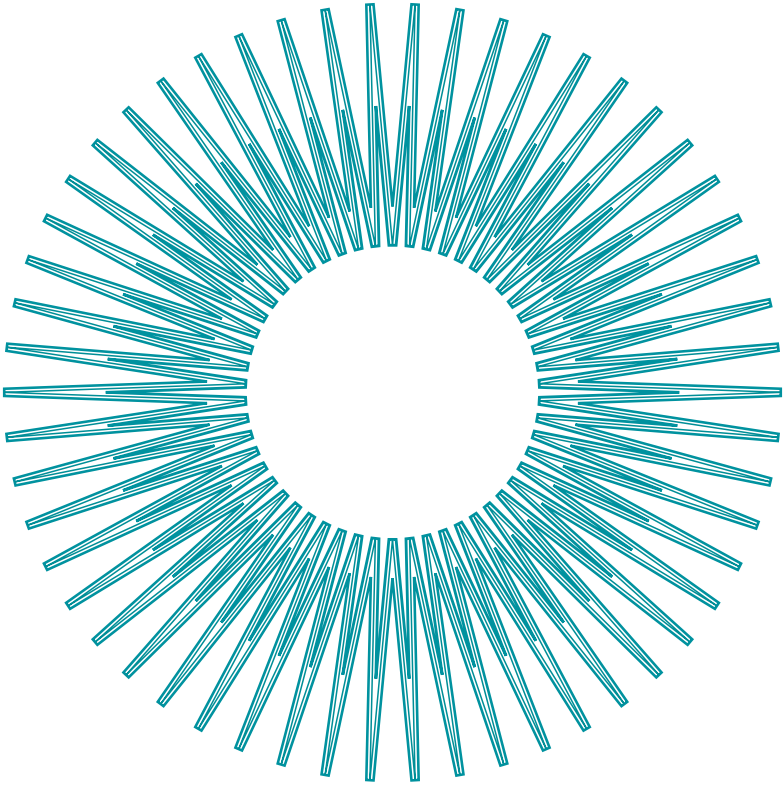
User Manual



iCheck
Iron

iCheck **Iron** is a testing device to measure Iron, empowering you with instant results to make confident decisions.

BioAnalyt

Quality Guarantee

Dear customer,
Congratulations on your acquisition of a new iCheck™ Iron!

iCheck Iron will be your reliable partner for the iron analysis.
iCheck is a high-tech portable photometer with precise and reliable results.

iCheck is produced following strict rules of quality assurance according to ISO 9001:2015. This is accomplished by the use of high-grade components and equipment as well as a stream-lined production process. This process includes quality controls of each component and rigorous calibration of the device by trained technicians.

Your iCheck Iron comes with a 2-year warranty.

Please note: If the device is used in a manner that does not comply with the operating instructions, the protection may be impaired.

If you have any questions, please contact us by calling ***+49 (0)33 28 35 15 000***
or sending an e-mail to support@bioanalyt.com.

www.bioanalyt.com
www.linkedin.com/company/bioanalyt

TOP 100

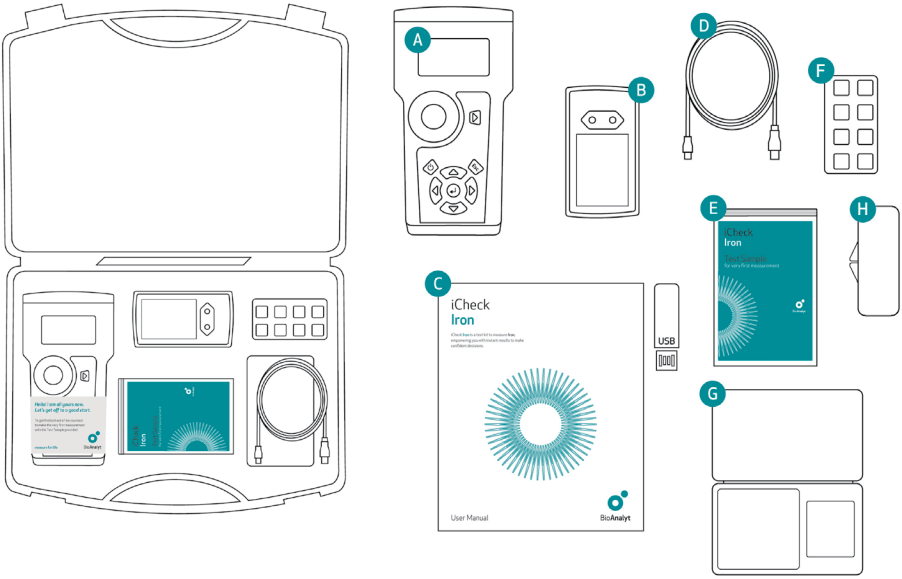
Development, manufacture and sales of all BioAnalyt test kits (devices, reagent vials) are carried out in accordance with ISO 9001:2015 and have been certified by TÜV NORD, Germany.

