

Child protective products – protective function of socket protectors, hob guards, locks and locking devices

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Abstract

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Young children have a natural curiosity and have not yet learned to avoid and get away from danger. It is often necessary to take measures to protect children from hazards. Many products sold on the European market are intended to be mounted to another product in order to protect children, i.e. a child protective locking device is mounted to a window to prevent children to open the window and fall out of it.

Statistics show that many children are killed and injured every day in Europe. Statistics also show that Sweden has the lowest number of child deaths compared to the other rich countries in the world. Sweden also has a tradition of child safety work and had their first child safety regulation in 1973.

Child protective window locking devices, socket protectors, hob guards and locking devices for drawers and cupboard doors are products that are intended to protect from some of the most serious hazards for small children such as; falling out of a window, getting in contact with live parts of socket outlets, getting in touch with hot surfaces or pulling down a pan and getting in contact with chemicals and sharp knives in cupboards and drawers.

Requirements and test methods for important properties such as child protective function, small parts, sharp edges, entrapment, mechanical function, structural integrity, electrical strength, insulation resistance and flammability have been proposed.

Key words: child protective products, child safety products, socket protector, hob guards, window locking device, drawer locking device, cupboard door locking device, requirement, test, testing, test method,

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Preface

Young children are a vulnerable group in our society. They are exposed to several hazards and many children are injured and killed every day. It is of most importance that standards, giving requirements and test methods, are available so that the properties, of the products that are supposed to protect our young children, can be verified.

This report targets people involved in the preparations of standards and people at authorities and test institutes as well as designers and manufacturers. The report focuses on; locking devices for windows, hob guards, socket protectors and locking devices for cupboards and drawers.

The study has been commissioned to SP Swedish National Testing and Research Institute by ANEC The European Association for the Co-ordination of Consumer representation in Standardisation. The work has been carried out at the department for Building Technology and Mechanics at SP and has also involved experts from SP's department for Fire Technology and SP's department for Electronics. Henrik Nordin of the Swedish Consumer Agency has extracted statistical information on child accidents from the Swedish EHLASS system. The work of the project advisors from ANEC Franz Fiala and Helen Amundsen has been of most importance for the project.

Borås, Sweden in June 2004

Erica Waller

1 Introduction

Safety of a product is a balance between the demand of safety and the demand for the product to be fit for purpose. A child protective product should provide protection for children and still be manageable for adults. In some cases it may be enough that the safety device is slowing the child's access to the hazard and in other cases it is necessary to prevent the child to get in contact with the hazard.

Young children are a very vulnerable group in society. They are unpredictable in their behaviour as they are developing their skills and getting more and more knowledge about their environment. Young children also have a natural curiosity and do not yet know how to avoid and get away from danger. This has to be taken into consideration when designing products for small children.

This report deals with the following child protective products: locking devices for windows, socket protectors, locking devices for drawers and cupboards, and hob guards. The purpose of the study has been to develop proposals for safety requirements and test methods.

Child protective locking devices for windows are devices that prevent a child from opening a window and fall out. The device permits a limited opening for airing etc.

A hob guard or cooker guard is a guard that fits across the front of the hob and prevents children from reaching up and get in touch with hot areas or pulling down saucepans containing hot liquid.

Socket protectors or socket guards are mock plugs or barriers, often made of plastics, which fit into the socket and prevent children from poking things in and get in contact with electrical current.

Child protective locking devices for drawers and cupboards are devices that maintain a drawer or a cupboard door in a closed position or restrict the opening, i.e. cupboard door locks.

All the child protective products that this report is concerned with are external products that can be mounted on to another product in order to protect children from hazards.

2 Accidents and injuries

It has been more difficult than expected to find European statistics of child accidents related to the products in this project. The European EHLASS “European Home and Leisure Accident Surveillance System” is of different status in different countries and therefore the focus of this project has been on information from the Swedish part of the EHLASS system.

Statistics from the Swedish EHLASS “European Home and Leisure Accident Surveillance System” are presented in table 1. In the time period of 1998-2001 10892 accidents involving children up to 5 years were reported to the system. Among these, the accidents related relevant situations have been selected. The use or misuse of protective products is normally not reported to the system and therefore the performance of the protective products could not be evaluated through this system. However, in one case it was reported that a child of 15 month reached a pan with boiling water and was injured even though a hob guard was mounted on the hob. In this case it is not clear whether the child was using any kind of equipment to climb on.

Table 1 Accidents in the Swedish EHLASS-system related to windows, drawers, cupboards, hobs, and sockets.

Type of accident	Number of registered accidents 1998-2001	Number of accidents per 100 000 children in the selected areas	Estimated number of accidents in Sweden per year	Notes
Falling out of window	7	6	20 – 60*	
Kitchen knife	22	18	100*	Not always possible to establish whether the knife has been in a drawer or not. Cases where it was registered that the knife was not in a drawer has been excluded.
Chemical and medical products	183	151	900	Not always possible to establish whether the product has been in a cupboard or not.
Hobs (burns i.e. from contact with hot area)	90	74	400	Scalds from hot liquids are not included.
Socket outlets	7	6	20 – 60*	Cases where the plug or the cord have been the cause have been excluded.

**) These estimations are based on low number of registered cases*

When considering the statistics from Sweden it should be kept in mind that Sweden has been working with child safety issues for a long time. Parents in Sweden are informed of child safety issues in parental education. This should lead to a good awareness in these issues. Since 1973 Sweden has had regulations within the area of child protection. Statistics from the Unicef Innocenti Report Card No 2 February 2001 “A League Table of Child Deaths by Injury in Rich Nations” show that Sweden had the lowest annual number of child injury deaths between 1991 and 1995 among the rich countries.

The number of children that fell out of a window corresponds to approximately 20-60 accidents per year in Sweden. Sweden has had a regulation prescribing child protective locking devices on windows in new buildings since 1973. It is likely that more accidents should happen in countries that do not have similar regulation.

It has been difficult to find accidents related to drawer and cupboard locking devices but the accidents with knives and chemical and medical products may give an indication of the size of the problem.

Hobs and stoves are dangerous areas in the kitchen. The number of accidents presented in table 1 does not include scalds. It is likely that the number of scalds when a child reaches and pulls down a pan with hot liquid is of the same magnitude as the number of burns.

Since 1973 Sweden has had regulations stipulation that new building shall have electrical outlets with built in protection. However, information provided by the Swedish National Electrical Safety Board show that at least two fatal child accidents related to electrical outlets have happened in the last 20 years in Sweden and statistics presented in table 1 show that a relatively large number of accidents happen every year even though most buildings are equipped with child protected sockets.

Injury related to home and leisure is an important cause of death and disability among children. In the report “Priorities for Child Safety in the European Union – Agenda for action” the European child safety alliance estimates that in the European Union 14 children die and another 30 000 children are injured and treated in hospitals and emergency departments each day.

In the report “Burns and scalds accidents in the home” by Department of Trade and Industry, accidents in Great Britain are presented. Pre-school children (under the age of five) are identified as a key group. 75% of the severely injured children were younger than five years. Within a year 3.500 severe burns and scalds accidents were reported for the age group 0 – 5 years. Many accidents (49 %), where pre-school children were injured, were located to the kitchen. In approximately 200 accidents per year, a pre-school child had reached up and touched a hot plate or pulled a pan of hot contents over itself. Cooker guards are pointed out as a key product that could prevent accidents if it was more frequently used and one of the main safety messages for parents is to use a fixed cooker guard.

