

# Safety of toys —

## Part 4: Experimental sets for chemistry and related activities

The European Standard EN 71-4:1990, with the incorporation of amendments A1:1998, A2:2003 and A3:2007, has the status of a British Standard

ICS 97.200.50

National foreword

This British Standard is the UK implementation of EN 71-4:1990, incorporating amendments A1:1998, A2:2003 and A3:2007. It supersedes BS 5665-4:1990, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A2 is indicated by A2 A2.

The UK participation in its preparation was entrusted to Technical Committee CW/15, Safety of toys.

A list of organizations represented on this committee can be obtained on request to its secretary.

In particular the attention of users is drawn to the Toys (Safety) Regulations 1989 (SI 1275).

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Committee and comes into effect on 15 December 1998

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ISBN 978 0 580 59560 8

Amendments issued since publication

| Amd. No. | Date             | Comments              |
|----------|------------------|-----------------------|
| 14510    | 12 November 2003 | See national foreword |
| 17222    | 31 August 2007   | See national foreword |
|          |                  |                       |
|          |                  |                       |

Descriptors: toys, games, chemical compounds, dangerous materials, approved doses, safety requirements, specifications, marking, instructions, graphic symbol

English version

## Safety of toys — Part 4: Experimental sets for chemistry and related activities

Sécurité des jouets —  
Partie 4: Coffrets d'expériences chimiques et  
d'activités connexes

Sicherheit von Spielzeug —  
Teil 4: Experimentierkästen für chemische und  
ähnliche Versuche

This European Standard was accepted by CEN on 29 May 1990. CEN members are bound to comply with the requirements of CEN/CENELEC Common Rules 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 CEN 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 CEN Central Secretariat has the same status as the official versions.

CEN members are the national standards organizations of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

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## Introduction

The Commission of the European Communities (CEC) informed in March 1985 the CEN Technical Board (CEN BT) of the activities of the Commission concerning the preparation of a new proposal for an EEC-directive within the field of safety of toys (now published as Council Directive 88/378/EEC of 3 May 1988).

On 1988-05-18 the Commission submitted a draft standardization request to CEN. This request charges CEN with the preparation of a European Standard on maximum concentration limits in chemical toys for dangerous substances and preparations as defined in directives 67/548/EEC and 88/379/EEC, essential to the functioning of chemical toys.

The draft standardization request was accepted by CEN BT on 1988-06-16/17 (resolution BT 86/1988).

A parallel draft EFTA standardization request was submitted from EFTA on 1988-09-23.

On 1988-06-08 CEN/TC 52 set up a working group CEN/TC 52/WG 5. The task of the working group was to prepare two final working drafts covering the mandate.

The working group, WG 5, convened in November 1988 in Berlin, in March 1989 in Salzburg and in October 1989 in Brussels.

The revised third working draft, as prepared during the meeting in Salzburg, was approved on 1989-03-16 by CEN/TC 52 for submission as a draft European Standard for enquiry. A revised draft European Standard, as prepared during the meeting of WG 5 in Brussels, was approved on 1989-10-17.

In accordance with the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

The following technical changes were introduced by EN 71-4:1990/A3:2007:

- deletion of dangerous substances which are suspected of having carcinogenic, mutagenic or toxic for reproduction (CMR) properties;
- improvement in the classification of substances.

## Foreword

This European Standard consists of the following parts:

- Part 1: Mechanical and physical properties;*
- Part 2: Flammability;*
- Part 3: Migration of certain elements;*
- Part 4: Experimental sets for chemistry and related activities.*

This standard is part 4 of the European Standard for safety of toys.

This part 4 should be read in conjunction with part 1, particularly the foreword and Clause 1 and Clause 2 of part 1.

It is intended to reduce the risks which may present health hazards to a child when the experimental sets are used as intended or in a foreseeable way, bearing in mind the normal behaviour of children.

When using these experimental sets, the possible dangers should be kept to a minimum, by adding appropriate information to make the experiment recognized and controllable.

Requirements are laid down in this standard. Differing legal requirements, e.g. for classification of dangerous substances, Risk/Safety phrases, labelling and limits for substances, exist in EFTA-countries.