Contents

Version 3.3

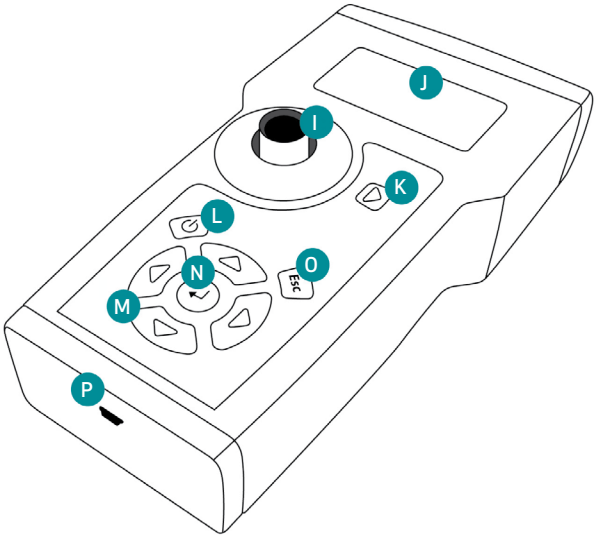
Check your Case Content

Your iCheck **Iron** is delivered in a portable case.
The items included in the case are listed below.



- **A** iCheck Iron with metal cap
- **B** Battery charger and 4 rechargeable batteries
- **C** User Manual and software on USB stick
- **D** USB cable for data transfer to computer
- **E** Test Sample
- **F** Stand for reagent vials
- **G** Digital balance and calibration weight
- **H** Iron Standard

Device
Description



- **I** Measurement chamber for iCheck Iron reagent vials with removable metal cap (not shown)
- **J** Display monitor
- **K** Measurement key
- **L** Power key (On / Off)
- **M** Menu navigation keys: left, right, up, down
- **N** Enter (OK) key
- **O** Escape key
- **P** USB cable mini-port for data transfer

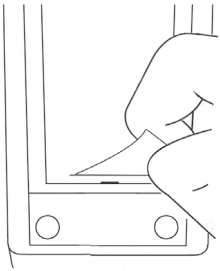
Use the 4 keys marked with triangles to navigate the menu structure of the device. To select an option, press the enter key. To exit an operation or to navigate one directory up, press the escape key.

Not shown:
Battery compartment on the back side.

Instructions
Iron

1 Insert the batteries

- The iCheck is equipped with 4 rechargeable batteries (AA). Please charge them fully before device use.
- Open the battery compartment at the back of the iCheck by lifting the tab.



- Insert the batteries as indicated.

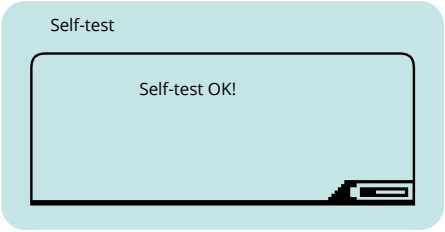
Note:
The batteries can be recharged with the supplied charger. It takes about 2-3 hours to fully charge an empty battery. Charging is best performed within the temperature range of +5 °C to +45 °C.