3 Current regulations and standards

3.1 European regulation

The European union has, by its member states, been given the power to take initiatives to promote consumer protection and public health and the European commission has been given the responsibility of regulations affecting the cross-border trade of products. Member states can exceed European laws to establish a higher level of safety but in the case of product regulation that could affect trade on the internal market they must be able to justify their actions.

The General Product Safety Directive 2001/95/EC requires that only safe products shall be placed on the European market. Both the General Product Safety Directive and the New Approach Directives rely on European standards to provide the technical specifications necessary to manufacture products that are safe and do not expose their users to known hazards.

If a product has been manufactured according to a harmonized European standard there is a legal presumption of safety and it will be up to the authorities to prove that the product is unsafe.

The enforcement of European regulations relies on market surveillance by the national authorities.

3.2 Child safety regulation in Sweden

Historically it may be of interest that the first regulations and recommendations concerning child safety in Sweden were published in 1973 by The National Board of Urban Planning, publication No 62 "Protection against accidents to children". This safety regulation was concerned with children up to the age of 6 years and in particular with children under the age of 3. Among other things it was stated that:

- windows accessible to children must be equipped with safety locks or barriers,
- that storage places for chemicals, knives and other hazardous equipment should be out of reach for children or equipped with locks or locking devices,
- that stoves should be designed so that it would be difficult for children to come in contact with hot areas
- and that electrical outlets should be designed so that it would be difficult for children to stick pointed objects into them and get in contact with electrical current.

The child safety regulations in Sweden have since 1973 been implemented, reworked and enhanced several times. Statistics show that Sweden has few child accidents compared to other countries. In the Unicef Innocenti Report Card No 2 February 2001 "A League Table of Child Deaths by Injury in Rich Nations", child injury deaths between 1991 and 1995 have been tabulated and it is shown that Sweden has the lowest number of child injury deaths.

3.3 European standardisation

According to the report from 1999 “Child protective products – Requirements and test methods” by Smith and Leach neither window locks, cupboard door locks, hob guards or socket guards were within the scope of CEN/TC 252 at that time and they especially point out the importance in bringing back these types of products on the agenda.

Child use and care articles are a group of products with large variation between different products. However many safety hazards are similar and similar safety principles can be applied to a wide range of products. Therefore the Technical Committee CEN/TC 252 “Child use and care articles” has published a report CEN report CR 13387:1999 “Child use and care articles – General and common safety guidelines”, that provides information that should be taken into consideration when developing safety standards for child use and care articles. This document is currently being revised.

In the CEN report CR 13387:1999 “Child use and care articles – General and common safety guidelines” different hazards together with safety philosophies and methods of verification related to those hazards have been described. It is stated that it is important to take into account the (foreseeable) age and development stage of the child. Mechanical hazards such as entrapment of the neck and fingers, entanglement and strangulation, choking and suffocation, hazardous heights and falls, instability and tipping are described in the report as well as chemical and thermal hazards.

3.4 General requirements

The relevant requirements for a child protective product vary with the age and development stage of the child that the product has been designed to protect. In the American Standard Consumer Safety Specification on Toy Safety there are more stringent requirements applicable to children up to 8 years of age whereas in the European EN 71-1 “Safety of toys – Part 1 Mechanical and physical properties” the more stringent requirements are applicable to 3 years old and younger.

Anthropometric data for children up to 48 months is presented in the CEN report CR 13387. For determination of accessibility areas, reach envelopes based on computer simulations are presented. Body dimensions and force measurements have been tabulated.

The CEN report also states that the protective function should not be reduced through normal or foreseeable use and misuse. The material should be suitable to reasonably foreseeable conditions of use.

The CEN report CR 13387:1999 “Child use and care articles – General and common safety guidelines” states that strength and durability cover the performance of a product for satisfying the intended and foreseeable use over the lifetime of the product. It also says that static and dynamic loads considering worst-case situations as well as long-term properties must be considered. The product should before testing be subjected to “foreseeable conditions likely to weaken the product” and the static tests should be performed after cyclic load tests and other endurance tests.

4 Proposed requirements and test methods

4.1 General

The proposed requirements and test methods for each product are presented in Appendices A, B, C and D. In this chapter requirements and test methods for the different properties are discussed.

4.2 Child protective function

For child protective products the protective function has to be verified. A lock or barrier shall not be possible for children to open. Panel tests with children are one way to verify the protective function. In this report panel tests according to EN ISO 8317 “Child resistant packaging – requirements and test procedures for reclosable packages” have been proposed for window locking devices.

Early experience of child protective products has showed that the necessity of applying large forces does not supply enough protection. Some small children are capable of applying large forces and in several cases capable of applying larger forces than some of the adult population, e.g. elderly. Therefore child resistant packaging is tested according to EN 28317 both with children and adults. The product should be possible to open for adults but not for children. For the child protective products covered in this report tests with children may be applicable.

For locking devices for windows a child panel test is proposed in appendix A. The child protective function shall meet the requirements concerning children according to EN ISO 8317. The Swedish type examination process includes a panel test with children and has done so for several years. Questions have been made about the repeatability of child panel tests but experience have shown that child panel tests are decisive and give valuable information.

Many socket protectors are designed so that a special designed tool is used to dismount the protector. Otherwise the mechanical function must be tested so that it is not possible for a child to dismount or move the socket protector out of position requirements and test methods have been proposed in appendix B.

In the report “Child protective products – Requirements and test methods” Smith and Leach states that the use of a key to release a lock or locking device provides a high level of protection if the keys kept out of reach of children. Locking devices that do not use keys provide only a moderate level of protection, according to Smith and Leach. Since it is only a matter of time before the child learns how to release the mechanism, Smith and Leach think that this type of locking device should be regarded only as slowing the child’s access to the hazard. However in this project it has been considered that a combination of force and two independent movements should provide the desired protective function.

The proposed requirement in appendix C for cupboard and drawer locking devices is that the release of the lock shall require the application of a force of 50N in combination with the operation of two independent movements or the use of a tool. If neither of these requirements are met, child panel tests shall be used to verify the protective function.

4.3 Small parts

Young children explore their environment, often by putting objects in their mouth. Therefore it is important that components are firmly attached to the product and that the product or parts of it cannot break into small pieces. Components that are removable should be sufficiently large not to cause a choking hazard. The small part cylinder used for testing of size is designed to simulate a child's throat.

The possibility to detach small part and the size of detachable components can be tested according to EN71-1:1998 "Safety of toys –part 1" (8.3 and 8.4). After any testing of a product, a re-check for small parts shall be done. The proposed requirements in appendix A,B,C and D include requirements for small parts.

4.4 Sharp edges and projecting parts

Sharp edges on products can cause cuts to the child's skin and projecting part can puncture the skin or an eye. Therefore edges and projections should be rounded or covered.

A test method for sharpness of edges is given in EN 71-1:1998. The proposed requirements in appendix A,B,C and D include requirements for sharp edges.

4.5 Entrapment of fingers

To avoid entrapment of fingers, according to CR 13387:1999, there shall be no accessible openings with a width greater than 5 mm and less than 12 mm unless the depth is less than 10 mm. For hob guards it is important that fingers cannot be trapped but it is also important that there is no openings that allow passage of hands or fingers. Therefore the relevant requirement is that there shall be no openings with a width greater than 5 mm. In the proposed test method for hob guards (appendix D) this is checked by means of test probes according to EN 1888:2003 "Child care articles – Wheeled Conveyances – Safety requirements and test methods".

4.6 Mechanical function and structural integrity

Products shall withstand many years of use. The mechanical loads and load cases vary between different products. However it is important that the product does not fail or crack, so that it no longer fulfils its intended function, when subjected to loads simulated its intended use. For many products it may be vital that the deflections and deformation are not too large. Both wear test and static tests have been included in the proposed methods. Impact tests are discussed in chapter 4.7.

