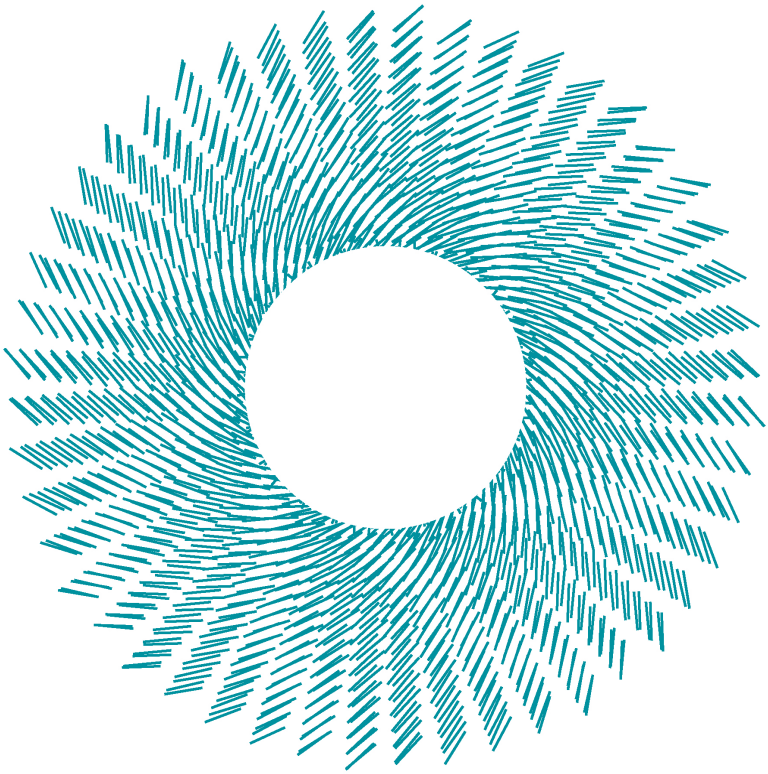
User Manual



iCheck
Chroma 3

iCheck **Chroma 3** is a testing device to measure **Vitamin A in oil**, empowering you with instant results to make confident decisions.

BioAnalyt

Quality Guarantee

Dear customer,
Congratulations on your acquisition of iCheck™ Chroma 3!

iCheck Chroma 3 will be your reliable partner for the vitamin A 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 9001:2008. This is accomplished by the use of high-grade components and equipment as well as a streamlined production process. This process includes quality controls of each component and rigorous calibration of the device by trained technicians with standards produced according to ISO 17025 standard.

Your iCheck Chroma 3 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.facebook.com/bioanalyt
www.linkedin.com/company/bioanalyt

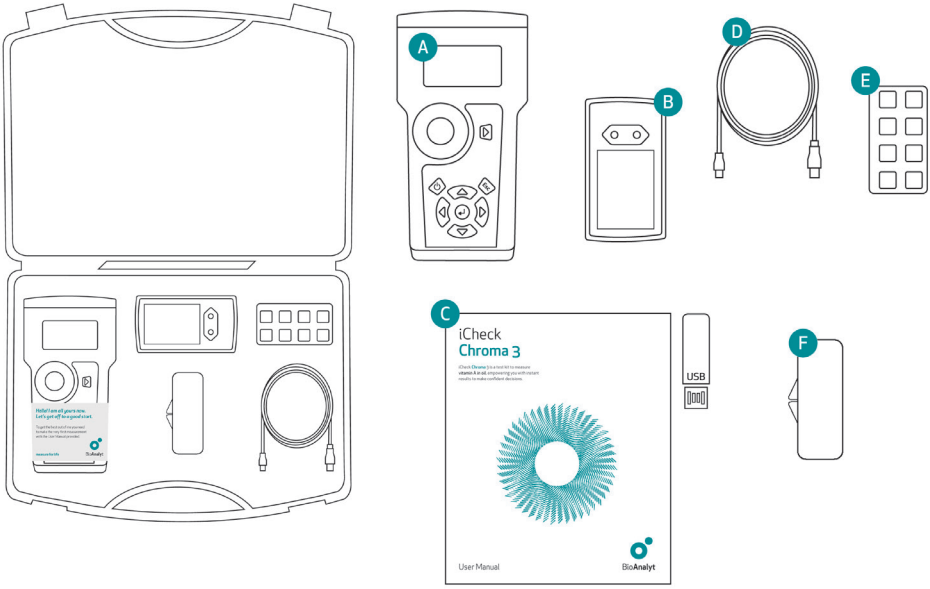
Development, manufacture and sales of all BioAnalyt test kits (devices, reagent vials) are carried out in accordance with ISO 9001:2015 and have been certified by TÜV NORD, Germany.

