



Institut luxembourgeois de la normalisation  
de l'accréditation, de la sécurité et qualité  
des produits et services

## ILNAS-EN 14735:2005

### **Characterization of waste - Preparation of waste samples for ecotoxicity tests**

Charakterisierung von Abfällen -  
Herstellung von Abfallproben für  
ökotoxikologische Untersuchungen

Caractérisation des déchets -  
Caractérisation des déchets - Préparation  
des échantillons de déchets en vue  
d'essais écotoxicologiques

08/2005



## National Foreword

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EUROPEAN STANDARD ILNAS-EN 14735:2005 **EN 14735**  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

August 2005

ICS 13.030.01

English Version

**Characterization of waste - Preparation of waste samples for  
ecotoxicity tests**

Caractérisation des déchets - Préparation des échantillons  
de déchets en vue d'essais écotoxicologiques

Charakterisierung von Abfällen - Herstellung von  
Abfallproben für ökotoxikologische Untersuchungen

This European Standard was approved by CEN on 27 June 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

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## Foreword

This European Standard (EN 14735:2005) has been prepared by Technical Committee CEN/TC 292 “Characterization of waste”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2006, and conflicting national standards shall be withdrawn at the latest by February 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## 0 Introduction

Ecotoxicity can be estimated using two approaches: a chemical-specific approach and a toxicity-based approach. Chemical analyses are compared, in the first case, to quality criteria or threshold values to estimate ecotoxicity. In the second one, ecotoxicity is measured directly using biological tests. These two approaches complement each other, however, determination of pollutants in complex mixtures of unknown composition, that is a characteristic of many wastes, does not allow a relevant estimation of ecotoxicity. For such samples, the toxicity based approach is usually recognised to be appropriate to assess potential toxicity. Bioassays integrate, indeed, the effects of all contaminants including additive, synergistic and antagonistic effects. They are sensitive to the bioavailable fraction of the contaminants only. Finally, bioassays integrate the effects of all contaminants, including those, not considered or detected by chemical analyses.

Ecotoxicity tests can be applied to wastes to identify their potential hazardous properties with respect to the environment for classification purposes or to assess the risk related to a site-specific exposure scenario.

### 0.1 Identification of properties potentially hazardous to the environment for classification purposes

A classification system, based on the assessment of intrinsic properties, should be independent of an exposure scenario. The main requirement, in order to establish a relevant system for classifying wastes and for assessment of hazard properties, is to obtain comparable test results. This can only be obtained if the ecotoxicity tests on wastes are carried out according to a unique procedure describing more or less conventional test conditions (an exclusive dilution medium for terrestrial tests, a unique L/S ratio for preparation of water extracts, a unique liquid / solid separation step etc). This procedure should be applicable to a very wide range of waste materials whatever their physical properties are.

Any strategy for the assessment of properties potentially hazardous to the environment used in a classification system should include test organisms representing the terrestrial and the aquatic compartment. Both types of tests should be considered because they expand the range of effect expression due to differences in species sensitivity and exposure. For this specific purpose, the water extracts preparations for toxicity testing do not simulate leaching from wastes under environmental conditions but measure the water available fraction of the toxic components of the wastes.

### 0.2 Site-specific exposure scenario

The second application of ecotoxicity tests to wastes refers to a risk assessment approach. In this particular case, the test strategy should model site specific exposure conditions and should take into account the transfer of contaminants via the food chain and to surface and ground water by run-off or leaching. This application concerns firstly the definition of generic scenarios frequently encountered (e.g. wastes deposit in stockpiles, re-use of wastes) and focus on the relevant way of exposure to terrestrial and aquatic organisms.

This European Standard describes the necessary steps to be performed before carrying out ecotoxicity tests on wastes within the context of assessment of ecotoxic properties used in a classification system.

## 1 Scope

This European Standard describes the necessary steps to be performed before carrying out ecotoxicity tests on wastes. The purpose of this European Standard is to provide guidance on the taking of the sample, transport, storage of wastes and to define preparation, for the determination of ecotoxicological properties of wastes under the conditions specified in this European Standard by biological testing either as raw wastes or water extracts from wastes. Sample preparation for other applications (e.g. assessment of waste effects on aquatic and terrestrial organisms in a disposal scenario) is not considered.

Specifying a test battery to characterize ecotoxicological properties of wastes is not in the scope of this European Standard.

This European Standard is applicable to solid and liquid wastes.

## 2 Normative references

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

prEN 14899, *Characterization of waste - Sampling of waste materials - Framework for the preparation and application of a Sampling Plan*

EN 12457-2:2002, *Characterization of waste – Leaching – Compliance test for leaching of granular waste materials and sludges – Part 2: One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 4 mm (without or with size reduction)*

EN ISO 5667-3, *Water quality - Sampling - Part 3: Guidance on the preservation and handling of water samples (ISO 5667-3:2003)*

ISO 10390, *Soil quality – Determination of pH*

ISO 11268-1, *Soil quality – Effects of pollutants on earthworms (Eisenia fetida) – Part 1: Determination of acute toxicity using artificial soil substrate<sup>1)</sup>*

ISO 11465, *Soil quality – Determination of dry matter and water content on a mass basis – Gravimetric method*

ISO 14238:1997, *Soil quality – Biological methods – Determination of nitrogen mineralization and nitrification in soils and the influence of chemicals on these processes*

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1) Definition of soil substrate.

### 3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

#### 3.1

##### **dilution medium**

liquid or solid used for the preparation of control vessels and the preparation of test mixture

#### 3.2

##### **ecotoxicological properties**

potential adverse effects to biological systems which a waste has an inherent capacity to cause

#### 3.3

##### **eluate**

solution recovered from a leaching test

[EN 12457-2:2002]

#### 3.4

##### **granular waste**

waste not being monolithic, nor a liquid, a gas or a sludge

[EN 12457-2:2002]

#### 3.5

##### **laboratory sample**

sample or subsample(s) sent to or received by the laboratory (IUPAC definition)

NOTE 1 When the laboratory sample is further prepared (reduced) by subdividing, mixing, grinding or by combinations of these operations, the result is the test sample. When no preparation of the laboratory sample is required, the laboratory sample is the test sample. A test portion is removed from the test sample for the performance of the test or for analysis. The laboratory sample is the final sample from the point of view of sample collection but it is the initial sample from the point of view of the laboratory.

NOTE 2 Several laboratory samples can be prepared and sent to different laboratories or to the same laboratory for different purposes. When sent to the same laboratory, the set is generally considered as a single laboratory sample and is documented as a single sample.

#### 3.6

##### **leachant**

liquid used in a leaching test

NOTE For the purpose of this European Standard the leachant is water as specified in Clause 4.

#### 3.7

##### **leaching test**

test during which a material is put into contact with a leachant and some constituents of the material are extracted

#### 3.8

##### **liquid sludge**

sludge that has the characteristic of a liquid as specified in the definition of a liquid waste

#### 3.9

##### **liquid waste**

waste that completely flows out of a calibrated opening, down to the upper level of the opening within a limited period of time (see Annex B of EN 12457-2:2002)