

aboni

HydroTracer FLV HT2

Operation Manual

Version HT2 STD

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aboni GmbH für Mess- und Automatisierungstechnik

Friedrich-Ebert-Str. 27
D-14548 Schwielowsee- Caputh

Tel.: +49 700 abonifon
+49 700 22664 366

Fax: +49 700 abonifax
+49 700 22664 329

E-Mail: info@aboni.de

Web: www.aboni.de

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Declaration of Conformity

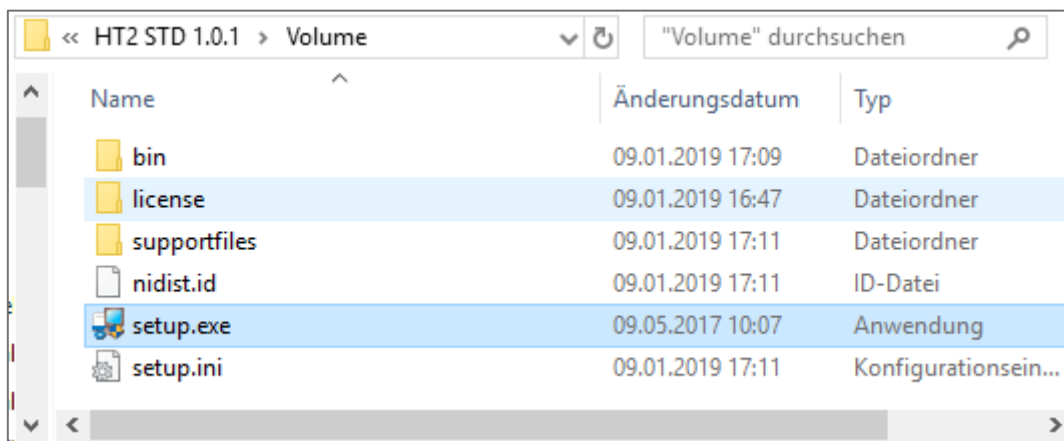
Safety Data Sheet Calcium Hydride

1. Initial Operation

The HydroTracer is controlled by a PC and the signals from the instrument are analysed by the PC software. The data transmission occurs via USB-Port. Before first operation, the control program and the driver must be installed.

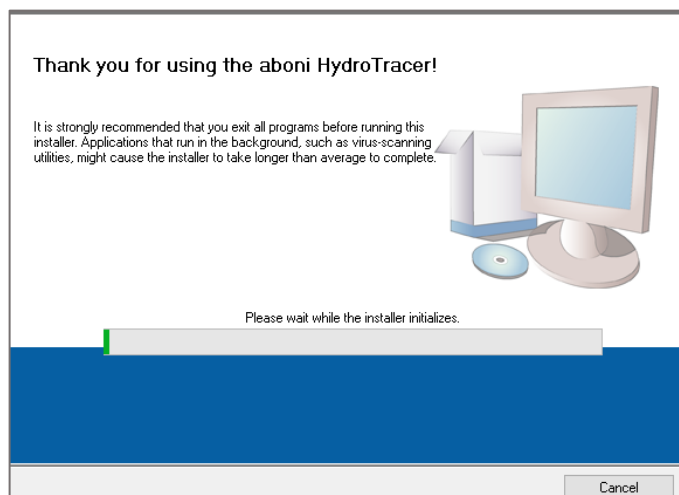
1.1 Installation of the Control Software HT2 STD

Insert the DVD and start the installation by running the **setup.exe** within the directory **[CD/DVD]: \HT2 STD\Volume**

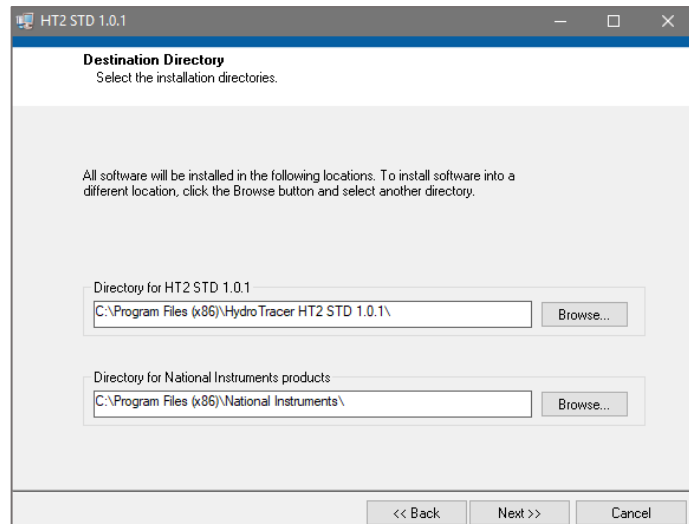


Please follow the instructions on the screen.

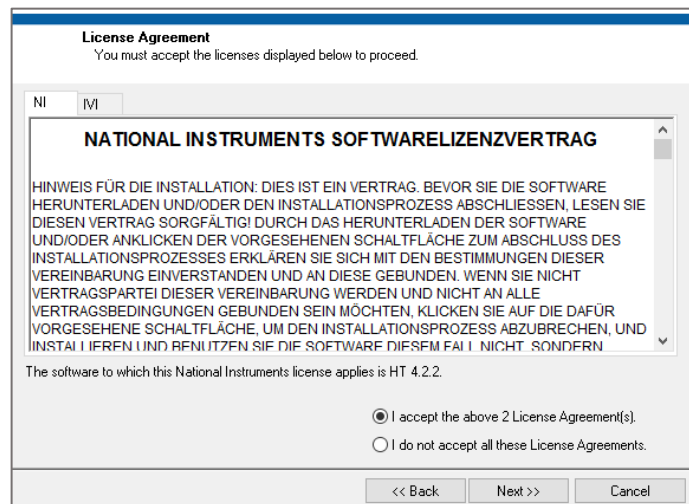
This mask appears and the installation program is initialized



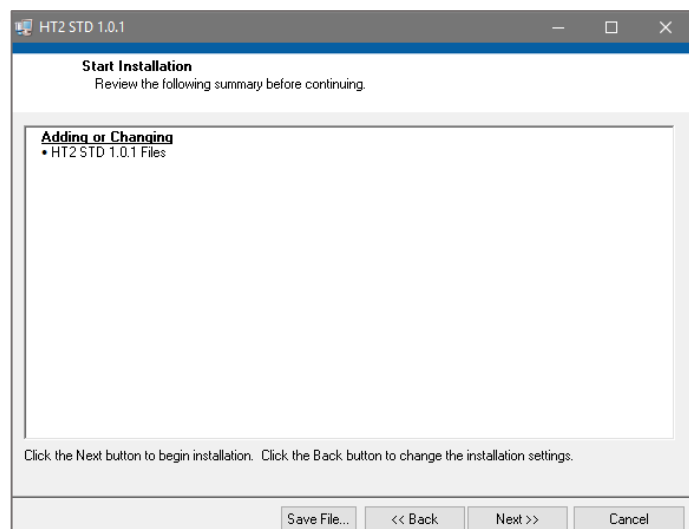
This mask appears. It is recommended not to change the settings. Click "Next >>"



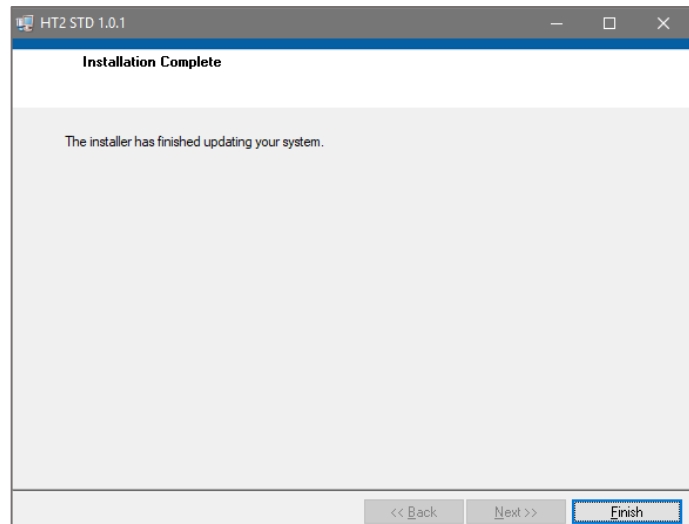
Now click on the field "I accept the license agreements", then on the field "Next >>"



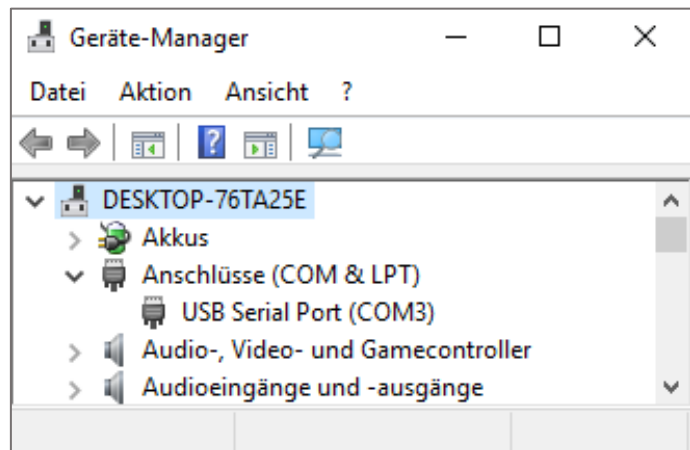
This mask appears. Click "Next >>"



This mask appears. Click "Next >>"



In the Windows® Device Manager, a new entry "USB serial port" appears under the "Ports (COM & LPT)" section when the HydroTracer is connected to the computer via USB cable.



1.2 Connecting the HydroTracer

Switch on your PC (if not done already).

Connect the power supply cable on the rear side of the HydroTracer. Connect the HydroTracer with the data cable (USB) to your PC. Switch on the power. If the HydroTracer is properly connected to the power supply, the system fan runs and the green LED glows.

The HydroTracer is now ready for operation.

1.3 Measuring Principle

The patented method of the HydroTracer determines the absolute water content. The mass of the water is measured within the reactor. The percentage of moisture of the sample is calculated by division with the sample weight.

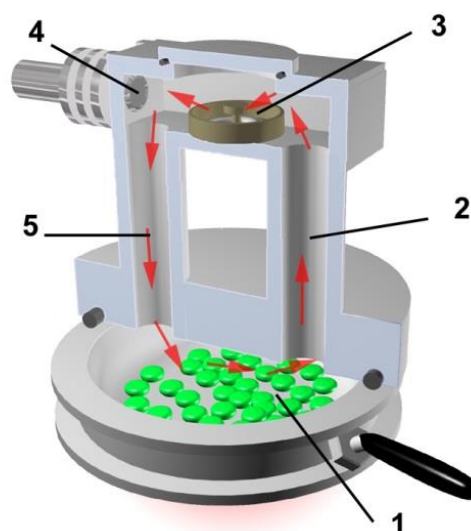
1 The test material is heated in the sample tray; water evaporates

2 The hot humid gas ascends

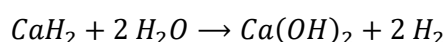
3 The Reagent exchanges water by hydrogen

4 The sensor measures the concentration of hydrogen

5 The cooled gas descends and can absorb water again



The sample is weighed and filled into the sample tray. The sample tray is shifted into the HydroTracer, being a part of the reactor. A heater warms the sample to a temperature chosen by the operator. The water within the sample material evaporates. The volatile water rises to the upper part of the reactor. Two pipes connecting the heated sample tray with the cooled upper part where the reagent is placed. The reagent tray is a small flat tray filled with approximately 0.1 g calcium hydride. When the humid air flows over the reagent, gaseous water reacts with calcium hydride according to the following equation:



So water vapor is exchanged against hydrogen and calcium hydride converts to calcium hydroxide (chalk lime).

The cooled, dried gas enters again the lower part of the reactor. The gas circulation is supported by natural convection, created by a special configuration of the vertical pipes. By this method even hygroscopic materials are completely dried. The final concentration of hydrogen in the reactor is proportional to the water content of the sample before the measurement.

