BS EN 517:2006

Prefabricated accessories for roofing — Roof safety hooks

The European Standard EN 517:2006 has the status of a British Standard

ICS 91.060.20

BSI British Standards

National foreword

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The UK participation in its preparation was entrusted by Technical Committee B/542, Roofing and cladding products for discontinuous laying, to Subcommittee B/542/1, Slating and tiling, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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Prefabricated accessories for roofing - Roof safety hooks

Accessoires préfabriqués pour couverture - Crochets de sécurité

Vorgefertigte Zubehörteile für Dacheindeckungen - Sicherheitsdachhaken

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Foreword

This document (EN 517:2006) has been prepared by Technical Committee CEN/TC 128 “Roof covering products for discontinuous laying and products for wall cladding”, the secretariat of which is held by IBN/BIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2006, and conflicting national standards shall be withdrawn at the latest by August 2006.

This document supersedes EN 517:1995.

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

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

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1 Scope

This document applies to roof safety (building products) situated on the surface of pitched roofs and permanently fixed to the load-bearing roof construction. They are intended for the attachment of slaters' ladders, for supporting working platforms and as anchorage points to which personal protective equipment against falls or for restraint are attached.

It specifies essential dimensions, materials to be used, requirements with respect to the load-bearing capacity, of the roof safety hooks fastened to the roof construction including their fastening system and the extent of testing.

This document does not apply to installations which are used exclusively as anchorage points to which personal protective equipment against falls or for restraint are attached (see EN 795).

2 Normative references

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

EN 355, *Personal protective equipment against falls from a height — Energy absorbers*

EN 364, *Personal protective equipment against falls from a height — Test methods*

EN ISO 1140, *Fibre ropes — Polyamide — 3-, 4- and 8-strand ropes (ISO 1140:2004)*

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods (ISO 1461:1999)*

3 Terms and definitions

For the purpose of this document, the following definitions apply.

3.1
roof safety hook
building product on a pitched roof surface used for securing persons and fixing loads predominantly used for the maintenance and repair of roof coverings

3.2
fastening system
combination of products which fasten the roof safety hooks to the load-bearing roof construction

3.3
load-bearing roof construction
part of the roof construction which is able to carry potential loads and to transmit them into the building structure

4 Symbols

a hook opening

h hook height

R lanyard

P test load

5 Materials

Roof safety hooks and their fastening systems shall be of metal and be resistant to corrosion as well as to atmospheric and climatic influences. The material shall be free from faults and inclusions which may impair their performance abilities.

The corrosion resistance shall be at least equivalent to that of hot-galvanized steel with a protective layer of 50 μm as in EN ISO 1461.

Parts of the fastening system beneath the roof covering may be from timber and shall then be protected against atmospheric and climatic influences.

6 Dimensions and construction requirements

6.1 General

Roof safety hooks are installations for creating higher workplaces by securing a slater's ladder or by attaching working platforms. They can simultaneously be used as anchorage points for personal protective equipment against fall or for restraint.

The type and size of the fastening system shall be specified by the manufacturer.

6.2 Roof safety hooks

Roof safety hooks are differentiated as follows (see Figure 1):

— Type A: Roof safety hooks designed to accept tensile forces in the direction of the slope of the roof (*y-axis*).

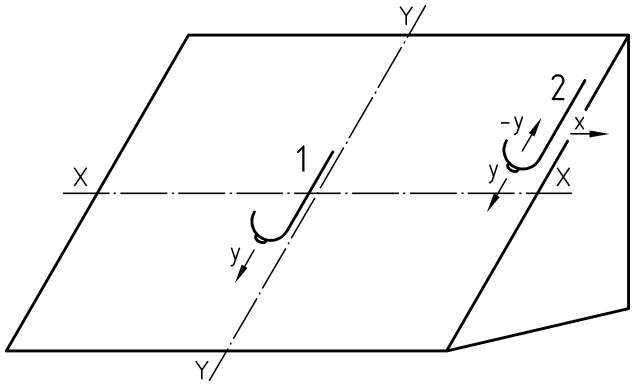
— Type B: Roof safety hooks designed to accept tensile forces in the direction of the slope of the roof (*y-axis*), in the opposite direction (*y-axis*) as well as in the perpendicular direction and parallel to the roof surface (*x-axis*).

Roof safety hooks shall have an opening of not less than 80 mm and not more than 150 mm, see Figure 2. The height h of the hook shall be at least 120 mm.

