

**Förpackningar och materialåtervinning –  
Kriterier för återvinningsmetoder – Beskrivning  
av återvinningsmetoder och flödesschema**

**Packaging and material recycling – Criteria for  
recycling methods – Description of recycling  
processes and flow chart**

Europastandarden EN 13437:2003 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 13437:2003.

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**EN 13437**

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English version

## Packaging and material recycling - Criteria for recycling methods - Description of recycling processes and flow chart

Emballages et recyclage matière - Critères pour les  
méthodes de recyclage - Description des procédés de  
recyclage et schéma de flux

Verpackungen und stoffliche Verwertung - Kriterien für  
stoffliche Verwertungsverfahren - Beschreibung von  
stofflichen Verwertungsprozessen und Flußdiagrammen

This European Standard was approved by CEN on 11 March 2003.

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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 Management Centre has the same status as the official versions.

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## **Foreword**

This document (EN 13437:2003) has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by November 2003, and conflicting national standards shall be withdrawn at the latest by November 2003.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This document contains Annexes A, B, C, D, E, F, G and H which are normative.

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

## **Introduction**

The Directive on Packaging and Packaging Waste (94/62/EC) defines requirements for the manufacturing and composition of packaging. EN 13427 provides a framework within which this and other standards may be used together to support a claim that a packaging is in compliance with the essential requirements for packaging to be placed on the market as required by the Directive.

This European Standard outlines the stages through which packaging passes from raw material to the recovery of the used packaging after it has served its purpose. It amplifies these requirements by describing the process of material recycling for the various materials used for packaging and its principal aim is to provide practical guidance.

The recycling processes used for the recovery of used packaging, (which are often comprised of more than one material) and other used applications, are influenced by three main aspects:

- 1) the material from which the product is manufactured;
- 2) the source of the used packaging; and
- 3) the application for which the recycled material is intended to be used.

Consideration of all these aspects is necessary in order to optimise the technical, economic and environmental effectiveness of the recovery operations. This European Standard describes the recycling operations for the main material types and their position within the overall material production, use and recovery cycle.

Material recycling of used packaging should be seen within the overall life cycle of products and packaging. The purpose of packaging is the containment, protection, distribution and presentation of products including instructions as to their use. A major role is one of prevention of damage/wastage of the products contained in the packaging.

## 1 Scope

This European Standard defines the criteria for a recycling process and describes the principal existing processes for material recycling and their inter-relationship.

Both packaging and recovery technologies are subject to continuing and rapid development. This European Standard describes the present stage of knowledge but may be subject to modifications in the light of new developments.

The essential relationship between this and the five mandated European Packaging Standards and one (mandated) CEN Report is specified in EN 13427.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 643, *Paper and board – European list of standard grades of recovered paper and board.*

## 3 Terms and definitions

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

### 3.1

#### **packaging**

all products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer

"Non returnable" items used for the same purpose shall also be considered to constitute packaging.

[Directive 94/62/EC]

### 3.2

#### **recycling**

reprocessing in a production process of the waste materials for the original purpose or for other purposes including organic recycling but excluding energy recovery

[Directive 94/62/EC]

### 3.3

#### **feedstock recycling**

recycling whereby typically organic materials are converted into low-molecular weight products which are reused for the production of other materials or in other chemical/production processes

### 3.4

#### **packaging waste**

any packaging or packaging material covered by the definition of waste in Directive 75/442/EEC, excluding production residues

[Directive 94/62/EC]

### 3.5

#### **scrap**

material which has passed through one or more of the operations of production, conversion and filling but is not part of the packaging or the packaging material sold for its intended purpose

## EN 13437:2003 (E)

**3.6**  
**reconditioning**  
necessary operations to bring a reusable packaging back into a functional state and having the same basic specification as the original packaging

NOTE An operation carried out on a used packaging, whether originally supplied as a single trip or reusable packaging, to bring it into a functional item of packaging but which changes its basic specification is defined as recycling, and not reconditioning.

**3.7**  
**primary raw material**  
material which has never been processed into any form of end use product

[EN 13430]

**3.8**  
**secondary raw material**  
material recovered for use as a raw material from used products and from scrap with the exception of the scrap arising within a primary production process

NOTE The precise nature of the primary production process may vary between material sectors. Reference to the relevant flow diagram will clearly identify this process.