The ambient air also contributes water to the reactor atmosphere. To achieve accurate results it is necessary to determine the air humidity and the air density. Integrated sensors measure the humidity of the ambient air, the temperature and the air pressure. With this data the software determines the water of the air humidity which is deduced off the final result.

The concentration of hydrogen is measured by a sensor detecting the thermal conductivity of the gas.

Note: *The air-hydrogen atmosphere does not react chemically, because the temperature is much lower than needed to supply the activation energy of the oxyhydrogen gas reaction. Even if it would react, the theoretic maximum of the reaction enthalpy (the amount of energy which would be set free by the reaction of hydrogen with the oxygen of the air) is about 0.1 kJ and therefore harmless.*

1.4 The Reagent

Calcium hydride reacts with water to calcium hydroxide (hydrated lime, agricultural hydrate), which is a weak base and quite harmless. Nonetheless, take care calcium hydride does not get into contact directly with (liquid) water. The reaction heat together with the oxygen of the air could ignite the developing gas. The small amount of reagent which is needed per measurement averts this danger. Always close the reagent bottle directly after use. Because the reagent is always added in surplus, it will be still reactive after the measurement. Avoid the contact with inflammable, especially wet materials and leave the used reagent exposed to the air, where it can react slowly with the air humidity. An ideal container is an open tin can. After a few hours calcium hydride is completely transformed to calcium hydroxide. If left even longer exposed to the air, calcium hydroxide reacts to calcium carbonate (CaCO_3 , chalk) with the carbon dioxide of the air and can be disposed without any problems.

2. Performing a Test

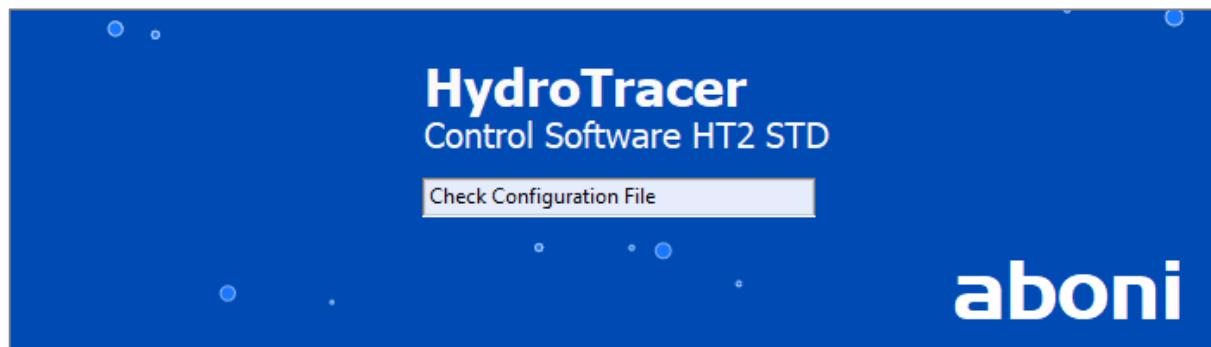
Take care the accessories are within reach. Do not leave your sample material exposed to the ambient air over a longer period, especially if it is hydroscopic.

Note: *It is recommended to acquaint oneself with the operation before doing a „serious“ test. Therefore run the program and follow the menu until you have reached the step START / F10. Then stop the program by clicking on the STOP–button. Repeat these steps until you are familiar with the procedure.*

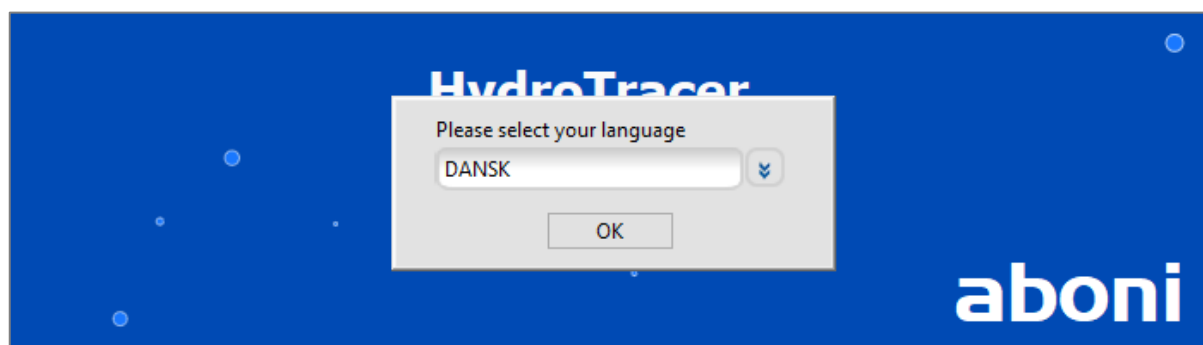
2.1 The procedure step by step

Please make sure that the HydroTracer (optional, the serial scale) is connected to the computer and powered on.

Start the program HT2 STD. A program window will open, which will initialize the software.

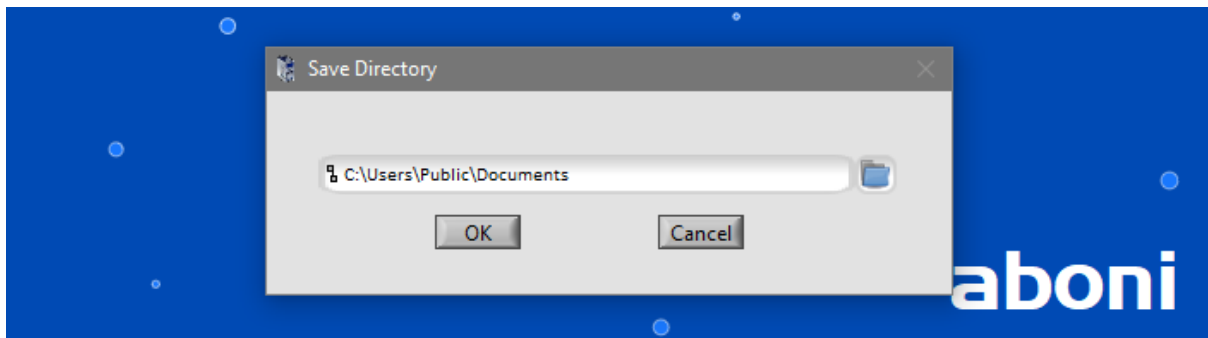


Select a language first.

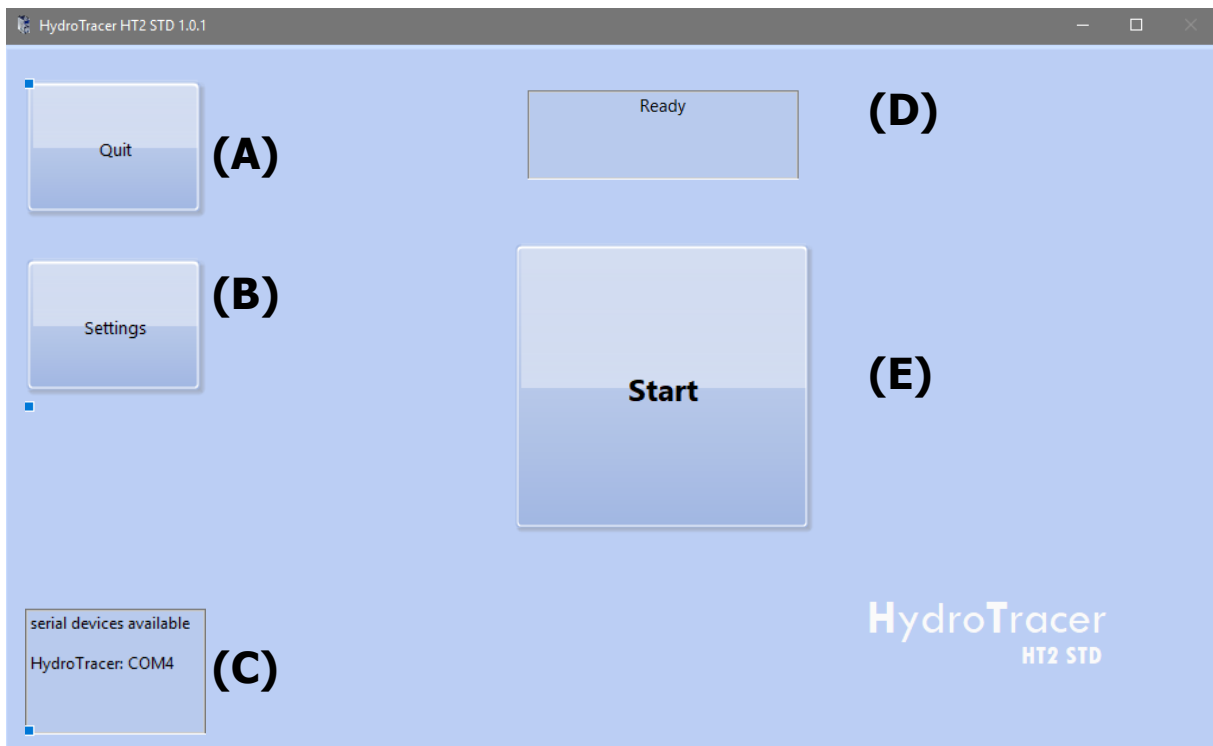


Then select a location on your PC where you want to store the measurement results and reports.

Then select a location on your PC where you want to store the measurement results and reports.



Then the software is ready for operation and the following main menu appears:



(A) „Quit“-Button closes the application

(B) „Settings“-Button opens the menu" Settings "(see „4.1 Menu: Settings & Company logo")

(C) Information display of available or connected serial devices

(D) Status indicator for the HydroTracer (see „4.4 Status Display & Information field")

(E) "Start"-Button starts a measurement. *Note: If no HydroTracer was detected during initialization, the "Connect" button will appear instead of "Start" and you can reconnect to the HydroTracer.*

After pressing the "Start" button, these input masks 1 appears:

The screenshot shows a software window with two main sections: "Operator List (A)" and "List of materials (B)".

Operator List (A): A list box containing "Operator 1" and "Operator 2", with "Operator 2" selected. Below the list are a plus sign button and a gear icon.

List of materials (B): A table with three columns: "Material", "Density", and "Heating temperature".

Material	Density	Heating temperature
ABS Acrylnitril-Butadien-Styrol	1,05	160
EVA Ethylen-Vinylacetat	1,15	130
PA 6 Polyamid 6	1,10	150
PA 6 GF 30 Polyamid 6/GF	1,50	150
PA 6.6 Polyamid 6.6	1,10	150
PA12 Polyamid 12	1,04	150
PAEK Polyaryletherketon	1,30	175
PBT Polybutylenterephthalat	1,30	150
PC Polycarbonat	1,25	175
PE Polyethylen	0,95	130

Below the table are a plus sign button and a gear icon.

Use standard operator? (C): A checkbox that is checked.

comments (D): A text input field.

At the bottom of the window are two navigation buttons: a left-pointing arrow and a right-pointing arrow.

(A) Selection field of existing operators

(B) Selection field of existing materials

(C) The checkbox "Use Standard operator?" is described in „4.2 Menu: Operator List“

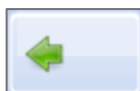
(D) Comment field for entering additional notes on the current measurement



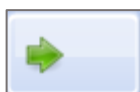
-Button: Add a new operator or material



-Button: Opens the Menu "Operator List" or "List of materials"



-Button: Change to previous menu





-Button: Change to next menu (Next)




-Button: Disabled "Next" button, unless all required entries have been made

After selecting an operator and a material, a second input mask 2 appears:

- (A) Display of the set parameters for the measurement
- (B) Pressing  opens a tool for determining the sample weight (see section „2.3 Selection of Sample Weight“)
- (C) Comment field
- (D) Checkbox for connecting a serial scale (if a scale is connected)
- (E) If a hook is set here, the program automatically opens an HTML report after the measurement has been completed

If all the settings have been made, you can press  to start the measurement process.

