

Draft Guidelines for Validation of Test Methods

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OUTLINE

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definitions

Validation:

(ISO 8402): Confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled

Verification:

(ISO 8402): Confirmation by examination and provision of objective evidence that specified requirements have been fulfilled

definitions

Method Validation:

(Eurachem): The process of establishing the performance characteristics and limitations of a method and the identification of the influences which may change these characteristics and to what extent. Which analytes can it determine in which matrices in the presence of which interferences? Within these conditions what levels of precision and accuracy can be achieved? The process of verifying that a method is fit for purpose; i.e. for use for solving a particular analytical problem.

Fitness for Purpose:

(IUPAC): Degree to which data produced by a measurement process enables a user to make technically and administratively correct decisions for a stated purpose

Example: Flexible Scope

Products of materials, type of activity	Measurement principle (measurand, range, types of tests)	Test method (method, international standard, validated laboratory-developed methods)
Electrotechnical products containing polymers and other insulating materials	Electrical tests	Documented Laboratory-developed Methods and Procedures and standard methods using: IEC 93:1980 BS 6233:1982 ASTM D257-92 CENELEC
	Surface resistivity	

From ILACG18:2002

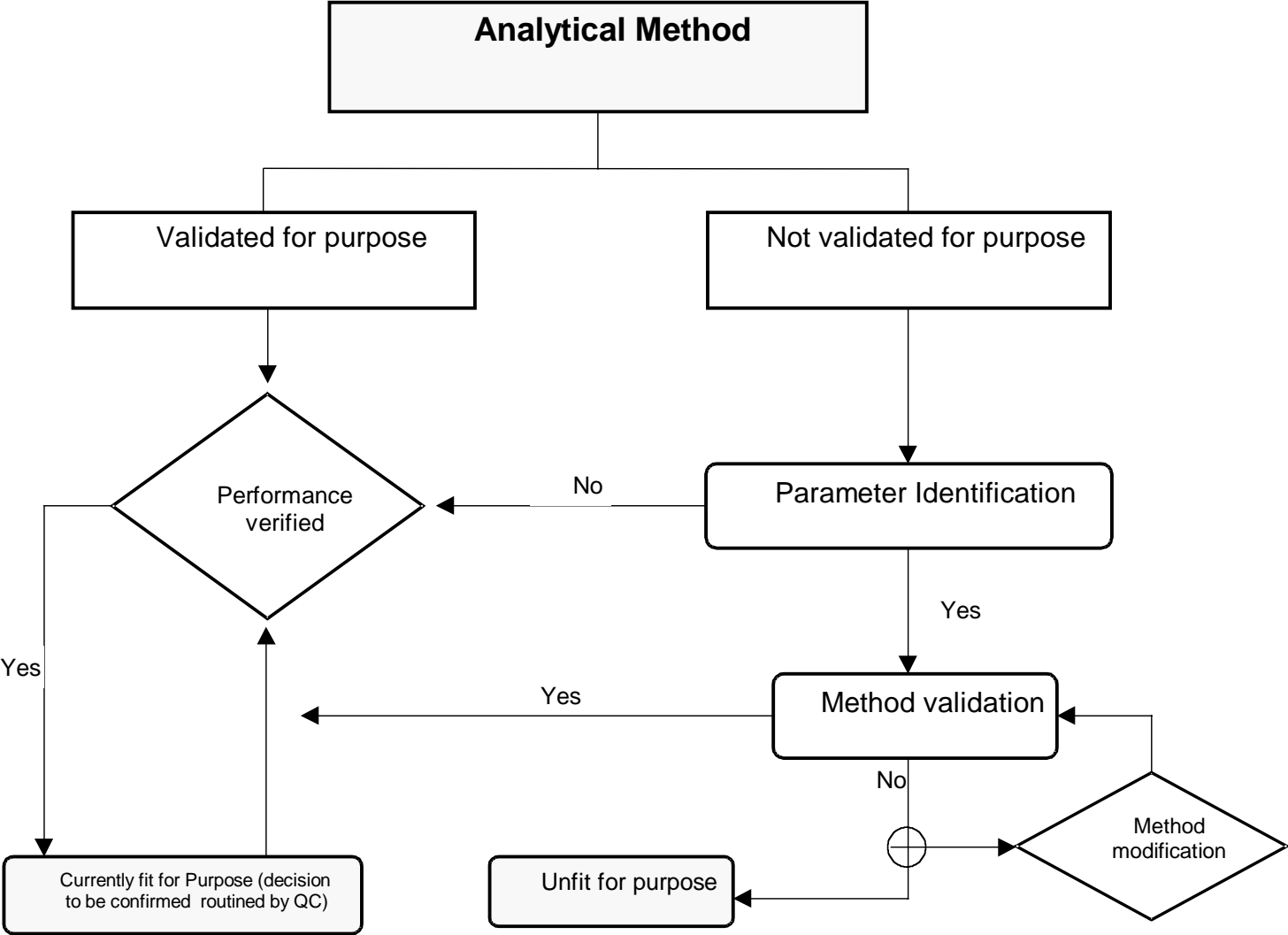
An FAO/IAEA Expert consultation recommended that validations in a laboratory be conducted according to five general principles:

- the laboratories operate under an internationally recognized quality system.
- the laboratories have a third party review of their validation process.
- analytical methods are assessed in respect to the general criteria for selection of methods (in the case of food control criteria according to Codex).
- the validation is documented in a report which clearly states the scope of the method.
- evidence of transferability is provided.

“Validation is always a balance between costs, risks and technical possibilities”

(CAN-P-4D: 5.4.5.3-Note 3)

Overview of Method Validation



Test method description	Validation or verification requirements
Standard method with performance data, e.g. collaboratively studied	Verification of performance, but validation may be required if any changes made
Developed inhouse	Full validation
Published in the literature without any performance data	Full validation
Published in the literature with performance data	Verification of performance but more likely full validation required

Test method description	Validation or verification requirements
Changes in implementation of previously validated method - i.e. changes to equipment, reagents, lab environment or staff.	Verification
Existing validated method applied to different matrices, different concentration ranges	Validation - extent will vary - e.g. having similar properties to those of representative matrices
Existing validated method applied to additional analytes	Validation
Method in prior use	See PALCAN D92.5-Edition E3 (November 2001) - PALCAN Interpretations for Conducting Assessments of Testing and Calibration Laboratories*

Test method description	Validation or verification requirements
Archived method reinstated	Verification
Ad hoc or special analyses	Extent of validation limited by circumstance
Commercial Test Kits - collaboratively tested, third party evaluation (e.g. AOAC)	Verification
Commercial Test Kits - no performance data available, incomplete or not applicable	Validation

definitions

Performance characteristic:

“means functional quality that can be attributed to an analytical method” (EC Directive). Examples of typical performance characteristics include: specificity, accuracy, trueness, recovery, precision, repeatability, reproducibility, detection limit, limit of quantitation, detection capability, ruggedness and stability. The validation may also evaluate sampling, sub-sampling and transportation of samples to the laboratory.

Performance criteria:

“means requirements for a performance characteristic according to which it can be judged that the analytical method is fit for the purpose and generates reliable results.”(EC Directive)

Example: Classification of analytical methods by the performance characteristics to be determined.

(From European Communities - Council Directive 96/23/EC for laboratories approved for official drug residue control in animals)

		Detection limit (capability - CC\$)	Decision Limit (Cc ")	Trueness/ Recovery	Precision	Selectivity/ specificity	Applicability/ ruggedness/ stability
Qualitative Methods	Screen	T				T	T
	Confirmatory	T	T			T	T
Quantitative Methods	Screen	T			T	T	T
	Confirmatory	T	T	T	T	T	T

Detection capability - the smallest content of the substance that may be detected, identified and/or quantified in a sample with an error probability of \$.

Decision Limit (Cc") - the limit at and above which it can be concluded with an error probability of " that a sample is non-compliant.

The laboratory should have a validation report available for review. The report should include:

- The analyte (unambiguously identified) and matrix to which validation applied, along with the source of analytical reference materials.
- Concentration range.
- The test method as validated. This includes information about equipment, reagents, calibration etc. (Confusion may arise if the method does not meet performance criteria and further method development is required).
- Reference to the validation procedure or plan used to generate the performance characteristics.

The laboratory should have a validation report available for review. The report should include:

- A summary of the performance characteristics and how these were calculated or defined. The raw data should also be available for review.
- The performance criteria against which the characteristics were evaluated and whether or not the method is fit for purpose.
- The intended use of the method.
- Estimates of uncertainty

What should assessors be looking for?

- How are test methods selected by the laboratory?
- Is the laboratory knowledgeable about best practices for validation in the applicable discipline and do they have access to relevant documents? Is the client providing any information?

What should assessors be looking for?

- Does the laboratory have a documented policy and procedures for validation or verification of methods? Are they followed? The procedure may be generic or project-specific.
- Does the laboratory have procedures for verification of test methods used in ad hoc/ non-routine testing?

- Who is assigned responsibility for validations? Are the staff trained in conducting validations and evaluating data packages?
- Is there a separation in the technical records between method development and validation?
- Is the validation documentation package complete?
- Is there evidence that the method has been successfully transferred to routine use, transferred to another laboratory or undergone some type of peer review
- Is there a process to review performance data generated for methods in routine use to demonstrate to clients ongoing fitness for purpose?