Contents

Version 2.3

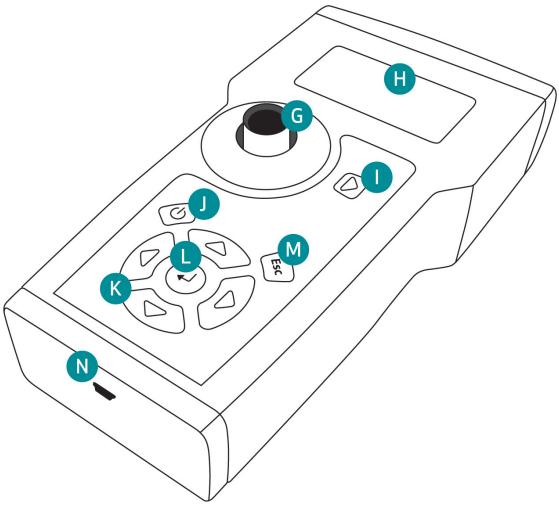
Check your
Case Content

Your iCheck **Chroma 3** is delivered in a portable case.
The items included in the case are listed below.



- **A** iCheck Chroma 3 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** Stand for reagent vials
- **F** Chroma 3 Standard

Device
Description



- **G** Measurement chamber for iCheck Chroma 3 reagent vials with removable metal cap (not shown)
- **H** Display monitor
- **I** Measurement key
- **J** Power key (On / Off)
- **K** Menu navigation keys: left, right, up, down
- **L** Enter (OK) key
- **M** Escape key
- **N** USB cable mini-port for data transfer

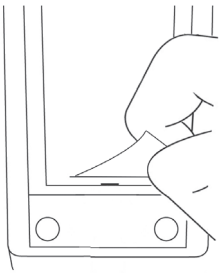
Use the 4 keys marked with triangles to navigate the menu structure of the device. To select an option, press the enter key. To exit an operation or to navigate one directory up, press the escape key.

Not shown:
Battery compartment on the bottom side.

Instructions
Chroma 3

1 Insert the batteries

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



- Insert the batteries as indicated.

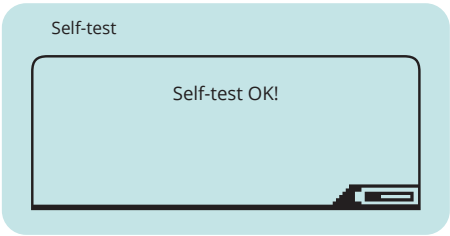
Note:
The batteries can be recharged with the supplied charger. It takes about 2-3 hours to fully charge an empty battery. Charging is best performed within the temperature range of +5 °C to +45 °C.

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 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

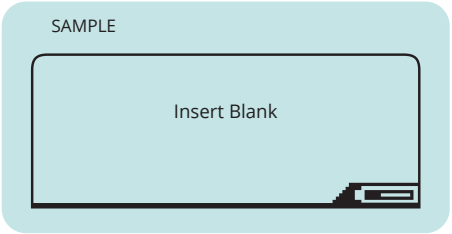
- Using the left and right navigation keys select "Device Control" mode. Carefully take out Chroma 3 Standard from its casing, remove the cap covering the measurement chamber and place Chroma 3 Standard inside.
- Make sure the metal edges of the Chroma 3 Standard fit into the 2 ridges of the measurement chamber. Press the measurement key and wait for the device to display a value.

- Control that the value displayed by the device (for example: 878.41 AU) is within the range indicated on the casing of the Chroma 3 Standard (for example: 451.00 - 1170.30 AU).
- 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 or measurement.

4 Measure the blank

- Make sure you are in the "Sample" mode. Press the measurement key and the device will instruct you to "Insert blank".