If you need to change the setting, you can access with  the previous menu

2.2 Selection of Temperature

The temperatures given in the materials table are proposals, which might not fit always for each member of a group of materials. Generally a temperature is chosen which is as high as possible to accelerate the evaporation of water but low enough to avoid thermal decomposing. Usually the melting of the sample should be avoided to allow easier cleaning of the sample tray. If you are not sure which temperature is appropriate, try lower temperatures first. In some cases the melting of the sample might be necessary (e.g. to investigate the behavior of compound fillers), then a (dry!) aluminum film can be inserted into the tray before the measurement.

If the heating temperature and the density of a single sample deviates from the usual characteristic, it can be added in the input mask 2 without changing the material table.

2.3 Selection of Sample Weight

The selection of the sample weight has to consider the expected moisture content: Samples with a high moisture content have to be smaller than samples with a low moisture content. A water content of more than 30 mg per sample has to be avoided. The software stops a test when a water content of 35 mg (respectively 50 mg for Hydrotracer type FLV) is exceeded.



After pressing  in input mask 2 the following window opens:

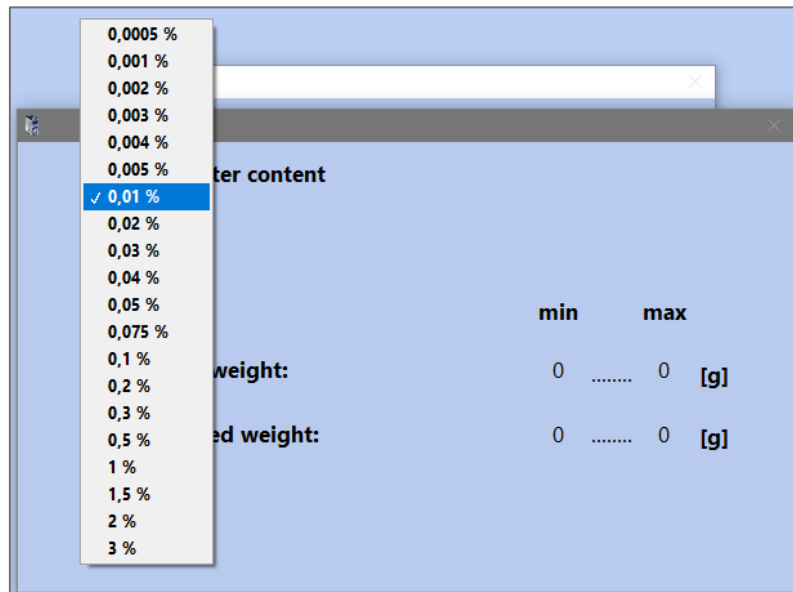
The screenshot shows a software window with a light blue background. It contains the following elements:

- (A)** A text input field labeled "expected water content" containing the value "0,01 %".
- (B)** A button with a green circular arrow icon, used for calculation.
- (C)** Two rows of output fields. The first row is labeled "permissible weight:" and the second "recommended weight:". Each row has two columns: "min" and "max", both containing "0 0 [g]".
- (D)** A "Close" button with a red 'X' icon.

- (A) Selection field for the expected water content of the sample
- (B) Pressing the button starts the calculation of the sample quantity
- (C) Display field for permissible sample weight and optimal sample weight
- (D) Pressing the button closes the application

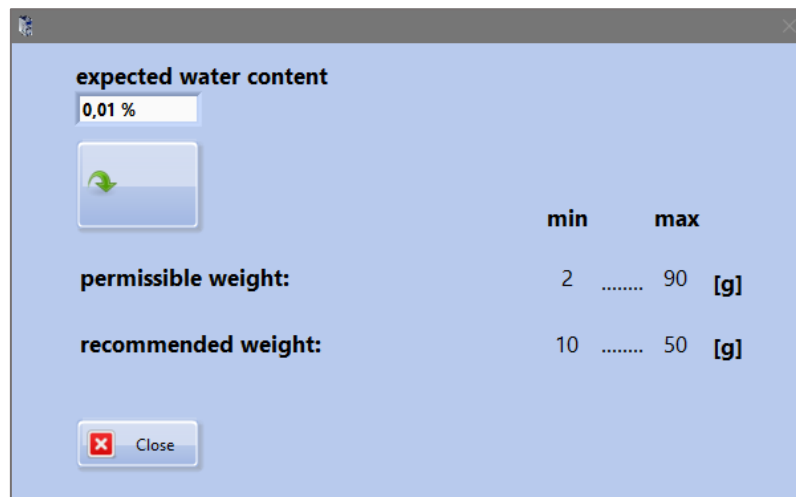
For an explanation, an example:

Selecting the selection field (A) opens a list of relative water contents according to the following figure:



An expected water content of 0.01% is selected. When pressing button (B) the permissible and, if necessary, the optimal water content is calculated.

The result of the calculation is shown in the following figure:



The permissible weight must not be less than 2 gram and not greater than 90 gram. The recommended sample weight is 10...50 gram. We recommend that you always use a sample weight near the lower limit of the recommended weight.

2.4 Using the serial balance

The connection of the serial scale with the software can be done in several ways:

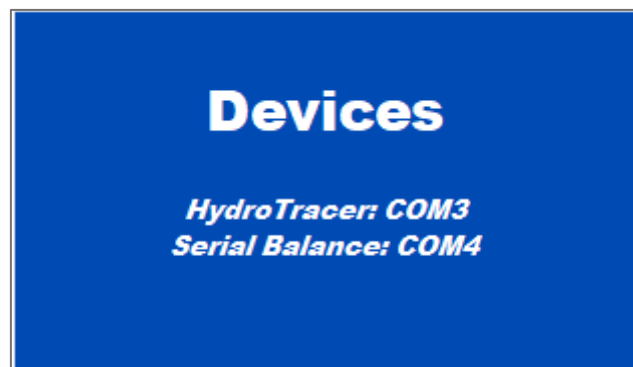
- A) Before starting the software HT2 STD connect the PC and the scale with the serial cable and switch on the scale.

Start the software HT2 STD. The software automatically detects the connected scale.

- B) The software HT2 STD is already started and you are in the main menu. Connect the PC and the scale to the serial cable and switch on the scale.

In the main menu, press the button "settings" and put a checkmark in the checkbox "Serial scale". To connect, press the "Connect" button. The scale is now connected to the software (for more information on the "Settings" menu, see „4.1 Menu: Settings & Company logo“).

If the balance is connected according to (B), you will receive the following info window as confirmation for the successful connection:

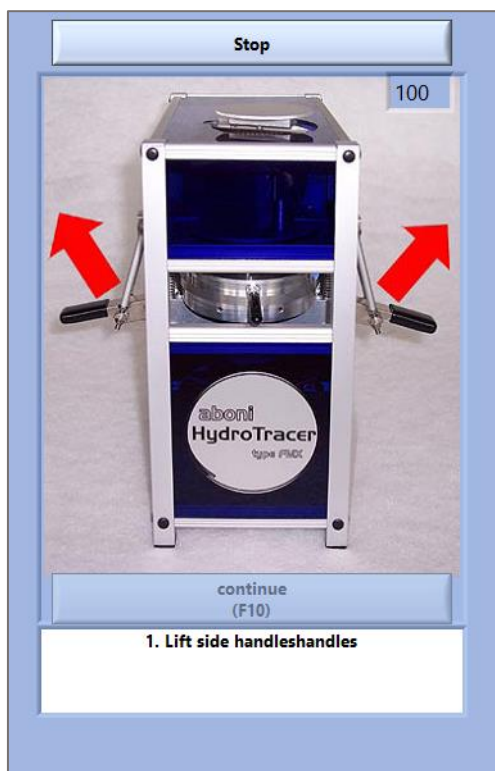


Note: *The number of the COM port may differ from the picture above!*

2.5 Operation menu with manual input: Loading the HydroTracer

This chapter describes the steps of the manual operation as shown on the screen.

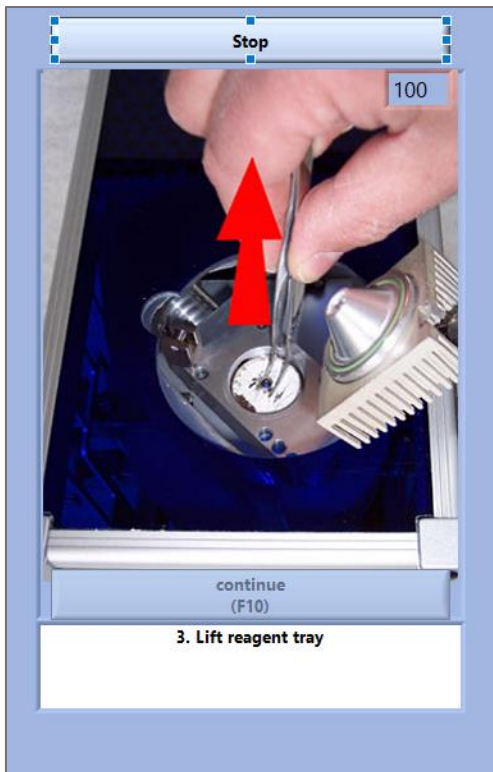
The pictures clarify the action momentarily needed. Below the picture this action is described shortly. The panel counting down the number on the right indicates the remaining time in seconds. The time schedule should be maintained rather accurate. The accuracy might be reduced by leaving the reactor open too long as well as too short. Press STOP to abort the test.



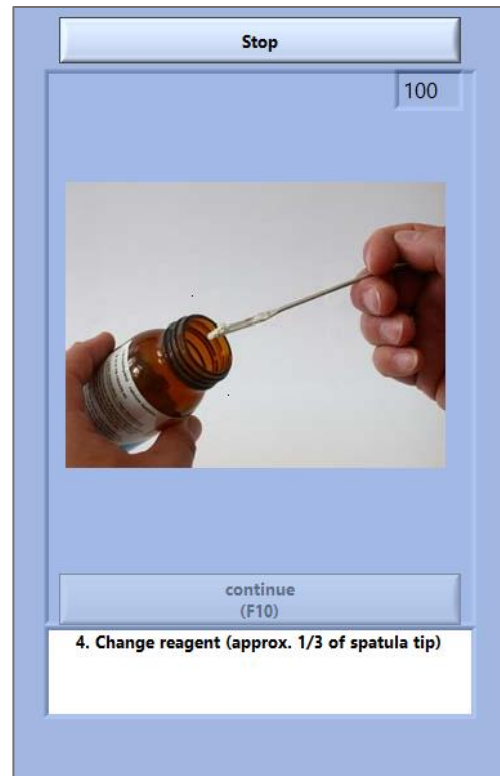
Open the reactor by lifting the side handles simultaneously. The system fan will stop.



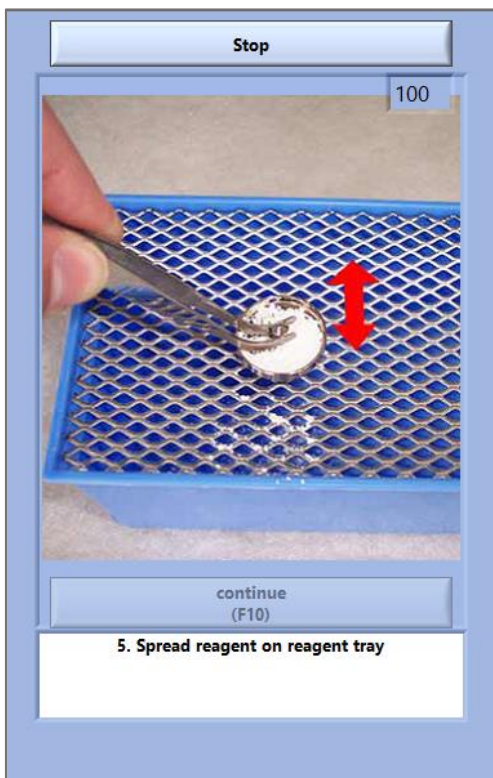
Open reactor by lifting the lid forward into the direction of the small semispherical cutout.



