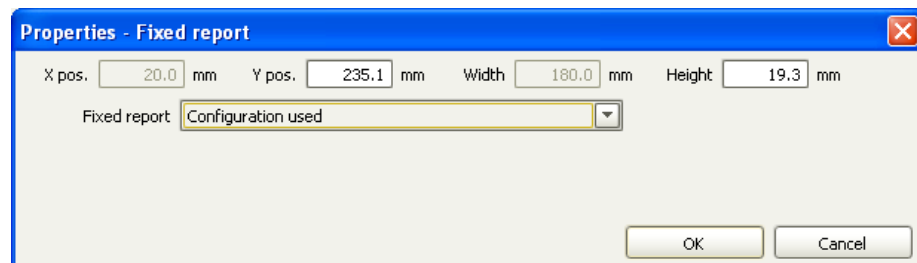


- 2 Open the dialog window for selecting the new graphics file by clicking on .
- 3 Select the desired new graphics file in JPG or PNG format and confirm with **[OK]**.
- 4 Adjust the position, width, height and size of the image.
- 5 Close the properties window with **[OK]**.

## Inserting a new fixed report

- 1 Select the  icon on the module bar and place it on the report template by creating a field with the left mouse button.

The properties window for the fixed report opens automatically.



- 2 Select the **Configuration used** option in the **Fixed report** field.
- 3 Close the properties window with **[OK]**.

## Saving the report template

- 1** Click on the **File ► Save as...** menu item.


The **Save report template** dialog opens.

- 2 Enter a name for the new report template and click on the **[Save]** button.

The report template is saved under the specified name.

## 4.6 Printing a determination report

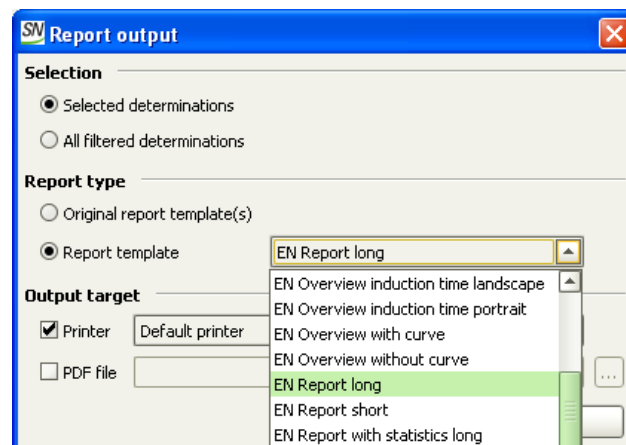
Proceed as follows to print a determination report:

- 1 Select the **Database** program part.
- 2 Click on the  icon or the **File ► Open...** menu item.  
The **Open database** dialog opens.
- 3 Select the desired database or enter the name in the **Database name** field.
- 4 Click on **[Open]**.

The data sets of the selected database are displayed in the **Determination overview**. The database name is displayed in the title bar of the program; the number of currently opened databases is displayed in the left upper corner of the database icon.

- 5 Select the desired determinations.
- 6 Click on the **File ► Print ► Report...** menu item.

The **Report output** dialog opens.





# Index

## B

Batch ..... 37

## C

Cell constant  
    Determine ..... 26  
Conductivity sensor  
    Define ..... 22  
Configuration ..... 4  
Curves  
    Change curve display ..... 41  
    Overlay curve display ..... 41  
    View ..... 39

## D

Determination  
    Carry out ..... 16  
    Change curve display ..... 41  
    Determination with advanced  
    functions ..... 22  
    Edit ..... 33  
    Prepare ..... 11  
    Print report ..... 55  
    Reprocess ..... 42  
    Search ..... 37  
    Simple determination ..... 4  
    Start ..... 20  
    View ..... 33  
Determination overview  
    Format ..... 33  
    Open ..... 33  
    Sort ..... 34  
Device  
    Configure ..... 5

## E

Evaluation parameters  
    Define ..... 24

Extrapolation

    Carry out ..... 50

## F

Filter  
    Quick filter ..... 35  
    Special filter ..... 35  
    User-defined (batch) ..... 37

## H

Heater  
    Start ..... 18

## M

Measuring parameters  
    Define ..... 24, 29  
Measuring vessel cover  
    Mount ..... 12  
Method  
    Create ..... 7  
    Save ..... 11  
    Select ..... 18  
    Test for plausibility ..... 11

## R

Reaction vessel  
    Connect ..... 19  
    Insert ..... 19  
Reaction vessel cover  
    Mount ..... 15  
Report  
    Edit a report template ..... 52  
    Print ..... 55  
Reprocess  
    Delete tangents ..... 46  
    Determine stability time ..... 48  
    Modify evaluation sensitivity  
    ..... 46

Move induction time ..... 42

Set tangent manually ..... 44

## S

Sample data  
    Enter ..... 18  
    Modify live ..... 20  
Samples  
    Prepare ..... 13  
    Sample identification ..... 18  
    Sample information ..... 18  
Search ..... 37  
Start software ..... 4

## T

Temperature correction  
    Automatic temperature correc-  
    tion ..... 27  
    Determine ..... 31  
Temperature sensor  
    Define ..... 28

## W

Workplace  
    Assign ..... 17

## Z

Zoom  
    Unzoom ..... 40  
    Zoom using the dialog ..... 40  
    Zoom using the mouse ..... 39