

## Test Scope: Water Matrix Comparison Tests

### Sample Information and Method:

Assigned value of parameters; It will be determined based on the median value of the results for up to 4 participants and the average result value for the number of participants above 4 in accordance with the requirements of ISO 17043 and ISO 17025. ISO 13528 conditions will be followed in the statistical calculations to be used. Natural water samples from the residential area in Turkey were used as samples. Homogenization and stability conditions will be determined before the samples are sent to the participants. The most suitable transportation and storage conditions will be determined according to the sample matrix and parameter, and the participants will be informed. Spike method can be applied to determine additional parameters in water samples. Only laboratories that are accredited from the relevant parameters or that are in the process of accreditation participate in our comparison tests.

### Test Condition for Samples:

The samples will be sent to the participants at the same time, and the participants should start the analysis within 24 hours, if possible, or if there are samples to be kept during this period, they should be kept at 4 - 8 oC, in an environment that is not exposed to light. Before starting the analysis, the bottle should be mixed with some shaking to re-homogenize the sample. Samples are sent ready for analysis. Participants will perform their analyzes in accordance with their own analysis methods.

In the samples arriving in plastic bottles, the relevant parameters are presented ready for analysis. It can be taken into the analysis process directly according to the participant's method without any dilution.

Samples presented in 30 ml amber glass bottles are shipped with the same coded blank sample. For samples arriving in 30 ml bottles, 10 ml is taken from the bottle and added into the blank sample bottle with the same code. The blank sample bottle is tightly closed and gently mixed up and down for approximately 30 seconds. Afterwards, the cover is opened and analyzed according to the participant method. Processing and analysis should be started immediately after opening the 30 ml amber glass bottle. If it is to be kept before analysis, it should be kept at 4 - 8 0C in an environment not exposed to light for a maximum of 48 hours.

For samples coming in ampoules; 3 ml of sample is taken from the sample in the ampoule with the help of a syringe or pipette and added to the blank sample bottle with the same code sent with the ampoule. The sample bottle is tightly closed and gently mixed up and down for approximately 30 seconds. Afterwards, the cover is opened and analyzed according to the participant method. Operations and analyzes should be started immediately after the ampoule is opened. If the bulbs are to be kept, they should be kept at 4 - 8 0C in an environment not exposed to light for a maximum of 72 hours.

### Data Entry:

On the Excel-formatted "Result-Entry-Form" that will be sent to you by e-mail, you only need to fill in the blank fields and send it to us. The fields you will fill in order; Your results (using only numbers without units and commas for decimal places), your analysis method, and your uncertainty value (if any).

### Parametre Aralıkları:

Parametre	Birim	Aralık
Alkalinity (as CaCO <sub>3</sub> )	mg/L	10 - 100
Aluminum	mg/L	1 - 5
Ammonia-N	mg/L	0,1 - 50
Antimony	mg/L	1 - 5
Arsenic	mg/L	1 - 5
Barium	mg/L	1 - 5
Biguanide	mg/l	4 - 40
Bismuth	mg/L	1 - 5
BOD	mg/L	100 - 500
Boron	mg/l	0,5 - 20
Bromide	mg/l	1 - 10
Cadmium	mg/L	0,1 - 2
Calcium	mg/L	1 - 100
Chloride	mg/L	1 - 100
Chromium	mg/L	1 - 5
Cobalt	mg/L	1 - 5
COD	mg/l	10 - 200

Parametre	Birim	Aralık
Magnesium	mg/L	1-100
Manganese	mg/L	1 - 5
Mercury	mg/L	1 - 5
Molybdenum	mg/L	1 - 5
Nickel	mg/L	1 - 5
Nitrate-N	mg/L	0,2 - 20
Nitrite-N	mg/L	0,1 - 10
Nitrogen, Total	mg/L	1 - 100
Nitrogen, Total Kjeldahl	mg/L	1 - 100
pH @ 25C	pH Unit	5 - 8
Phenol	mg/l	0,5 - 50
Phosphate as P	mg/L	1 - 50
Phosphorus - Total P	mg/L	1 - 100
Potassium	mg/L	1 - 100
Salinity	%	10 - 40
Selenium	mg/L	1 - 5
Silica (as Si)	mg/L	1 - 10

