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Operation Manual

trinamiX Liquid Analysis Stamp Kit

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NOTICE

The trinamiX Liquid Analysis Stamp Kit (hereafter referred to as “the setup”) is exclusively designed for conducting transmission measurements with the associated trinamiX PAL One NIR spectrometer.





1 Components

1



1x Vial Holder

2



10x Glass Vials

3



1x Stamp (Aluminum 5083)

2 Intended Use

The Liquid Analysis Stamp Kit is intended for measuring liquids using near-infrared spectroscopy in conjunction with the trinamiX NIR Spectroscopy Solution. However, the Liquid Analysis Stamp Kit is not intended for the following purposes:

- Medical or safety-critical applications.
- Use in potentially explosive environments.
- Use by consumers or children.
- Legally regulated measurement applications.
- Use or contact with corrosive or caustic liquids or strong bases.
- Contact with food or feed. Food or feed must be disposed of after contact with the setup.
- Contact with hazardous, radioactive, or infectious liquids or materials.
- Use in outdoor environments or in strong magnetic fields.

The Liquid Analysis Stamp Kit is an accessory for the trinamiX PAL One NIR spectrometer. The stamp is made of aluminum. The stamp is intended to be used in dedicated sample glass vials provided by trinamiX for the measurement of liquid samples. By placing the stamp in a liquid-filled glass vial, a layer of fixed thickness is created. Light emitted from the spectrometer during measurement is reflected by the metal surface of the stamp back to the spectrometer, creating an effective path length of twice the layer thickness. The absorption of a thin layer can be measured in this method.

The stamp can be used on both front faces, which differ in the thickness of the liquid film to be measured. The 200 μm layer side is intended to be used with aqueous samples such as water or alcoholic mixtures. The 500 μm layer side can be used for less strongly absorbing liquids such as transparent oils.



Figure 1: The Liquid Analysis Stamp. The left side provides a layer thickness of 200 μm , the right side a layer thickness of 500 μm as indicated on the stamp.

The Liquid Analysis Stamp Kit is intended to be used for material classification. Use the Liquid Analysis Stamp Kit for qualitative analysis. The usage for quantitative analysis is not recommended.

3 Operating Conditions

Operating temperature	0–40 °C
Humidity	20%–80 %
Storage temperature	0–45 °C
Conditions	Use only in dry indoor areas

4 Safety Instructions

Please read this operating manual and the operating manual of the spectrometer carefully. Pay attention to all warnings, instructions, and disclaimers before operating the setup to ensure maximum safety and smooth operation. Keep the manuals in an easily accessible place. The safety features of the setup and its components may be compromised if they are not operated in accordance with their intended use and operating conditions. Do not use the setup if it is damaged.

⚠ WARNING

The glass vials are made of glass. Handle them with care. Liquids can spill from the vial and stamp surface. Always wear protective clothes when handling hazardous substances. Risk of food contamination: Do not use the device for measurement of food or feed that may be sold or eaten after the measurement.

5 Installation and Usage

1. Turn on the trinamiX NIR spectrometer and select an application. Perform the calibration of the spectrometer as usual, using the white reference standard inside the cap at the bottom of the spectrometer.
2. Put the vial holder on the measurement head of the trinamiX NIR spectrometer. Make sure it is properly aligned with the scan window.
3. Fill the glass vial with roughly 1 ml of the liquid sample to be measured.
4. Hold the glass vial at an angle of about 45° and insert the stamp into the glass. Rotate the stamp while pushing it into the liquid. Make sure that no air bubbles are present at the bottom of the glass. If air bubbles can be seen, try to remove them by further rotating the stamp.

NOTICE

Air bubbles may distort the recorded spectra and make the analysis unreliable. Always remove air bubbles before the measurement. Do not touch the bottom of the vial or the sample interface with your finger. In case of contamination, clean all surfaces with a mild detergent and non-fuzzing tissue.

5. Place the filled glass vial with the inserted stamp into the vial holder on the scan window of the trinamiX NIR spectrometer. Make sure the vial is centered on the scan window and not placed on the metallic surrounding.
6. Start the measurement and check the spectrum. If the absorbance ($\log(R)$) exceeds values of 2 in any spectral region while using the 500 μm side of the stamp, it is recommended to repeat the measurement with the 200 μm side.
7. Remove the glass vial from the spectrometer before taking out the stamp to avoid spilling the sample on the spectrometer. Clean the stamp with a mild detergent such as soap & water and non-fuzzing tissue. Rinse the stamp with ethanol and let the stamp dry or dry with non-fuzzing tissue.