2 Switch on the device

- Start by placing the iCheck on a flat and stable surface. Make sure the metal cap is covering the measurement chamber.
- Switch on your iCheck by pressing the power key.

Self-test

- The device will automatically perform a self-test of the photometric unit and software. This will take approximately 10 seconds.
- When the self-test is successful the device will display “Self-test OK” and automatically bring you into the measurement mode.

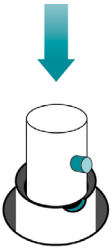


- The iCheck has an energy-saving function. 10 minutes after the last keystroke the photometer will switch off automatically.

Important: iCheck must be used with charged batteries at all times. It is not recommended to perform any measurement using the USB cable.

3 Control the device

- Using the left and right navigation keys enter "Device Control" mode. Press the measurement key. The device will display "Insert Standard".
- Carefully take out Iron Standard from its casing, remove the cap covering the measurement chamber and place Iron Standard inside.
- Make sure the metal edges of the Iron Standard fit into the 2 ridges of the measurement chamber. Press the measurement key again and wait for the device to display a value.



- Control that the value displayed by the device, for example 55 AU, is within the range indicated on the casing of the Iron Standard. For example: [20 - 100].
- When the value is within the range return to the "Sample" mode to proceed with the measurement using left or right navigation key.
- When the value displayed by the device is outside the indicated range, repeat the measurement. If the value remains outside the indicated range contact BioAnalyt Support at support@bioanalyt.com for assistance.

Note:
It is not necessary to cover the measurement chamber while performing Device Control.

4 Prepare the Test Sample

- Your iCheck Iron case includes a Test Sample - solution of ferrous iron. Use this Test Sample to verify your measurement procedure and the device performance.
- Prepare the Test Sample according to the instructions supplied with it. Measure the Test Sample and compare your result with the concentration indicated on the Test Sample.
- If your result deviates from the expected concentration of the Test Sample by more than ±10% contact BioAnalyt Support.

5 Prepare your sample

- iCheck Iron quantitatively analyzes total iron in food samples. iCheck Iron measurement range is 1.5 - 12.0 mg/L.
- If the expected concentration of your sample is above iCheck Iron measurement range, dilute your sample in distilled or bottled water to fit the middle of the measurement range (i.e. 5 mg/L).
- Record the weight of the sample, the total diluted sample volume and calculate the dilution factor (DF): DF = (mL total sample volume)/(g sample weight).
- Total sample volume is the final volume of the sample that you obtain after mixing your sample with the water.

Instructions
Iron

Weigh in your sample

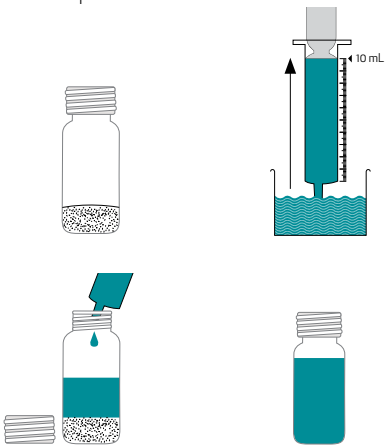
- Place a weighing dish on the balance and press Z/T to 0 (tare) the weight of the dish. The display should show 0.0 g. Now you are ready to weigh your sample.
- Weigh in your sample and record the exact weight in your documentation.
- Next, measure and record the water volume in your documentation.
- Mix your sample and water until a homogenous suspension is formed Record the final total volume of your sample solution for dilution factor calculation.
- For support with dilution and calculation please contact BioAnalyt Support at support@bioanalyt.com.

Important: The iron concentration of the sample solution has to be in the measurement range of iCheck Iron which is 1.5 - 12.0 mg/L.

6 Prepare the additive

The additive is supplied in 10 mL vials with a screw-on top. To prepare the additive you need to add 10 mL distilled or bottled water into the vial with dry additive provided with your test kit.