Technical rules for inclusion and exclusion of substances in Table 1 are in preparation and will be added to this standard at the earliest opportunity.

## Foreword to amendment A1

This amendment EN 71-4:1990/A1:1998 to EN 71-4:1998 has been prepared by Technical Committee CEN/TC 52, Safety of toys, the Secretariat of which is held by DS.

This amendment to the European Standard EN 71-4:1990 has been prepared under a mandate given to CEN by the European Commission, and supports essential requirements of EU Directive(s).

NOTE Different legal requirements may exist in non-EU countries.

This amendment to the European Standard EN 71-4:1990 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 1998, and conflicting national standards shall be withdrawn at the latest by October 1998.

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Foreword to amendment A2

This document (EN 71-4:1990/A2:2003) has been prepared by Technical Committee CEN/TC 52, Safety of toys, the Secretariat of which is held by DS.

This Amendment to the European Standard EN 71-4:1990 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2004, and conflicting national standards shall be withdrawn at the latest by January 2004.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to 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.

## Foreword to amendment A3

This document (EN 71-4:1990/A3:2007) has been prepared by Technical Committee CEN/TC 52 “Safety of toys”, the secretariat of which is held by DS.

This Amendment to the European Standard EN 71-4:1990 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2007, and conflicting national standards shall be withdrawn at the latest by November 2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 88/378/EEC.

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

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

## 1 <sup>A3</sup> Scope

This part of the European Standard EN 71 specifies requirements for the maximum amount of certain substances and preparations used in experimental sets for chemistry and related activities.

These substances and preparations are

- chemicals classified as dangerous by the Directives on dangerous substances [1] and dangerous preparations [2] (including substances which have been self-classified according to the requirements of these Directives);
- substances and preparations which in excessive amounts may harm the health of the children using them but which are not classified as dangerous by the above mentioned Directives and
- other chemical substances and preparations delivered with the toy.

This standard applies to chemistry sets and supplementary sets. It also covers toys for experiments within the fields of mineralogy, biology, physics, microscopy and environmental science whenever they contain one or more chemical substances and/or preparations.

It also specifies requirements for marking, contents list, instructions for use and for equipment intended for carrying out the experiments. <sup>A3</sup>

## <sup>A3</sup> 2 <sup>A3</sup> <sup>A2</sup> Normative references <sup>A2</sup>

<sup>A3</sup> EN ISO 8317, *Child-resistant packaging — Requirements and testing procedures for reclosable packages (ISO 8317:2003)*. <sup>A3</sup>

<sup>A3</sup> Text deleted <sup>A3</sup>

<sup>A2</sup> EN ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shorehardness) (ISO 868:2003)*.

ISO 7619, *Rubber — Determination of indentation hardness by means of pocket hardness meters*. <sup>A2</sup>

<sup>A3</sup> Text deleted <sup>A3</sup>

## <sup>A3</sup> 3 <sup>A3</sup> Definitions

For the purpose of this part of EN 71 the following definitions apply.

### <sup>A3</sup> 3.1 <sup>A3</sup>

#### **chemistry set**

a toy consisting of one or more chemical substances and/or preparations with or without equipment intended for carrying out chemical experiments

NOTE The definition also covers toys for experiments within the fields of mineralogy, biology, physics, microscopics and environmental sciences whenever they contain one or more chemical substances and/or preparations.

### <sup>A3</sup> 3.2 <sup>A3</sup>

#### **supplementary set**

a chemistry set which is intended to be used with a complete chemistry set

## <sup>A3</sup> 4 <sup>A3</sup> Chemical substances

<sup>A3</sup> Only chemical substances, preparations and indicators given in Table 1 and Table 2 can be supplied in chemistry sets up to the amounts stated. <sup>A3</sup>

NOTE The quality of the chemicals used should be appropriate for the experiments described. In particular the chemicals should not contain impurities or blends which allow undefined and dangerous reactions.

Additionally, denatured methylated spirits and the reagents <sup>A3</sup> referred to in Table 3 <sup>A3</sup> may be prescribed for use, but shall not be provided with the toy.