**3.9**  
**recycling process**  
process which converts collected and sorted used packaging and scrap, together in some instances with other material, into secondary raw material or products

## 4 Description of Material Recycling Processes

### 4.1 Criteria for recycling processes

The basic criterion for a recycling process is that it has a specified input of used (packaging) material from which it recovers value in usable material. Recycling of used packaging will have an input of used packaging, which may or may not be processed with other materials, and the output will be feedstock or material used in the production of new products, which may, or may not, be for packaging applications. The recycling process will vary substantially according to the material to be processed, the source from which it comes, and the applications for which the recovered/recycled material is to be used.

Additionally the recycling process will use scrap from the various production, filling and packaging operations. Subsequent to the primary production process, the recycling process is a useful means of diverting this material from landfill. It should be noted that used packaging reprocessed through material recycling will be included in the recycling rate described by Directive 94/62/EC, while scrap will not be included in this rate.

Where the 'second life' application has a high demand for cleanliness and consistency, the recycling process will be required to ensure a high level of removal of extraneous/different material with stages in the recycling process for cleaning the recovered material by washing, de-inking etc. In other operations where the new application has a lower demand on the specification, separation of small amounts of extraneous material may not be necessary, nor complex cleaning operations. It will be environmentally and economically wrong to base recycling on the higher end of the quality specification, and the recycling operation is often designed to meet the specific needs of the source recovered products and the application for which the recycled material is to be used.

To cover this wide diversity of processes, the following clauses introduce the methodology and detailed descriptions of the recycling processes.

Detailed information on the specific material recycling processes is given in the explanatory notes for the individual material flow charts.

## 4.2 General Flow Chart

The General Flow Chart is in annex A and defines the Packaging and Packaging Material Flows for packaging in general. Explanatory notes to annex A give the definition of the flows designated by letters in the diagram. The nature of some flows is also indicated by text in the diagram and the main processes are identified by text on the diagram with additional information provided as appropriate in annex A.

## 4.3 Multi Component Packaging

For packaging to effectively meet its functional requirements, the unit of packaging will often comprise more than one component. Examples of these are:

- a liquid container with a label and closure with a sealing pad inside the closure;
- a corrugated case with adhesive tape or metal staples to effect closure;
- a drum with loose liner with lid and labels.

For material recycling it is necessary that the various components of the unit of packaging be compatible with the overall system and the expected final application in which the recycled material will be used.

To achieve this, the components need to satisfy at least one of the following requirements:

- compatible with each other in meeting the specification requirements of the application in which they are to be used;
- separable in the recycling process such that the targeted material/component can be cleaned and processed to the necessary specification;
- separable by hand, or in the sorting process prior to recycling, to leave the targeted material/component ready for recycling to the necessary specification.

Different recycling processes have been developed for the various materials used in packaging and are described in the annexes B, C, D, E, F, G and H. In addition, the recycling processes for any one material can vary dependant on the source of material and application into which the recycled material is to be used.

The compatibility of materials and requirements are further detailed in EN 13430 and CR 13688.

## 4.4 Technological Development

Research continues in the technology for the recovery and recycling of all materials so that they can be reused within and outside of the field of packaging, as indicated by the flows y and z. The descriptions given in each of the elaborations for the specific flow chart are therefore examples and are not limiting to the current and future processes.

## 4.5 Import and Export

Import and export occur for raw materials, packaging, (both unfilled and filled) and also used packaging for recovery and recycling. These are influenced by commercial pressures on supply and demand, as well as the availability of process capacity, in particular for recycling.

## 4.6 Specific Flow Charts

In addition to the General Flow Chart, a number of material-specific flow charts have been elaborated and these are as follows:

- annex B, Aluminium;
- annex C, Glass;

## EN 13437:2003 (E)

- annex D, Paper and Board;
- annex E, Plastic;
- annex F, Steel;
- annex G, Wood;
- annex H, Other Materials

In a number of situations, two or more of these material will be used together in the production of packaging in order to achieve specific properties. Where this is the case, the flow sheet associated with the dominant material by weight should be used.

These material-specific flow charts have the same overall layout as the general flow chart and retain the same identification for the flows. In particular, the lower half of the material-specific flow diagrams are identical to the general flow chart. The upper half however allows a definition of the variations in flows and processes which are specific to each material type.

Flows which are not possible with particular materials are hatched on the relevant diagrams.