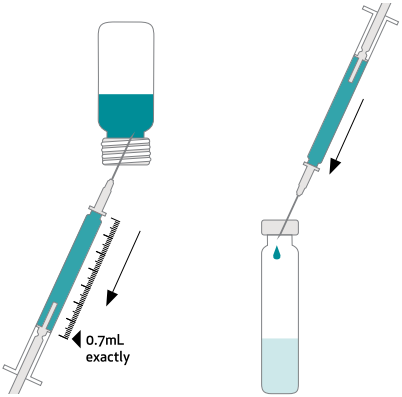
- Use big 10 mL syringe provided with your test kit to measure in exactly 10 mL and add it to the vial with dry additive. Shake the vial vigorously until the additive is completely dissolved. This process may take up to 5 minutes.



NOTE:
The volume of one solubilized additive vial is sufficient to activate approx. 14 iCheck Iron reagent vials. Solubilized additive vials can be stored up to 6 weeks at 4°C.

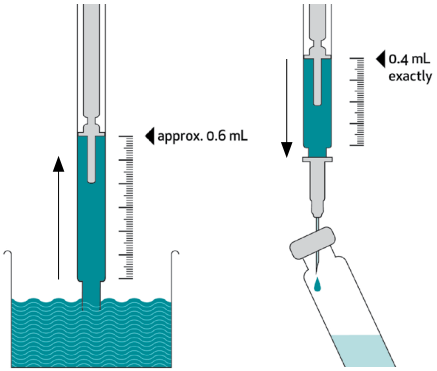
7 Activate the reagent vial

- Activate the iCheck Iron reagent vial just before analysis by injecting 0.7 mL (700 µL) of additive solution.
- To do so, slowly draw up 0.7 mL additive solution using a small 1 mL syringe with a thin green needle. Push the needle through the red rubber septum of the in the top of solubilized additive vial. Draw up exactly 0.7 mL of the additive solution while holding the vial upside down. Make sure there are no air bubbles in the syringe.
- Take a new iCheck Iron reagent vial and inject 0.7 mL additive solution into it. Vigorously shake iCheck Iron reagent vial for 10 seconds. The syringe and needle used to take up additive can be reused next time after rinsing it twice with water.



8 Inject your sample

- Mix your sample solution well to ensure homogeneity. With a new syringe take up approx. 0.6 mL of the sample.
- Clean the end of the syringe with a paper tissue. Place a thick white needle on the syringe. Hold the syringe with needle pointing up and gently tap on the syringe with your fingers to get the air bubbles to move up.
- Adjust the volume of the sample to exactly 0.4 mL (400 µL) by ejecting excessive volume into the paper tissue. Make sure no air bubbles are left inside.
- Slowly inject 0.4 mL of the sample solution into the activated iCheck Iron reagent vial through the red septum using the thick (white) needle.
- Vigorously shake the vial for 10 seconds.

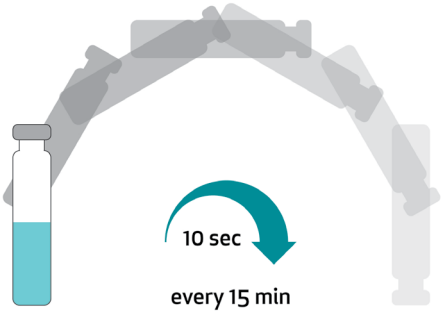


Instructions
Iron

9 Reaction time

Let the vial with the sample stand upright at room temperature for at least 60 minutes.

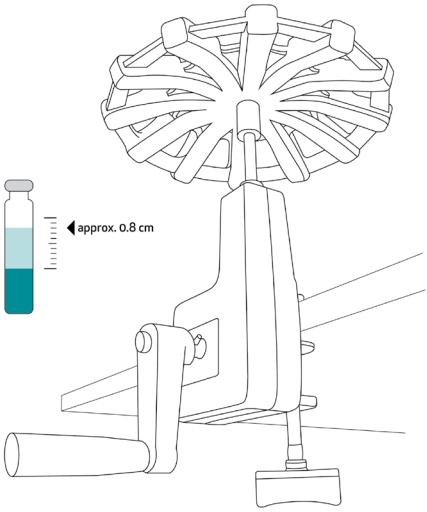
Shake the vial every 15 minutes during the incubation time. If iron is present in the sample, you will see a pink color develop inside the vial.



