



SLOVENSKI STANDARD

SIST EN 71-5:2013

01-september-2013

Nadomešča:

SIST EN 71-5:1995

SIST EN 71-5:1995/A1:2006

SIST EN 71-5:1995/A2:2009

Varnost igrač - 5. del: Kemijske igrače (kompleti), razen kompletov za kemijske poskuse

Safety of toys - Part 5: Chemical toys (sets) other than experimental sets

iTeh STANDARD PREVIEW

Sicherheit von Spielzeug - Teil 5: Chemisches Spielzeug (Sets) ausgenommen Experimentierkästen

SIST EN 71-5:2013

Sécurité des jouets - Partie 5 : Jeux chimiques (coffrets) autres que les coffrets d'expériences chimiques

Ta slovenski standard je istoveten z: EN 71-5:2013

ICS:

97.200.50 Igrače

Toys

SIST EN 71-5:2013

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 71-5:2013

<https://standards.iteh.ai/catalog/standards/sist/25a94810-9ce5-410a-9d9a-394dc028e479/sist-en-71-5-2013>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 71-5

June 2013

ICS 97.200.50

Supersedes EN 71-5:1993

English Version

Safety of toys - Part 5: Chemical toys (sets) other than experimental sets

Sécurité des jouets - Partie 5: Jeux chimiques (coffrets)
autres que les coffrets d'expériences chimiques

Sicherheit von Spielzeug - Teil 5: Chemisches Spielzeug
(Sets) ausgenommen Experimentierkästen

This European Standard was approved by CEN on 29 May 2013.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

SIST EN 71-5:2013

<https://standards.iteh.ai/catalog/standards/sist/25a94810-9ce5-410a-9d9a-394dc028e479/sist-en-71-5-2013>



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

| | Page |
|---|------|
| Foreword..... | 4 |
| Introduction | 6 |
| 1 Scope..... | 7 |
| 2 Normative references..... | 7 |
| 3 Terms and definitions | 7 |
| 4 Plaster of Paris (gypsum) moulding sets | 9 |
| 4.1 Marking..... | 9 |
| 4.2 First aid information..... | 9 |
| 4.3 Safety rules..... | 9 |
| 5 Ceramic and vitreous enamelling materials supplied in miniature workshop sets | 10 |
| 5.1 Chemical mixtures | 10 |
| 5.2 Marking..... | 10 |
| 5.3 First aid information..... | 10 |
| 5.4 Safety rules..... | 11 |
| 6 Oven-hardening plasticised PVC modelling clay sets..... | 11 |
| 6.1 Chemical substances..... | 11 |
| 6.2 Marking..... | 12 |
| 6.3 First aid information..... | 12 |
| 6.4 Safety rules..... | 12 |
| 7 Plastic moulding sets..... | 12 |
| 7.1 Polystyrene granules..... | 12 |
| 7.2 Embedding sets | 13 |
| 8 Adhesives, paints, lacquers, varnishes, thinners and cleaning agents (solvents) supplied or recommended in model sets..... | 14 |
| 8.1 General | 14 |
| 8.2 Adhesives..... | 14 |
| 8.3 Water-based paints and lacquers..... | 20 |
| 8.4 Solvent-based paints, lacquers, thinners and cleaning solvents | 22 |
| 9 Marking..... | 24 |
| 9.1 General | 24 |
| 9.2 Marking of the primary packaging..... | 24 |
| 9.3 Marking of individual containers and any packagings..... | 24 |
| 10 Instructions for use..... | 25 |
| 10.1 General | 25 |
| 10.2 Contents list | 25 |
| 10.3 Advice for adult supervision..... | 25 |
| 10.4 Safety rules..... | 26 |
| 10.5 Instructions for carrying out the activities..... | 26 |
| 10.6 Spills and disposal of chemicals..... | 26 |
| 11 Test methods..... | 27 |
| 11.1 General | 27 |
| 11.2 Determination of elements in ceramic and vitreous enamelling materials..... | 27 |
| 11.3 Determination of plasticisers in oven-hardening polyvinyl chloride (PVC) modelling clay sets | 32 |
| 11.4 Determination of the emission of benzene, toluene and xylenes from oven-hardening plasticised PVC modelling clay sets and plastic moulding sets..... | 44 |