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<sup>A3</sup> Footnotes deleted <sup>A3</sup>

Other substances shall not be supplied with the toy. However, the instructions for use may prescribe the use of other substances, e.g. sugar, that are not considered as dangerous substances or preparations <sup>A3</sup> (see [1] and [2]). <sup>A3</sup>

The chemical substances and preparations listed in Table 1, in so far as they are classified as dangerous within the definitions contained in the above Directives, shall have their containers labelled accordingly.

## <sup>A3</sup> 5 <sup>A3</sup> Equipment

### <sup>A3</sup> 5.1 <sup>A3</sup> General requirements

Chemistry sets shall be supplied with instructions for use, the containers necessary for carrying out the experiments described in the instructions for use, eye protection and if required a test tube stand.

Supplementary sets shall be supplied with a contents list as specified in Clause 8 and marked in accordance with 6.3.3.

All experiments described shall be evaluated by the manufacturer. In particular, substances shall not be produced in amounts that are injurious to health.

NOTE Any known hazards arising from the use of the toy, especially during the experiments, should be described in detail (e.g. handling of chemicals, handling of glassware, retarded boiling point, back-flow of barrier water into overheated glassware, evolution of gases and handling of burners and other heating sources).

<sup>A3</sup>

**Table 1 — Maximum amounts of chemical substances and preparations and labelling**

| Chemical substances/<br>preparation <sup>a</sup> | Max. amount<br>per set | Danger symbol(s)<br>(see Figure 1 and<br>Figure 2) | CAS<br>number <sup>b</sup> | EINECS<br>number <sup>b</sup> |
|--------------------------------------------------|------------------------|----------------------------------------------------|----------------------------|-------------------------------|
| Aluminium potassium<br>sulfate <sup>c</sup>      | 10 g                   | —                                                  | 10043-67-1                 | 233-141-3                     |
| Ammonium carbonate <sup>g</sup>                  | 5 g                    | Xn                                                 | 10361-29-2                 | 233-786-0                     |
| Ammonium chloride                                | 30 g                   | Xn                                                 | 12125-02-9                 | 235-186-4                     |
| Ammonium iron (III)<br>sulfate <sup>g</sup>      | 5 g                    | Xi                                                 | 10138-04-2                 | 233-382-4                     |
| Ammonium sodium<br>hydrogen phosphate            | 5 g                    | —                                                  | 13011-54-6                 | 235-860-8                     |
| Calcium carbonate <sup>g</sup>                   | 100 g                  | Xi                                                 | 471-34-1                   | 207-439-9                     |
| Calcium chloride                                 | 10 g                   | Xi                                                 | 10043-52-4                 | 233-140-8                     |
| Calcium hydroxide <sup>d, g</sup>                | 20 g                   | Xi                                                 | 1305-62-0                  | 215-137-3                     |
| Calcium nitrate <sup>g</sup>                     | 5 g                    | Xi, O                                              | 10124-37-5                 | 233-332-1                     |
| Calcium oxide <sup>d, g</sup>                    | 10 g                   | C                                                  | 1305-78-8                  | 215-138-9                     |
| Calcium sulfate                                  | 100 g                  | —                                                  | 7778-18-9                  | 231-900-3                     |
| Charcoal <sup>c</sup>                            | 100 g                  | —                                                  | 7440-44-0                  | 231-153-3                     |
| Citric acid <sup>g</sup>                         | 20 g                   | Xi                                                 | 77-92-9                    | 201-069-1                     |
| Clove oil <sup>c, g, i</sup>                     | 10 ml                  | Xn                                                 | 84961-50-2                 | 284-638-7                     |
| Copper sheet                                     | 100 g                  | —                                                  | 7440-50-8                  | 231-159-6                     |
| Copper (II) oxide <sup>g</sup>                   | 10 g                   | Xn                                                 | 1317-38-0                  | 215-269-1                     |
| Copper (II) sulfate                              | 15 g                   | Xn, N                                              | 7758-98-7                  | 231-847-6                     |

<sup>A3</sup>