Lift the reagent tray with the pincers and remove the used reagent.



Take a 1/3 of a spoon with the spatula and fill it into the reagent tray. Take out the sample tray by lifting it slightly and pull it out off the front. Remove old sample material.



Spread the reagent on the reagent tray.



Close tightly the reagent glass.



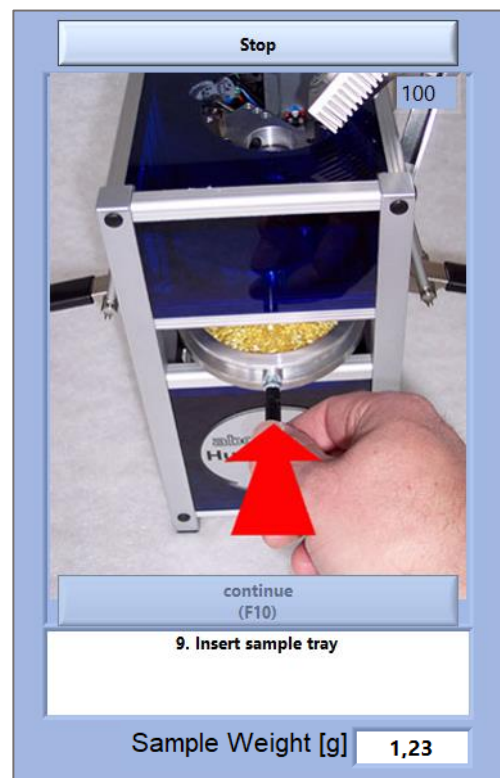
Remove the sample tray and dispose the sample material of the former test. Place the sample tray on the balance and tare it.



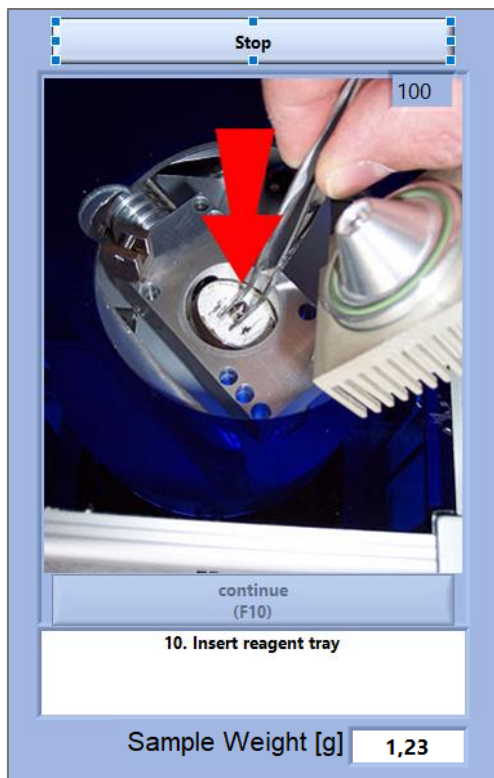
Fill in the sample material. Enter the weight in grams. Click on "Continue".



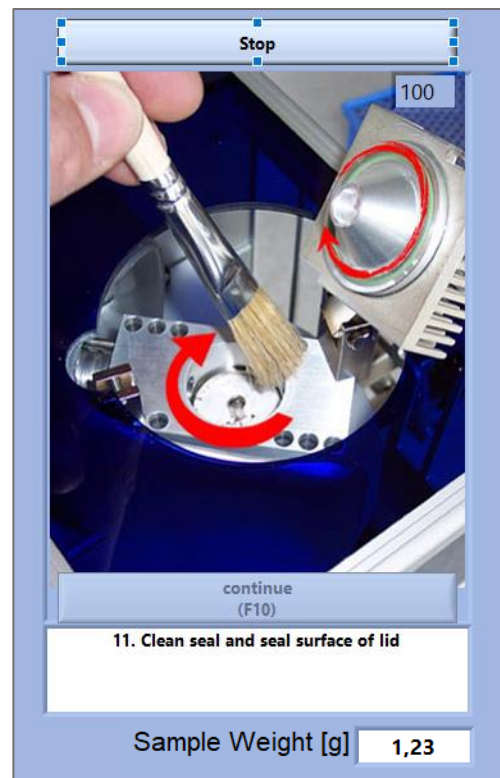
Clean the rim with the brush.



Insert the sample tray. Take care that the lower rim of the tray is properly placed over the heating plate.



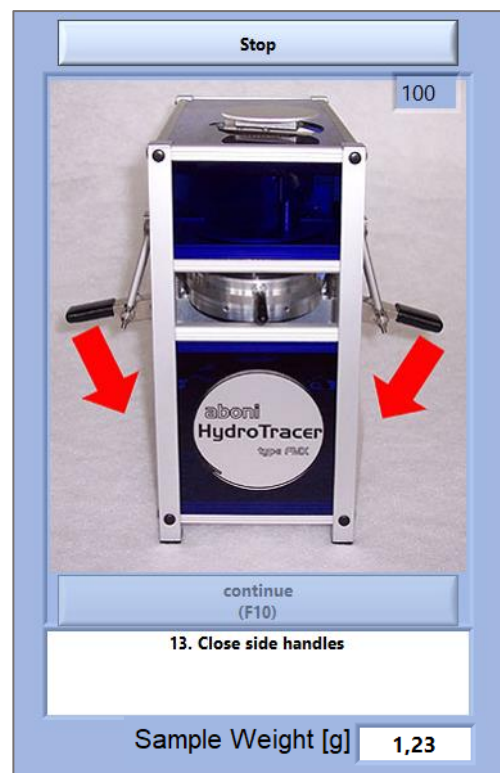
Insert the reagent tray with the pincers.



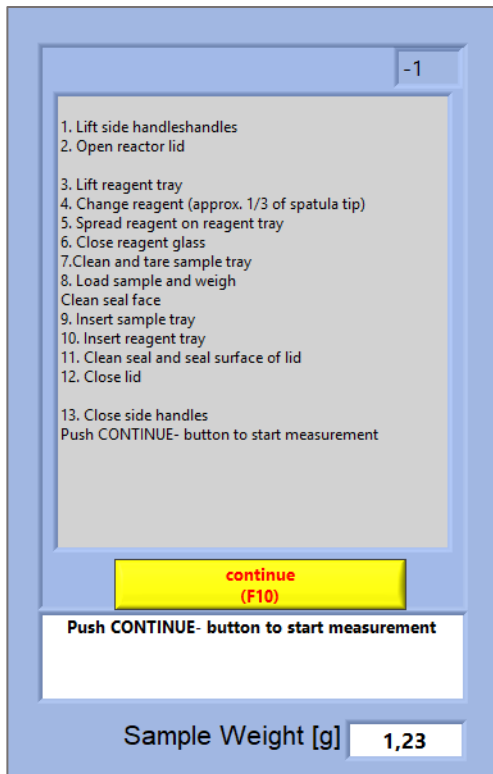
Clean O-ring and seal face of with the brush



Close reactor lid. Take care the clasp is properly locked.



Push down simultaneously the side handles. The system fan must run again.



After 99 seconds the CONTINUE button appears.

The handling steps are displayed in case further assistance is needed.

Click on Key F10 to start the measurement. No further action is required by the operator

2.6 Operation menu with automatic weight input: Loading the HydroTracer

The menu with a connected balance is quite similar to the manual weight input menu. Below are shown the deviations to the manual input of the weight.

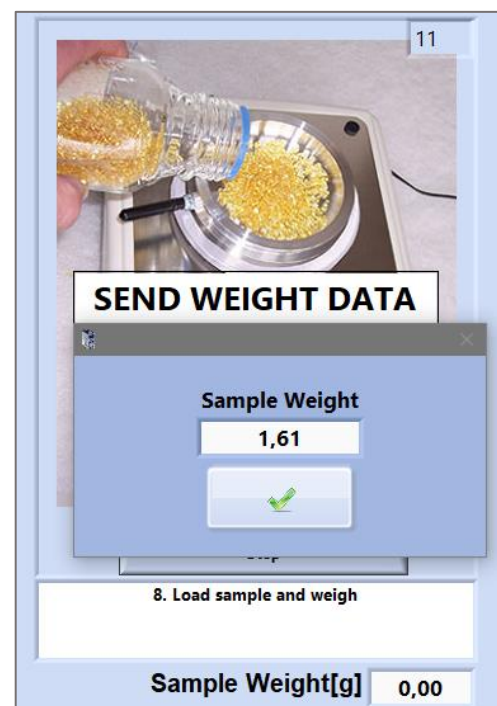


Place the sample tray on the weighing plate and tare. Fill in the sample material. Spread the sample material so that the bottom of the tray is evenly covered.



Transfer the weight data from the balance (Kern-balance: Push "PRINT"-key). The array "Sample weight" shows shortly the transferred weight and a beep sounds after the successful input.

If no transfer occurred within 30 seconds, an input menu appears to enter the data manually.

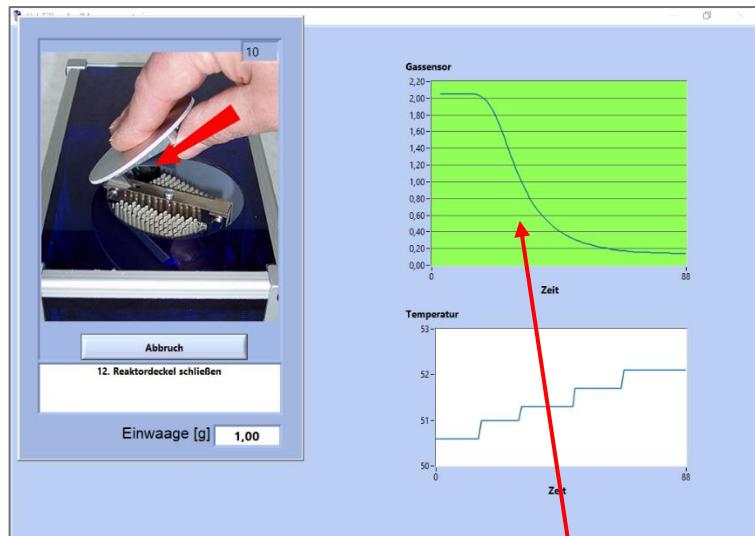


2.7 Influence of the filling procedure on the accuracy of the test

During the filling procedure the decline of the hydrogen concentration is detected. This decline is used by the software to detect the minimum sensor signal (signal at zero hydrogen content).

This value is subtracted from the signal value obtained during the test. By doing so, any zero-drift of the sensor electronics is compensated.

This procedure can work only if a decline of the hydrogen concentration is detectable during the filling of the reactor. Otherwise there will be serious errors in the calculation of the zero-value and thus in the final result.



So the concentration can only be detected correctly when the curve follows a certain form. To give an indication if this happens, the background of the diagram turns from red to green if the curve behaves properly. Otherwise, the background remains red.