A closed loop with an opening of at least 20 mm $\times$ 40 mm, e.g. a closed eyelet welded on (see Figure 2), to which personal protective equipment against falls or for restraint may be attached, shall be fitted to the hook base.

Where roof safety hooks are fastened by nails to the load-bearing roof construction, at least three radially grooved nails (6,0 mm x 80 mm or 5,0 mm x 70 mm) shall be used.

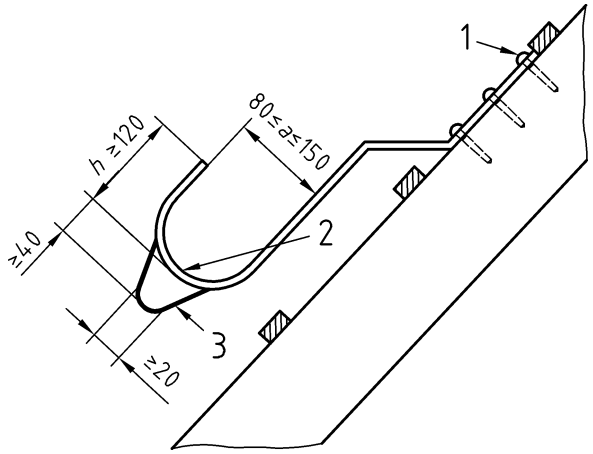
The load-bearing capacity of all fastener systems shall be proved by testing according to Clause 7.



Key
1 Type A
2 Type B

Figure 1 — Roof safety hooks, types

Dimensions in millimetres



Key
1 Fastening system
2 Hook base
3 Loop

Figure 2 — Roof safety hook (example)

7 Requirements

7.1 Static load in the hook base

Roof safety hooks including their fastenings shall be designed for a single load of $F_v \geq 1{,}5$ kN in the direction of the *y-axis* in the hook base, see Figure 2.

Compliance with the requirements shall either be proved by means of a static calculation or, if this is not possible, the product shall be tested according to 8.1.2.

NOTE For further calculations see ENV 1993 and ENV 1999.

Under this load the distortion shall not be more than 5 mm in the direction of the *y-axis*.

The deflections and deviations shall be measured relative to the load-bearing roof construction.

7.2 Static load in the anchorage point

Roof safety hooks of Type A including their fastenings shall be designed to accept a single static load at the anchorage point of F_{y2} = 10 kN in the direction of the *y-axis*.

Roof safety hooks of Type B including their fastenings shall be designed to accept a single static load at the anchorage point of F_{y} = 10 kN in the direction of the *y-axis* (both directions) as well as a single static load of F_{t2}= 10 kN in the direction of the *x-axis*.

Compliance with the requirements shall either be proved by means of a static calculation or, if this is not possible, the product shall be tested according to 8.1.3.

The indicated single loads are test loads which shall at least be specified.

NOTE For further calculations see ENV 1993 and ENV 1999.

The roof safety hooks and their fastenings shall not fail under the single loads as indicated, the single loads shall be held safely.

7.3 Fatigue strength

Roof safety hooks including their fastenings shall be designed to withstand the dynamic load of the test according to 8.2 at any point where it is possible to attach personal protective equipment against fall or for restraint (anchorage point).

7.4 Reaction to fire and external fire performance

Installations (safety hooks) covered by this document are reaction to fire Class A1 without the need for testing[1)] and are deemed to satisfy external fire performance requirements[2)].

8 Testing

8.1 Static load

8.1.1 Number of specimens

Each test shall be made once each on three different specimens. All specimens shall pass the tests.

8.1.2 Test in the hook base

The specimens (roof safety hooks) shall be fastened to the simulation of the load-bearing roof construction according to the instructions of the manufacturer.

The test load of 1,5 kN shall be applied within one minute and maintained for a period of five minutes.

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1) See Commission Decision 96/603/EC as amended by Commission Decision 2000/605/EC.

2) See Commission Decision 2000/553/EC.

The deformation shall be measured under the test load of 1,5 kN and shall not deflect more than 5 mm in direction of the force.

The test load is then increased to 1,5 kN x 1,7 kN = 2,6 kN for a further minute. In case of the maximum load of 2,6 kN the functioning of the specimen and its fastening shall not be impaired.

NOTE The value of 1,7 is a safety factor.

8.1.3 Test at the anchorage point

Apply a static test load of F_{y2} = 10 kN to the anchorage point for protective equipment against falls or for restraint in the direction of use (direction of *y-axis*) for roof safety hooks.

Apply an additional static test load of F_{y2} = 10 kN in the direction of the negative *y-axis* and in the direction of the *x-axis* for roof safety hooks of Type B. The test loads in the y-direction and x-direction are applied to different specimens.

