

# INTERNATIONAL STANDARD

# ISO 7597

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## Forged steel lifting hooks with latch, grade 8

*Crochets de levage forgés en acier avec loquet, classe 8*



Reference number  
ISO 7597:2013(E)

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. [www.iso.org/directives](http://www.iso.org/directives)

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. [www.iso.org/patents](http://www.iso.org/patents)

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 111, *Round steel link chains, chain slings, components and accessories*, Subcommittee SC 3, *Components and accessories*.

This second edition cancels and replaces the first edition (ISO 7597:1987), which has been technically revised.

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## Introduction

The hooks covered by this International Standard are normally supplied to be part of a sling, but they can also be used for other applications. In such instances, it is important that the hook design is checked to ensure its fitness for the intended use.

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# Forged steel lifting hooks with latch, grade 8

## 1 Scope

This International Standard specifies requirements for forged steel lifting hooks with latch of grade 8 having eye or clevis and pin up to 63 t working load limit (WLL), mainly:

- for use in chain slings according to ISO 4778 and ISO 7593;
- for use in steel wire rope slings according to ISO 7531;
- for use in textile slings;
- intended for lifting objects, materials or goods.

This International Standard does not apply to hand forged hooks.

[Annex A](#) gives the bases for calculation of hook dimensions.

[Annex B](#) gives an example of a designation system for hooks of grade 8.

## 2 Normative references

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

ISO 8539:2009, *Forged steel lifting components for use with Grade 8 chain*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8539 apply.

## 4 Safety requirements

### 4.1 Design

The articulation and relative movement shall be in accordance with 4.1 of ISO 8539:2009.

NOTE The form of the hook is not specified in detail. For example, a minimum value of dimension  $F$  (see [Figure 1](#)) as measured in any direction is specified so that the eye of the hook can accommodate a pin, but the eye of the hook need not be circular.

The form of the upper end shall be either of the eye type or the clevis type as designated in [Table 1](#) and [Figure 1](#).

Each hook shall have a spring-loaded latch conforming to [4.6](#) to ensure that the load cannot become accidentally unhooked.

Table 1 — Forms of hook

Form	Description	Principal use
E	Eye type	Chain slings, wire rope slings and textile slings
C	Clevis type	Mechanically assembled chain slings

## 4.2 Dimensions

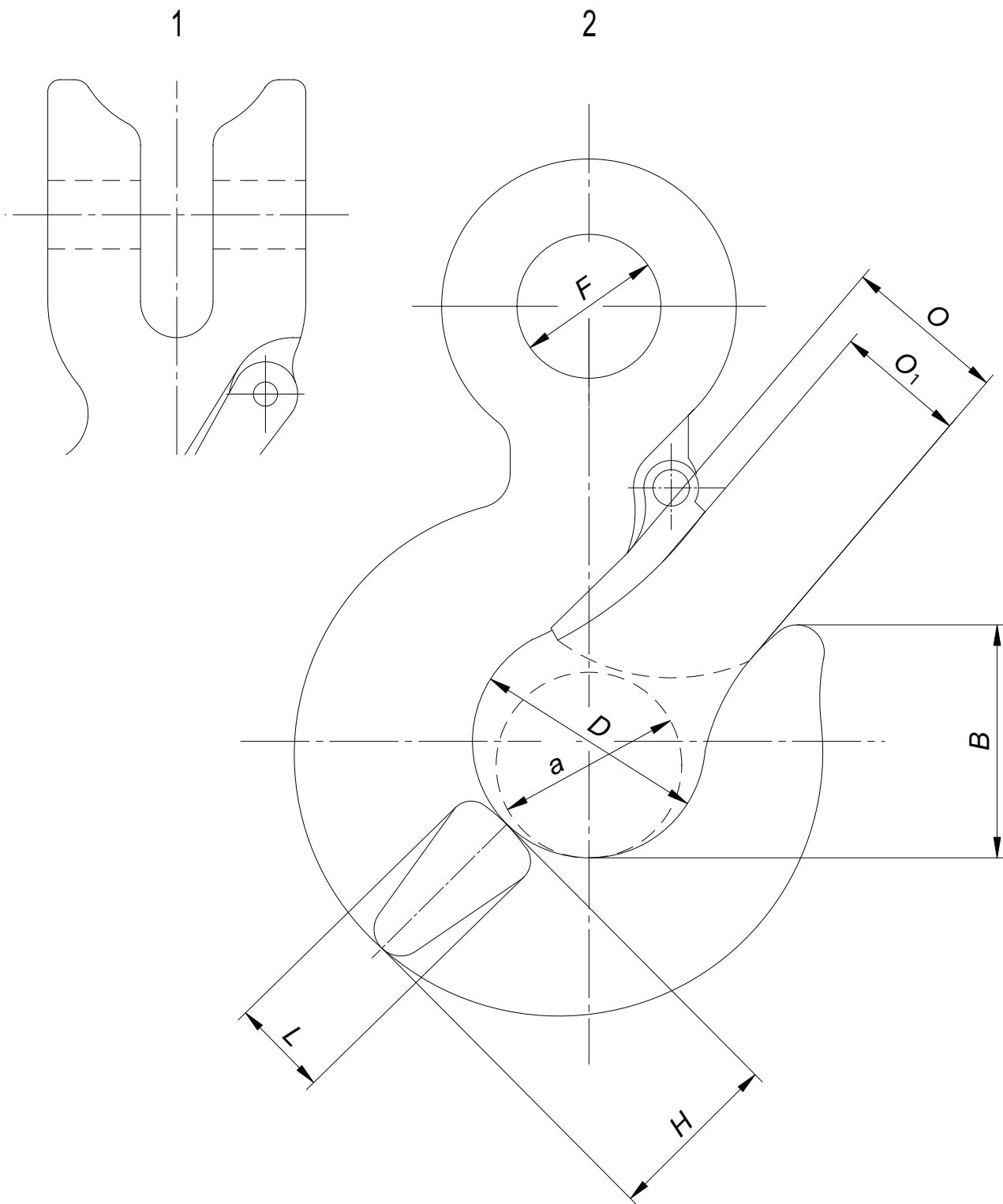
The principal dimensions of the hooks shall conform to [Table 2](#), in which the hook dimensions are related to the working load limit.