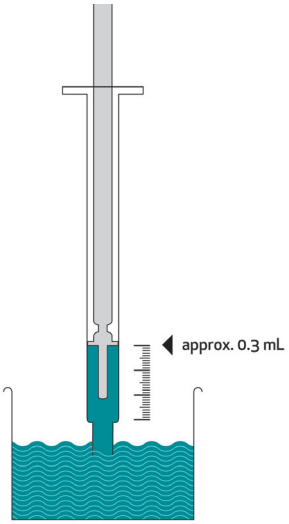


- Take a new iCheck Chroma 3 reagent vial.
- Clean the vial with a paper tissue before inserting. Be sure to only hold the vial by its metal top.
- Remove the metal cap and insert the vial into the measurement chamber of the iCheck.
- Press the measurement key again. Wait until the iCheck displays "Prepare for measurement".
- Take the vial you used for blank measurement and proceed with sample injection.
- Your iCheck Chroma 3 will l ask you to perform a blank measurement during each measurement. Always use a new vial for the blank measurement and then use the same vial to inject your sample.

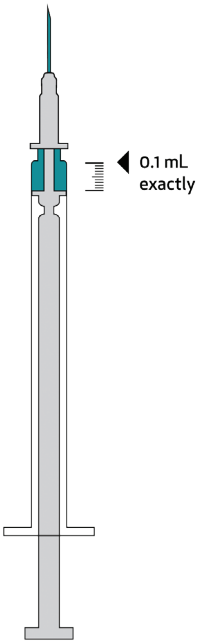
Instructions
Chroma 3

5 Prepare your sample

- iCheck Chroma 3 quantitatively analyzes vitamin A in refined edible oil fortified in the range of 3 - 30 mg retinol equivalents (RE)/kg (10 - 100 international units (IU)/g).
- Mix the oil sample well as vitamin A tends to precipitate in oil.
- If the oil is solid, warm it up to a maximum of 50°C to make it liquid.
- If the expected concentration of the oil sample is **above 30 mg RE/kg,** dilute the sample with unfortified oil.
- Use a new syringe without a needle attached and take up approx. 0.3 mL of your oil sample.

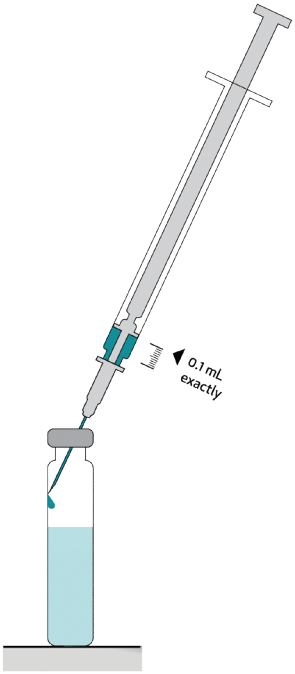


- Clean the end of the syringe with a paper tissue. Place the needle in the syringe. Hold the syringe with the needle pointing up and gently tap the syringe with your fingers to get the air bubbles to move up.
- Adjust the volume of the sample to exactly 0.1 mL (100 µL) by ejecting excessive volume into the paper tissue. Make sure no air bubbles are left inside.



6 Inject your sample

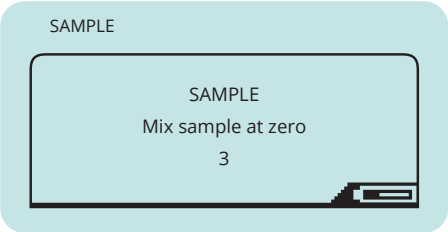
- Hold the vial on the table for stability.
- Inject the oil sample slowly into the vial along the glass surface.
- At this stage, the oil should not be mixed with the reagent, therefore do not shake the vial, keep it standing still on the table.
- If you have injected the sample correctly, the content of your vial should look very similar to the image below. The oil will form a thin layer on top of the clear reagents in the vial. Make sure not to shake the vial yet.
- Proceed immediately with measurement.



Instructions
Chroma 3

7 Start the measurement

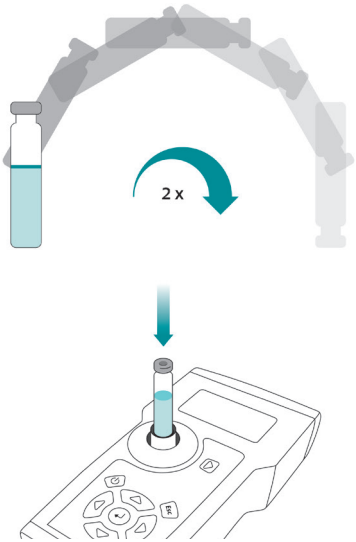
- Now that your sample is ready, press the measurement key on the iCheck Chroma 3 and follow the instructions as indicated on the display.
- The display will immediately indicate: ”Mix your sample at zero” and start a countdown: 3 > 2 > 1 > 0.