Neither the roof safety hook nor the fastening shall become loose, and the test load shall be held safely.

8.2 Test of fatigue strength

Roof safety hooks shall additionally be tested in accordance with the requirements of 7.3.

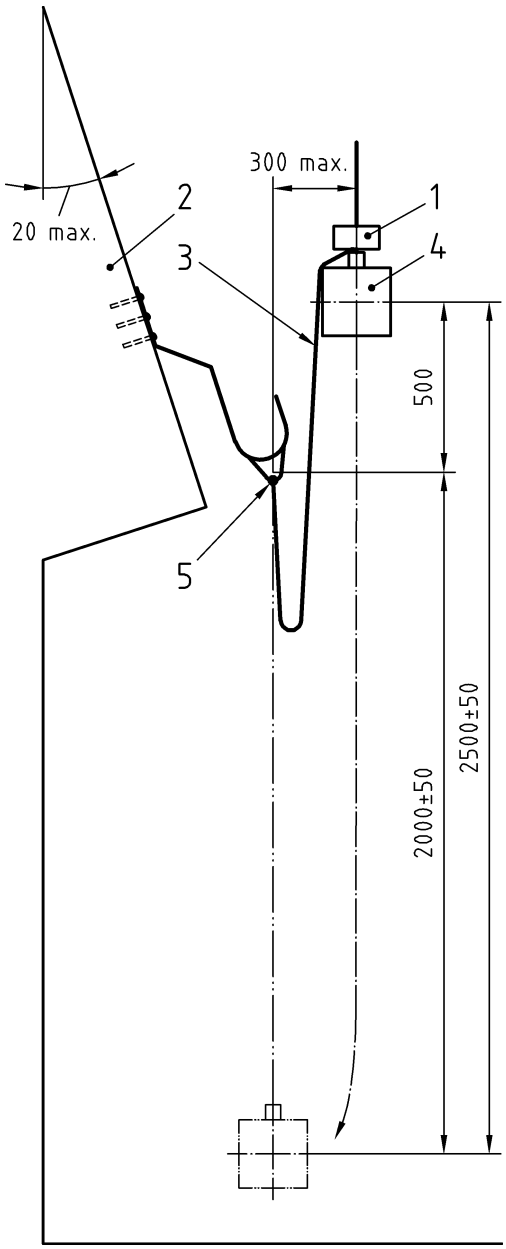
Three test specimens shall be submitted to a drop test (see Figure 3).

The test specimens shall be fixed by their fastening systems to a simulation of the load-bearing roof construction in a position between 70° and 90° from the horizontal.

The load and deflection criteria of the drop test shall conform to EN 364.

For the test, a hawser laid polyamide lanyard of three strands and of 12 mm diameter according to EN ISO 1140 shall be used.

Dimensions in millimetres



Key
1 Rapid release
2 Roof construction
3 Lanyard
4 Drop mass
5 Anchorage point

Figure 3 — Dynamic test (fatigue strength)

An eye of (75 ± 10) mm size shall be spliced into each end of the lanyard with splices of 5 full tucks and equipped with karabiners. The effective length of the lanyard measured under a load of (40 ± 5) N shall be (2 000 ± 50) mm.

One end of the lanyard shall be attached to the anchorage point of the test specimen. At the other end of the lanyard a drop mass of (100 ± 1) kg and (200 ± 2) mm in diameter shall be fastened.

The drop mass shall be suspended at a maximum horizontal distance of 300 mm from the anchorage point of the lanyard and a vertical distance of 500 mm from that point by means of a quick release device. Release the drop mass which will fall freely through (2 500 ± 50) mm before the lanyard arrests the fall.

Observe any deformations and deflections of the test specimen and its fastenings, and the test load shall be supported safely.

9 Evaluation of conformity

9.1 General

The conformity of roof safety hooks to the requirements of this document and with the stated values (including classes) shall be demonstrated by:

— initial type testing; and

— factory production control by the manufacturer, including product assessment.

Roof safety hooks, which differ only in aspects that do not influence the properties required in this document, may be collected into product groups.

Providing that a roof safety hook within the group meets the requirements of this document, then all products within the same group shall be assumed to conform. If the same roof safety hook fails to conform, then the whole group shall be assumed to have failed to conform to this document.

Roof safety hooks, which differ only with regard to some properties, may be grouped together for these common properties. Providing that a product within this defined group meets the requirements of this document, then all products within the group shall be assumed to conform for the properties concerned. The properties outside the common group shall be tested product by product, unless included in a group for one or more of these properties.