The proposed test method for locking devices for windows describes testing for wear by repeated opening and closing, testing with respect to static load and impact load and testing of resistance to stamping (clipping). The main requirements are that the device should not break and should be fully functional after the test. The device shall also prevent the opening between window frame and window casement from exceeding 75 mm.

In the proposed test method for locking devices for windows (appendix A) the wear test comprises 5 000 cycles where the device is closed, opened, loaded with 50 N and unloaded. Together with ageing in terms of UV-exposure and 3000 hours at 70 °C, the wear test can be described as pre-conditioning for the mechanical tests.

In the static test that is proposed for locking devices for windows, the object is loaded horizontally with 600 N in the opening direction and 200 kN perpendicular to the opening direction and then vertical with 200 kN. The load is applied three times and retained for 60 seconds each time.

Since locking devices for windows are intended to prevent children from falling out of windows it seems reasonable to have a serviceability load of 400 N and combine that load with a requirement that the maximum opening shall not exceed 75 mm. The requirement for the ultimate limit state (failure and fracture) has been proposed to 600 N and that the device should not break and be fully operable.

Some of the requirements for toys have been implemented in the proposed requirements for this product. In the European standard for toy safety EN 71-1 “Safety of toys – Part 1: Mechanical and physical properties” a specified feeler gauge is used to determine whether the component is grippable or not. The toys standard stipulates that if the component is grippable it shall be subjected to a tensile force 90 N if the accessible dimension is greater than 6 mm and 60 N if it is 6 mm or less.

A socket protector is likely to be mounted and dismounted many times during its lifetime. For electrical plugs the IEC 60884-1 states that the plugs shall be inserted and withdrawn from the socket outlet 5000 times at a frequency of 15 cycles per minute. A similar wear test has been included in the proposed test method for socket protectors.

The proposed test procedure for cupboard and drawer safety devices (appendix C) comprises wear test, strength test and function test. In the wear test the tested device is subjected to a force of 50 N that is applied in the position where the device restricts further opening, and then closed. 5000 cycles of this opening and closing is performed. The wear test can be regarded as pre-conditioning for the mechanical tests that are performed afterwards. In the strength test a static load of 500 N is applied.

In the proposed test method for hob guards (appendix D) a vertical and a horizontal load of 200 N shall be applied to the mid-span of the front of the hob guard. When the horizontal load is applied the deformations of the hob guard should not result in openings that the hand or fingers of a child could get in touch with the hot area of the hob. The maximum opening when the horizontal load is applied should not exceed 5 mm.

4.7 Impact and stamping

Small children some times explore their environment by means of hitting or striking. Products are also exposed to other, often accidental, impacts during their lifetime. Therefore an impact test has been included in the proposed test methods. The proposed test method is designed to simulate a stroke from a hammer, maybe in the hands of a child. It should also cover many of the hits and bumps that the product may be exposed to during it's lifetime.

Some materials are brittle and a brittle failure often produces small pieces and sharp surfaces. Brittle failures are often fast and unexpected. It is therefore important to reduce

the risk of brittle failures. In combination with rapid ageing (heat, UV-light etc.) an impact test can be an effective tool to disqualify products with a potential for brittle behaviour.

For all products an impact test has been proposed (appendix A, B, C and D) as all products are considered to be exposed to hits and strokes. In this impact test the object is subjected to 10 strokes by a steel pendulum of prescribed dimensions. This has been considered to be a realistic impact test for several indoor child protective products.

In the toy safety standard an impact test is performed with a weight of 1 kg falling from a height of 10 cm. A similar test is specified in the IEC 60884-1. However for socket protectors the same impact test as for the other child protective products has been proposed.

The material in the hob guard should be able to withstand both impact loads. If plastic components are included in product these should be subjected to ageing in heat and UV-light before the impact test.

In addition, a stamping test is described (appendix A) that is applicable to parts of locking devices for windows that are links between window frame and window encasement. Those are subjected to a stamping load of 3600 N.

4.8 Hot surfaces

Small children do not have the same ability as adults to get away from hot surfaces. Burns are the consequences of the temperature of the surface and the time of contact. Thermal hazards are addressed in the CEN report CR 13387:1999 “Child use and care articles – General and common safety guidelines” where it is estimated that the contact period can be up to 15 seconds. Recommended maximum surface temperatures can be found in EN 563:1994 “Safety of machinery – Temperature of touchable surfaces – Ergonomics data to establish temperature limit values for hot surfaces”, i.e. the recommended temperature for a metal surface is 47 °C.

4.9 Electrical strength and insulation resistance

A basic requirement for socket protectors is that they are non-conductive. According to IEC 60884-1 accessories shall have adequate insulation resistance electrical strength. Requirements and test methods have been described in appendix D. The insulation resistance is tested by application of a d.c. voltage of 500 V and after 1 minute the measured insulation resistance shall be 5 MΩ or more. The electrical strength is tested with a high test voltage, i.e. 2000 V, that are applied for one minute and no flash over or break down shall occur.

4.10 Contact with live parts

In many reported accidents a child had poked an object into a socket. Therefore it is important that a socket protector covers all electrical components so that it is not possible for children to get in contact with live parts even if they use objects like nails and needles. In the proposed test method for socket protectors (appendix D) this is tested by means of test probes.

4.11 Effect on electrical function

The use of a child safety product shall never create other serious hazards. Some types of socket protectors are designed to allow insertion of the plug without having to remove the protector. In these cases the thickness of the protector can affect the electrical contact between the plug and the socket outlet. As insufficient electrical contact may create fire hazards this type of socket protector should not be allowed. As an alternative, it must be shown that the socket protector does not affect the electrical function of the plug and outlet.

4.12 Flammability

The kitchen is a place where fires in private homes often start. Products used close to hobs and ovens, for example hob guards, must not create fire hazards and shall not contribute to spread of flame and fire. For products used in this environment the material must be chosen with caution. Hob guards are manufactured from different materials, metals such as steel and aluminium but also plastic materials are frequent.

Materials classified in Classes A1 and AI_{FL} “No contribution to fire” according to Commissions Decision of 4 October 1996 are for example steel, aluminium, copper, glass and ceramics. These materials could be considered to be safe for hob guards. Products made of other materials must be tested regarding the reaction to fire.

The standard EN ISO 11925-2 “Reaction to Fire tests – Ignitability of Building Products Subjected to Direct Impingement of Flame- Part 2 : Single-Flame Test” evaluates ignitability of a product under exposure of a small flame. A material that meets the criteria of Euroclass D, according to EN13501-1 “Fire Classification of Construction Products and Building Elements – Part 1 Classification using Test Data from Reaction to Fire Tests”, when tested according to EN ISO 11925-2 does not contribute to rapid flame spread in the material. This is considered to be a minimum requirement for the reaction to fire of hob guards and material used in hob guards.

5 Conclusions

Young children are a vulnerable group. Statistics and experience from Sweden show that child protective locking devices for windows, socket protectors, child protective cupboard and drawer safety devices and hob guards are products with a potential to seriously reduce accidents to children in Europe. It is of great importance that there are clear requirements for products designed to protect children and that the properties of these products are verified. Therefore it is important to have European standards for these products as soon as possible.

In appendix A, B, C and D proposals for requirements and test methods for the products; child protective locking devices for windows, socket protectors, child protective cupboard and drawer safety devices and hob guards, are presented.

6 References

“A League Table of Child Deaths by Injury in Rich Nations”, Innocenti Report Card No 2, Unicef, February 2001, Florence, Italy.

