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CONSUMER POLICY AND CONSUMER HEALTH PROTECTION
Directorate A - Consumer Policy
Unit A4 - Consumer safety and environment

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DRAFT FRAMEWORK STANDARDIZATION MANDATE
TO CEN RELATIVE TO
THE SAFETY OF CONSUMERS AND CHILDREN

LADDERS

1 – INTRODUCTION.

This mandate under the framework standardisation mandate in the field of consumer safety deals with ladders.

The current standards EN 131-1 and EN 131-2 took many years to develop and although they have been in existence since 1993 they have not been universally accepted throughout Europe. For differing reasons they do not cater for the national requirements and conditions in a number of countries. Having been effectively frozen since their introduction, no changes to the initial documents have taken place and in this time the European Directive on General Product Safety (92/59/EEC) has been issued.

2 - IDENTIFICATION OF HAZARDS AND RISKS.

Ladders have become widely distributed and are everyday pieces of equipment in both the home and the place of work. Their use is often taken for granted and the suitability of the combination of ladder and user for the task in hand is not always given consideration. Instinctive ways of working with them exist which are known to be dangerous, hence these should be considered and eliminated at the design stage as far as possible.

Additionally, accessories are available for use on or with ladders that present special risks.

Portable ladders can be grouped into two major types, self-supporting (typically stepladders) and leaning (typically extending ladders).

Risks from the use of ladders whether in the home or at work are many but can be categorised as follows:

- Injury/fatality to the user from mishandling, inappropriate use for the task to be performed and using the ladder incorrectly
- Injury/fatality to third parties
- Damage to property

Analyses from studies show that ladders can be used safely and provide safer means of carrying out many tasks than with the use of some alternatives. When so used, ladders provide an economical means of carrying out the task. However not every job can be done with a ladder, and not every job can be done by all people. The importance of a competent person selecting the correct product for the task at hand is paramount. In industrial applications this is understood but in domestic situations the user should be able to rely on information both on and supplied with the product.

3 - SELECTED LADDER ACCIDENT STATISTICS

EHLASS data has shown that in France over a 5-year period approximately 1% of total accidents is accounted for by falls from ladders.

In the UK HASS/LASS data over a 5-year period shows that falls from ladders account for approximately 0.6% of all reported accidents.

The range of injuries from accidents on ladders is wide, with the head/brain affected in many cases. The majority of injuries that occur when users do fall from ladders are to the upper and lower extremities. Although some falls are from relatively small heights, serious injuries still occur.

4 - NATIONAL AND EUROPEAN REGULATIONS

Europe – General Product Safety Directive (92/59/EEC)

France – Decree DC 96 – 333

Germany – * GUV 26.4.1

* GUV 26.4.2

* GUV 26.4.3

* LBG 3.8 Special Regulations for ladders

* VBG 74 Ladders and Steps

* VBG 74 DA Implementing instructions

* Zh 1/266 Ladders

Netherlands – Warenwet 1987

Note: * It has not been possible to assess the effect of this legislation and this will need to be confirmed.

UK – No specific ladder legislation but the following legal framework exists:

General : General Product Safety Regulations 1994

Consumer : Consumer Protection Act 1987

Workforce : Health & Safety at Work Act 1974

5 - STUDIES

Studies have concluded that the major cause of accidents on ladders arises from misuse by the user. Whilst there are cases of product failure, most accidents occur due to non-compliance with safety rules and guidelines. There is a widely held perception by the user that operating a ladder is child's play, requiring not even basic instructions to be read.

Some studies have recommended that major public awareness campaigns should be carried out to drive the message home to users. In some cases this has been done but it is too soon to judge their effectiveness.

In France it is a legal requirement to have instructions on the ladder when it is sold.

In Holland it is a legal requirement that certain safety messages appear on or with the product when sold.

In the Swedish Standard only marking of the product with manufacturer details and maximum permissible load is required.

In the UK, safety booklets have been produced dealing with ladders as well as stepladders, and are available at the retail outlets where ladders are sold. In the British Standards it is a requirement that certain safety messages are on the ladder when it is sold.

