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***Assistant:***
*Françoise BRONET*
*Direct line: + 33 (0)1 41 62 86 83*
*Françoise.bronet@afnor.org*

***Your contact:***
*Rim CHAOUY*
*Direct line : + 33 (0)1 41 62  85 74*
*Rim.chaouy@afnor.org*


# ISO/WD 18634.0
# Environmental management- Environmental technology verification and performance evaluation

FOLLOW UP

For discussion during the next meeting :
**2013-06-25 from 08.30 to 17.00**
**2013-06-26 from 09.00 to 17.00**

**ISO/TC 207/SC 4**

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ISO/TC 207/SC 4/WG 5

Secretariat: ANSI

# Environmental management — Environmental technology verification and performance evaluation

*Management environnemental — Evaluation de la performance et vérification des technologies environnementales*

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# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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ISO 18634 was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 4, *Environmental performance evaluation*.

This second/third/... edition cancels and replaces the first/second/... edition (), [clause(s) / subclause(s) / table(s) / figure(s) / annex(es)] of which [has / have] been technically revised.

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— *Part [n]:*

— *Part [n+1]:*

# Introduction

TO BE ADDED

The **introduction** is an optional preliminary element used, if required, to give specific information or commentary about the technical content of the document, and about the reasons prompting its preparation. It shall not contain requirements.

Whenever alternative solutions are adopted internationally in a document and preferences for the different alternatives provided, the reasons for the preferences shall be explained in the introduction [see ISO/IEC Directives, Part 2, 2004[1], A.6 d)]. Where patent rights have been identified in a document, the introduction shall include an appropriate notice (see ISO/IEC Directives, Part 2, 2004[1], Annex F).

The introduction shall not be numbered unless there is a need to create numbered subdivisions. In this case, it shall be numbered 0, with subclauses being numbered 0.1, 0.2, etc. Any numbered figure, table, displayed formula or footnote shall be numbered normally beginning with 1.

# Environmental management — Environmental technology verification and performance evaluation

## 1 Scope

A paragraph.

This International Standard would describe the approach and steps of verification organisations to undertake for an environmental technology verification (ETV). This Standard specifies the principles and requirements of the ETV process and provides guidance for those managing and conducting performance verification of environmental technology.

This standard may be applied by verifiers or other organizations to support the selection of test bodies and/or analytic laboratories; specify requirements for suppliers; identify performance needs; plan tests; assess test data, other relevant information and test reports; analyze and evaluate test findings; and prepare verification reports and statements. It may also be used by verifiers or other organizations interested in verifications regardless of their activities, market orientation, location or size.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO ab-c:199x, *General title of series of parts — Part c: Title of part*

ISO xyz (all parts), *General title of the series of parts*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply / the terms and definitions given in … and the following apply.

**3.1**
**environmental technology verification**
The establishment or validation of environmental technology performance claims based on test data generated through testing using established protocols or specific requirements.

**3.2**
**environmentally sound technology**
Environmental sound technologies are technologies that result in reduced environmental damage relative to their comparable counterparts. They are less polluting, use their resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they were substitutes.

**3.3**
**environmental technology**
An all-inclusive term that is used to describe products, technology-based services, processes or systems thereof that are used to measure pollutants in the environment or remove or prevent their entry to the environment.

**3.4**
**proposer**
A proposer is an individual or an organization submitting a technology that will be verified through an environmental technology verification process.

**3.5**
**verifier**
An individual, group or organization responsible for the implementation of the environmental technology verification process, including the preparation of the verification plan, its implementation and reporting on the environmental technology verification.

**3.6**
**stakeholder (in the context of verification)**
Representative of a group with an interest in the results of environmental technology verification (e.g. buyer, user, developer, financier, regulator, etc.). The purpose of stakeholder participation is to ensure the relevance of verification procedures, processes, data, and products.

## 4 Principles of ETV

### 4.1 General

Environmental technology verification is based upon a number of principles to ensure the reported data, information and related disclosures are free from material discrepancy, avoid bias in their selection and presentation, provide a credible and balanced account, and are capable of being depended upon by intended users and other interested parties.

When conducting an environmental technology verification, the verifier shall apply the following principles in validating, verifying and reporting verifications.