CEN report CR 13387:1999 “Child use and care articles – General and common safety guidelines”

“Child protective products – Requirements and test methods”, Smith and Leach, Consumer’s Association Research and Testing Centre, 1999, Milton Keynes, United Kingdom

EN13501-1 “Fire classification of construction products and building elements – part 1 classification using test data from reaction to fire tests”

EN ISO 11925-2 “Reaction to fire tests – ignitability of building products subjected to direct impingement of flame- part 2 : single-flame test”

EN 60335-1 ”Household and similar electrical appliances – Safety – Part 1: General requirements”

EN 61032 “Protection of persons and equipment by enclosures – Probes for verification”

EN 71-1 “Safety of toys – Part 1: Mechanical and physical properties”

EN ISO 8317 “Child resistant packaging – requirements and test procedures for reclosable packages”

IEC 60 884-1 ”Plugs and socket-outlets for household and similar purposes – Part 1: General requirements”

ISO 4892-2 “Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc sources”

Child protective locking devices for windows – requirements and testing

1. Introduction

This appendix describes requirements and testing of devices intended to be fitted to windows and French windows in order to prevent accidents to children.

2. Scope

The requirements and test methods in this document are applicable to locking devices intended to be fitted to windows and French windows (window doors) in order to prevent accidents to children.

3. Normative references

ISO 4892-2 “Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc sources”

EN ISO 8317 “Child resistant packaging requirements and test procedures for reclosable packages”

EN 71-1 “Safety of toys – Part 1: Mechanical and physical properties”

4. Definitions

Child protective locking device for windows

article/device mounted on windows and French windows intended to prevent passage of small children

5. Requirements

5.1 Child protective function

The child protective function, i.e. that the device prevents children from opening the window, shall meet the requirements concerning children according to clause 4.3.1 of EN ISO 8317 taking into account the provisions of clause 7.4.1.

5.2 Mechanical function and structural integrity

When tested according to 6.4.3, 6.4.4, 6.4.5, 6.4.6, 6.4.7 and 6.4.8 none of the tested items or any part of the items shall be broken or have any visible damage (such as cracks or permanent deformation) and the devices shall be fully functional during and after the tests.

When the force is applied according to clause 6.4.5 the opening between the sash and the window frame shall not exceed 75 mm.

5.3 Small parts

The possibility to detach small parts shall be tested according to clauses 8.3 and 8.4 of EN 71-1:1998.

Any small component, which is detachable or become detached during the testing according to the test methods described in clause 7 of this document, shall not fit wholly within the small part cylinder described in clause 8.2 of EN 71-1:1998/A5:2000.

5.4 Sharp edges

There shall be no accessible edges that present an unreasonable risk of injury. Requirements and test methods are given in clause 4.7 and 8.11 of EN 71-1:1998.

5.5 Product information and user instructions

Product information shall be provided to reduce the possible consequences of foreseeable hazards connected with the use of the product.

Information concerning safe use of the product shall be provided. This instruction shall include at least the following:

- The name or trade mark of the manufacturer, importer or organization responsible for its sale.
- The instruction: Read these instructions carefully before mounting and using the device. The child protective function of the device may be affected if you do not follow the instructions. Keep the instructions for future reference.
- Information on which types of windows the product is intended for.
- Instructions on how and where to mount the device to ensure the intended function. Different instructions may be needed for different types of windows. Since the mounting of the device is vital for the child protective function, the instruction has to be precise in this subject and in some cases special mounting tool may need to be provided.
- Any other information for safe usage.

6. Testing

6.1 General test conditions

Testing consists of different parts: ageing, wear and tear testing, mechanical testing and testing of child protective function. In addition for products with a flexible part such as chain, wire, rope etc. the stamping test shall be applied.

The device shall be mounted according to the manufacturer's instructions.

If nothing else is given forces in the tests shall be applied in the most onerous direction.

The tests shall be carried out in indoor conditions with a temperature of 23 ± 5 °C.

Forces shall be measured with an uncertainty of measurement not exceeding ± 1 %, and displacements with an uncertainty of measurement not exceeding ± 1 mm.

6.2 Test equipment

Equipment for ageing with artificial sun light (out door), according to ISO 4892-2 and 3000 hours at 70 °C.

A test rig simulating a window of height 1000 (+10) mm and width 1000 (+10) mm, to/on/in which the window safety device can be fitted in accordance with its manufacturer's fitting instructions. The rig shall consist of a moving part and a fixed part. The fixed part (the window frame) shall be sufficiently rigid to ensure that it cannot affect the results. The stiffness of the moving part shall be according to clause 6.2.1.

Equipment that makes it possible to perform 5 000 opening, loading and closing operations for the wear testing. By 'opening' is meant opening the moving part of the test rig to the point where further opening is restricted by the safety device under test.

Equipment for applying a force in the opening direction, and for measurement of deformation in the opening direction.

Equipment for impact test with a pendulum of steel according to figure A1. The weight of the pendulum head shall be 0.3 kg and that of the arm shall be 0.6 kg. It shall be possible to use a drop angle of at least 45° .

Small parts cylinder according to clause 8.2 of EN 71-1:1998/A5:2000.

Equipment for determination of sharp edges according to EN 71-1:1998, 8.11.

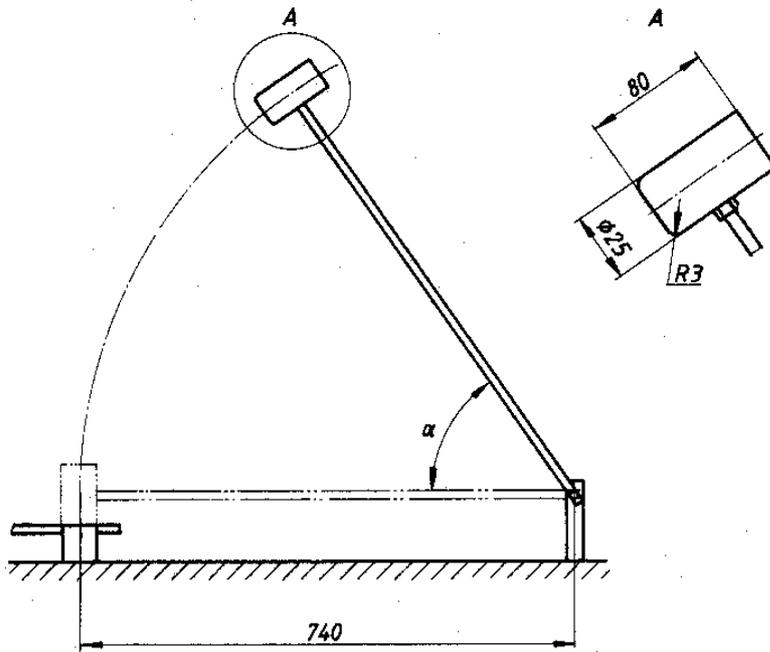


Figure A1 Equipment for impact test.

Equipment for stamping test with a fixed part and a moving part according to figure A2. The design of the equipment shall be so that no deformations in the equipment can affect the results. Hole diameter d_2 of the fixed part shall be 0.02-0.04 mm larger than the diameter d_1 of the moving part.

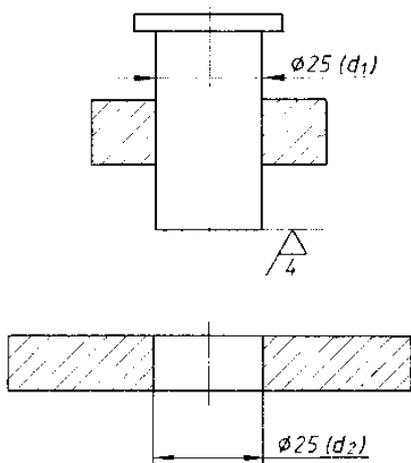


Figure A2 Equipment for stamping test.