10 Check phase separation

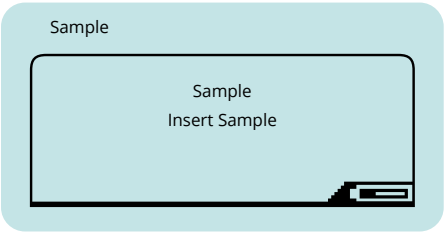
- To proceed with the measurement, you must observe a clear upper phase of approx. 0.8 cm.
- If you do not observe a clear upper phase then briefly centrifuge the vial at low speed (approx. 300 rpm) for 1 minute.

Portable hand centrifuge can be purchased from BioAnalyt (see the image below).



11 Insert the vial

- Press the measurement key. The device will instruct you to “Insert Sample”.
- Control the glass surface of the vial. If the glass is not clean, wipe it with a paper tissue before inserting into the iCheck.
- Be sure to hold the iCheck reagent vial only by its top. Insert the vial into the iCheck and cover the vial with the metal cap.



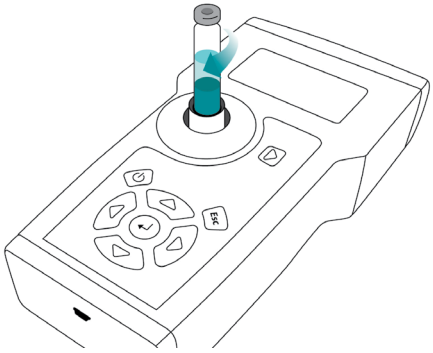
Important: Take care that no other objects, liquid or dust enters the measurement chamber. This would result in damaging the sensor and interfere with accurate measurement.

12 Start the measurement

Press the measurement key again. This will initiate one of 8 measurements of your sample.

Reposition the vial

- When the display indicates “...next position”, the position of the vial must be changed in order to take another measurement.
- To do this, lift the metal cap, turn the vial in the measurement chamber and cover the vial with metal cap again.
- Press the measurement key again.
- Repeat repositioning of the vial as many times as indicated by the display.

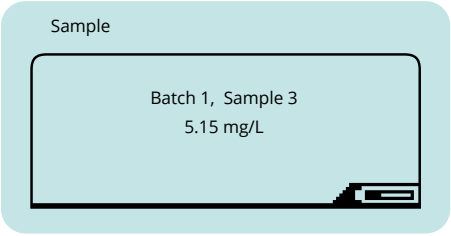


NOTE:
Turn the vial in ¼ of a turn. Repositioning and multiple measurements of the same vial increase the precision of your results.

Instructions
Iron

13 Result display

- When the sample measurement has been completed, iCheck Iron calculates the average over the eight measurements. The result is displayed in mg/L and indicates the total iron concentration in the sample.
- If you diluted your sample before measuring, then multiply the result by the dilution factor. For support contact BioAnalyt at support@bioanalyt.com.



14 Data storage

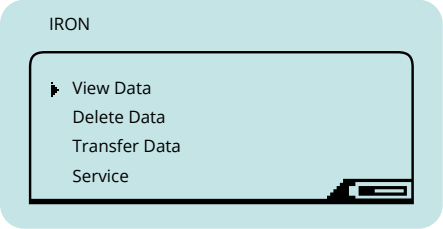
- For documentation purposes, iCheck Iron has an internal memory to store up to 600 individual measurements including such information as batch number, sample number, date, time, and result.
- For detailed description of the data transfer to a computer please refer to the “Data Transfer” section.

15 Disposal

- Reagent vials contain hazardous chemicals and are disposed of according to national regulations for hazardous materials. Collect the vials in a container and hand them over to a chemical waste company. Material safety data sheet (MSDS) of the reagent vials is provided with each shipment.
- Take extra care when disposing of the used needles to prevent injury: discard used needles into special container.

Menu
Functions

By pressing the enter key you enter the menu of iCheck Iron. Using the arrow keys you can scroll through the different options of the menu and with the enter key you can choose a function.



View data

You can select the following options:

- View Samples
  To display individual measurement results.