6 - EXISTING STANDARDS AND STANDARDISATION WORK IN PROGRESS

The CEN/TC 93 Committee on ladders has recently been reactivated and has commenced work on amending the Standards. A number of Working Groups have been set in motion to deal with specific issues. These are:

- WG 1- Stepstools
- WG 2- Multi or one piece hinge-joint ladders
- WG 3- User information
- WG 4- Plastics and Composites

General

In considering the standards available, only standards that cover portable ladders have been included. Other standards for professional use do exist. E.g. Firemen's ladders.

Europe

EN 131-1 and-2 exist and are available throughout Europe. However in addition there are national standards as follows: -

Australia

- AS/NZS 1892 Portable ladders
- DR 97240 Portable ladders selection, safe-use and care

Austria

- OENORM Z 1510 Portable LADDERS

Belgium

- NBN I 08-001 H Aluminium ladders
- NBN I 08-002 PR Ladders Terminology
- NBN I 08-003 PR Requirement for tests, marking

Canada

- CAN3-Z11-M81 Portable ladders

Czech Republic

- CSN 74 3282 Steel ladders

Denmark

- DS 2069.5 Portable ladders – Ladderstools

Germany

- DIN 4679: Stepstools

Japan

- CPSA 0037 Aluminium alloy ladder for household use
- CPSA 0066 Metal stepladders for household use
- CPSA 0090 Aluminium alloy articulated ladder for household use

Netherlands

NEN 2484: Portable access material; Ladders and steps

Norway

NS – INSTA 650 Ladders portable

Spain

UNE 27609: Steel steps

Sweden

- SS 2091: (INSTA 650): Ladders - Portable ladders

United Kingdom

- BS 2037: Portable aluminium ladders, steps, trestles and lightweight stagings
- BS 1129: Portable timber ladders, steps, trestles and lightweight stagings
- BS 7377: Step stools
- BS 7553: Loft Ladders

USA

- ANSI A 14.1 ladders – Portable wood – Safety requirements
- ANSI A 14.2 ladders – Portable metal – Safety requirements
- ANSI A 14.4 ladders – Job made wooden ladders - Safety requirements
- ANSI A 14.5 ladders – Portable reinforced plastic - Safety requirements
- UL 112 Portable wood ladders
- UL 184 Portable metal ladders

7 - SUMMARY OF EVIDENCE AND INCIDENTS

A close correlation exists between major accident causes from studies carried out globally.

The major causes of falls from self-supported portable ladders (stepladders) are, lack of stability and sliding.

The major causes of falls from non-self-supporting portable ladders (leaning ladders) are, lateral sliding at the top support, outward sliding at the lower base support and human slip.

Investigations have shown that less than 20% of all ladder accidents are attributable to defective equipment; the other 80% to ladder users, which is not helped by lack of product information.

It has been shown that accidents with ladders in the workplace represent approximately one third of all ladder accidents, the remainder occurring around the home, therefore it is vital to address the causes.

8 - REQUIRED IMPROVEMENTS.

8.1 - General Product Safety Directive

The standards must provide for the requirements of the General Product Safety Directive (92/59/EEC) to be met. This would require a section on marking and information for the user.

8.2 - A “*safe product*” is any product which under normal or reasonably foreseeable conditions of use, including duration, presents no risk or only minimal risk compatible with the product’s use and which is consistent with a high level of protection for consumers.

8.3 - The safety of a product will be assessed having regard to a number of matters and, in particular:

- a) The product’s characteristics;
- b) Packaging
- c) Instructions for assembly and maintenance, use and disposal
- d) The effect on other products with which it might be used
- e) Labelling and other information provided to the consumer

(It is not considered that products will be expected to be labelled with a warning about every conceivable potential hazard. The Standard should specify the minimum warning requirements. Whether a warning should be given must depend on a variety of factors, including:

- * The severity of the hazard
- * The risk of the hazard being realised
- * The degree to which the risk is obvious
- * The type of consumer likely to be at particular risk)

The considerations set out under “Minimum risk compatible with the product’s use” below, apply also to an assessment of the labelling needs

f) The categories of consumers at serious risk when using the product, particularly children.

8.4 - Minimum risk compatible with the product's use.

