Z-Test
A part of Labsert

External Quality Control Tests - Interlaboratory Comparison Test
Preparation and Information Guide

Test Scope: Environment 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. Environment samples are obtained from the proficiency test rounds which are provided in Turkiye. 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 test 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 material should be stored in a dry place away from light, at the temperature specified in the certificate or product information form. Labsert cannot be held responsible for any changes that may occur in the material due to non-compliance with the storage conditions and usage instructions reported regarding the material. Samples are sent ready for analysis. Participants will perform their analyzes in accordance with their own analysis methods.

The content of the bottle must be mixed before use. All precautions should be taken to prevent contamination and moisture absorption during the opening and use of the bottle, and the bottle cap should not be left open for a long time.

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). You will have 10 business days to submit your results after receiving the samples from cargo.

Parameter Range:

Parametre	Birim	Aralık
Fertilizer		
Total Nitrogen	%	2 - 80
Water soluble phosphorus	%	2 - 80
Water soluble potassium	%	2 - 80
Ground Colemanite		
Al	mg/kg	100 - 2000
As	mg/kg	2 - 200
B	g / 100 g	2 - 200
Ca	g / 100 g	2 - 200
Fe	mg/kg	20 - 1000
Mg	g / 100 g	0,1 - 20
Na	mg/kg	20 - 1000
S	mg/kg	150 - 3000
Si	g / 100 g	0,2 - 50
Sr	g / 100 g	0,02 - 10
Loss of ignition (LOI)	g / 100 g	2 - 200

Parametre	Birim	Aralık
Soil - 1		
Total organic matter	%	0,5 - 80
Lime	%	0,5 - 80
Soil - 2		
As	mg/kg	5 - 500
Cd	mg/kg	0,2 - 50
Co	mg/kg	5 - 500
Cr	mg/kg	10 - 800
Cu	mg/kg	5 - 500
Fe	mg/kg	5000 - 80000
Hg	mg/kg	0,01 - 10
Mn	mg/kg	50 - 2000
Ni	mg/kg	5 - 500
Pb	mg/kg	5 - 500
Sb	mg/kg	0,2 - 50
V	mg/kg	5 - 500
Zn	mg/kg	10 - 800

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.

Uncertainity 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/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 negletion 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 σ: Standard Deviation of Test

x': Assigned Value U: Uncertainity 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.