Delete data

You can select the following options:

- Delete Sample
  To delete an individual result.
- Delete Batch
  To delete a batch with several measurements.
- Delete File
  To delete the file with all measurements performed on the device.
- Delete Memory
  To delete all measurements performed on the device.

Transfer data

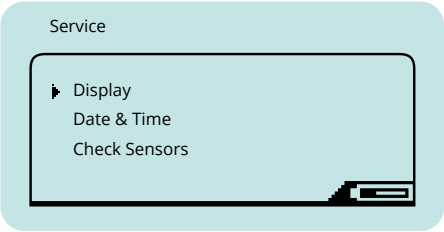
Use this function to transfer the data from the iCheck to your computer. Refer to the section “Data Transfer” in this manual.

Note:
Data menu function is only displayed after a minimum of one measurement. Data Transfer menu function is only displayed after a minimum of two measurements.

Menu
Functions

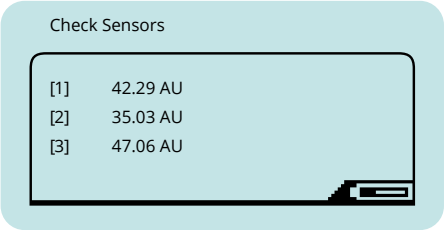
Service

To configure your iCheck you can select the following options:



- Display
  Set the brightness and contrast of the display.
- Date & Time
  Set the correct time and date of your time zone.

Check Sensors
Use this function when instructed by BioAnalyt Support. To perform a check cover the measurement chamber with the metal cap. Select Check Sensors with the enter key. Record the values displayed by the device and send them to BioAnalyt Support.



Note:
The Calibration Data of your iCheck can be provided on request. For this contact BioAnalyt Support at support@bioanalyt.com and provide the serial number indicated on the back of your device.

Software Installation

Software installation

- The data stored on your iCheck can be transferred to a computer. To do so, install *BioAnalyt Lab* software which is provided on the USB stick  .
- Initiate *BioAnalyt Lab* software set-up by double-clicking on the “Set-up” icon on the USB stick. Follow the instructions on your computer and make sure that *BioAnalyt Lab* is installed in the “Programs” directory. Create a shortcut to your desktop if you wish to. Finish installation by clicking “Finish”. The driver will automatically be installed.
- Upon accepting the License Agreement, a window will pop up where you can enter your personal information. This information can be viewed and edited by clicking on the “Settings” window.

Note:
BioAnalyt Lab software only works with Windows operating system (XP and later versions).

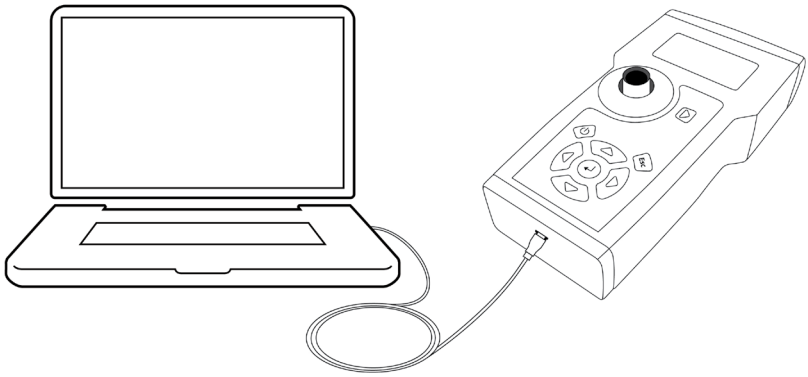
Software update

- *BioAnalyt Lab* software can be updated by clicking on the “Update” window. For the program to detect whether there are new updates available from BioAnalyt computer must be connected to the internet.
- If your current version (e.g. 1.1.0) is different from the newest version click on the “Update” key to proceed with the software update.