Consumers recognise that some products carry risks, which it is not possible to eliminate. Examples are knives and scissors, which must have sharp edges to perform their function but where reasonable precautions can be taken to ensure that handles are sturdy and hands are kept away from the functional edges when such items are in use. In other cases, it could be argued that consumers should be aware of the potential risks of misuse through general knowledge, education and experience. Thus a balanced view must be taken based on the nature of the product, its acceptability to consumers and an understanding of the characteristics which consumers may reasonably expect. The range of potential hazards that require to be drawn to the attention of consumers will depend on a number of factors (referred to above under labelling)

The safety of a product is given in respect to the criteria of foreseeable use and misuse. It takes into account:

- The age and ability of the intended user of the ladder
- Relevant risk factors presented by the users environment and activity

9 - MANDATE

For the reasons set out above and given the need to improve the current European standards, the European organisations responsible for standardisation in this sector, are requested to accept this mandate to amend and improve the European Standards.

The Mandate should exclude ladders for special professional use.

10 - EXECUTION OF THE MANDATE

CEN shall inform the Commission of the arrangements to be adopted for the execution of the work within three months of acceptance of this mandate.

CEN shall present target dates for the presentation and adoption of the draft standards revising EN 131-1 and EN 131-2 to the Commission within six months of the acceptance of this mandate. CEN shall present the draft standards listed therein by the target dates specified.

The European Standards (EN) shall be adopted by the target dates specified. At these dates, the three linguistic versions (German, English and French) shall be available, as well as the correct titles in the other European Union languages.

CEN shall notify the Commission of the addition or removal of standards projects, with their target dates in the case of additions, which it approves for addition to its work programme that may be necessary.

Relevant interested parties, such as representatives of consumers and industry, shall have the possibility to participate in the process. The developments on the international level shall be taken into account.

The European standards accepted shall be transposed into national standards and differing national standards shall be withdrawn from the catalogues of the national standards organisations in the Member States within six months of their adoption.

Acceptance by CEN of this mandate starts the standstill period referred to in Article 7 of the Council Directive 98/34/EEC of 22 June 1998 (Of N° L 204/37 of 21 July 1998)

INFORMATIVE ANNEX

1 - GENERAL PRINCIPLES OF SAFETY FOR LADDERS FOR THE PURPOSE OF THIS MANDATE

GENERAL.

When determining principles of safety for ladder products, reference should be made to standardisation work currently being undertaken in other areas such as PPE (personal protective equipment), machine safety, risk assessment, tools etc.

DEFINITIONS.

- **LADDERS**

A device incorporating steps or rungs on which a person may step to ascend or descend. For the purposes of this mandate they should be considered to be portable, however consideration could be given to the inclusion of loft ladders which are normally fixed.

- **ACCESSORIES**

A device to improve stability or safety when used in conjunction with a ladder. For example:- stand-off, ladder leveller.

PRINCIPLES OF SAFETY OF LADDERS.

Ladder products shall only be available for sale when they are in accordance with Directive (92/59/EEC) on General Product Safety and do not jeopardise the safety and health of the users or others.

The degree of safety of ladder products should be defined according to the criteria of usage in conformity with the product instructions, but also taking into account the actual use of such products and the risks associated with them, having regard to the normal behaviour and physical characteristics of the intended users.

Accessories should be considered as parts of the ladders and included in the requirements

PRODUCTS EXCLUDED FROM THE SCOPE OF LADDERS.

The Mandate should exclude ladders for special professional use such as fire brigade ladders, roof ladders...

HAZARDS AND OBJECTIVES OF PROTECTION.

The health and safety of the user of the ladder as well as other persons are to be protected against hazards:

- which are linked to the design, construction or composition of the ladder and should be minimised at the design and manufacturing stage through appropriate technical specifications

- Of a residual nature which are inherent in the use of the ladder and cannot be eliminated by modifying the product's construction and composition without altering its function or depriving it of its essential properties.

FORESEEABLE USE AND MISUSE.

The safety of a product is given in respect to the criteria of foreseeable use and misuse. It takes into account:

- The age and ability of the intended user of the ladder
- Relevant risk factors presented by the users environment and activity

SAFETY INFORMATION.