9.2 Initial type testing

9.2.1 General

Initial type testing shall be performed to demonstrate conformity with this document. Tests previously performed in accordance with the provisions of this document (same product, same characteristic(s), test method, sampling procedure, system of attestation of conformity etc.) may be taken into account. In addition, initial type testing shall be performed at the beginning of the production of a new permanently fixed roof ladder type (unless a member of the same group) or at the beginning of a new method of production (where this may affect the stated properties).

All characteristics in Clause 7 requiring testing shall be subject to initial type testing. The results of all type tests shall be recorded and held by the manufacturer for at least 10 years after the date of last production of the products to which they apply.

Whenever a change occurs in the installations for roof access, the raw material or supplier of components, or the production process (subject to the definition of a group), which would change significantly one or more of the characteristics, the type tests shall be repeated for the appropriate characteristic(s).

9.2.2 Test report

The test report shall make reference to this document and shall include the following information:

a) name of the sponsor;

b) standard designation of the product according to Clause 11;

c) number of static and dynamic tests passed and failed;

   1) static tests, largest single value and arithmetic mean of deflections as result of the static test effected by the test load;

   2) dynamic test, test weight, if applicable.

d) other changes resulting from the test load and general assessment of the product;

e) name of the test institute and date.

9.3 Factory production control

9.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market conform to the stated performance characteristics. The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

An FPC system conforming to the requirements of EN ISO 9001 and made specific to the requirements of this document, is considered to satisfy the above requirements.

The results of inspections, tests or assessments requiring action shall be recorded, as shall any action taken. The action to be taken when control values or criteria are not met shall be recorded.

Products shall be tested and/or evaluated with a frequency sufficient to ensure that all products meet the requirements of this document.

9.3.2 Equipment

All measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

9.3.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their conformity.

9.3.4 Non-conforming products

In the event of any non-conformity of any product claiming to conform to this document, that product shall be separated and action taken to rectify the cause of non-conformity. Products shall not subsequently be despatched until the problem has been solved.

9.3.5 Design process

The factory production control system shall document the various stages in the design of products, identify the checking procedure and those individuals responsible for all stages of design.

During the design process itself, a record shall be kept of all checks, their results, and any corrective actions taken. This record shall be sufficiently detailed and accurate to demonstrate that all stages of the design phase, and all checks, have been carried out satisfactorily.

10 Instructions for mounting and use

The manufacturer of roof safety hooks shall provide instructions for the mounting and use of his products. They shall include all safety relevant information for storage, mounting and use of the products and the fastenings to be applied and shall be written in the language or languages in the country where the products are to be used.

The manufacturer shall specify that the roof safety hooks were tested according to this document and that they are only provided for the use by a single person with an energy absorber according to EN 355.

As to roof safety hooks the manufacturer shall specify that the installation shall be inspected every twelve months by a competent person, and that it shall be maintained if deemed necessary by the manufacturer.

11 Designation

Roof safety hooks shall be designated with the applicable classification according to the type and the number of this document, i.e. EN 517.

EXAMPLE Roof safety hook of Type A: EN 517 — A

12 Marking

Products conforming to this document shall be clearly, visibly, legibly and indelibly marked, with the following information:

— product name;

— name or identifying mark and address of the manufacturer or authorised representative;

— traceability code;

— designation code;

— intended use (roof safety hook for inclined roofs of buildings).

Where and in so far as the marking requirements of ZA.3 cover the same information as this clause, the requirements of this clause are met.

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Directives

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under a mandate M/122 “Roof coverings, rooflights, roof windows and ancillary products” given to CEN by the European Commission and the European Free Trade Association.

The clauses of this European Standard shown in this annex meet the requirements of the mandate given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the roof safety hooks covered by this annex for the intended uses indicated herein; reference shall be made to the information accompanying the CE marking.

WARNING — Other requirements and other EU Directives, not affecting the fitness for intended uses, can be applicable to the roof safety hooks falling within the scope of this European Standard.

NOTE In addition to any specific clauses relating to dangerous substances contained in this standard, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply. *An informative database of European and national provisions on dangerous substances is available at the Construction web site on EUROPA (accessed through http://europa.eu.int/comm/enterprise/construction/internal/dangsub/dangmain.htm).*

This annex establishes the conditions for the CE marking of the roof safety hooks intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable.

The scope of this annex is defined by Table ZA.1.