Data Transfer

- Start *BioAnalyt Lab* program by double-clicking the link on your desktop or by going to the Start Menu >> Programs >> BioAnalyt GmbH >> *BioAnalyt Lab* .
- Plug in your iCheck to your computer via USB cable. A configuration window will appear after you connect your device to the computer. Here you can enter the information about your device. The serial number of the device can be found on the back of the iCheck.
- Now the information about iCheck is saved on your computer and will be displayed the next time you connect your iCheck to your computer. This way, information about multiple iCheck devices can be stored on your computer.
- To initiate data transfer click on “Start Transfer”. Wait for data transfer to proceed and the sign “Data Transfer in Progress” to disappear.
- Now, all your data is saved and listed under “Documents”. You can view, save and edit this data by clicking on the “Documents” window.
- To save your data in CSV or EXCEL format select the file in the “Documents”, select the format and save the files to the desired location.

Note:
Power supply units and laptops/PCs must comply with appliance class III.



Technical Data

Quality assurance

iCheck and iCheck Iron Test Kit are produced according to quality management system (DIN EN ISO 9001:2015) certified by TÜV Nord in Germany.

TECHNICAL DATA	
Sample	
Analyte:	Iron as NaFeEDTA, ferrous fumarate, ferrous sulfate or ferrous nitrate
Sample:	Premix, flour, soy and fish sauces, corn soy blend (CSB), lipid-based nutrient supplement (LNS)
Sample preparation:	For solid samples: dilution and homogenization in distilled or bottled water, optionally in 0.2M hydrochloric acid solution.
Sample volume per analysis:	0.4 mL (400 µL)
Concentration range:	>1.5 ppm (mg/kg), samples above 12 ppm must be diluted in water or 0.2M HCl
Device	
Analytical method:	Photometric determination of iron concentration using colorimetric reaction with bathophenantrolin
Units displayed:	mg/L
Linear range:	1.5 - 12.0 mg/L
Calibration:	Factory set (standards included for control)
Time per analysis:	60 min
Environment:	20 –30°C, no direct sunlight
Accuracy:	Coefficient of variation is 3 - 16%; extended measurement uncertainty at 95% confidence at 25°C is 7 - 34% depending on sample type.
Method comparison:	Atomic Absorption Spectroscopy (AAS)
User training:	1 day training
Use:	Laboratory and field
Data output:	Sample #, Batch #, Result, Date, Time (in transferred data)
Connectivity and data:	Results are stored in the device and transferred to a PC via USB
Power source:	NiMH rechargeable batteries included; 1.2V or 1.5V
Warranty:	2 years
Device weight:	0.45 kg
Device dimensions:	11 x 4 x 20 cm (W x H x L)
Voltage (recommended)	5V ±10%
Voltage (max)	5.5V
Test Kit	
Content:	100 reagent vials and 10 additive vials; 110 syringes - 1.0 mL; 100 needles - 1.6mm x 25mm; 10 needles - 0.8mm x 16mm; 1 syringe - 10 mL
Chemical composition:	Bathophenantrolin in organic solvent, reducing and chelating agents
Volume per reagent vial:	1.5 mL
Shelf life:	12 months at 20 –30°C, no direct sunlight, upright
Dimension of test kit:	26 x 14.5 x 16.5 cm
Disposal instructions:	Hazardous waste

Frequently Asked Questions

Power Supply

iCheck does not turn on.

Make sure that the batteries are fully charged. In the lower right corner of the display a battery symbol is shown indicating the remaining battery charge. To recharge the batteries, place them in the charger provided in the case, connect it to a power supply and wait until the light turns green, indicating that power is at 100%. Place the batteries back in the device, switch it on. If iCheck is still not turning on, please contact BioAnalyt Support.

May I use other batteries?

You may use other AA/2100mAh/1.2V or 1.5V batteries. However you cannot recharge those with the supplied charger.

What is the overvoltage category?

The overvoltage category is I .

Measurement

The self-test failed when I switched on the device. What should I do?

If the self-test fails, switch the device off and on again. If after restarting the self-test it still fails, contact BioAnalyt Support.

During Device Control the value displayed is outside the range. What should I do?

If during Device Control the value is outside of the range indicated on the back of your device, measure again. If the value is still out of range, please contact BioAnalyt Support.

Do I need to calibrate iCheck Iron?