- ***OBJECTIVES AND REQUIREMENTS***

Safety information should be provided to prevent accidents that cannot be avoided by design. The information should identify potential hazards and/or consequences and indicate precautions to be taken

Safety information comprises purchase information, instructions for use, markings and warnings.

Safety information accompanying ladder products should be designed to draw the user's attention to the hazards likely to be encountered when using the product and the precautions to be taken in order to avoid accidents. The inclusion of diagrams to complement and illustrate safety instructions should be considered.

- ***CONDITIONS TO BE SATISFIED BY THE INFORMATION***

Safety information should be readable, understandable and as comprehensive as possible whilst at the same time being formulated concisely.

The information should be confined to actual and potential hazards genuinely likely to occur.

There should be no conflict between the safety information supplied with the product and the normal use of the product.

The safety information should be written in the language(s) of the country(s) in which the product is to be sold and used.

The safety information should be legible and drawings should be provided where necessary for assembly, installation, adjustments, maintenance, and inspection and for checking correct operation.

Warnings together with information on restrictions on use depending on the age, weight, size or ability of the user or other criteria indicated by the manufacturer should:

- Be visible at the point of purchase or sale
- Where possible be permanently attached to the ladder, except where a label would cause a hazardous situation.
- Be legible throughout the life of the product
- Be preceded by the word **WARNING** in upper case print.
- Be separated from other information in order to avoid confusion.
- Be indicated in catalogues and sales brochures

The identification of the product and the manufacturer should be attached to the product. If practically possible, this information should be permanently marked on the product.

- *PURCHASE INFORMATION*

The purchase information should be visible at the point of sale. It should inform the potential buyer of the safety-related characteristics of the product so that the buyer can decide whether the product meets the perceived needs and the anticipated conditions of use. Where applicable the following information should be specified:

- The size and/or weight of the user for which the ladder is suitable
- Warnings in accordance with the former paragraph “CONDITION TO BE SATISFIED BY THE INFORMATION” together with an explanation of the hazard.
- Fitting, installation and assembly requirements of importance for the purchasing decision

- *INSTRUCTIONS FOR USE*

All ladders should be accompanied by instructions for use including at least the following:

- An identification of the product e.g. type and/or serial or reference number
- A repeat of the purchase information required in the clause headed “purchasing information” above.
- An identification of the manufacturer
- Foreseen use of the ladder
- Information for assembly if applicable
- Information for installation if applicable
- Information for normal use including adjustments if applicable

- Information for storage
- Information for maintenance and replacement parts
- Information to obtain repairs and servicing
- Information for disposal
- Warnings drawing the attention of the user to the risks involved in use and precautions which must be taken, this also must include ways in which the ladder should not be used
- Information to keep the instructions for future use
- A repeat of all warnings on the product and purchase information.

PHYSICAL PROPERTIES.

The structural integrity of the ladder should not present any hazard to the users. Materials used in the structure of the ladders should not present any hazard.

- ***STRUCTURAL INTEGRITY***

Ladders should be designed and manufactured so that there are no inadequacies in the strength and durability, which could result in hazardous situations.

- ***WOOD***

Wood should be free from splinters, decay, infestation and fungal attack, and should be suitable for the purpose. Consideration should be given to indicating suitable types of wood.

- ***METALS***

Surfaces and other metallic parts should be resistant to corrosion and flaking.

- ***OTHER MATERIALS***

Thermoplastic materials should be provided with protection against weathering including against ultra violet rays.

Glass-fibre reinforced plastics should be protected against penetration of water and dirt. Surfaces should be smooth with fibres embedded.

MECHANICAL PROPERTIES.

- ***ACCESSIBLE EDGES, POINTS AND CORNERS***

Ladders should not have sharp edges, points, corners and abrasive surfaces. Accessible edges and corners should be rounded and/or chamfered. Materials used should be free from splinters.

- *PROTRUDING PARTS OR SNAGGING FEATURES*

There should be no protrusions on the ladder, on which a user could snag clothing or fall and be injured.

There should be no protrusions on which the user's clothing or accessories could be caught.