Table ZA.1 — Relevant clauses for roof safety hooks and intended use

Product: Roof safety hooks as defined in the Scope of this standard **Intended use:** Securing people and loads, on pitched roofs			
Essential characteristics	**Requirement clauses in this European Standard**	**Levels and/or classes**	**Notes**
Mechanical resistance	7.1, 7.2, 7.3		Load depends on type: Type A and Type B
Reaction to fire External fire performance	7.4	A1 B_{roof}	
Durability of mechanical resistance	Clause 4		

ZA.2 Procedure for attestation of conformity of roof safety hooks

ZA.2.1 System of attestation of conformity

The system of attestation of conformity of roof safety hooks indicated in Table ZA.1, in accordance with the Decision of the Commission 98/436/EC of 1998-07-06 as given in Annex III of the mandate for "Roof coverings, rooflights, roof windows and ancillary products", is shown in Table ZA.2 for the indicated intended use and relevant level or class.

Table ZA.2 — System of attestation of conformity

Product	Intended use	Level(s) or class(es)	Attestation of conformity system
Roof safety hooks	Attachment of slaters' ladders, for supporting working platforms and as anchorage points for personal protective equipment against fall for inclined roofs in buildings	A1 B_{roof}	3
System 3: See Directive 89/106/EEC (CPD) Annex III.2.(ii), Second possibility.			

The attestation of conformity of the roof safety hooks in Table ZA.1 shall be according to the evaluation of conformity procedures indicated in Table ZA.3 resulting from application of the clauses of this European Standard indicated therein.

Table ZA.3 — Assignment of tasks for evaluation of conformity

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks under the responsibility of the manufacturer	Factory production control (F.P.C)	Parameters related to all relevant characteristics of Table ZA.1	9.3
	Initial type testing by a notified test lab	All characteristics of Table ZA.1 requiring testing	9.2

ZA.2.2 Declaration of conformity

When compliance with the conditions of this annex is achieved, the manufacturer or his agent established in the EEA shall prepare and retain a declaration of conformity (EC Declaration of conformity), which entitles the manufacturer to affix the CE marking. This declaration shall include:

— name and address of the manufacturer, or his authorised representative established in the EEA, and place of production;

NOTE 1 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

— description of the product (type, identification, use, …), and a copy of the information accompanying the CE marking;

NOTE 2 Where some of the information required for the Declaration is already given in the CE marking information, it does not need to be repeated.

— provisions to which the product conforms (i.e. Annex ZA of this EN) and a reference to the ITT report(s) and factory production control records, as appropriate;

— particular conditions applicable to the use of the product, (e.g. provisions for use under certain conditions);

— name and address of the notified laboratory(ies);

— name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or his authorised representative.

This declaration shall be presented, if requested, in the language or languages accepted in the country of use of the product.

ZA.3 CE marking and labelling

The manufacturer or his authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EC and shall be shown on the roof safety hooks (or when not possible it may be on the accompanying label, the packaging or on the accompanying commercial documents e.g. a delivery note). The following information on the product and its essential characteristics shall accompany the CE marking symbol:

— name or identifying mark and registered address of the producer;

— the last two digits of the year in which the marking is affixed;

— reference to this European Standard;

— description of the product: traceability and designation codes and intended use (the fastening system specified in the installation instructions).

Figure ZA.1 gives an example of the information to be given on the product, label, packaging and/or commercial documents.

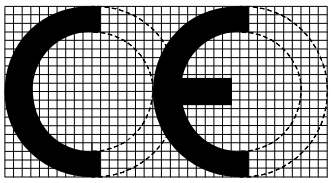
	*CE conformity marking, consisting of the "CE"-symbol given in Directive 93/68/EEC*
Manufacturer Country **06**	*Name and address of the manufacturer or his authorised representative within the EEA and of the production place of the product* *Last two digits of the year in which the marking was affixed*
EN 517 — A Attachment of slaters' ladders and as anchorage points for inclined roofs in buildings, P004	*Number of this European Standard and designation* *Intended use and traceability code*

Figure ZA.1 — Example CE marking information

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

NOTE European legislation without national derogations need not be mentioned.

Bibliography

[1] EN 795, *Protection against falls from a height — Anchor devices — Requirements and testing*

[2] EN 1993-1-1, *Eurocode 3: Design of steel structures – Part 1-1: General rules and rules for buildings*

[3] EN 1999-1-1, *Eurocode 9: Design of aluminium structures – Part 1-1: General rules – General rules and rules for buildings*

[4] EN ISO 9001, *Quality management systems — Requirements (ISO 9001:2000)*

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