No, there is no need to calibrate iCheck Iron, because the device is calibrated during the manufacturing process and calibration is programmed into the software.

The result I received for a sample is higher/lower than expected. What might be the reason for this?

1. Incorrect activation of the reagent vials:
It is very important, that the exact amount of additive is added to the reagent vials.

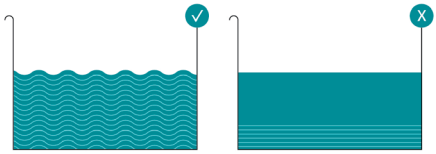
2. Incorrect volume:
Make sure, that exactly 400 µL (0.4 mL) of sample is injected into iCheck Iron reagent vial.

3. Make sure to take into account that the iron content is different from the total fortificant content (i.e. ferrous sulfate has 37% of iron and ferrous fumarate 33%) and that there is intrinsic iron commonly present in the samples.

Frequently Asked Questions

Measurement

4. The accuracy also depends on the mixing of the sample. When measuring solid samples make sure that you do not wait for the particles to settle down in the water. Mix the sample and immediately take up the suspension into the syringe.



5. The result can be additionally influenced by environment, sample preparation and skills of the operator.

6. The operator was not well trained. Contact BioAnalyt to obtain training and iCheck certification.

What might interfere with the measurement procedure?

1. Incorrect sample extraction:
It is very important, that the extraction and phase separation has occurred.

2. Unclean vial surface:
Check, if the vial you used is absolutely clean and does not have any fingerprints on it. If not, wipe the vial with a paper tissue (optional: wet the tissue with alcohol to improve the cleaning).

3. Sunlight:
Do not measure in direct sunlight.

How should I store the reagent vials?

iCheck reagent vials must be stored upright at room temperature and protected from direct sunlight.

Do temperature or humidity influence the iCheck measurements?

1. It is recommended to measure at an ambient temperature between 20 - 30 °C (68 - 86 Fahrenheit). Do not use iCheck at temperatures above 40 °C or at altitude above 2000m.

2. It is further recommended to store the iCheck and the iCheck reagent vials at least two hours before starting the measurement in the room in which the measurement will be performed. This procedure ensures that both, the vials and the device have the same temperature.

3. The device can be used indoors or outdoors, as long as there is no direct sunlight.

4. Maximum relative humidity of 80 % at 30 °C.

What is a batch and how can I select a new batch?

For selecting a new batch press the right arrow key. The batch function is used to group samples, e.g. samples from 1 day or 1 region can be measured in batch 1. If you proceed to measure the samples of a different day or region, select a new batch (i.e. 2).

Frequently Asked Questions

General

Which form of iron can be measured?

iCheck Iron measures total iron: added iron (i.e. the fortificant) plus the intrinsic iron (i.e. natural iron). iCheck Iron measures ferrous salts (i.e. ferrous sulfate and ferrous fumarate) and ferric salts (i.e. NaFeEDTA). iCheck Iron does not work for elemental or electrolytic iron, since it is poorly soluble in water.
Solubilization of iron is facilitated by diluting your sample in 0.2M hydrochloric acid instead of water.

Does the Data Transfer work with other operating systems like Apple OSX etc.?

No, BioAnalyt Lab may only be used with Windows Operating System.

How can iCheck Iron test kits be ordered?

An order can be placed by visiting the BioAnalyt website www.bioanalyt.com/order or by sending e-mail to contact@bioanalyt.com.

What is the pollution degree for this equipment?

The expected pollution around iCheck was established in the standard of degree 2: Normally only nonconductive pollution occurs. Ocasionally, temporary conductivity caused by condensation maybe be expected.

Where do I get help with other questions that are not mentioned here?

We would love to hear from you! Please send us an e-mail at support@bioanalyt.com.

You can also join the discussion by following us via Facebook or LinkedIn.

www.facebook.com/bioanalyt

www.linkedin.com/company/bioanalyt

USB Stick

Find the *BioAnalyt Lab* Software and further product information on the USB stick.

measure for life

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contact@bioanalyt.com · www.bioanalyt.com