6.2.1 Calibration of test rig

The moving part of the test rig (the sash) shall have a stiffness corresponding to a deflection of 50 ± 10 mm when loaded with $F= 300$ N in the lower corner and fixed in the upper corner. The deflection shall be measured in the lower corner.

6.3 Extent of testing

The following numbers of devices are used for complete testing:

- 6 - devices for ageing and wear testing. After ageing and wear testing, three devices will be subjected to strength testing and three will be subjected to impact testing. All devices shall meet the requirements related to the tests.
- 1 - devices for function testing. The device shall meet the requirements related to this test.

6.4 Test procedure

6.4.1 Child protective function testing

The child protective function shall be tested and evaluated according to clause 5.4 of EN ISO 8317. The product shall be mounted in accordance with manufacturer's instructions using the test rig described in clause 6.2.

6.4.2 Ageing

Before tested according to chapter 6.4.3, 6.4.4, 6.4.5, 6.4.6, 6.4.7 and 6.4.8, the devices shall be subjected to ageing with UV-light and increased temperature.

The objects shall be subjected to UV outdoor light according to ISO 4892-2.

Place the test objects in a cabinet with a temperature of 70 °C for 3000 hours.

6.4.3 Wear of opening restriction

Before tested according to clause 6.4.5 and 6.4.6 the devices shall be subjected to wear test.

Fit the device to/on/in the test rig in accordance with its instructions. A force F of 50 N shall be applied to the device at its operating position (i.e. where it restricts further opening), after which it shall be unloaded and closed. Perform this opening/closing cycle at a frequency of 20 - 30 cycles per minute, to give a total of 5 000 cycles.

6.4.4 Wear of locking mechanism

Before tested according to clause 6.4.5 and 6.4.6 the locking mechanism shall be subjected to wear test.

The locking mechanism shall be subjected to 5000 cycles where the locking mechanism shall be engaged and disengaged.

The wear test for the locking mechanism can be included in the cycle described in 6.4.3 if it is possible with regard to the design of the device.

6.4.5 Mechanical function

After the ageing and wear test, apply a force F_1 of 400 N in the opening direction of the test rig. Maintain the load for one minute. The force shall be applied 100 mm \pm 5 mm from the lower, outer corner of the sash. Repeat 3 times. Measure the largest opening in the direction of opening and in the lower outer corner of the sash, when the load is applied.

6.4.6 Structural integrity

Apply a force F_2 of 200 N on the device in the most onerous position and in the horizontal direction perpendicular to the opening direction and maintain for 1 minute. Repeat 3 times.

Apply a force F_3 of 200 N on the device in the most onerous position and in the vertical direction and maintain for 1 minute. Repeat 3 times.

Apply a force F_4 of 600 N in the opening direction of the test rig, in the lower outer corner of the sash. Maintain the load for 1 minute and release. Repeat 3 times.

6.4.7 Impact testing

After the ageing and strength testing, the device is subjected to impact loading. The device shall be subjected to 10 strokes by the steel pendulum described in clause 6.2. The drop angle α shall be $45 \pm 2^\circ$, see figure A1. The pendulum shall hit the device when the pendulum is in horizontal position.

The stroke shall hit the device in the most onerous position.

6.4.8 Stamping test

Devices, where the part that are the link between the window frame and window casement are made of any material that not obviously is impossible to cut of, shall be subjected to a stamping test. A stamping force of 2000 N shall be applied to the stamping tool described in clause 6.2.

7 Test Report

The test report shall include the information necessary for the interpretation of the results and at least the following information:

- a title
- the name and address of the laboratory, and the location where the tests were carried out if different from the address of the laboratory
- the names, functions and signatures or equivalent identification of persons authorizing the test report
- the name and address of the client
- unique identification of the test report and on each side an identification in order to ensure that the page is recognized as a part of the test report and a clear identification of the end of the test report
- identification of the test method used
- deviations from, additions to or exclusions from the test method
- information on specific test conditions, such as environmental conditions
- a description of, the condition of and an unambiguous identification of the items tested
- the date of receipt of the test item and the date of performance of the test
- reference to sampling plan and procedure
- the test results and units of measurement
- a statement on the estimated uncertainty of measurement
- a statement of compliance or non-compliance with requirements and/or specifications

Child protective socket protectors – requirements and testing

1. Introduction

This document describes requirements for and testing of socket protectors (socket covers).

2. Scope

The method is applicable to socket protectors intended to be fitted to sockets in order to prevent children to get in contact with live parts.

3. Normative references

ISO 4892-2 “Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc sources”

IEC 60 884-1 ”Plugs and socket-outlets for household and similar purposes – Part 1: General requirements”

EN 60335-1 ”Household and similar electrical appliances – Safety – Part 1: General requirements”

EN 61032 “Protection of persons and equipment by enclosures – Probes for verification”

EN 71-1:1998 “Safety of toys – Part 1: Mechanical and physical properties”

4. Definitions

Socket protector

a barrier that is fitted to the electrical outlet (socket) in order to prevent children’s contact with live parts of electrical equipment.

5. Requirements

5.1 General

The socket protector shall fulfil the specified requirements when fitted to any of the types of sockets that the manufacturer has specified that it can be applied to.

A socket protector must never affect the function of the socket outlet and the plug. In cases where the socket protector is designed to allow insertion of the plug without the removal of the protector, it shall be shown that the presence of the socket protector does not create insufficient electrical contact or in any other way affect the electrical function of the socket outlet and the plug.

5.2 Accessibility of live parts

After the tests described in clause 6, it shall not be possible to touch live parts neither by fingers nor by pointy objects. This is tested according to clause 6.4.5 by means of the test probe.

5.3 Humidity, insulation resistance and electrical strength

The socket protector shall be proof against humidity that may occur in normal use. Compliance is checked by humidity treatment followed by measurement of insulation resistance and electric strength test, as described in clause 6.4.2.

The insulation resistance shall not be less than 500 M Ω and no flashover or breakdown shall occur when the socket protectors are tested according to clause 6.4.2.

5.4 Mechanical function and structural integrity

After and during the tests described in clause 6, the tested items shall show no damage and be fully functional.

When a tensile force or torque is applied according to 6.4.3 the socket protector shall not be dismantled or moved out of position so that it is possible to get in touch with live parts by fingers or by pointy objects, see 5.2.

None of the tested items shall break, split, crack or in any other way be visibly damaged when subjected to tensile force according to 6.4.3 or impact test according to clause 6.4.4.

5.5 Small parts

The possibility to detach small parts shall be tested according to clauses 8.3 and 8.4 of EN 71-1:1998.

Any small component, which is detachable or becomes detached during the testing according to the test methods described in clause 6 of this document, shall not fit wholly within the small part cylinder described in clause 8.2 of EN 71-1:1998/A5:2000.

5.6 Sharp edges

There shall be no accessible edges, before or after the test, that present an unreasonable risk of injury. Requirements and test methods are given in clause 4.7 and 8.11 of EN 71-1:1998.

5.7 Product information and user instructions

Product information shall be provided to reduce the possible consequences of foreseeable hazards connected with the use of the product.

Information concerning safe use of the product shall be provided. This instruction shall include at least the following:

- The name or trade mark of the manufacturer, importer or organization responsible for its sale.
- The instruction: Read these instructions carefully before mounting and using the device. The child protective function of the device may be affected if you do not follow the instructions. Keep the instructions for future reference.
- Information on which types of sockets the product is intended for.
- Instructions on how to mount the device to ensure the intended function. Different instructions may be needed for different types of sockets.
- Any other information for safe usage.