- *STABILITY*

In order to avoid injury from falling from the ladder, the ladder should withstand forces that could cause tipping.

The ladder should be designed so that it remains stable in the most unfavourable conditions of loading and use. Consideration should be given for the practice of sideways working on stepladders.

Consideration should also be given to the provision of stabiliser bars to improve sideways stability.

- *FOLDING MECHANISMS*

Folding products should be equipped with a durable locking mechanism, which may consist of one or more locking devices in order to preclude hazards of entrapment, shearing and crushing, falls and other injuries.

2 - TECHNICAL IMPROVEMENTS.

In addition to what is already included in EN 131 –1 and –2 the following improvements should be considered :

- *Loading Test*

There is a need for a reliable loading test for ladders, involving the whole ladder as well as individual components such as rungs, in the as used condition. This should allow a margin for heavy individuals, a load carried and an impact effect.

- *Durability*

Durability must be considered for ladder products consistent with actual use.

- *Stepstools*

Stepstools must be incorporated into the Standards.

- *Hinged Articulated ladders*

Hinged Articulated ladders must be included in the Standards.

- *Fibreglass*

The section on Fibreglass ladders must be made more meaningful in the Standards.

- *Accessories*

The relationship of ladders to accessories must be covered in the Standards.

- *Loft Ladders*

The Standards should embrace Loft ladders.

- *Ladder Classes*

The Standards should be set up to include more than one class of ladder dependent on the use.

It is accepted that requirements for ladders in industrial use differ from those for consumers and between the two there is a range of uses.

It is accepted that industry has a duty to provide employees with tools suitable for the task in hand. This is controlled through legal frameworks.

No provision is made in the current single class European standards for products that require a heavier duty rating than the minimum loading of 150 Kg (“maximum vertical static load”).

This needs addressing. Currently member countries overcome this shortfall by having separate national standards, in some cases supported by legal frameworks. Dimensional changes are also required to accommodate the needs of professional workers in some countries because of the protective workwear necessary in different climates.

It is acknowledged that there are ladders on the market in many EU countries which have a lower duty rating than EN 131. A need therefore exists to create another class for these products to ensure their safety.

In the Mandate, Minimum Safe Loadings shall be incorporated in the Standard consistent with the Class of Ladder.

Currently the **European Standard** is a single classification standard which: -

“in the working position all ladders are determined for a maximum static load of 150kg”

In the **American ANSI** Standard for portable ladders there are four classes of ladder, designed for four duty classifications

		<i>Working Load</i>	
<i>Duty Rating</i>	<i>Ladder Type</i>	<i>Pounds</i>	<i>Kilograms</i>
Extra heavy duty	IA	300	136
Heavy duty	I	250	114
Medium duty	II	225	102
Light duty	III	200	90

In the **Australian/New Zealand Standard AS/NZS 1892** there are two classes which dictate minimum loading requirements:

<i>Classification</i>		<i>Load Rating (Kilograms)</i>
Industrial	(a)	Min 120
Domestic	(b)	Min 100

However, provision is made for ladders to be rated at **higher than the minimum** and in such cases the Standard provides for different test levels for ratings up to 160kg.

In the **Belgian Standard NBN I08-001** a single classification exists.

In the **British Standards BS 2037 and BS 1129** there are three classes (BS EN 131 approximates to Class2):

<i>Duty Rating</i>	<i>Classification</i>	<i>Duty Rating Kg</i>
Industrial	Class 1	130
Light Trades	Class 2	110
Domestic	Class 3	95

In the UK, the “*Domestic*” class of ladder, with a lower duty rating and generally lower cost than the European standard product has achieved by far the greatest distribution over many years. Independent studies have convinced the British Standards committee that the domestic class of ladders is fit for purpose.

In **British Standards BS 7377** Stepstools there are two grades:

<i>Duty Rating</i>	<i>Classification</i>	<i>Duty Rating Kg</i>
General Domestic and light commercial use	Grade G	100
More Severe domestic and commercial use	Grade H	120

In **British Standards BS 7377** Loft Ladders there are two grades:

<i>Duty Rating / Use</i>	<i>Classification</i>	<i>Duty Rating Kg</i>
For relatively low frequency and non-onerous conditions of use and storage	Grade G	100
For relatively high frequency and non-onerous conditions of use and storage	Grade H	120

In the **Canadian Standard CAN3-Z11-M81** there are three classes:

<i>Grade</i>	<i>Projected Use</i>	<i>Load Rating</i>
1	Construction and Industrial	Heavy
2	Tradesman & Farm	Medium
3	Household	Light

In Holland the **Dutch Standard NEN 2484** contains a single classification.