NOTE To meet the articulation and relative movement requirement when directly connected in wire rope slings and textile slings, dimension  $F$  will need to be larger than the minimum value given in [Table 2](#).

In addition, the following requirements shall be met:

- a) the actual point height,  $B$ , shall be equal to or greater than the full throat opening  $O$  (see [Figure 1](#));
- b) the full throat opening,  $O$ , shall not exceed 95 % of the actual seat diameter  $D$ ;
- c) the hook latch shall be capable of closing over the maximum diameter of bar (figure footnote a), as indicated in [Figure 1](#), that can be admitted through the actual throat opening  $O_1$ .





**Key**

- 1 clevis type
- 2 eye type
- a Maximum diameter of bar.

**Figure 1 — Dimensions of hooks**

**Table 2 — Dimensions of hooks (see [Figure 1](#))**

Code number	Working load limit (WLL) t	<i>D</i> min. mm	<i>O</i> min. mm	<i>O</i> <sub>1</sub> min. mm	<i>F</i> min. mm	<i>H</i> max. mm	<i>L</i> max. mm
3	0,25	11	8	8	6	12	8
4	0,5	15	11	11	8	17	11
5	0,8	19	14	14	10	21	14
6	1,12	22	17	16	12	25	17
7	1,5	26	20	18	14	29	20
8	2	30	23	21	16	34	23
9	2,5	34	26	24	18	38	26
10	3,15	38	29	27	20	43	29
11	3,75	42	32	30	23	48	32
13	5,3	49	37	35	26	55	37
14	6	52	40	37	28	59	40
16	8	60	46	43	32	68	46
18	10	67	51	48	36	76	51
19	11,2	71	54	51	38	80	54
20	12,5	75	57	53	40	85	57
22	15	82	63	58	44	93	63
23	16	85	65	60	46	96	65
25	20	95	72	68	51	107	72
26	21,2	98	75	70	52	111	75
28	25	106	81	76	57	120	81
32	31,5	119	91	85	64	135	91
36	40	134	102	96	72	152	102
40	50	150	115	107	81	170	115
45	63	168	129	120	90	190	129

**4.3 Materials and heat treatment**

Materials and heat treatment shall be in accordance with [4.2](#) and 4.3 of ISO 8539:2009.

**4.4 Manufacturing methods and workmanship**

Manufacturing methods and workmanship shall in accordance with 4.4 of ISO 8539:2009.

**4.5 Mechanical properties**

The mechanical properties shall conform to 4.5 of ISO 8539:2009.