6. Method of testing

6.1 General test conditions

Testing consists of preconditioning, electrical testing and mechanical testing.

The device shall be mounted according to the manufacturer's instructions.

If nothing else is given forces in the tests shall be applied in the most onerous direction.

The tests shall be carried out in indoor conditions with a temperature of 23 ± 5 °C.

Forces shall be measured with an uncertainty of measurement not exceeding ± 1 %. For voltage the uncertainty of measurement shall not exceed ± 3 % and for insulation resistance ± 5 %.

6.2 Test equipment

Equipment for ageing with artificial daylight irradiance behind window glass (indoor), according to method B of ISO 4892-2 and 3000 hours at 70 °C.

Humidity cabinet that can provide a humidity of 91-95% at a temperature of 20-30°C.

Test probe 17 of EN 61032:1998, corresponding to a thin needle.

Test probe 19 of EN 61032:1998, corresponding to a small child's finger.

Equipment for testing of electrical strength and measurement of insulation resistance.

A test rig for mechanical testing with a socket in which the socket protector can be fitted in accordance with manufacturer's fitting instructions.

Equipment for examination of grippability according to EN 71-1:1998.

Equipment for applying a force and for measurement of force.

Equipment for impact test with a pendulum of steel according to figure B1. The weight of the pendulum head shall be 0.3 kg and that of the arm shall be 0.6 kg. It shall be possible to use a drop angle of at least 45° .

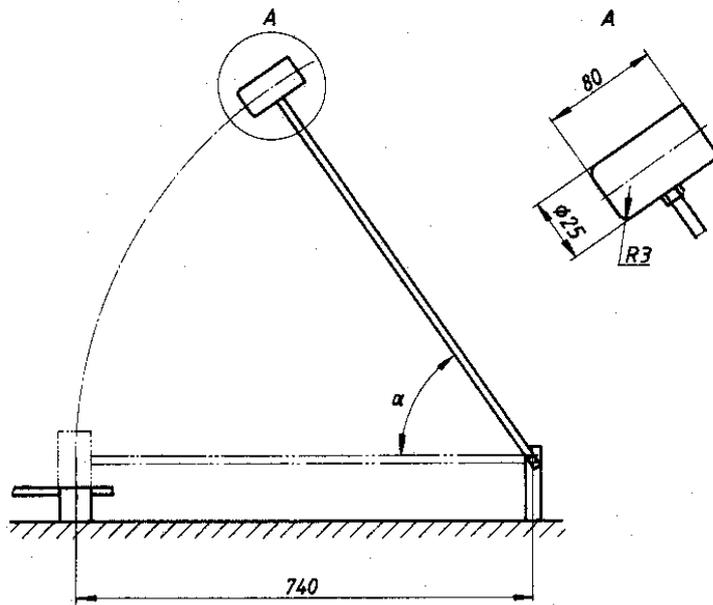


Figure B1 Equipment for impact test

Small parts cylinder according to clause 8.2 of EN 71-1:1998/A5:2000.

Equipment for determination of sharp edges according to EN 71-1:1998, 8.11.

6.3 Extent of testing

The following numbers of devices are required for complete testing:

- 3 - socket protectors. After pre-conditioning, these devices will be used for the electrical testing and strength testing.
- 3 sockets of each type that the socket protector is intended for.
- 3 plugs of each type that the socket protector is intended for.

All three socket protectors shall meet the requirements according to clause 5.

6.4 Test procedure

6.4.1 Ageing and wear

The object shall be subjected to UV indoor light according to ISO 4892-2.

Place the test objects in a cabinet with a temperature of 70 °C for 3000 hours.

For wear test the protective function of the socket protector should be engaged and disengaged 5000 times at a frequency of 10-20 cycles per minute. The engaging and disengaging shall be done in the same way as in ordinary use. Plug type socket protectors with tools/keys shall be mounted and dismounted with the original tools or keys. The “push and turn” type socket protectors are activated and deactivated by the use of a plug. Those and other more complicated mechanisms can be separated in the test so that 5000 cycles of rotation is done first and then 5000 cycles of inserting the plug.

6.4.2 Insulation resistance and electrical strength

The test objects shall be pre-conditioned in a humidity cabinet for 48 hours. The cabinet shall contain air with a relative humidity maintained between 91% and 95%. The temperature of the air shall be between 20 °C and 30 °C and be maintained within 1 K.

The socket protector shall be mounted in a socket according to the manufacturer’s instructions.

Before the tests all accessible surfaces of the socket protector shall be covered with metal foil. The metal foil shall be pushed into corners and similar locations by means of test probe 19 of EN 61032:1998.

The insulation resistance between live parts of the socket-outlet and the metal foil is measured with 500 V d.c., the measurements shall be made 1 min after application of the voltage.

The electric strength between live parts of the socket-outlet and the metal foil is tested with 3000 V/50 Hz during 1 min.

6.4.3 Mechanical function

Use the feeler gauge specified in EN71-1:1998 to determine if the protector is grippable. If it is grippable a tensile force of 90 N shall be applied in the most onerous direction. If the protector is not grippable a tensile force of 20 N shall be applied in the most onerous position.

For the “push and turn” type of socket protectors a torque of 0.5 Nm shall be applied to the protector.

6.4.4 Impact testing

After the ageing (6.4.2) and mechanical function testing (6.4.3), the device is subjected to impact loading. The device shall be subjected to 10 strokes by the steel pendulum described in clause 5.2. The strokes shall hit the device in the most onerous position. The drop angle α shall be $45 \pm 2^\circ$, see figure B1. The pendulum shall hit the device when the pendulum is in horizontal position.

6.4.5 Accessibility of live parts

Use test probe 17 ($\varnothing 0,5$ mm test wire) of EN 61032 :1998 in order to see if it is possible to get in contact with live parts by means of the test probe. The probe shall be applied, on all accessible surfaces and openings of the socket protector and between the socket protector and the socket.

7 Test report

The test report shall include the information necessary for the interpretation of the results and at least the following information:

- a title
- the name and address of the laboratory and the location where the tests were carried out if different from the address of the laboratory
- the names, functions and signatures or equivalent identification of persons authorizing the test report
- the name and address of the client
- unique identification of the test report and on each side an identification in order to ensure that the page is recognized as a part of the test report and a clear identification of the end of the test report
- identification of the test method used
- deviations from, additions to or exclusions from the test method
- information on specific test conditions, such as environmental conditions
- a description of, the condition of and an unambiguous identification of the items tested
- the date of receipt of the test item and the date of performance of the test
- reference to sampling plan and procedure
- the test results and units of measurement
- a statement on the estimated uncertainty of measurement
- a statement of compliance or non-compliance with requirements and/or specifications

Child protective locking devices for cupboards and drawers— requirements and testing

1. Introduction

This appendix describes requirements and testing of child protective locking devices that are fitted to cupboards or drawers in order to prevent accidents to children.

2. Scope

The method is applicable to devices intended to be fitted to cupboards or drawers in order to prevent accidents to children.

3. Normative references

EN 71-1 “Safety of toys – Part 1: Mechanical and physical properties”

EN ISO 8317 “Child resistant packaging requirements and test procedures for reclosable packages”

4. Definitions

Child protective locking device for cupboards and drawers

device mounted on cupboards and drawers intended to prevent children’s access to the contents of the cupboard/drawer.

5. Requirements

5.1 Child protective function

The device shall operate automatically so that when the product to which it is attached is placed in a closed position the locking device will be in a locking position.