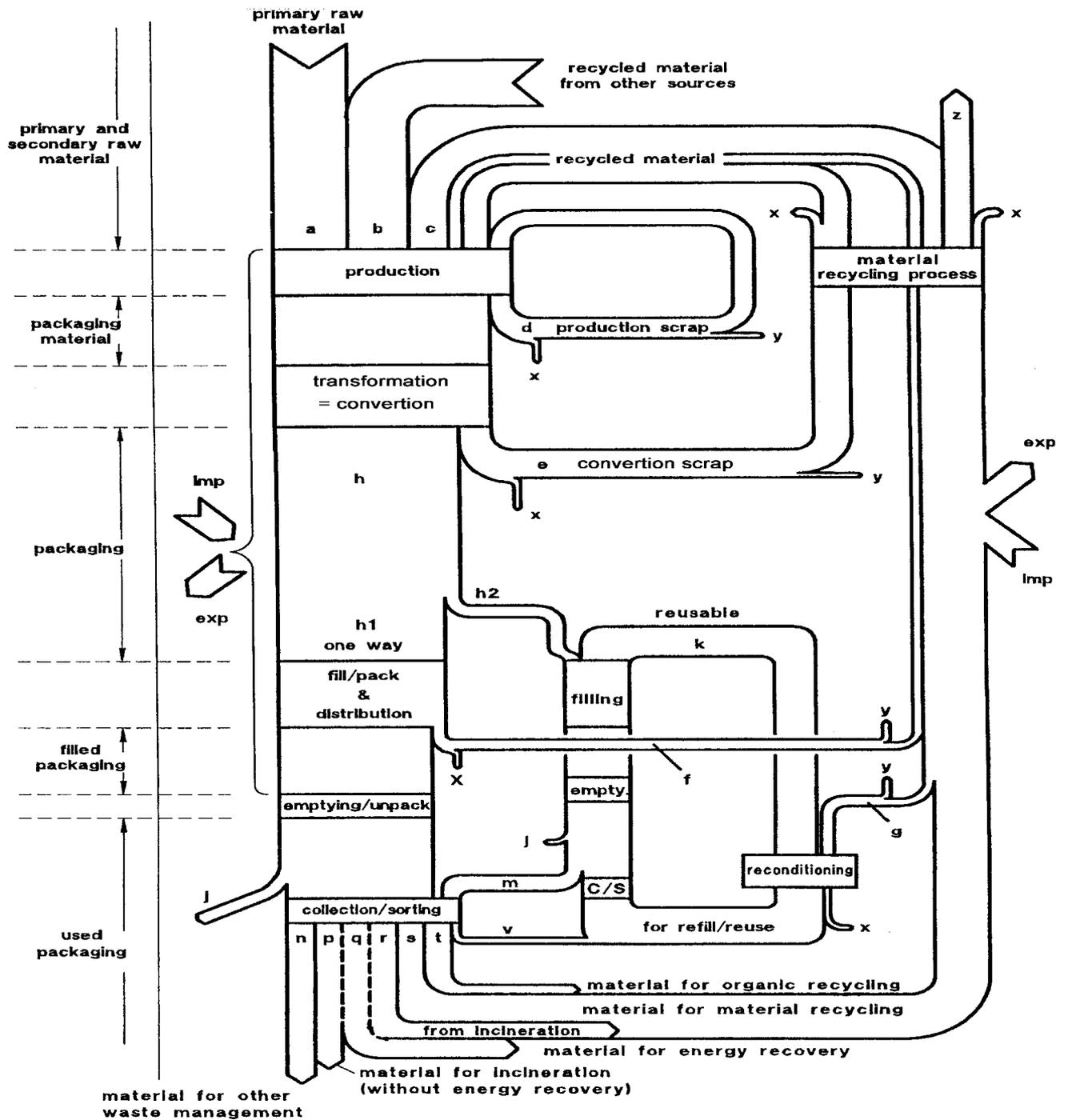
Explanatory notes to annex A also apply to annexes B to G.

The following sections of this standard contain a commentary on each of the material-specific flow charts to enable a full appreciation of the processes and flows described.

## Annex A (normative)

### Packaging and packaging material flows

(relating to packaging as defined in the packaging and packaging waste directive)



The size of flows do not correspond to the volume of the flows.

Figure A.1 – Packaging and packaging material flows