#### 4.6 Hook latches

The latch shall engage in the point of the hook to form a complete closure of mating surfaces. With the hook in any orientation, the spring shall ensure that the latch is held positively in the closed position. Latches operated solely by gravity shall not be used.

The force required to fully open the latch should not exceed that which can be applied manually.

NOTE [Table 3](#) contains guidance on the minimum initial torque and maximum torque during latch opening necessary to fulfil these requirements, whilst ensuring that the force required to fully open the latch does not exceed that which can be applied manually.

**Table 3 — Torque values for latches — Guidance**

Code number		Minimum initial torque Nm	Maximum torque during opening Nm
from	up to and including		
3	5	0,05	0,1
6	7	0,1	0,2
8	10	0,2	0,4
11	14	0,3	0,6
16	18	0,75	1,5
19	23	1	2
25	28	2	4
32	45	3,5	7

The spring shall be constructed from corrosion protected material and shall be able to withstand at least 10 000 complete openings of the latch without fracture.

The latch shall be able to withstand force  $F_1$ , applied across the width of the latch, equidistant between the point of the hook and the centre of rotation of the latch, and force,  $F_2$ , which shall be applied across the thickness of the latch laterally to  $F_1$  (see [Figure 2](#)). Both  $F_1$  and  $F_2$  shall be equivalent to 300 kg or 10 % of the working load limit of the hook, whichever is the greater, but  $F_2$  shall not exceed 20 kN.

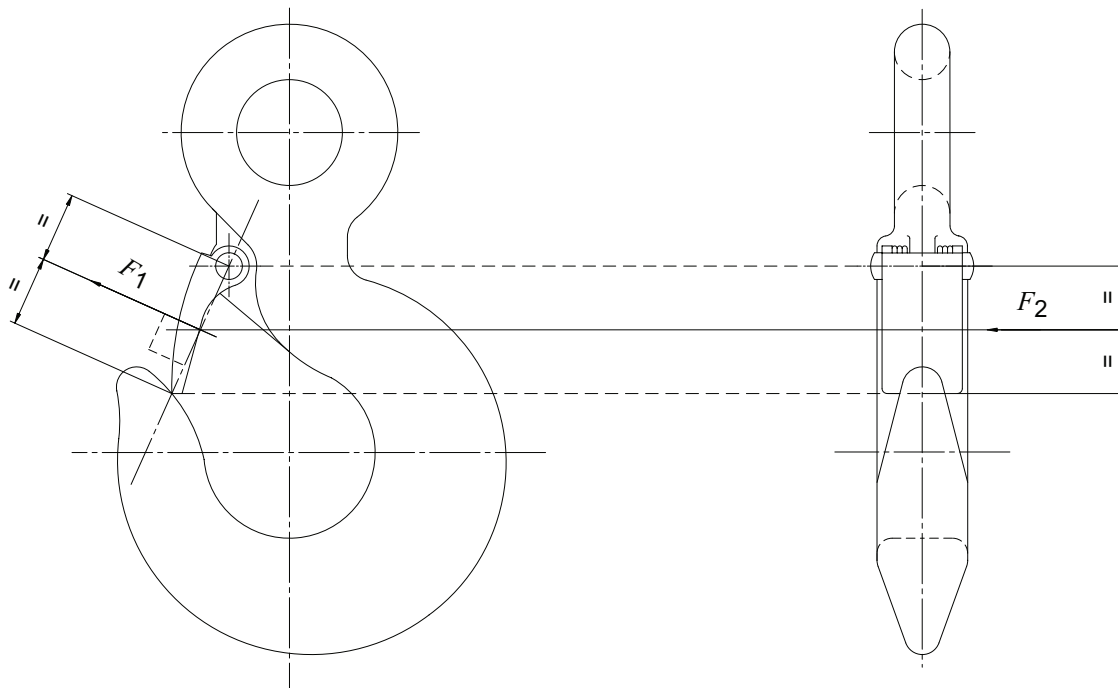


Figure 2 — Application of forces for type testing of the latch

## 5 Verification of safety requirements

### 5.1 Qualification of personnel

All testing and examination shall be carried out by a competent person.

### 5.2 Type tests

Type tests and acceptance criteria shall be in accordance with 5.2 of ISO 8539:2009.

In the tests specified in 5.2.3 to 5.2.5 of ISO 8539:2009, the force shall be applied to the hook axially, without shock, using a test fixture of diameter not greater than 60 % of the seat diameter,  $D$ , of the hook.