| | | |
|---------------------------|--|-----------|
| 11.5 | Determination of styrene content in polystyrene granules | 47 |
| 11.6 | Determination of organic solvents | 50 |
| 11.7 | Combined approach for the determination of plasticisers in solvent-based adhesives and in solvent-based paints and lacquers, film-forming agents in paints and lacquers and modifiers in solvent-based paints and lacquers | 70 |
| Annex A | (normative) Environmental, health and safety precautions | 82 |
| Annex B | (informative) Organic solvents | 83 |
| Annex C | (informative) Maximum permitted element concentrations for the compounds permitted in ceramic and vitreous enamelling materials | 85 |
| Annex D | (informative) Validation of test methods | 86 |
| Annex E | (informative) Rationale | 87 |
| E.1 | General remark | 87 |
| E.2 | Primary packaging (4.1; 5.2; 6.2; 7.1.2; 7.2.2; 8.2.1.2.2; 8.2.2.6; 8.3.2; 8.4.3; 9.2)..... | 87 |
| E.3 | Minimum age (4.1; 5.2; 6.2; 7.1.2; 7.2.3; 8.2.1.2.3; 8.2.1.3.3; 8.2.2.6; 8.3.3; 8.4.3)..... | 87 |
| E.4 | Phthalates (6.1 Table 2; 8.2.2; 8.4.1) | 87 |
| E.5 | Benzene (6.1, Table 3; 8.2.2.4, Table 12; 8.4.1, Table 16)..... | 88 |
| E.6 | Preservatives (7.2.1; 8.2.1.1; 8.3.1) | 88 |
| Annex F | (informative) Significant technical changes between this European Standard and the previous version | 89 |
| Annex ZA | (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2009/48/EC | 90 |
| Bibliography | iTeh STANDARD PREVIEW | 91 |

(standards.iteh.ai)

SIST EN 71-5:2013

<https://standards.iteh.ai/catalog/standards/sist/25a94810-9ce5-410a-9d9a-394dc028e479/sist-en-71-5-2013>

EN 71-5:2013 (E)**Foreword**

This document (EN 71-5:2013) has been prepared by Technical Committee CEN/TC 52 “Safety of toys”, the secretariat of which is held by DS.

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 December 2013, and conflicting national standards shall be withdrawn at the latest by December 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 71-5:1993.

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 2009/48/EC, see informative Annex ZA, which is an integral part of this document.

The significant changes from the previous edition of this standard are detailed in Annex F.

This standard is Part 5 of the European Standard for safety of toys, EN 71.

This Part 5 of the EN 71 series is intended to be read in conjunction with EN 71, Part 1, Part 2 and Part 3, particularly the Introduction and Clause 1 of Part 1.

EN 71, *Safety of toys*, 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;*
- *Part 5: Chemical toys (sets) other than experimental sets;*
- *Part 7: Finger paints — Requirements and test methods;*
- *Part 8: Activity toys for domestic use;*
- *Part 9: Organic chemical compounds — Requirements;*
- *Part 10: Organic chemical compounds — Sample preparation and extraction;*
- *Part 11: Organic chemical compounds — Methods of analysis;*
- *Part 12: N-Nitrosamines and N-nitrosatable substances;*
- *Part 13: Olfactory board games, gustative board games, cosmetic kits and gustative kits;*

— *Part 14: Trampolines for domestic use.*

NOTE 1 In addition to the above parts of EN 71, the following guidance documents have been published: CEN Report, CR 14379, *Classification of toys — Guidelines*, CEN Technical Report CEN/TR 15071, *Safety of toys — National translations of warnings and instructions for use in EN 71*, and CEN Technical Report CEN/TR 15371, *Safety of toys — Replies to requests for interpretation of EN 71-1, EN 71-2, and EN 71-8.*

NOTE 2 Words in *italics* are defined in Clause 3 (Terms and definitions).

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

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 71-5:2013](https://standards.iteh.ai/catalog/standards/sist/25a94810-9ce5-410a-9d9a-394dc028e479/sist-en-71-5-2013)

<https://standards.iteh.ai/catalog/standards/sist/25a94810-9ce5-410a-9d9a-394dc028e479/sist-en-71-5-2013>

EN 71-5:2013 (E)**Introduction**

This European Standard is intended to reduce the risks which may present health hazards to a child when the *chemical toys* are used as intended or in a foreseeable way, bearing in mind the behaviour of children.

When using these *chemical toys*, potential risks should be kept to a minimum by inclusion of appropriate information to give special attention to possible hazards, risks and other problems.