To obtain a proper test result it is therefore necessary that

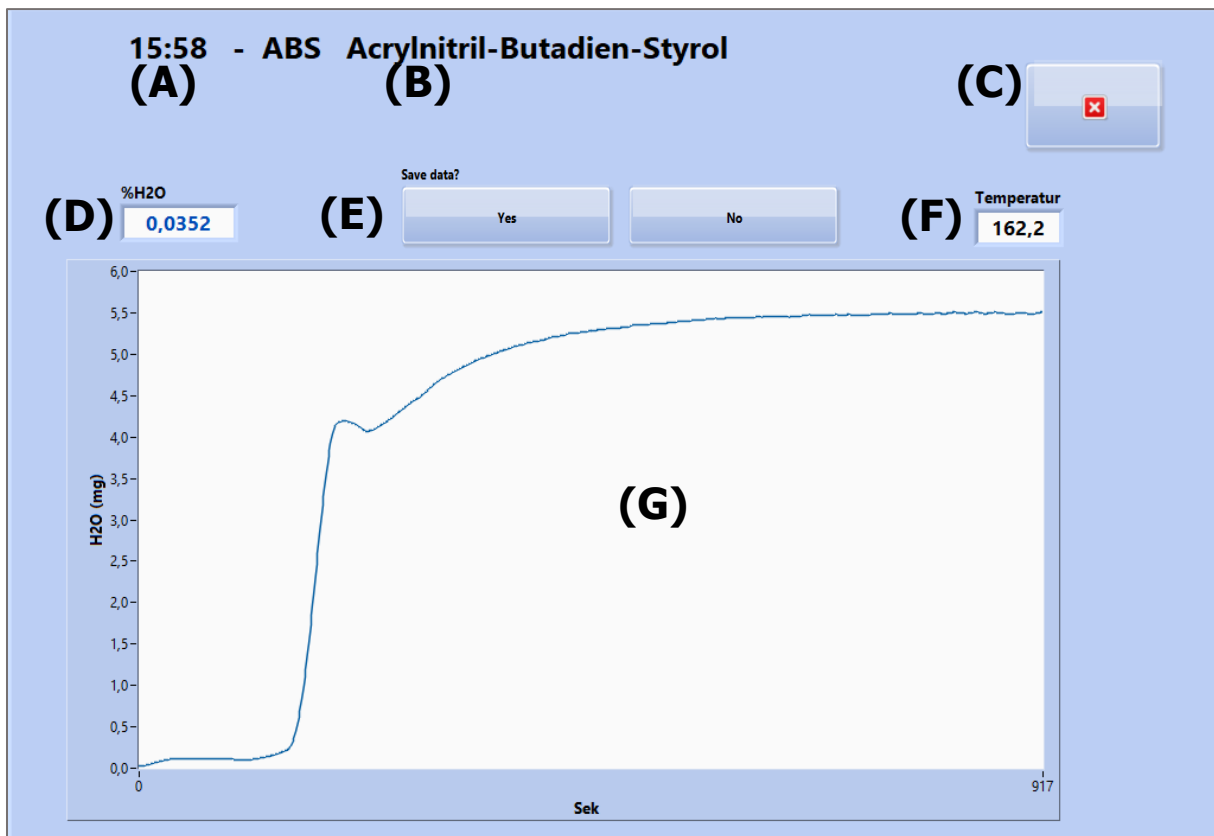
- 1) the reactor will not be opened before the pictures of the filling procedure are shown on the screen
- 2) the period when the reactor is open is not less than 70 seconds (this allows the hydrogen to evaporate completely)

2.8 Measuring period

Now the sample is heated to the selected temperature. The current heating temperature is shown in the digital display **(F)**.

In the diagram **(G)** the current total amount of water is shown in [mg]. That means both the amount of water from the sample and the amount of water from the ambient air introduced during the filling procedure are displayed.

The duration of the test depends on the type of sample and the amount of water contained and is between 12 – 40 minutes. After a time dependent on the measurement process (mostly 500 seconds), a display **(D)** of the relative humidity of the material sample appears as a percentage. This is a prognosis that interpolates the function of the water increase over time. Only when the HydroTracer has finished the measurement the result will be displayed correctly.



Furthermore are shown, the time at the start of the measurement **(A)**, the material **(B)** selected under Input Mask 1 and the button **(C)** to terminate the current measurement prematurely and the selection menu **(E)** which is only displayed after the measuring end.

2.9 End of the test

At the end of the measurement, a selection menu appears (see **(E)** „2.8 Measuring period“), whether the measurement should be saved or discarded. If no selection is made within 5 seconds, the measurement is saved automatically.

After saving, the measurement results are displayed as HTML-Report according to “3.1 HTML-Report”. Then the heater is switched off and the main cooler is adjusted to cool the HydroTracer to 50 °C stand-by temperature.



To indicate that the HydroTracer is in the cooling phase, a warning field **(A)** and a temperature scale **(B)** are displayed. Using the temperature scale, you can see at what temperature the HydroTracer is currently in the cooling phase.

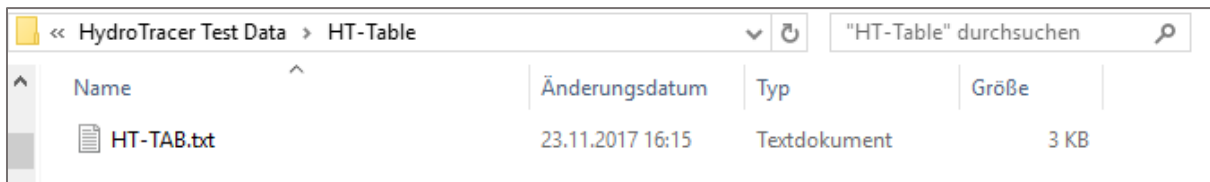
Note: Never turn off the power supply of the HydroTracer before the device reaches the default temperature of 50 °c and the main fan turns off.

3. Output of the results and storage

The measurement results of a measurement are stored twice and (optionally) displayed immediately after measuring.

In the file "HT-TAB. txt" all parameters of the measurements performed in the test report are stored line by row. You can find this file at the following location:

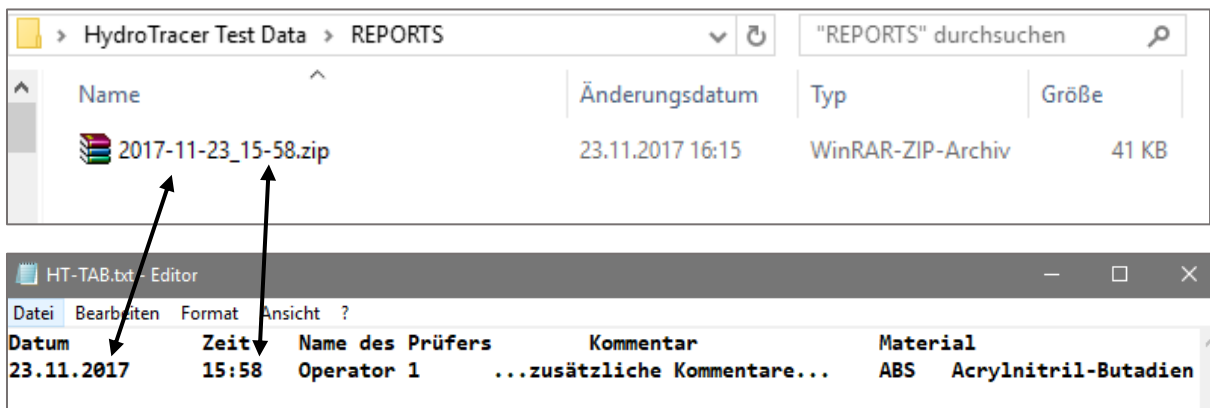
*|*Your chosen directory*|HydroTracer Test Data|HT-Table*



The purpose of this file is to provide the measurement data for further processing systems such as Microsoft © Excel.

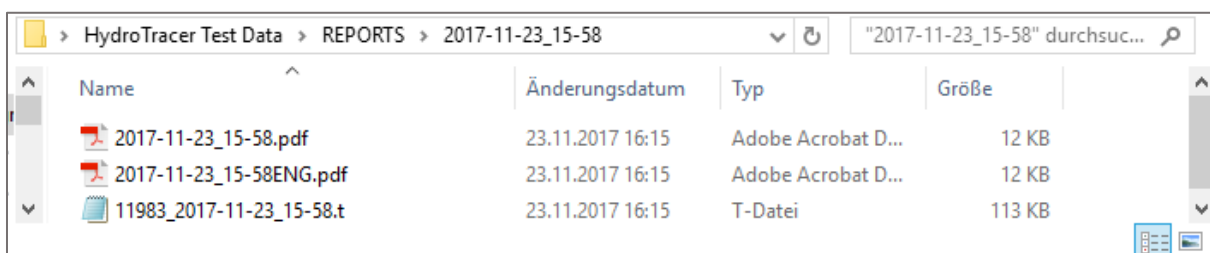
A container file (".zip") is created for each stored measurement and stored in the following storage path:

*|*Your chosen directory *|HydroTracer Test Data|REPORTS*



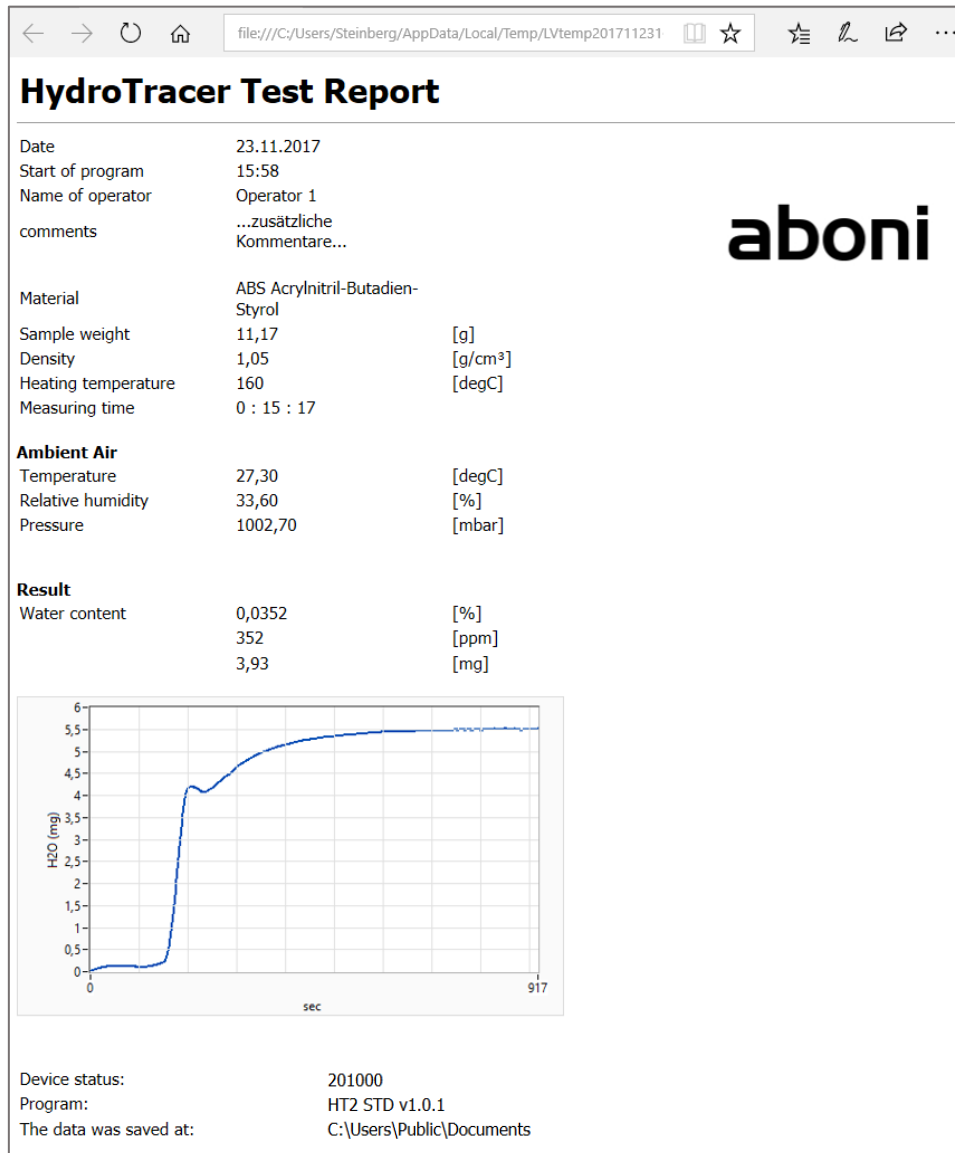
The name of the ".zip" file follows the convention "Year-Month-Day_Hour-Minute.zip". In connection with the "HT-TAB. txt", each report can be assigned in the table.