Color	Pt-Co	5 - 100
Conductivity @ 25°C	uS/cm	100 - 2000
Copper	mg/L	1 - 5
Cyanide (Free)	mg/l	0,5 - 50
Dissolved Oxygen	mg/l	1 - 100
Fat, Oil & Grease	mg/l	5 - 100
Fluoride	mg/L	0,1 - 5
Free Chlorine	mg/L	0,5 - 5
H2O2	mg/L	10 - 100
Hardness, Total (as CaCO3)	mg/L	1 - 200
Iron	mg/L	1 - 5
Isocyanuric Acid	mg/l	10 - 100
Lead	mg/L	1 - 5
Lithium	mg/L	1 - 5
Acidity	mg/L	50 - 500
Hydrazine	mg/L	1 - 10
Beryllium	mg/l	1 - 5
Permanganate Index	mg/l	1 - 10

Silver	mg/L	1 - 5
Sodium	mg/L	1 - 100
Solids - Dissolved	mg/L	10 - 500
Solids - Suspended	mg/L	10 - 500
Solids - Total	mg/L	20 - 1000
Strontium	mg/L	1 - 5
Sulfate	mg/L	1 - 50
Sulfur (S-2)	mg/l	1 - 100
Sulphite (SO3-2)	mg/l	1 - 100
TOC	mg/l	5 - 50
Total Residual Chlorine	mg/L	0,5 - 5
Turbidity	NTU	1 - 50
Vanadium	mg/L	0,1 - 2
Zinc	mg/L	1 - 5
Hydrocarbon	mg/L	1 - 10
MBAS	mg/L	0,1 - 10
Tin	mg/L	1 - 5

### Privacy Policy:

All information about participants and results are saved in our own digital records. Any part of this report is never shared with other participants or 3. part share holders with participant name. Representation of Lab ID codes are just known by Labsert.

### Objections:

Participants can appeal the entire test program or the test results. The objection period is 3 working days following the publication of the report. Objections can be made by e-mail or postal mail.

### Compatibility:

This report was published to show the results have Z' score of < 1, Z'score of ≥ 1 and < 2 and Z'score of > 2 according to ISO 17043 scopes. Within the scope of this comparison test, statistical calculations, homogeneity and stability tests were applied and the results were presented in this report In accordance with ISO 13528. Assigned value is calculated from overall median of the total results and standard deviation (S.D) is calculated as overall median standard deviation according to participant number (p<4).

### Assigned Value:

First, the Grubbs outlier test is applied to participant results. For the final results, the median value calculated over the presented results is considered as assigned value.

### Standard Deviation of Test Program:

First, the Grubbs outlier test is applied to participant results. For the final results, the median standard deviation calculated over the presented results is considered as standard deviation of the test program.

### Uncertainty of Assigned Value:

The standard uncertainties of assigned values determined as described in Article 5 are obtained by calculating the standard error of the participants' means ( $u = s/\text{SQRT}(n)$ ) for each parameter.

### Z' Scores:

If the number of participants in the comparison tests organized by Labsert "Z-Test" is <4, the Z'-score calculation is used for the performance evaluations of the participants. The Z'-Score calculation, whose formula is given below, can be also used when the assigned value uncertainty cannot be neglected. The meaning of neglection is given belo with the formula.

$$U_x \leq 0,3 * \sigma$$

If the formula given above can be matched for  $U_x$  value and the number of participants is more than 6, then Z score can be considered with the formula below.

$$Z = (x - x') / \sigma$$

As we described above, Z' score calculation is used for the laboratory comparison tests that we provide with the number of participants <4 instead of Z score.

$$Z' = (x - x') / \sqrt{\sigma^2 - u_x^2}$$

x: Participant Result       $\sigma$ : Standard Deviation of Test  
x': Assigned Value      U: Uncertainty of Assigned Value

### Reports

As a result of the comparison test, a single final report is prepared for all participants separately for each parameter. This report is the final report. The calculations are done using an Excel spreadsheet or dedicated software.