Chemical Abstract Service Registry Number (CAS) and European Inventory of Existing Chemical Substances Number (EINECS) given in various tables are provided for information purposes only.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 71-5:2013](https://standards.iteh.ai/catalog/standards/sist/25a94810-9ce5-410a-9d9a-394dc028e479/sist-en-71-5-2013)

<https://standards.iteh.ai/catalog/standards/sist/25a94810-9ce5-410a-9d9a-394dc028e479/sist-en-71-5-2013>

1 Scope

This European Standard specifies requirements and test methods for the substances and materials used in *chemical toys* (sets) other than *experimental sets*. These substances and mixtures are:

- those classified as dangerous by the EC-legislation applying to dangerous substances and dangerous mixtures [5];
- substances and mixtures which in excessive amounts could harm the health of the children using them and which are not classified as dangerous by the above mentioned legislation; and
- any other chemical substance(s) and mixture(s) delivered with the *chemical toy*.

NOTE The terms “substance” and “mixture” are defined in the REACH regulation No. (EC)1907/2006 and in the CLP regulation (EC) No. 1272/2008.

Additionally, requirements are specified for markings, warnings, safety rules, contents list, instructions for use and first aid information.

This Part of EN 71 applies to:

- *plaster of Paris (gypsum) moulding sets*;
- *ceramic and vitreous enamelling materials supplied in miniature workshop sets*;
- *oven-hardening plasticised PVC modelling clay sets*;
- *plastic moulding sets*;
- *embedding sets*;
- adhesives, paints, lacquers, varnishes, thinners and cleaning agents (solvents), supplied or recommended in *model sets*.

2 Normative references

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

EN ISO 3104, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity (ISO 3104)*

EN ISO 3219, *Plastics — Polymers/resins in the liquid state or as emulsions or dispersions — Determination of viscosity using a rotational viscometer with defined shear rate (ISO 3219)*

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696)*

EN ISO 22854, *Liquid petroleum products — Determination of hydrocarbon types and oxygenates in automotive-motor gasoline — Multidimensional gas chromatography method (ISO 22854)*

3 Terms and definitions

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

EN 71-5:2013 (E)**3.1****chemical toy**

toy intended for the direct handling of chemical substances and mixtures and which is used in a manner appropriate to a given age-group and under the supervision of an adult

[SOURCE: EN 71-4:2013, 3.1]

3.2**experimental set**

chemical toy where the experimental and explorative character in playing with single chemical substances and mixtures along strict instructions dominates over the creative ideas of the user

[SOURCE: EN 71-4:2013, 3.2]

3.3**plaster of Paris (gypsum) moulding set**

toy containing moulds into which a mixture of water and gypsum is poured and allowed to harden

Note 1 to entry: The gypsum consists predominantly of calcium sulfate hemihydrate $\text{CaSO}_4 \cdot 0,5 \text{H}_2\text{O}$.

Note 2 to entry: Plaster of Paris (gypsum) moulding sets are for example used for preparing figures and plates.

3.4**ceramic and vitreous enamelling materials supplied in miniature workshop set**

toy containing ceramic glazes and vitreous enamels (transparent, opaque or coloured) which after addition of water are painted on ceramic and metallic bodies to obtain smooth coatings, after which it is dried and fired at temperatures above 700 °C

3.5**oven-hardening plasticised PVC modelling clay set**

toy to be used for creating all kinds of figures, brooches, fashion jewellery etc. prepared by hardening in the oven at temperatures between (100–130) °C

3.6**plastic moulding set**

toy to be used in substitution of ceramic materials to create decorative articles or models by fusion of a polymer by heating in an oven up to a maximum of 180 °C

3.7**embedding set**

toy to be used to preserve certain products in a transparent material

3.8**model set**

product used to assemble and coat models which are supplied with or recommend adhesives, paints, lacquers, varnishes, thinners and cleaning agents

Note 1 to entry: Examples for these models are motorcars, aeroplanes, houses and ships.

3.9**adhesive**

non-metallic substance capable of joining materials by surface bonding (adhesion) and the bond possessing adequate internal strength (cohesion)

3.10**water-based paints and lacquers**

water based pigmented material which when applied in a liquid form to a surface, forms after a time a dry adherent film or coating

3.11**solvent based paints and lacquers**

solvent based pigmented material which when applied in a liquid form to a surface, forms after a time a dry adherent film or coating

3.12**varnish**

low viscosity lacquer

3.13**thinners and cleaning agents**

solvents

products which are intended to obtain the required viscosity of paints and lacquers and to clean tools and brushes

4 Plaster of Paris (gypsum) moulding sets

NOTE Basically plaster of Paris (gypsum) is not a harmful material, but if the powder is inhaled or swallowed, it may form hard clots in the lungs or in the stomach.