The container file contains the report as PDF file and a binary data file with the extension ".t". The latter is used for support and remote fault diagnosis by **aboni** GmbH.



3.1 HTML-Report

If a checkmark has been set in the CheckBox "Show test Report" in Input mask 2 (see „2.1 The procedure step by step“) a measurement report is opened in the Web browser after a measurement has been completed:

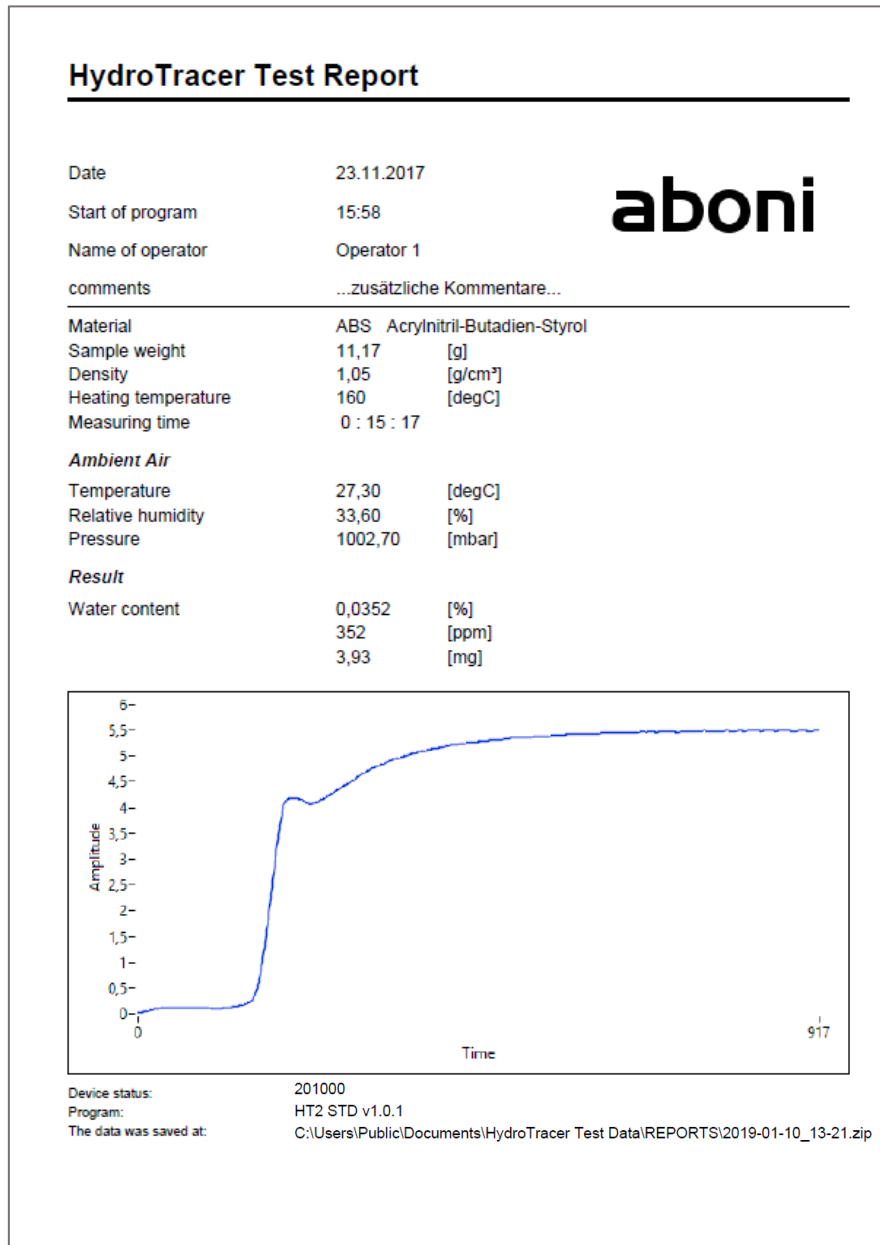


The HTML test report contains all the information provided by the user, the measurement results and information about the location and the software version.

Note: The HTML report is only saved temporarily!

3.2 PDF-Report

The PDF report of a measurement is stored in each case. It contains the same information as the HTML report:



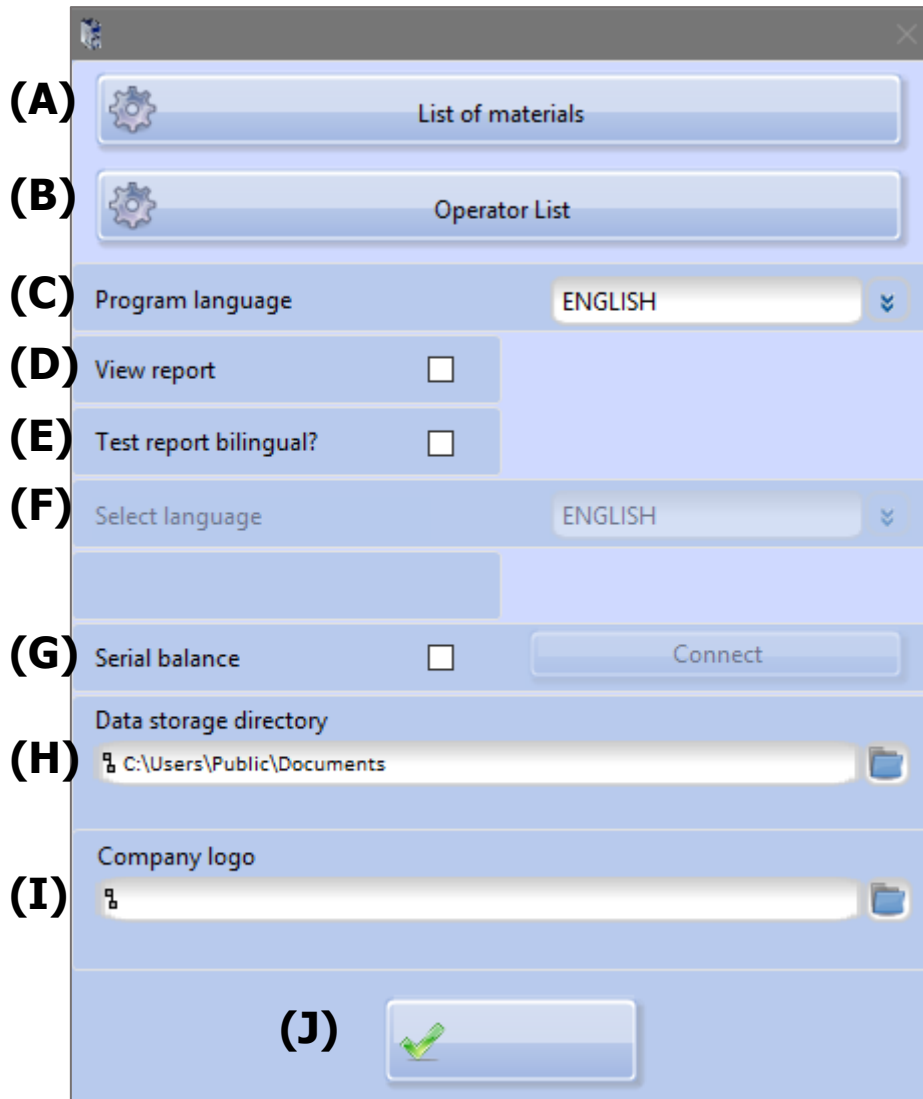
If you have selected the option "test report bilingual?" in the Menu "settings" (see „4.1 Menu: Settings & Company logo“), an additional report is created in the desired language.

Furthermore you have the possibility to insert a company logo into the report (cf. company logo "aboni" in the picture above). The insertion of a company logo is explained in „4.1 Menu: Settings & Company logo“.

4. Selection Menus & Status Display

4.1 Menu: Settings & Company logo


After calling up the menu "settings" from the main screen, this window appears:



- (A) Press to open the menu „List of materials“
- (B) Press to open the menu „Operators List“
- (C) Selection of program language
- (D) Display HTML report after measurement (hook: yes, empty: no)
- (E) Create a test report in a second language (hook: yes, empty: no)
- (F) If a checkmark is set in checkbox **(E)**, the language for the additional report can be selected here.

(G) Place the hook in the checkbox and connect the PC and the scale with the serial cable and switch on the scale. Then press the "Connect" button and the software will connect the scale. You get the info window as in „2.4 Using the serial balance“ described.



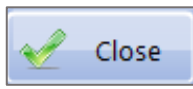
(H) The current storage path of the test reports. By pressing the  - folder icon a new storage path can be selected.

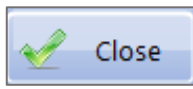
Note: The old memory path, including the data included, is preserved!



(I) By pressing the  -folder icon to insert an image file.

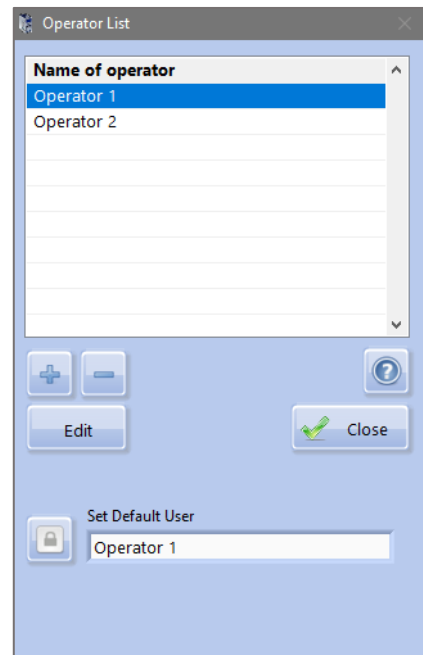
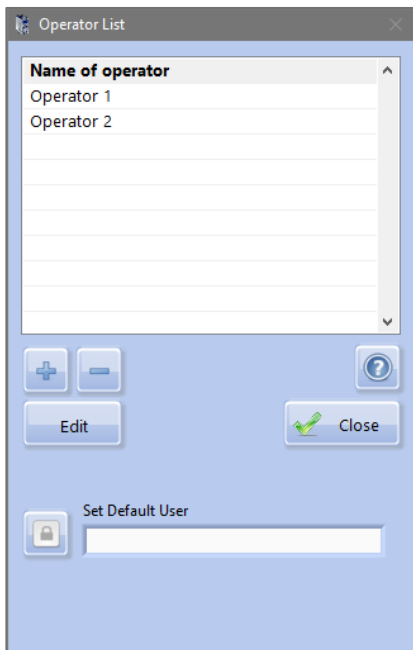
Important: The image must be in ".jpg" format. In order to achieve an optimal representation of your company logo, the image height should be 0.75 x of the picture width.



(J) By pressing the  -button closes the "Settings" window and leads to the main menu.

4.2 Menu: Operator List

Explanation of the functions within the "Operator List".