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.

8 Invert and insert the vial

- Press the measurement key on your device and follow the instructions on the display.
- Pick up the vial with injected oil when display shows “1”. Quickly invert it two times as soon as the display shows “0”. **Be quick**!
- Immediately insert the vial into the iCheck measurement chamber while the display shows “Insert vial”.



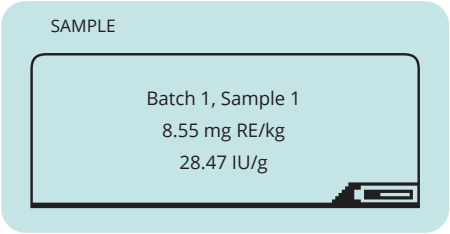
Note:
The content of the vial will instantly turn light blue, if the sample contains vitamin A.

9 Result display

- iCheck Chroma 3 will now analyze your sample. This will take approx. 30 seconds.
- Do not move the vial or the iCheck until the result is displayed.

Sample result

- The result is displayed in mg RE/kg and in IU/g.
- Multiply your result by 3.33 to convert from mg RE/kg to IU/g.



- If the concentration of your sample is under 3 mg RE/kg (10 IU/g), the device will display: "Value below 3 mg RE/kg". You will observe no blue color in the reagent vial.
- If the concentration of your sample is above 30 mg RE/kg (100 IU/g), the device will display: "Value above 30 mg RE/kg". You will observe intense blue color in the reagent vial.
- In case the concentration of your sample is above 30 mg RE/kg (100 IU/g), dilute the sample with unfortified refined edible oil.
- To get the final concentration of your sample after a dilution, multiply the results displayed on the device by the dilution factor (DF).
- DF = (fortified oil, g + unfortified oil, g)/ fortified oil, g.

Note:
For conversion of mg RE to IU please refer to the following factors:
1 mg RE = 1 mg retinol = 3333 IU
1000 IU = 0.3 mg RE.

For support with dilution and calculation, please contact BioAnalyt Support at **support@bioanalyt.com**.

Instructions
Chroma 3

10 Data Storage

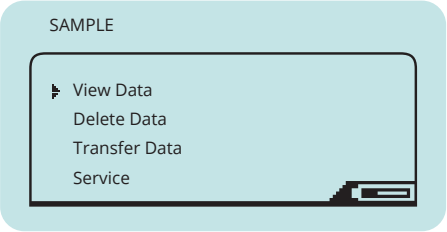
- For documentation purposes, iCheck Chroma 3 has an internal memory to store up to 600 individual measurements including such information as batch number, sample number, date, time, and result.
- For detailed description of the data transfer to a computer please refer to the “Data Transfer” section.

11 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 upon request.
- 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 Chroma 3. Using the arrow keys you can scroll through the different options in the menu and with the enter key you can choose a function.



View data

You can select the following option:

- **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 under either “Sample” or “Device Control” option.
- **Delete Memory**
  To delete all measurements performed on the device regardless of the mode you are at.

Transfer data

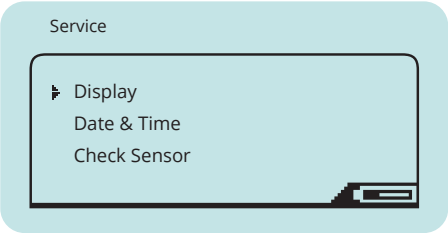
Use this function to transfer the data from the iCheck to your computer. Refer to the section “Data Transfer” of this manual.

Note:
Data menu function is only displayed after a minimum of 1 measurement. Data Transfer menu function is only displayed after a minimum of 2 measurements.