The release of the locking mechanism of the device shall require:

a) the application of a force of at least 50 N and the operation of two independent mechanisms

or

b) the use of a tool.

or

c) the child protective function, i.e. that the device prevents children from accessing the contents of cupboards/drawers, shall meet the requirements concerning children according to clause 4.3.1 of EN ISO 8317 taking into account the provisions of clause 7.4.1.

5.2 Mechanical function and structural integrity

When tested according to chapter 6, none of the tested devices or any part of the devices shall be broken or have any visible damage (such as cracks or permanent deformation) and the devices shall be fully functional during and after the tests.

To ensure that a child can not reach the contents of the drawer/cupboard, the maximum gap when the locking device is in the maximum open position shall be restricted. When the force F is applied according to clause 6.4.2 the measured opening shall not exceed 25 mm.

5.3 Small parts

The possibility to detach small parts shall be tested according to EN 71-1:1998 clause 8.3 and 8.4.

Any small component, which is detachable or becomes detached during the testing according to the test methods described in chapter 7 of this document, shall not fit wholly within the small part cylinder described in clause 8.2 of EN 71-1:1998/A5:2000.

5.4 Sharp edges

There shall be no accessible edges that present an unreasonable risk of injury. Requirements and test methods are given in clause 4.7 and 8.11 of EN 71-1:1998.

5.5 Product information and user instructions

Product information shall be provided to reduce the possible consequences of foreseeable hazards connected with the use of the product.

Information concerning safe use of the product shall be provided. This instruction shall include at least the following:

- The name or trade mark of the manufacturer, importer or organization responsible for its sale.
- The instruction: Read these instructions carefully before mounting and using the device. The child protective function of the device may be affected if you do not follow the instructions. Keep the instructions for future reference.
- Information on which types of drawers/cupboards the product is intended for.
- Instructions on how and where to mount the device to ensure the intended function. Different instructions may be needed for different types of drawers/cupboards. Since the mounting of the device is vital for the child protective function, the instruction has to be precise in this subject and in some cases special mounting tools may need to be provided.
- Any other information for safe usage.

6. Method of testing

6.1 Main principles

Testing consists of wear test, strength testing and function testing.

The device shall be mounted according to the manufacturer's instructions.

If nothing else is given forces in the tests shall be applied in the most onerous direction.

The tests shall be carried out at indoor conditions with a temperature 23 ± 5 °C.

Measure the forces with an uncertainty of measurement not exceeding ± 1 %, and measure displacements with an uncertainty of measurement not exceeding ± 1 mm.

6.2 Test equipment

A test rig, to/on/in which the cupboard and drawer safety device can be fitted in accordance with its manufacturer's fitting instructions. The rig shall consist of a moving part and a fixed part, and shall be sufficiently rigid to ensure that it cannot affect the results. See the diagram under 7.4.2 on the next page for a suggested arrangement of the test rig.

Equipment that makes it possible to perform 5 000 opening and closing operations for the wear and tear testing. By 'opening' is meant opening the moving part of the test rig to the point where further opening is restricted by the safety device under test. It shall be possible to measure the force applied to the device.

Equipment for applying a force in the opening direction, and for measurement of deformation in the direction of the force.

Small parts cylinder according to clause 8.2 of EN 71-1:1998/A5:2000

Equipment for determination of sharp edges according to EN 71-1:1998, 8.11.

6.3 Extent of testing

The following numbers of devices are required for complete testing:

- 3 - devices for testing according to 6.4.1 and 6.4.2. All devices shall meet the requirements according to clause 5.
- 1 - device for child panel testing (if applicable).

6.4 Test procedure

6.4.1 Wear of opening restriction and locking mechanism

Before tested according to 6.4.2, 6.4.3 and 6.4.4 the device shall be subjected to wear test.

Fit the device to/on/in the test rig (a drawer or a cupboard door) in accordance with the manufacturer's instructions. A force F of 50 N shall be applied to the device at its operating position (i.e. where it restricts further opening), the force shall be released and the drawer / cupboard door shall be closed (and the locking device shall automatically be in its locking position). Perform this opening/closing cycle at a frequency of 10 - 20 cycles per minute, to give a total of 5 000 cycles.

The locking mechanism shall be engaged and disengaged 5000 times. This can be included in the cycle described above if it is possible with regard to the design of the device.

6.4.2 Structural integrity

After the wear and tear test, apply a force F of 500 N in the opening direction of the test rig, applying the force in line with the device.

6.4.3 Function testing

The product shall be mounted according to the manufacturer's instruction.

Check that the device operates automatically so that, when the product to which it is attached is placed in a closed position, the device will be in a locking position.

One of the following alternatives, a), b) or c), shall be used to verify the protective function:

- a) Check that the release of the locking mechanism requires the use of a force of at least 50 N and the operation of two independent mechanisms.
- b) Check that the release of the locking mechanism requires the use of a tool or a key.
- c) Perform and evaluate panel test with children according to clause 5.4 of EN ISO 8317.

7. Report

The test report shall include the information necessary for the interpretation of the results and at least the following information:

- a title
- the name and address of the laboratory and the location where the tests were carried out if different from the address of the laboratory
- the names, functions and signatures or equivalent identification of persons authorizing the test report
- the name and address of the client
- unique identification of the test report and on each side an identification in order to ensure that the page is recognized as a part of the test report and a clear identification of the end of the test report
- identification of the test method used
- deviations from, additions to or exclusions from the test method
- information on specific test conditions, such as environmental conditions
- a description of, the condition of and an unambiguous identification of the items tested
- the date of receipt of the test item and the date of performance of the test
- reference to sampling plan and procedure
- the test results and units of measurement
- a statement on the estimated uncertainty of measurement
- a statement of compliance or non-compliance with requirements and/or specifications

Child protective hob guards – requirements and testing

1. Introduction

This appendix describes requirements and testing of hob guards intended to prevent accidents to children.

2. Scope

The requirements and test methods in this document are applicable to hob guards.

3. References

EN 71-1:1998 “Safety of toys – Part 1 : Mechanical and physical properties”

EN 1888:2003 “Child care articles – Wheeled child conveyances – Safety requirements and test methods”

EN13501-1 “Fire classification of construction products and building elements – part 1 classification using test data from reaction to fire tests”

EN ISO 11925-2 “Reaction to fire tests – ignitability of building products subjected to direct impingement of flame- part 2 : single-flame test”

4. Definitions

Child protective hob guard

barrier that is fitted to the hob in order to prevent children to get in touch with the hot area or to pull down a pan.

5 Requirements

5.1 Dimensions

The hob guard shall be of minimum dimensions according to figure D1.

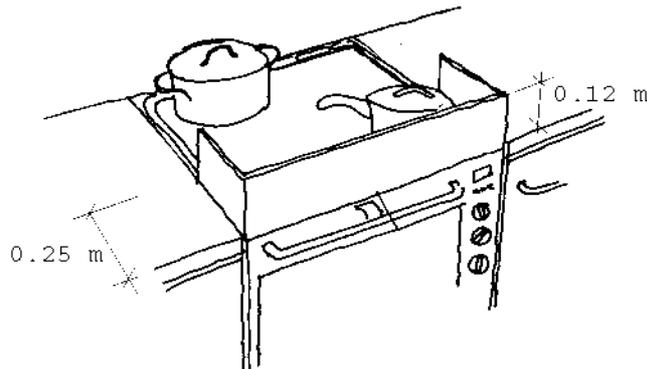


Figure D1 Required dimensions of a hob guard.

5.2 Mechanical function and structural integrity

When tested according to clause 6, the hob guard shall not be detached or moved out of position, none of the tested items or any part of the items shall be broken or have any visible damage (such as cracks or permanent deformation) and the device shall be fully functional during and after the tests.