-Button: Add or remove a operator

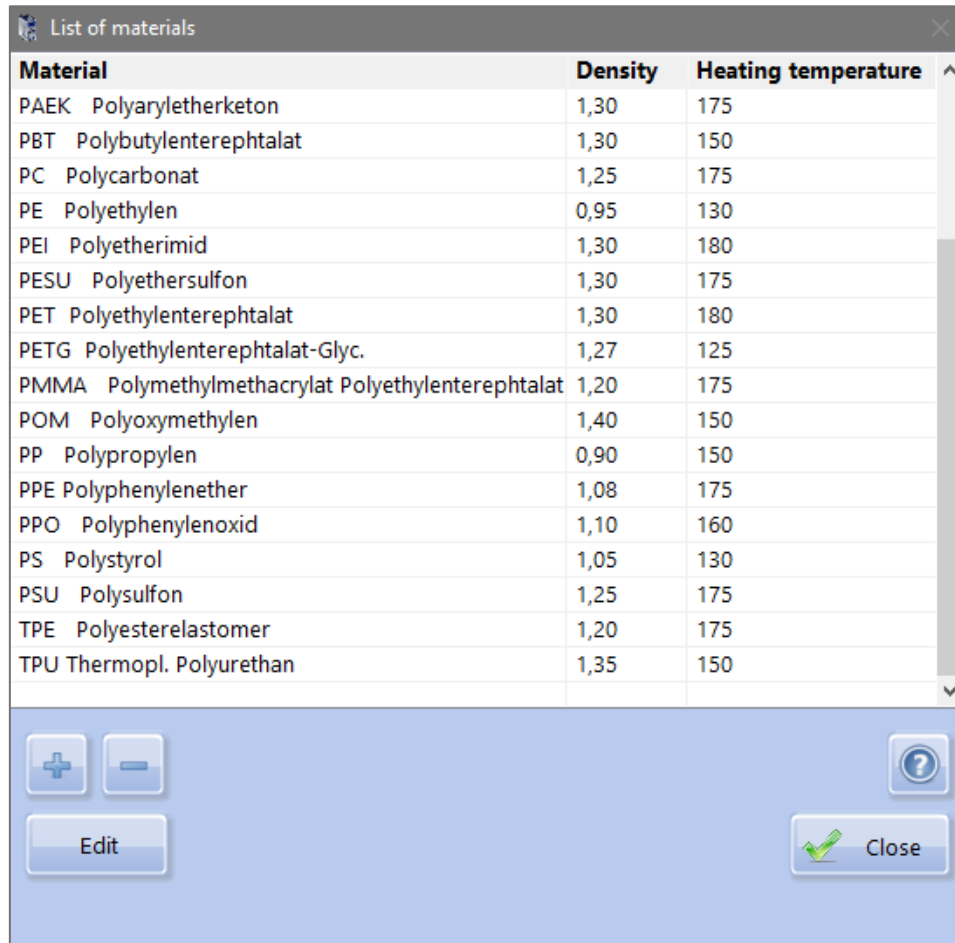


-Button: Sets the selected operator as the default, i.e. for each new measurement, it is already selected

With the button "Edit" the selected operator can be edited. The "Close" button exits the menu.


4.3 Menu: List of materials

Explanation of the functions within the "List of materials".



Material	Density	Heating temperature
PAEK Polyaryletherketon	1,30	175
PBT Polybutylenterephthalat	1,30	150
PC Polycarbonat	1,25	175
PE Polyethylen	0,95	130
PEI Polyetherimid	1,30	180
PESU Polyethersulfon	1,30	175
PET Polyethylenterephthalat	1,30	180
PETG Polyethylenterephthalat-Glyc.	1,27	125
PMMA Polymethylmethacrylat Polyethylenterephthalat	1,20	175
POM Polyoxymethylen	1,40	150
PP Polypropylen	0,90	150
PPE Polyphenylenether	1,08	175
PPO Polyphenylenoxid	1,10	160
PS Polystyrol	1,05	130
PSU Polysulfon	1,25	175
TPE Polyesterelastomer	1,20	175
TPU Thermopl. Polyurethan	1,35	150

The material list already contains a variety of materials, indicating the density and recommended heating temperature.

 -Button: Add or remove a material

With the button "Edit" the selected material can be edited. The "Close" button exits the menu.

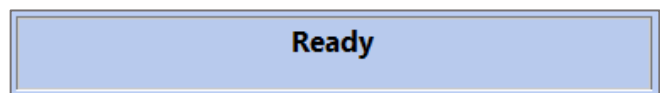
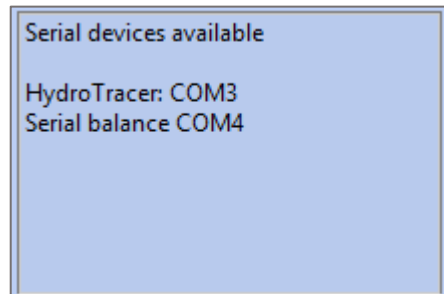
4.4 Status Display & Information field

In the main menu (cf. „2.1 The procedure step by step“ field „(C)“ and „(D)“) you get information about the connection of the HydroTracer (and the serial scale), as well as a status message about the HydroTracer itself.

If the HydroTracer and a serial balance are connected, you will receive this information in the Information field (C).

If no scale is connected, only the HydroTracer with the COM port number is displayed.

The field (D) gives you information about the operating status of the HydroTracer.



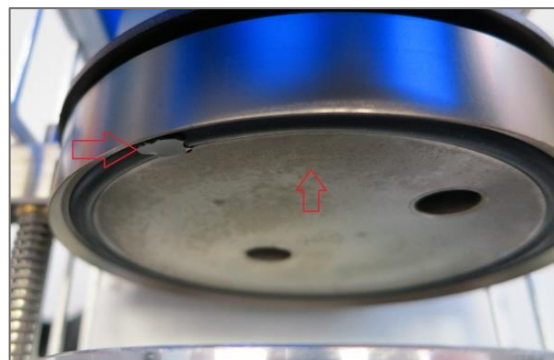
Three status messages are possible here:

1. "Ready" – the HydroTracer is ready for a measurement
2. "Warm Up" – the HydroTracer is not yet on stand-by temperature and is warmed up
3. "Systemtest" – the HydroTracer performs an internal system test. This happens every time after switching on the instrument.
4. "Cool Down" – the HydroTracer is currently cooling down to the stand-by temperature of 50 °c

5. Cleaning the reactor interior

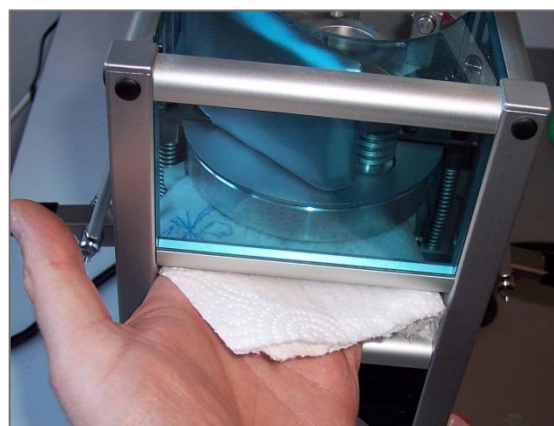
Sometimes volatiles are set free during the measurement, e.g. softeners and waxes. These substances will condense on the cooler inner surfaces of the reactor depending on condensing temperature and heating temperature. It may be necessary to clean the reactor sometimes, if visible layers occur.

Important: Check the O-Ring regularly for deposits!



To do this, switch off the power, open the reactor and take out reagent tray and sample tray.

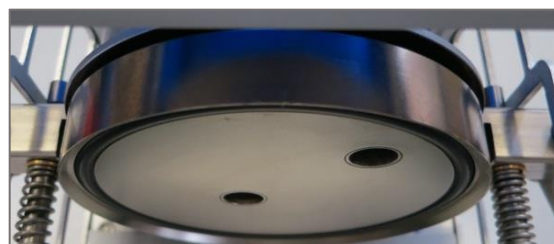
Use a paper tissue, wetted with pure alcohol (moist but not dripping) and wipe over the soiled spots. Especially the reactor- surface opposite to the sample tray can be cleaned this way.



The pipes are cleaned best with a test-tube brush (see picture). Put in the sample tray to avoid contamination of the heating plate.



Afterwards, check the O-ring. No dirt particles may remain on the sealing.



If the reagent was dispersed involuntary in the whole reactor, it is also recommended to clean the reactor. If the powder is only below the reagent tray in some quantities, just pull out the cables, open the reactor, take out reagent tray and sample tray, turn the instrument on the top and let the powder fall out.

After the cleaning a dry run should be performed.

6. Dry Run

A dry run is necessary:

- Before first use,
- after the reactor has been left open for a longer period
- or
- if the water content of a previous measurement exceeded 50 mg

Although very low water contents are to be measured and the device was not in use before, a dry run is recommended. If the HydroTracer is not in use the unit must always be kept closed and be filled with reagent

A dry run is carried out in accordance with section "2 Performing a Test", with the difference:

- no sample material is used
- the heating temperature is set to 210 °C
- for the sample weight is enter 1 g and for the density 1g/cm³

7. Errors

If an error occurs during the communication between Hydrotracer and PC, the HydroTracer sends an error message to the software. In some cases, this will interrupt the measurement.

Following table shows the possible errors:

Code	Error
2	Reactor Heater
4	Door Contact Reactor
16	PT1000 Mainboard (PTC3)
32	BME280 – Temperature
64	BME280 – Humidity
128	BME280 – Pressure
256	Communication Mainboard <-> PC
512	Communication Mainboard <-> Sensorboard
1024	general Sensorboard

If the connection between PC and HydroTracer is interrupted for more than 4 minutes, the measurement is automatically cancelled and the HydroTracer cools down.

8. Remarks concerning calcium hydride

Calcium hydride is reported as dangerous goods in the material safety data sheet.

This classification refers to large amounts, so that the recommended precautions to exposure are valid over any length of time with any great amount (e.g. filling a silo or the like)

About the toxicity of calcium hydrid:

Calcium hydride reacts with **water** immediately to **calcium hydroxide** (slaked lime) and **hydrogen**. In this reaction, heat is released. In minor amounts, which are used in the measurement with the HydroTracer, damage by heat development is virtually impossible.

In an aqueous solution of **calcium hydroxide** reacts alkaline (pH up to about 11). The resulting solution is an irritant and skin contact should be avoided. From the overall experience it is known as calcium lime mortar. In the food industry, calcium lime is added as an acidity regulator for foods and in the EU as a food additive called E 526 approved without maximum limit (quantum satis) generally for food.

The resulting **hydrogen** is produced also as a metabolite in the human body and is non-toxic.

About the explosion capacity of calcium hydride:

Hydrogen is produced by the reaction of calcium hydride with water. In air hydrogen is explosive at concentrations of 4% (detonating gas reaction). Since only small amounts of the reagent used (maximum of 75g per bottle) it is practically impossible to create a flammable mixture with air in a room. The very high volatility of the hydrogen gas prevents locally higher concentrations formed in the air.

Disposal of the used reagent:

The reagent used in the HydroTracer is still largely reactive after the measurement. By exposure to air, it can react slowly with atmospheric moisture to calcium hydroxide (approximately 1-2 hours). Subsequently calcium hydroxide reacts with the carbon dioxide of the air to calcium carbonate (limestone) and can then be disposed of with household waste.

Conclusion:

When dealing with calcium, it is crucial that the amount used is minimized. Ingestion inhalation and contact with the mucous membranes should be avoided to prevent irritation. The minor potential of harm is also caused by the small amounts (about 0.1 g) which are advised in the manual. The chemical hazard corresponds to that of slaked lime.

In normal use no risk of explosion due to hydrogen gas.

CE- Konformitätserklärung / CE Declaration of Conformity**Die Firma / The manufacturer**

aboni GmbH für Mess- und Automatisierungstechnik

Anschrift/Address: Friedrich-Ebert-Str. 27, 14548 Schwielowsee, Deutschland / Germany

Telefon/Phone: ++49(0)700 22664 366 Fax: ++49(0)700 22664 329

Web: www.aboni.de E-Mail: info@aboni.de

erklärt hiermit, dass die Produkte / hereby declares that the following products

Produktkennzeichnung / Product name

HydroTracer type FMX, FLV

Feuchtemessgerät für Feststoffe, moisture analyser for solids

**mit den Bestimmungen der nachstehenden EU-Richtlinien übereinstimmen /
are in accordance with the following European directives**

Referenz-Nummer / Reference no.	Titel / Title
2006/42/EG / 2006/42/EC	Maschinenrichtlinie / Machinery Directive
2004/108/EG / 2004/108/	EC Elektromagnetische Verträglichkeit / Electromagnetic Compatibility
2006/95/EG / 2006/95/	EC Niederspannungsrichtlinie / Low Voltage Electrical Equipment
2006/95/CE	CE Kennzeichnung / CE marking

**und dass die nachstehenden Europäischen Normen zur Anwendung gelangt sind. /
and comply with the following european standards.**

Norm / Standard	Titel / Title
EN 61326	Electrical equipment for measurement, control and laboratory use-EMC requirements
EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use
EN 14121:2007	Safety of machinery

Das Gerät wurde überprüft bezüglich seiner Funktionsfähigkeit der Genauigkeit der Messergebnisse. Die Funktionen des Gerätes sind in der Betriebsanleitung dokumentiert.