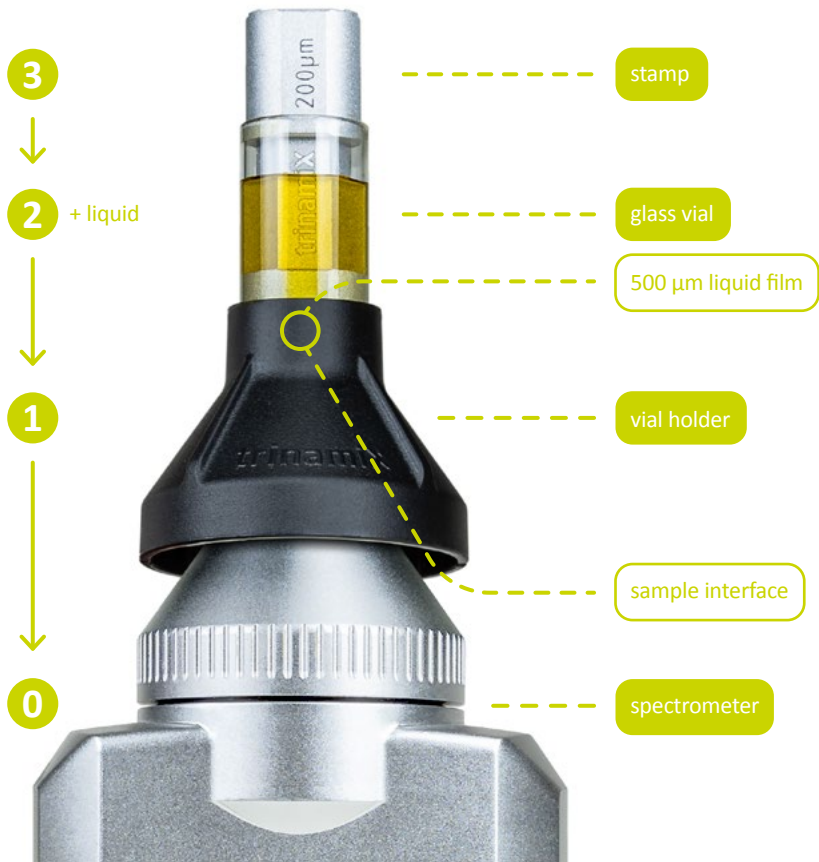


Figure 2: Measurement setup with trinamiX PAL One NIR spectrometer, vial holder, glass vial and stamp.

6 Disclaimer

Devices, software, documentation and other parts of products offered by trinamiX are not designed to be used outside the intended use.

To the maximum extent permitted by law, all other terms, conditions and warranties, whether expressed or implied are expressly excluded. To the maximum extent permitted by law, liability under any condition or warranty, which cannot be legally excluded, is limited at trinamiX option to replacement or resupply of goods or services or payment for the same.

6.1 Liability

The protection of the setup may be impaired in the following cases.

Liability for property damage and personal injury is then transferred to the user:

- The setup or its components are not used according to this operating manual.
- The setup is used outside of its intended use.
- The user makes changes to the setup.
- The setup is used with accessories that have not been recommended by trinamiX.
- The setup is serviced by people who have not been authorized by trinamiX.

6.2 Disclaimer

Although the descriptions, designs, data and information contained herein are presented to the best of our knowledge and belief and are deemed correct, they are for your guidance only. As many factors can affect processing or application/use, we recommend that you conduct tests prior to use to determine the suitability of the setup for your specific purpose. This does not release you from the obligation to perform a complete inspection of the setup upon delivery or any other obligation.

The setup is provided “as is” and “with all faults” to the extent permitted by law. No express or implied warranties of any kind, including warranties of merchantability or fitness for a particular purpose, are given with respect to described products or designs, data or information, or that the products, designs, data or information can be used without infringing the intellectual property rights of others. In no event shall the descriptions, information, data or designs provided be considered as part of our terms of sale.

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6.3 Compatibility of material

Aluminum 5083 is a high-strength aluminum alloy with excellent corrosion resistance, particularly in marine environments. It is commonly used in applications where high strength and good weldability are required, such as shipbuilding, offshore structures, and aerospace.

The resistance of Aluminum 5083 to chemicals depends on various factors, including the type of chemicals, concentration, temperature, and duration of exposure. Generally, Aluminum 5083 is highly resistant to many common chemicals, including water, saltwater, many organic compounds, and many acids.

However, it is important to note that Aluminum 5083 is not resistant to strong alkaline solutions and certain aggressive acids such as nitric acid and sulfuric acid. It is advisable to check the specific chemical resistance for your application as it may vary depending on the conditions

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This operation manual describes the following product:
trinamiX Liquid Analysis Stamp Kit