### 4.2 Independence

*To be determined*

### 4.3 Ethical conduct

*To be determined*

### 4.4 Confidentiality

*To be determined*

## 5 Overview of the ETV process

### 5.1 General

The validation of the performance claim of an environmental technology is done through a process that is administered by a verifier. To begin the procedure, the verifier evaluates the proposal to verify if a technology is suitable for verification. Next, the verifier identifies and defines the parameters to

be verified and identifies the appropriate tests. Finally, the verifier analyzes the available data and/or recommends that additional data be generated in regards to the parameters. The verifier then evaluates all the data and drafts a final report.

### 5.2 Main steps of ETV

The following table 1 provides the steps in a typical ETV process.

| | ETV Steps | Description |
|---|---|---|
| **1** | **Evaluation of selected technology** | Describe the technology under verification, including any conditions or constraints. |
| **2** | **Definition of the performance parameters** | Define, in detail, the parameters and the ranges of those that are relevant for verification, including any operational constraints or additional parameters for recording. |
| **3** | **Verification planning** | Define the data and data quality required to meet the performance parameters; design the overall test and any test methods required. |
| **4** | **Assessment of existing data** | Assess any existing data submitted by the proposer that can be used to fulfill the data requirements. |
| **5** | **Testing** | If existing data is not available or acceptable, a test plan is developed and testing is performed to produce the needed data. |
| **6** | **Verification/analysis** | Evaluation and analysis of data on the parameters against the performance claim of the technology. |
| **7** | **Reporting** | Develop a verification report and/or a verification statement. |

**Table 1 — Steps in a typical ETV process.**

## 6 ETV process requirements

### 6.1 Description of the technology

A clear understanding of the technology to be verified is essential for designing an effective verification plan. Based on information provided by the proposer, the verifier shall prepare a written

description of the technology. The description shall include the technology's functions, specifications, benefits and limitations, and applications. The needs of users and any regulatory constraints on the use of the technology shall also be considered.

The description of the technology shall be defined in terms of:

a) Environmental medium: Components of the natural environment for which the technology is intended for, including air, water, soil, etc.

b) Purpose: The physical, biological or chemical property that is affected by the technology and the way it is affected (e.g., emissions are reduced.), and the parameters to be used to monitor this effect. It is possible to define more than one purpose.

c) Other significant impacts on the environment not described under the headings environmental medium and purpose, e.g., impacts related to recycling or disposal at the end of life of a technology, by-products, etc.

### 6.2 Definition of performance parameters

The verifier shall define relevant performance parameters for the testing and verification of the technology. This is to ensure that the performance parameters evaluated will focus on the intended application of the environmental technology, considering as a minimum:

a) Regulatory requirements

b) Application-based needs / user needs

c) State of the art performance of similar products

d) Detailed technical vendor claims on technology (vendor claims)

e) Existing verification procedures and similar relevant technical references

The proposers' claims, including the performance characteristics, design features and operating parameters, are evaluated against the factors listed above. The final performance parameters and relevant ranges are determined by the verifiers and are agreed upon by the proposer before the start of the testing and verification processes.

Additional parameters may be included in the evaluation. These could include, but are not limited to, information to assess the applicability of the technology for a specific use; information on operating costs (including energy consumption and chemical consumption); and environmental health and safety issues.

If available and relevant, standardized methods, preferably international standards, shall be recommended for testing and for measurement of parameters.

The relevant operating conditions and technology design features pertaining to the technology performance parameters must be clearly described, in order to have a complete claim expressing technology performance.

### 6.3 Verification planning

The verifier shall prepare a verification planning document known as a verification protocol. Each verification protocol is tailored to the technology being verified and includes all the necessary technical details of the planned verification.

While developing the verification protocol, the verifier shall, based on the defined application and the performance parameters, take into consideration:

a) the overall set-up of the test design and test principles;
b) the data quality and the assessment method for testing; and
c) the data results required. This shall include test-data requirements (specification of amount and quality).

### 6.4 Existing data assessment

The proposer may submit existing test data on the technology to the verifier for consideration. The quality and reliability of the data shall be evaluated by the verifier to determine whether the obtained test results (data) are acceptable.

In order for the proposer's data to be included in the verification, the following requirements will have to be met:

a) Tests are performed either by a qualified test body or by the proposer. If performed by the proposer, then the testing plans and all preparatory measures, such as sampling and tests, are implemented in agreement and, where appropriate, or a qualified test body.

b) The laboratory analysis is performed in accordance with defined procedures.

c) The test procedures, performance and data are documented and formally controlled.

d) Raw data and quality control data are made available.

e) The test design and principles, and the test data fulfil the requirements provided in the verification protocol.

If existing data for defined performance parameters meet the requirements listed above, then further testing may not be necessary for these parameters.