The instrument was validated with respect to functionality, analytical performance and accuracy of the results. The instrument functions are documented in the instruction manual.

Schwielowsee , 04.07.2018

Holger Hofmann, Geschäftsführer / Managing Director

aboni GmbH

CaH2 Typ K 0-2 mm - Lager

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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : CaH2 Typ K 0-2 mm - Lager

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Reducing agents, Alloy component., Pyrotechnics.
Recommended restrictions on use : None known.

1.3 Details of the supplier of the safety data sheet

Company : Albemarle Germany GmbH
Industriepark Höchst, Gebäude G 879
65926 Frankfurt a.M.
Telephone : +49 69 40 12 6-0
Telefax : +49 69 40 12 6-7 2000

Contact person product safety
Telephone : +49(0)5326 51-1292
E-mail address : productsafety@albemarle.com

1.4 Emergency telephone number

Emergency telephone number : +32 (0) 70-233-201 (EUROPE)
(+1)225-344-7147 (US and WORLDWIDE)
+65-6733-1661 (ASIA PACIFIC)

NHS Direct
111

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Substances and mixtures, which in contact with water, emit flammable gases, Category 1
H260: In contact with water releases flammable gases which may ignite spontaneously.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word : Danger

Hazard statements : H260 : In contact with water releases flammable gases which may ignite spontaneously.

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Precautionary statements

Prevention:

P231 + P232

Handle and store contents under inert gas.
Protect from moisture.

P280

Wear protective gloves/ protective clothing/
eye protection/ face protection.

Response:

P305

IF IN EYES:

P351

Rinse cautiously with water for several
minutes.

P307

IF exposed:

P310

Immediately call a POISON CENTER or
doctor/ physician.

P378

In case of fire, use extinguish media on
basis of NaCl or pulverized limestone. Nev-
er use water.

Hazardous components which must be listed on the label:

- 7789-78-8 Calcium hydride

2.3 Other hazards

Keep under argon.

The information required is contained in this Material Safety Data Sheet.

Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

CAS-No.: 7789-78-8 , CAS Name: Calcium hydride , EINECS-No.: 232-189-2

3.2 Mixtures

Chemical nature : Solid
powder

Hazardous components

Chemical name	CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration [%]
Calcium hydride	7789-78-8 232-189-2	Water-react. 1; H260	>= 80 - <= 100

For the full text of the H-Statements mentioned in this Section, see Section 16.

For the full text of the Notas mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

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- General advice : First Aid responders should pay attention to self-protection and use the recommended protective clothing
Take off contaminated clothing and shoes immediately.
Move out of dangerous area.
Keep warm and in a quiet place.
- If inhaled : Provide fresh air.
If not breathing, give artificial respiration.
Keep the victim calm and in a semi-upright position.
Call a physician immediately.
- In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes.
Consult a physician.
- In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Call a physician immediately.
- If swallowed : Clean mouth with water and drink afterwards plenty of water.
Never give anything by mouth to an unconscious person.
Do NOT induce vomiting.
Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

- Symptoms : No information available.

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : Treat symptomatically.
For specialist advice physicians should contact the Poisons Information Service.

SECTION 5: Firefighting measures

5.1 Extinguishing media

- Suitable extinguishing media : Dry extinguishing media based on NaCl or pulverized limestone.
- Unsuitable extinguishing media : Water
Carbon dioxide (CO₂)
Foam

5.2 Special hazards arising from the substance or mixture

- Specific hazards during fire-fighting : Dust can form an explosive mixture in air.
In contact with water releases flammable gases which may ignite spontaneously.
Hazardous decomposition products formed under fire conditions.
Hydrogen
Calcium oxide

5.3 Advice for firefighters

- Special protective equipment for firefighters : Wear full protective clothing and self-contained breathing apparatus.

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Further information : Use water spray to cool unopened containers.
Be aware of a dangerous reaction with water, if the container is ruptured.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Remove all sources of ignition.
Ensure adequate ventilation.
Wear personal protective equipment.
Avoid contact with skin, eyes and clothing.
Do not breathe dust.
Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

Environmental precautions : Do not flush into surface water or sanitary sewer system.
Avoid subsoil penetration.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Never allow contact with water.
Avoid dust formation.
Cover spilled material with limestone powder.
Pick up and transfer to properly labelled containers.
Adequate disposal

6.4 Reference to other sections

See chapter 8 and 13

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Keep under argon.
Handle under inert gas.
Never allow water to come into contact with the product.
Provide sufficient air exchange and/or exhaust in work rooms.
Wear personal protective equipment.
Avoid dust formation.
Handle in accordance with good industrial hygiene and safety practice.
In general, emissions are controlled and prevented by implementing an appropriate management system, including regular informing and training workers.

Advice on protection against fire and explosion : Keep away from sources of ignition - No smoking.
Take precautions against dust explosion.
Take precautionary measures against static discharges.
Use explosion-proof equipment.

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7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep under argon.
Store in original container.
Keep container tightly closed in a dry and well-ventilated place.
Protect from moisture.
Avoid contact with air/oxygen.
Keep away from heat.

Advice on common storage : Never allow product to get in contact with water during storage.
Do not store near acids.
ammonia
Oxidizing agents
Alcohols

7.3 Specific end use(s)

Specific use(s) : Reducing agents, Alloy component., Pyrotechnics.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Engineering measures

Provide sufficient air exchange and/or exhaust in work rooms.
Take precautionary measures against static discharges.
Electrical equipment should be protected to the appropriate standard.

Personal protective equipment

Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment.
For short-time or low exposures, use breathing apparatus with a filter.
Half mask with a particle filter P2 (EN 143)
For intensive or prolonged exposure, use a self-contained breathing apparatus.

Hand protection : Glove material: Wear suitable gloves.
Protective gloves complying with EN 374.
and
: Glove material: Flame retardant gloves
Protective gloves complying with EN 659.
The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other.
The exact break through time can be obtained from the protective glove producer and this has to be observed.

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	Protective gloves have to be replaced at the first sign of deterioration.
Eye protection	: Tightly fitting safety goggles Eye protection (EN 166)
Skin and body protection	: Flame retardant antistatic protective clothing.
Hygiene measures	: Take off contaminated clothing and shoes immediately. Avoid contact with skin, eyes and clothing. Do not breathe dust. When using do not eat, drink or smoke. Wash hands before breaks and at the end of workday. Keep away from food, drink and animal feedingstuffs.
Protective measures	: Facilities storing or utilizing this material should be equipped with an eyewash facility and safety shower. Handle in accordance with good industrial hygiene and safety practice.
Environmental exposure controls	
General advice	: Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	: powder
Colour	: grey white
Odour	: odourless
Odour Threshold	: No data available
Flash point	: No data available
Ignition temperature	: 300 °C
Lower explosion limit	: No data available
Upper explosion limit	: No data available
Flammability (solid, gas)	: No data available
Flammability of liquid	: Substances and mixtures, which in contact with water, emit flammable gases, Category 1 In contact with water releases flammable gases which may ignite spontaneously.
Oxidizing properties	: No data available
Auto-ignition temperature	: No data available
Burning number	: No data available

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Molecular weight	:	42.10 g/mol
pH	:	No data available
Melting point/ range	:	816.0 °C
Decomposition temperature	:	600 °C
Sublimation point	:	No data available
Vapour pressure	:	No data available
Density	:	ca.1.9 g/cm ³ at 20.0 °C
Relative density	:	No data available
Bulk density	:	No data available
Water solubility	:	at 20 °C Method: OECD Test Guideline 111 Substance hydrolyses rapidly.
Partition coefficient: n-octanol/water	:	No data available
Solubility in other solvents	:	No data available
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Flow time	:	No data available
Impact sensitivity	:	No data available
Relative vapour density	:	No data available
Surface tension	:	No data available
Evaporation rate	:	No data available

9.2 Other information

Explosivity : Dust can form an explosive mixture in air.

SECTION 10: Stability and reactivity

10.1 Reactivity

Risk of violent reaction.

10.2 Chemical stability

Product is sensitive to moisture., Sensitive to air.

10.3 Possibility of hazardous reactions

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Hazardous reactions : In contact with water releases flammable gases which may ignite spontaneously.
Dust can form an explosive mixture in air.
Dangerous reaction with water, acids and oxidising substances to form flammable gases.

10.4 Conditions to avoid

Conditions to avoid : Keep away from open flames, hot surfaces and sources of ignition.
Keep away from heat.
Protect from moisture.
Avoid dust formation.
Static discharge.
Avoid contact with air/oxygen.

10.5 Incompatible materials

Materials to avoid : Water
Halogenated compounds
Oxidizing agents
Strong acids
ammonia
Humid air
Alcohols

10.6 Hazardous decomposition products

Risk of decomposition. : Decomposes on contact with water.
Hydrogen
Calcium

Thermal decomposition : 600 °C
To avoid thermal decomposition, do not overheat.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity : No data available

Skin corrosion/irritation

Skin irritation : May cause skin irritation in susceptible persons.

Serious eye damage/eye irritation

Eye irritation : May cause eye irritation with susceptible persons.

Respiratory or skin sensitisation

Sensitisation : No data available

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SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish : No data available

12.2 Persistence and degradability

Biodegradability : The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Bioaccumulation : No data available

12.4 Mobility in soil

Physico-chemical removability : No data available

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Additional ecological information : slightly water endangering
: Do not flush into surface water or sanitary sewer system.
Avoid subsoil penetration.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Dispose of in accordance with local regulations.
Contaminated packaging : Dispose of in accordance with local regulations.
Waste Code : Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

SECTION 14: Transport information

14.1 UN number

ADR : UN 1404
RID : UN 1404
IMDG : UN 1404

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IATA : UN 1404

14.2 UN proper shipping name

ADR : CALCIUM HYDRIDE

RID : CALCIUM HYDRIDE

IMDG : CALCIUM HYDRIDE

IATA : Calcium hydride

14.3 Transport hazard class(es)

ADR : 4.3

RID : 4.3

IMDG : 4.3

IATA : 4.3

14.4 Packing group

ADR
Packing group : I
Classification Code : W2
Tunnel restriction code : (E)

RID
Packing group : I
Classification Code : W2
Hazard Identification Number : X423

IMDG
Packing group : I
EmS Code : F-G, S-O
Segregation group : Alkalis

IATA_C
Packing instruction (cargo aircraft) : 487
Maximum quantity : 15.00 KG
Packing group : I

IATA_P : Not permitted for transport

14.5 Environmental hazards

ADR
Environmentally hazardous : no

RID
Environmentally hazardous : no

IMDG
Marine pollutant : no

14.6 Special precautions for user

Not applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

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SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

- REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).
- Major Accident Hazard Legislation : Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.
OTHER HAZARDS
O2
Quantity 1: 100 to
Quantity 2: 500 to
- Water contaminating class (Germany) : WGK 1 slightly water endangering
- Other regulations : The product is classified and labelled in accordance with EC directives or respective national laws.
Regional or national implementations of GHS may not implement all hazard classes and categories.
: Take note of Dir 94/33/EC on the protection of young people at work.
Occupational restrictions for pregnant and breast feeding women

15.2 Chemical safety assessment

A Chemical Safety Assessment is not required for this substance.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H260 In contact with water releases flammable gases which may ignite spontaneously.

Further information

The information provided is based on our current knowledge and experience and apply to the product as delivered. Regarding the product properties, these are not guaranteed. The delivery of this safety datasheet does not free the recipient of the product from his own responsibility to follow the relevant rules and regulations concerning this product.