4.1 Marking

The primary packaging shall in addition to the marking required in Clause 9 bear the following:

"Warning. Not suitable for children under (*) years. For use under adult supervision.

Read the instructions before use, follow them and keep them for reference.".

(*) The age is to be specified by the manufacturer, authorised representative or importer. It shall not be below 5 years.

<https://standards.iteh.ai/catalog/standards/sist/25a94810-9ce5-410a-9d9a-394dc028e479/sist-en-71-5-2013>

4.2 First aid information

The instructions for use shall in addition to the general first aid information in 10.2 d) contain the following:

- "In case of eye contact: Wash out eye with plenty of water, holding eye open. Seek immediate medical advice.";
- "If swallowed: Wash out mouth with water, drink some fresh water. Do not induce vomiting. Seek immediate medical advice.".

4.3 Safety rules

The instructions for use shall in addition to the rules required in 10.4 contain the following safety rules:

- "Do not place the material in the mouth.";
- "Do not inhale dust or powder.";
- "Do not apply to the body.".

EN 71-5:2013 (E)

5 Ceramic and vitreous enamelling materials supplied in miniature workshop sets

5.1 Chemical mixtures

These ceramic glazes and vitreous enamels are ready-made mixtures consisting of substances and mixtures given in Table 1. In each mixture there shall be not more than one of the pigments given in Table 1 with the limit for the pigment in the glaze. The maximum mass of each ready-made mixture in a set shall not exceed 50 g.

NOTE A ceramic glaze is a vitrified inorganic silicate material. A ceramic frit is a vitrified inorganic silicate material incorporating a pigment. These ready-made mixtures of silicate glazes are incorporating metal oxides and other compounds.

Table 1 — Chemical mixtures

| Chemical substance/mixture | CAS-Number | EINECS-Number |
|--|------------|---------------|
| Calcium silicate hydrate (clay) | 1344-96-3 | - |
| Kaolin (china clay) | 1332-58-7 | - |
| Sparingly soluble silicate glazes, e.g. enamel and ceramic frits | 65997-18-4 | 266-047-6 |
| Pigments | CAS-Number | EINECS-Number |
| Copper oxide | 1317-38-0 | 215-269-1 |
| Di-iron trioxide | 1309-37-1 | 215-168-2 |
| Ferro-zirconium silicate | 68412-79-3 | 270-210-7 |
| Tin dioxide | 18282-10-5 | 242-159-0 |
| Vanadium-zirconium silicate | 68186-95-8 | 269-057-9 |
| (x)Aluminium-(y)cobalt (z)oxide | 1333-88-6 | — |
| Zirconium orthosilicate | 10101-52-7 | — |
| Zirconium-praseodymium silicate | 68187-15-5 | 269-075-7 |

5.2 Marking

The primary packaging shall in addition to the marking required in Clause 9 bear the following warnings:

"Warning. Not suitable for children under (*) years. For use under adult supervision.

Read the instructions before use, follow them and keep them for reference."

(*) The age is to be specified by the manufacturer, authorised representative or importer. It shall not be below 5 years.

5.3 First aid information

The instructions for use shall in addition to the general first aid information in 10.2 d) contain the following:

— "In case of eye contact: Wash out eye with plenty of water, holding eye open. Seek immediate medical advice."

5.4 Safety rules

The instructions for use shall in addition to the rules required in 10.4 contain the following safety rules:

- "Do not inhale powder.";
- "Do not place the powder in the mouth.";
- "Do not apply to articles intended to come into contact with food and drink.";
- "Keep the set away from food and drink.";
- "The firing process is not part of the function of the toy. Therefore keep children away during the firing process and do not inhale gases emitted."

6 Oven-hardening plasticised PVC modelling clay sets

6.1 Chemical substances

These modelling clay sets shall consist of PVC (polyvinylchloride) and plasticisers and may contain modifiers, fillers (e.g. China clay) and colourants. Only plasticisers given in Table 2 shall be used.

The maximum content of plasticisers in the mixture shall not exceed 30 %.