### 6.5 Test planning

When testing is needed, a test plan shall be drafted by the verifier in cooperation with the test body, following the verification protocol and in agreement with the proposer. The resulting test plan shall specify the tests and the manner in which they are to be performed, where and by whom, as well as any and all corresponding quality control tests and analyses.

### 6.6 Testing

The testing shall be performed according to the agreed test plan. The verifier will ensure that the technology operates under the predetermined operating conditions identified in the test plan and that all relevant operating data are recorded for each test period. Any changes to the test plan before the start of testing (amendments) or during testing (deviations) shall be reported by the test body and approved by the verifier.

The testing shall be documented in a report (test report). The test report shall contain, as a minimum, the following items:

a) The name and qualifications of the test body
b) The technology evaluated
c) The date of testing
d) The type of tests performed
e) Who performed the tests
f) The standards and methods used for testing
g) Any deviations from the standards and methods, and the effect of these deviations on the test results
h) The test results
i) Conclusions

Note: The test report can be part of the verification report if no separation of the reports is desired.

### 6.7 Analysis

Test organizations may send samples for analysis to an analytical laboratory, provided that the analytical laboratory meets the quality criteria specified in the test plan. The report from the analytical laboratory shall contain analytical results together with uncertainty and limit of detection of methods used and all other data required in the test plan.

### 6.8 Verification

The verifier shall evaluate the results from the tests described in the test plan. If there is data from previous tests, then the verifier shall also assess these pre-existing data. The verifier reviews the procedures described in the corresponding test plan and determines if the data satisfies the requirements of the verification protocol. Based on this evaluation, the verifier provides his statement on the environmental performance claims of the technology. Finally, the verification process may also include a comparison of the performance of the verified technology to regulatory standards in the target market.

### 6.9 Verification report

The results of the verification shall be reported by the verifier. The verification report shall be based on information from the verification protocol and separate test report and shall give information on verification results, test and analysis performed, deficiencies and results of quality assurance.

The verification report shall, as a minimum, reference all relevant documents produced during verification, including:

a) Verification protocol and test plan
b) Test report
c) Reporting of any deviations from the required procedures.

The verifier may combine the listed report elements in one report or separate reports. They can also be included as appendices to the verification report.

### 6.10 Verification statement

Based on the verification report, the verifier may draft a verification statement. The verification statement is a summary of the verification. As a minimum, the verification statement shall:

a) Summarize the actual completed results of the performance of the technology that has been verified;

b) Summarize the results of the verification process, including the verified performance parameters, test results and any subsequent evaluation of additional parameters; and

c) Provide additional information to be used for further evaluations and analysis shall be upon arrangement with the proposer and/or other interested parties.

The overall format shall be implemented in the same form for all technologies.

### 6.11 Publication of verification report and statement

The verifier will ensure that performance results and verification report as well as other complete and unbiased information are made publicly available in an open and comprehensive manner to the intended user. As a minimum:

a) The verification statement, or the complete verification report in the absence of verification statement, shall be published. Where appropriate or required by legal or other parties, verification protocols and test plans may also be published; and

b) Additional information to be used for further evaluations and analysis shall be made available upon arrangement with the proposer and/or other responsible parties.

The verifier shall have access to all information under the applicable confidentially rules.

### 6.12 Post-verification

Since verified technologies can change over time, a post-verification process shall be incorporated to reconfirm that the technology claims and the associated verification are still valid. It is essential for the credibility of the verification process that all parties continue to have confidence in the validity of the verifications and that the verification statement refers to the same technology that was originally verified.

Verifiers shall ensure that verification statements are only valid as long as the verified technology is not changed in a way that materially affects the performance as verified and reported.

The terms of use of verification results (reports, statements) must be clear for the proposer. In particular, the proposer shall make the statement available to users in full and shall not use parts of the statement for any fraudulent purpose.

# Annex A
(informative)

# Guidance for the use of the standard

To be determined

# Bibliography

[1] ISO 9001:2008--Quality management systems--Requirements;

[2] ISO 14050:2006--Environmental management--Vocabulary;

[3] ISO/IEC 17000:2004--Conformity assessment--Vocabulary and general principles;

[4] ISO/IEC 17020:2012--Conformity assessment--General criteria for operation of various types of bodies performing inspection;

[5] ISO/IEC 17025:2005--General requirements for the competence of testing and calibration laboratories; and

[6] ISO/IEC/FDIS 17065:2011 1st. Ed.--Conformity assessment--Requirements for bodies certifying products, processes and services