

# Proficiency testing schemes for sampling?

## Introduction

This leaflet gives some hints for the application of ISO/IEC 17043 (General requirements for proficiency testing (PT) for PT providers organising PT schemes for sampling. If there is a comparison between participants and a mechanism for performance evaluation which meets the objective of the PT scheme for sampling, then it can be recognised under ISO/IEC 17043.

## Types of PT schemes for sampling

**Type 1:** Only the sampling procedure is taken into consideration and evaluated. Performance assessment can be done through a pre-established scoring system or criteria. The performance can be assessed by deviations from a standard procedure or through an audit process where experts judge the performance of the participant.

**Type 2:** Samples collected by the participants are tested by a single laboratory chosen by the PT provider who must ensure that validated methods with low variability are used. Thus, the variability obtained is attributed to the participant's sampling variability and not to the testing method variability.

**Type 3:** The performance of the participant, which is based on the testing results, takes into consideration both sampling and testing procedures. Here the participant can perform the test at the sampling site or at the participant's laboratory. The use of a common certified reference material by each participant enables the analytical variance to be determined. The performance assessment is based on the sampling and testing combined or differentiated.



## Interpretation of some technical requirements for sampling PT

The following considerations should be taken into account:

- **Personnel:** The demonstration of the competence (knowledge of the planning of sampling, sampling techniques and preparation of sampling sites) of the personnel related to the preparation of the sampling site.
- **Equipment, accommodation and environment:** Environmental conditions should be taken into consideration, by including them in the performance evaluation or by minimizing or eliminating their influence.
- **Planning:** Production, quality control, storage and distribution of proficiency test items for sampling PTs can be interpreted as "requirements for the sampling site" and handling/transportation of the samples once the sampling is performed.
- **Preparation of PT items:** The sampling site must enable participants to perform sampling in equivalent conditions (possible influences: rain, wind, temperature, etc).



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- **Homogeneity and Stability:** The two types of sampling sites, static e.g. a contaminated field or mobile site e.g. a river are to be taken into consideration in order to provide a fair challenge to every participant.
- **Statistical design:** ISO 13528 should be considered when establishing the statistical design. It is important to distinguish between the sampling elements and the analytical elements in the statistical design, which will depend on the type of sampling PT being operated. Sample transport effects that could have an influence should also be considered.
- **Assigned value / Evaluation criteria:** The determination of any assigned value will depend on the type of sampling PT being operated. The evaluation criteria should also cover the pre-sampling (e.g. container used) and the post-sampling (e.g. sample storage and transportation) concepts.
- **PT items handling and storage:** The sampling site and the samples taken during the sampling activity are considered as the PT item.
- **Packaging, labelling and distribution of PT items:** The PT provider should provide clear instructions when specific labelling and packaging is required. Where there is a direct measurement the requirements of this section are not applicable.
- **Data analysis and records:** Where the performance evaluation is based on a comparison to a reference procedure, this can be purely qualitative. Alternatively, observed deviations can be converted to numerical scores (e.g. 0 for negligible, 1 for minor, 2 for major) and some appropriate statistical data analysis performed.
- **Confidentiality:** When all the participants (or groups) are performing the sampling at the same time, then this must be made clear to the participants and reasonable precautions taken to prevent collusion.



## Conclusion

PT schemes for sampling are an important part of the improvement of the sampling procedure and also for the participants from an educational point of view, especially if workshops with the participants are organised. PT schemes for sampling can also give an appreciation of the contribution of the sampling error in relation to the overall quality of the measurement.

## More information and further reading

Information about PT providers and schemes can be obtained from your national accreditation body, from the EPTIS website ([www.eptis.org](http://www.eptis.org)) or from other national or international organizations.