When a load F_1 according to clause 6.4.6 is applied to the mid span of the hob guard, there shall be no gap larger than 5 mm between the lower front edge of the hob guard and the hob.

5.3 Heat conductivity and flammability

The heat conductivity of a hob guard shall be so low that the outer surface temperature do not exceed 47 °C at intended use.

The hob guard shall be made of non- flammable material not causing horizontal progressive spread of flame from the point of ignition in the material. The material shall not form burning droplets. The minimum reaction to fire requirement of the material is that it shall meet the criteria of Euroclass D according to EN 13501-1, when tested according to EN ISO 11925-2 (both edge and surface ignition).

Materials classified in Classes A1 and A1_{FL} according to COMMISSION DECISION of 4 October 1996 establishing the list of products belonging to Classes A 'No contribution to fire' provided for in Decision 94/611/EC, may be used without further testing.

5.4 Entrapment

To avoid entrapment of fingers there shall be no accessible openings with a width greater than 5 mm and smaller than 12 mm, unless the depth is less than 10 mm.

5.5 Small parts

The possibility to detach small parts shall be tested according to EN 71-1:1998 chapters 8.3 and 8.4.

Any small component, which is detachable or becomes detached during the testing according to the test methods described in chapter 7 of this document, shall not fit wholly within the small part cylinder described in clause 8.2 of EN 71-1:1998/A5:2000.

5.6 Sharp edges

There shall be no sharp edges that present an unreasonable risk of injury. Requirements and test methods are given in clause 4.7 and 8.11 of EN 71-1:1998.

5.7 Product information and user instructions

Product information shall be provided to reduce the possible consequences of foreseeable hazards connected with the use of the product.

Information concerning safe use of the product shall be provided. This instruction shall include at least the following:

- The name or trade mark of the manufacturer, importer or organization responsible for its sale.
- The instruction: Read these instructions carefully before mounting and using the device. The child protective function of the device may be affected if you do not follow the instructions. Keep the instructions for future reference.
- Information on which types of hobs the product is intended for.
- Instructions on how and where to mount the device to ensure the intended function. Different instructions may be needed for different types of hobs. Since the mounting of the device is vital for the child protective function, the instruction has to be precise in this subject and in some cases special mounting tool may need to be provided.
- Any other information for safe usage.

6. Testing

6.1 General test conditions

The device shall be mounted according to the manufacturer's instructions.

If nothing else is given, forces shall be applied in the most onerous direction.

The test shall be carried out in indoor conditions with a temperature 23 ± 5 °C.

Forces shall be measured with an uncertainty of measurement not exceeding ± 1 %, and displacements with an uncertainty of measurement not exceeding ± 1 mm.

6.2 Test equipment

Equipment for pre-conditioning in 70° for 3000 hours.

A test rig, to/on/in which the hob guard can be fitted in accordance with its manufacturer's fitting instructions. The rig shall be sufficiently rigid to ensure that it cannot effect the results.

Equipment for applying a force and for measurement of force and deformation (in the direction of the force).

Equipment for impact test with a pendulum of steel according to figure D2. The weight of the pendulum head shall be 0,3 kg and that of the arm shall be 0,6 kg. It shall be possible to use a drop angle of at least 45° .

Small parts cylinder according to clause 8.2 of EN 71-1:1998/A5:2000.

Equipment for determination of sharp edges according to EN 71-1:1998, 8.11.

Probe, 5 mm, according to EN 1888:2003 for determination of entrapment risk.

Equipment for determination of reaction to fire properties according to EN ISO 11925-2.

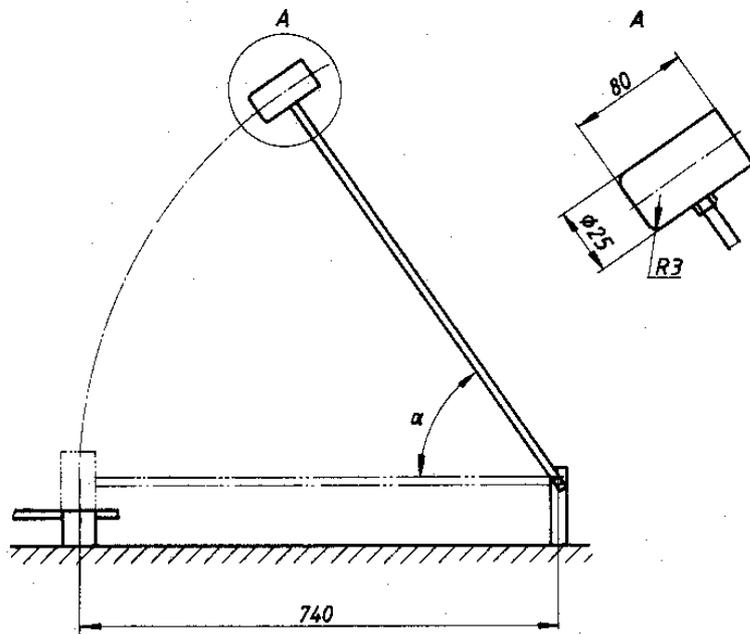


Figure D2 Equipment for impact testing

6.3 Extent of testing

Three devices are required for complete testing. After ageing, the same devices will be used for the strength testing and impact testing. All devices shall meet the requirements according to 5.1, 5.2, 5.3, 5.4, 5.5 and 5.6 when tested according to 6.4.

6.4 Test procedure

6.4.1 Dimensions

Check that the height of the hob guard is at least 0.12 m and that the protective length on the side perpendicular to the front is at least 0.25 m.

6.4.2 Entrapment

Use the 5 mm probe and apply with 30 N according to EN 1888:2003 to check that there are no accessible openings that present a risk of entrapment of fingers.

6.4.3 Sharpness of edges

Determine the sharpness of the accessible edges according to EN 71-1:1998, 8.11.

6.4.4 Ageing

Plastic components shall be exposed to 70 °C for 3000 hours.

6.4.5 Structural integrity

Apply a horizontal force F_1 of 200 N in the mid span of the upper front edge of the hob guard and measure the deformation in lower front, in the direction of the load. The force shall be applied in both the outwards and the inwards directions.

Apply a vertical force F_2 of 200 N in the mid span of the upper front edge of the hob guard. The force shall be applied in both the upwards and the downwards directions.

6.4.6 Impact testing

After the ageing and strength testing, the device is subjected to impact loading. The device shall be subjected to 10 strokes by the steel pendulum described in clause 6.2. The drop angle α shall be $45 \pm 2^\circ$, see figure D2. The pendulum shall hit the device when the pendulum is in horizontal position.

The stroke shall hit the device in the most onerous position, i.e. fastenings may be a weak point and the most onerous position for impact may be close to the fastenings. The direction of the stroke shall be the most onerous and several directions shall be used in combination.

7 Test Report

The test report shall include the information necessary for the interpretation of the results and at least the following information:

- a title
- the name and address of the laboratory, and the location where the tests were carried out if different from the address of the laboratory
- the names, functions and signatures or equivalent identification of persons authorizing the test report
- the name and address of the client
- unique identification of the test report and on each side an identification in order to ensure that the page is recognized as a part of the test report and a clear identification of the end of the test report

- identification of the test method used
- deviations from, additions to or exclusions from the test method
- information on specific test conditions, such as environmental conditions
- a description of, the condition of and an unambiguous identification of the items tested
- the date of receipt of the test item and the date of performance of the test
- reference to sampling plan and procedure
- the test results and units of measurement
- a statement on the estimated uncertainty of measurement
- a statement of compliance or non-compliance with requirements and/or specifications

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