

Scope and application: For Quality Assurance.



Test preparation

Test storage

Storage temperature: 2–8 °C (35–46 °F)

Contents of the package

Description
Combined standard and spiking solution
Ring test solution A
Ring test solution B

Before starting

Special Attention

The stated shelf-life of the solutions can only be guaranteed after first use if the bottle is always closed immediately after use and kept in a cool place. A solution which has been removed from one of the bottles should not be returned to it. The necessary reaction temperature is specified on the working procedure for the cuvette test. This temperature applies to the cuvettes (reagents/DosiCaps/MicroCaps) as well as the addista solutions, and must be achieved before the test is carried out.

Standard solution

The standard solution contains various parameters with known concentrations. It serves to check the handling and the materials used (pipette, reagents, photometer, etc.).

Ring test solutions

The ring test solutions provide another option for checking the analysis system. Successful participation is documented by an external confirmation of the proper condition of the materials and the correct operation of the analysis system.

Spiking solution

The spiking solution is used to identify sample-specific interferences. Even if working methods and materials are faultless, samples may contain substances which distort the analysis. These can be recognized by using spiking solutions, protecting against undetected faulty measurements.

Documentation

Documentation, being a record of the measures taken, is a key component of analytical quality assurance. The manufacturer documents the successful participation in a ring test by presenting it with an evaluation and a certificate. These verify the regular implementation of analytical quality assurance measures and create the basis for correct analysis.

Safety advice

On grounds of quality and reliability, the analysis should be carried out only with original accessories from the manufacturer.

Review safety information and expiration date on the package.

Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

ADDISTA—Quality Assurance—Standard Solution

Internal checks of handling and materials

Recommended minimum frequency

Each **10th** sample per parameter (person-related) at least **once** monthly

in addition:

- if measurement results seem implausible
- if measurement results are especially critical (control by water authority, comparative measurement, etc.)

Procedure

The exact procedure is described in the working procedure of the relevant cuvette test (analyse the standard solution instead of the water sample).

Evaluation

The evaluation is carried out as described in the working procedure for the relevant cuvette test. The range of confidence is specified in the table on the addista package.

Documentation of the measurement results

Record the measured values on a standard control card.

If a measurement result is **inside** the specified range of confidence, materials and handling are fine. If it is **outside** the range of confidence, the source of error must be identified. As a first step run through the following checklist, which is designed to helping eliminate possible sources of error.

- Has the shelf life of the cuvette test and/or the standard solution been exceeded?
- Was the current working procedure used?
- Was a new pipette tip used?
- Was the right volume pipetted?
- Was the cuvette inverted and wiped clean?
- Were the reaction time and temperature correct?
- Was zeroing carried out against the correct blank-value?
- Do the photometer settings correspond to the documented data in the working procedure?

If the source of error have not been found after working through this list, the individual instruments and accessories must be checked. This can best be done by replacing the components one by one. Ask the manufacturer for more detailed information.

ADDISTA—Quality Assurance—Spiking Solution

Testing the water sample for sample-specific interferences

Recommended minimum frequency

Each **20th** sample (person-related) at least once every **3 months**

in addition:

- if the sample matrix changes (considerably)
- if the measurement results seem implausible

Procedure

The exact procedure is described in the working procedure of the relevant cuvette test (analyze the standard solution instead of the water sample).

1. Analyze the sample in accordance with the working procedure for the relevant cuvette test
2. Pipette into a clean beaker: **5 mL** sample and **5 mL** spiking solution

Mix and analyze with the relevant cuvette test in the same way as a sample. Proceed further as described in the working procedure of the relevant cuvette test.

Evaluation

The evaluation is carried out as described in the working procedure for the relevant cuvette test.

Documentation of the measurement results

Record the calculated spiking rate on the recovery control card.

After spiking the following calculation must be performed:

Calculation of the **spiking rate**:

$$\text{result with spiking solution} - \frac{\text{result with sample}}{2} = \text{spiking rate}$$

Example: Nitrate LCK 339

displayed result of the sample: **11.2 mg/L** nitrate-N

displayed result of the spiking solution: **8.53 mg/L** nitrate-N

Calculation of the **spiking rate**:

$$8.53 \text{ mg/L} - \frac{11.2 \text{ mg/L}}{2} = 2.93 \text{ mg/L}$$

Required spiking rate:

3 mg/L +/- 0.5 mg/L nitrate-N

If the spiking rate is within the range of confidence (see table on the addista package) it can be assumed that the water sample does not contain any interferences. If the result is outside the range of confidence, it is not possible to draw any conclusions about the accuracy of the analysis result obtained from the sample. In this case contact the manufacturer.

Note

This method cannot detect additive errors (turbidities).

ADDISTA—Quality Assurance—Ring Test

External check of your analysis system

Recommended minimum frequency

Twice yearly per parameter (person-related)

Procedure

Analyze ring test solutions **A** and **B** and the **standard** solution (double determination in each case). The exact procedure is described in the working procedure for the relevant cuvette test.

Evaluation

The evaluation is carried out as described in the working procedure for the relevant cuvette test.

Documentation of the measurement results

Record the calculated spiking rate on the recovery control card.

Record the measured values on the accompanying ring test evaluation form and return this to the manufacturer. You will receive a ring test evaluation and, if the test was successful, a certificate.

Summary of method

ADDISTA is the analytical quality assurance system for checking precision and accuracy of analysis results at any time. Regular checks safeguard the long-term reliability of the measuring system.



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