The vinyl chloride monomer content shall be below 1 mg/kg (see [11]).

Table 2 — Plasticisers in oven-hardening plasticised PVC modelling clay sets

| Chemical substance | CAS-Number |
|--|-------------|
| Adipic acid polyesters | - |
| Alkylsulfonic acid esters (C ₁₂ to C ₂₀) of phenol | - |
| Di-isononyl cyclohexane-1,2-dicarboxylate (DINCH) | 166412-78-8 |
| Phthalic acid esters with straight-chain aliphatic (C ₆ upwards except C ₈) alcohols and mixtures of these esters | - |
| Tributyl acetylcitrate | 77-90-7 |
| Tris(2-ethylhexyl) acetylcitrate | 144-15-0 |

During heating of these materials at the maximum permitted temperature and duration, the limits given in Table 3 shall not be exceeded for the emission of the listed toxic substances when tested according to 11.4.

Table 3 — Limits for the emission of substances from oven-hardening plasticised PVC modelling clay sets and plastic moulding sets during heating

| Substance | Limit mg/kg |
|-----------|----------------|
| Benzene | 5 |
| Toluene | 15 |
| Xylenes | 25 |

EN 71-5:2013 (E)**6.2 Marking**

The primary packaging shall in addition to the marking required in Clause 9 bear the following warning:

“Warning. Not suitable for children under (*) years. For use under adult supervision.

Read the instructions before use, follow them and keep them for reference.”.

(*) The age is to be specified by the manufacturer, authorised representative or importer. It shall not be below 8 years.

6.3 First aid information

The instructions for use shall in addition to the general first aid information in 10.2 d) contain the following:

- “In case of accidental overheating and inhalation of poisonous gases: Remove person to fresh air and seek immediate medical advice.”.

6.4 Safety rules

The instructions for use shall in addition to the rules required in 10.4 contain the following safety rules:

- “Do not place the material in the mouth.”;
- “Do not exceed a hardening temperature of 130 °C or harmful gases may be produced.”;
- “Do not exceed a hardening time of 30 minutes.”;
- “The hardening process is not part of the function of the toy and should be carried out by the supervising adult.”;
- “Use a domestic oven thermometer, e.g. bimetal, to measure the temperature.”;
- “Do not use a glass thermometer.”;
- “Do not heat the material and cook food at the same time in a domestic oven”;
- “Do not use a microwave oven.”.

7 Plastic moulding sets**7.1 Polystyrene granules****7.1.1 Chemical substances**

These sets shall contain uncoloured and coloured polystyrene granules in accordance with Table 4.

Table 4 — Polystyrene

| Chemical substance | CAS-Number | EINECS-Number |
|---|------------|---------------|
| Polystyrene with monomer content of styrene ≤ 500 mg/kg | 9003-53-6 | - |

7.1.2 Marking

The primary packaging shall in addition to the marking required in Clause 9 bear the following warnings:

"Warning. Not suitable for children under (*) years. For use under adult supervision.

Read the instructions before use, follow them and keep them for reference."

(*) The age is to be specified by the manufacturer, authorised representative or importer. It shall not be below 10 years.

7.1.3 First aid information

The instructions for use shall in addition to the general first aid information in 10.2 d) contain the following:

— "In case of accidental overheating and inhalation of poisonous gases: Remove person to fresh air and seek immediate medical advice."

7.1.4 Safety rules

The instructions for use shall in addition to the rules required in 10.4 contain the following safety rules:

- "Do not exceed a melting temperature of 180 °C";
- "The melting process is not part of the function of the toy and should be carried out by the supervising adult.";
- "Use a domestic oven thermometer, e.g. bimetal, to measure the temperature.";
- "Do not swallow material.";
- "Do not heat the material and cook food at the same time in a domestic oven.";
- "Do not use a glass thermometer.";
- "Do not exceed the maximum recommended processing period.";
- "Do not use a microwave oven."

7.2 Embedding sets

7.2.1 General

Substances classified as dangerous substances (see [5]) shall not be used in *embedding sets*.

NOTE Substances such as gelatine or agar could be utilised with suitable preservation.

Only preservatives permitted in foodstuffs (see [9]) and/or cosmetics, except those preservatives which are only allowed in cosmetic products that are rinsed-off after use, (see [10]) shall be used.

7.2.2 Packaging

The name(s) of any preservative(s) used shall be indicated on the primary packaging.