3 - REFERENCES AND BIBLIOGRAPHY

- ***Baker J., Jameson C.***

Consumer Safety Research: Analysis of accidents involving ladders and stepladders

Department of Trade and Industry, London, 1986

- ***de Winter P.E., Vrouwenvelder A.C., Bruggers J.***

Act Decree on portable climbing equipment: amendment to test load

Amsterdam, Consumer Safety Institute, 1993

- ***de Winter P.E., Vrouwenvelder A.C.***

Structural engineering concepts applied to products Probability-based design and test loads for ladders.

International Journal for Consumer Safety 1994 Vol 1 No 3

- ***Lawrence, Hopkinson N., Norris B.J., Wilson J.R.***

Consumer Safety Research: Assessment of the safety of stepladders

London, Department of Trade and Industry, June 1996 DTI/Pub2685/5K/3/97/R

- ***Page M.***

Research into the dynamic circumstances surrounding domestic ladder use

In : Proceeding of the International Conference on Product Safety Research, Amsterdam, 22-23 November 1993

Amsterdam, ECOSA, 1993

- ***Which?*** March 1986

Step up

- ***Which?*** April 1992

Ladders on test

- ***Which?*** July 1993

Stepping up safely

- ***ANON.*** Stepping up safely. *Staying Alive.* 1996 Autumn, 1 1

- ***COHEN, H.H. and L. LIN.*** A scenario analysis of ladder fall accidents.

Journal of Safety Research. 1991, **2231-9**.

- **COHEN, H.H. and L. LIN.** A retrospective Case-Control Study of Ladder Fall Accidents. *Journal of Safety Research*. 1991
- **Department of Trade and Industry, C.S.** The stepladder user's guide. DTI/Pub 2423/200K/9/96/R URN 96/778
- **Department of Trade and Industry, C.S.** The ladder user's handbook: DTI/Pub 1531/550K/3.95/NP URN 95/577
- **The General Product Safety Regulations 1994** Guidance for Businesses, Consumers and Enforcement Authorities

Department of Trade and Industry, C.S.U.

DTI/Pub 1782/10K/2/96/R URN 95/696

- Commission de la sécurité des consommateurs

Echelles: fiche pratique et avis de la Commission

Paris, Commission de la sécurité des consommateurs, février 1993

- European Committee for Standardization

Ladders: requirements, testing, marking

Brussels, CEN, 1993

- Hitchcock D., Stroud P., Cooper S.

Ladders: a survey of uses, usage and accidents

London, Trade and Industry, 1989

- Onderzoeks- en Informatiecentrum van de Verbruikersorganisaties OIVO

Ladders en trapladders

Brussels, OIVO, 1993

- Poyner B.

Accidents on stairs and ladders: an in-depth study

London, The Tavistock Institute of Human Relations, 1980

- RoSPA bulletin 15(1985)8(August)

Portable aluminium ladders, steps, tresles and lightweight stagings

- Trump J.

An analysis of accidents involving falls from ladders and stepladders. Department of Trade and Industry, London, 1983

Comparative Testing

- Choice, January 1988

Step and step extension ladders

- Choice, January 1997

One step up?

- Choice, December 1997

A big step up

- Consumentengids, September 1992

Bezint eer ge aan een keukentrapje begint

-

- Consumentengids, January 1991

Veiligheid trappen en ladders onvoldoende gecontroleerd

- Consumer reports 55, September 1990

Safe choices in stepladders

- Koopkracht 21, February 1991

Sterkte huishoudtrappen laat te wensen over

- Stichting Vergelijkend Warenonderzoek SVWO

Ladders en trappen

Den Haag: SVWO, 1991

- Test-aankoop magazine, September 1986

Tot in de hemel?