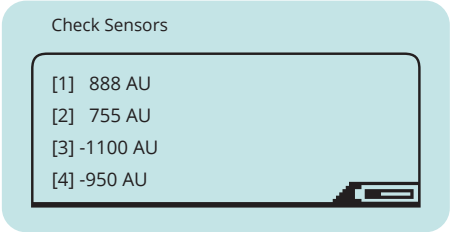
Menu
Functions

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 place the Chroma 3 Standard into the measurement chamber. Press the measurement 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 setup by double-clicking on the "Setup" 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

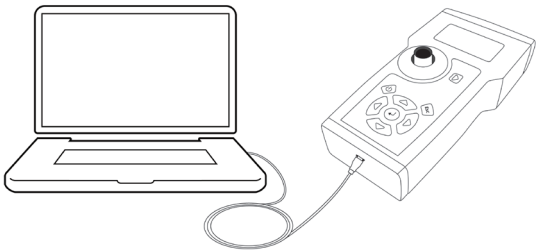
- *BioAnalyt Lab* software can be updated by clicking on the "Update" window. For the program to detect whether there are new updates available from BioAnalyt computer must be connected to the internet.
- If your current version (e.g. 1.1.0) is different from the newest version click on the "Update" 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 side 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 Chroma 3 Test Kit are produced according to quality management system (DIN EN ISO 9001:2015) certified by TÜV Nord in Germany.

TECHNICAL DATA	
Sample	
Analyte:	Vitamin A (retinol) as retinyl palmitate
Sample:	Refined edible oils: palm, soy, cottonseed, sunflower, corn, peanut, rapeseed, coconut, rice bran
Sample preparation:	If the oil is solid, warm it up to a maximum of 50°C to make it liquid
Sample volume per analysis:	0.1 mL (100 µL)
Concentration range:	>3.0 ppm (mg/kg), samples above 30.0 ppm must be diluted in refined unfortified oil
Device	
Analytical method:	Photometric determination of retinol concentration using colorimetric Carr-Price reaction combined with compensation for matrix effect
Units displayed:	mg RE/kg and IU/g; RE – retinol equivalents, IU – international units
Linear range:	3.00 – 30.00 mg RE/kg (10.00 - 100.00 IU/g)
Calibration:	Factory set (standards included for control)
Time per analysis:	< 2 min
Environment:	20 –30°C, no direct sunlight
Accuracy:	Max coefficient of variation is 13%; extended measurement uncertainty at 95% confidence at 25°C is 30%.
Method comparison:	High-performance liquid chromatography (HPLC)
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; AA 1.2 or 1.5V
Warranty:	2 years
Device weight:	0.45 kg
Device dimensions:	11 x 4 x 20 cm (W x H x L)
Test Kit	
Content:	100 reagent vials; 100 syringes - 1.0 mL; 100 needles - 0.8mm x 16mm.
Chemical composition:	Chloroform and antimony trichloride
Volume per reagent vial:	2.0 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
Optional equipment:	50 mL falcons, reference samples

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 batteries. However you cannot recharge those in the supplied charger.

What is the overvoltage category?

The overvoltage category is I .

Measurement

My Chroma 3 Standard value is outside the range. What should I do?

If the measured Chroma 3 Standard value is outside of the range indicated on the casing of the Chroma 3 Standard, measure again. If the value is out of range again, please contact BioAnalyt Support.

Do I need to calibrate iCheck Chroma 3?

No, there is no need to calibrate iCheck Chroma 3, 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. The oil sample was not well mixed before taking up with the syringe. Mix the oil sample well before taking up into the syringe.

2. Incorrect execution of the test:
It is very important to mix the vial at exactly "0". Insert the vial immediately after mixing. Maximum waiting time allowed between mixing and inserting into iCheck Chroma 3 is 2 seconds.

3. Incorrect volume:
Make sure that exactly 100 µL (0.1 mL) of sample is injected into iCheck Chroma 3 reagent vials.
4. Incorrect injection:
There has to be a distinct interface between oil sample and reagents in the vial before mixing.

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

Frequently asked Questions

Measurement

What might interfere with the measurement procedure?

1. Unclean vial surface:
Make sure the reagent vial you are measuring 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).

2. 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 vitamin A can be measured?

iCheck Chroma 3 measures vitamin A in the form retinyl palmitate, a common formulation of vitamin A added to refined edible oil.

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

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

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. Occasionally, temporary conductivity caused by condensation may be expected.

How can iCheck Chroma 3 test kits be ordered?

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

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 on 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.

BioAnalyt

measure for life

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