### 5.3 Manufacturing test regime and acceptance criteria

The manufacturing test regime and acceptance criteria shall be in accordance with 5.5 of ISO 8539:2009.

### 5.4 Hook latches

A type test (see 5.2 of ISO 8539:2009) to verify conformity to 4.6 shall be carried out on three sample latches for each size of hook. The test shall be carried out with the latches *in situ* or in a test fixture that accurately simulates the location of the latch and hook point. Forces  $F_1$  and  $F_2$  shall be separately applied as indicated in Figure 2. The latch shall show no permanent deformation following removal of the forces.

If any of the three samples fails the test, the latch of the size submitted for type testing shall be deemed not to conform to this International Standard.

## 6 Marking

Marking shall be in accordance with Clause 6 of ISO 8539:2009.

## 7 Manufacturer's declaration

The manufacturer's declaration shall conform to Clause 7 of ISO 8539:2009.

## 8 Instructions for use

The manufacturer shall provide specific instructions for use. The instructions for use shall accompany the hooks and shall advise on how to assemble and disassemble hooks, and how to ensure the correct fit of any pin.

## Annex A (informative)

### Bases for the calculation of hook dimensions

The dimensions given in [Table 2](#) are derived from the following formulae:

$$D = 21,2\sqrt{WLL} \quad (\text{A.1})$$

$$O = 16,2\sqrt{WLL} \quad (\text{A.2})$$

$$O_1 = 15,1\sqrt{WLL} \quad (\text{A.3})$$

$$F = 11,4\sqrt{WLL} \quad (\text{A.4})$$

$$H = 24\sqrt{WLL} \quad (\text{A.5})$$

$$L = 16,2\sqrt{WLL} \quad (\text{A.6})$$

where WLL is the working load limit.

The dimensions (in millimetres) are calculated using the WLL given in [Table 2](#) and rounded to the nearest whole number.

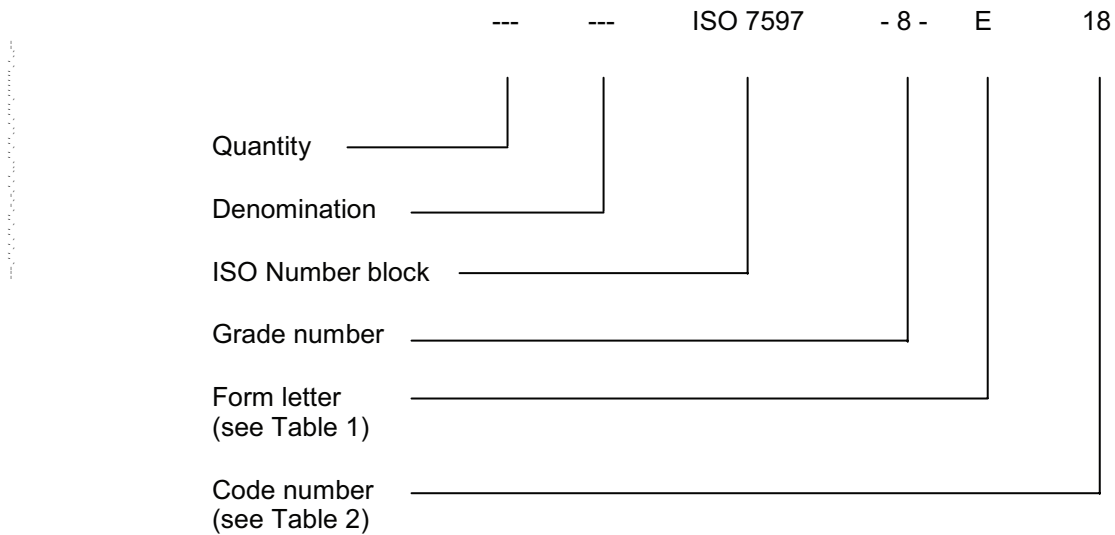
## Annex B (informative)

### Designation system for hooks — Grade 8

#### B.1 Designation

Designation of hooks should be in accordance with the general format given in B.2. The denomination of a hook should be determined by the manufacturer.

#### B.2 General format



## Bibliography

- [1] ISO 4778, *Chain slings of welded construction — Grades M (4), S (6) and T (8)*
- [2] ISO 7531, *Wire rope slings for general purposes — Characteristics and specifications*
- [3] ISO 7593, *Chain slings assembled by methods other than welding — Grade T(8)*



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