

INTERNATIONAL STANDARD

ISO
9714-1

First edition
1991-03-15

Orthopaedic drilling instruments —

Part 1:

Drill bits, taps and countersink cutters

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Instruments orthopédiques — Instruments de forage —

Partie 1: Tarauds, forets et fraises à lamer

ISO 9714-1:1991

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Reference number
ISO 9714-1:1991(E)

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9714-1 was prepared by Technical Committee ISO/TC 150, *Implants for surgery*.

ISO 9714 currently consists of the following part, under the general title *Orthopaedic drilling instruments*:

- Part 1: *Drill bits, taps and countersink cutters*

NOTE — Further parts will be prepared in due course.

Annexes A and B of this part of ISO 9714 are for information only.

Orthopaedic drilling instruments —

Part 1: Drill bits, taps and countersink cutters

1 Scope

This part of ISO 9714 specifies materials and mechanical properties, dimensions and marking requirements for drill bits, taps and countersink cutters made of stainless steel for use in orthopaedic surgery with bone screws as specified in ISO 5835.

NOTES

1 The interrelationship of International Standards dealing with bone screws, bone plates and relevant tools is shown for information in annex A.

2 At present only stainless steel has been considered as a material for manufacturing these instruments. Other materials and coatings may be included at a later revision.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9714. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9714 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5835:1991, *Implants for surgery — Metal bone screws with hexagonal drive connection, spherical under-surface of head, asymmetrical thread — Dimensions.*

ISO 7153-1:1983, *Instruments for surgery — Metallic materials Part 1. Stainless steel.*

3 Materials and mechanical properties

Drill bits, taps and countersink cutters shall be made from metal complying with the requirements given in ISO 7153-1, reference letter of steel grade: D, H, I and R.

4 Dimensions

4.1 Drill bits

The diameter of the drill bit shall be as given in table 1. The point angle shall be in the range 80° to 100°.

4.2 Taps

The core diameter and outside diameter shall be as given in table 1. The thread form and pitch shall be that of the appropriate screw as specified in ISO 5835.

4.3 Countersink cutters

The diameter of the pin and cutter head shall be as given in table 1 and figure 1. The cutter shall be either of conical form with an angle of 90° or of spherical form.

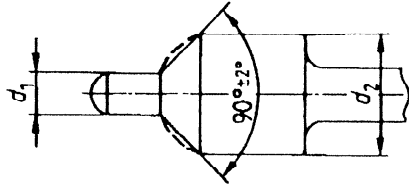


Figure 1 — Countersink cutter

5 Marking

5.1 Drill bits

Drill bits shall be marked with the diameter of the bit, expressed in millimetres.

5.2 Taps

Taps shall be marked with the code and nominal size of the screw, as specified in ISO 5835, with which they are intended to be used.

5.3 Countersink cutters

Countersink cutters shall be marked with the nominal sizes of the screw, as specified in ISO 5835, with which they are intended to be used.

Table 1 — Dimensions of drill bits, taps and countersink cutters

Dimensions in millimetres

Screws (These data are extracted from ISO 5835 and are given here for information.)				Drill bits		Taps ¹⁾			Countersink cutters	
ISO 5835 code	Nominal diameter	Core diameter	Pitch	Diameter of drill intended for drilling clearance hole	Diameter of drill intended for drilling pilot tapping hole	Outside diameter	Core diameter	Pitch	Pin diameter d_1	Cutter head diameter d_2
				0 0,02	0 -0,02	0 -0,15	0 -0,15		0 -0,1	
Screws with shallow thread:										
HA 1,5	1,5	1,1	0,5	1,5	1,1	1,5	1,1	0,5	1,1	4
HA 2	2	1,3	0,6	2	1,5	2	1,3	0,6	1,1	4
HA 2,7	2,7	1,9	1	2,7	2	2,7	1,9	1	2,5	6
HA 3,5	3,5	2,4	1,25	3,5	2,5	3,5	2,4	1,25	2,5	6
HA 4	4	2,9	1,5	4	3	4	2,9	1,5	2,5	6
HA 4,5	4,5	3	1,75	4,5	3,2	4,5	3	1,75	4,5	8
HA 5	5	3,5	1,75	5	3,7	5	3,5	1,75	4,5	8
Screws with deep thread:										
HB 4	4	1,9	1,75	Not applicable to HB screws	2	4	1,9	1,75	Not required for HB screws	
HB 6,5	6,5	3	2,75		3,2	6,5	3	2,75		
1) It is recommended that the maximum variation from the theoretical profile at any point on thread form should not exceed: <ul style="list-style-type: none"> — 0,050 mm for HA 1,5 and HA 2 — 0,075 mm for HA 2,7 to HA 5 — 0,075 mm for HB 4 and HB 6,5 										

Annex A

(informative)

Interrelationship of International Standards dealing with bone screws, bone plates and relevant tools

It has been decided that the set of International Standards dealing with bone screws, bone plates and relevant tools should be divided into two parallel series. The basis of the division into two series is the essentially different designs of the screw threads of the bone screws (HA and HB type screws as opposed to HC and HD type screws).


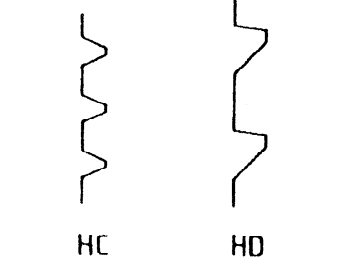

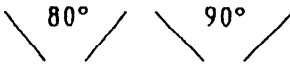

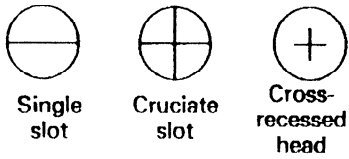


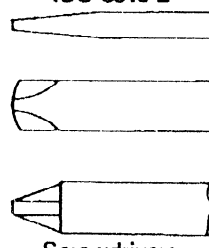
A simplified schematic guide illustrating the interrelationship between screws, plates and tools covered by the parallel series of International Standards is given on the following page.

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Screws	Thread	<p>ISO 5835</p>  <p>HA HB</p>	<p>ISO 9268</p>  <p>HC HD</p>
	Head under-surface	 <p>Spherical</p>	<p>80° 90°</p>  <p>Conical</p>
	Drive connection		 <p>Single slot Cruciate slot Cross-recessed head</p>
			<p>Combined drive connections</p>  <p>Single slot and cross-recessed head Cruciate slot and cross-recessed head</p>
	Mechanical requirements	<p>ISO 6475 Breaking torque/ angle of rotation</p>	In preparation
Plates	Holes and slots	<p>ISO 5836</p>	ISO 9269
	Mechanical requirements	ISO 9585	ISO 9585
Driving tools	Keys and screwdrivers	<p>ISO 8319-1</p>  <p>Hexagon keys</p>	<p>ISO 8319-2</p>  <p>Screwdrivers</p>
	Drill bits, taps, countersink cutters	ISO 9714-1	In preparation

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Annex B (informative)

Bibliography: International Standards referred to in table in annex A

- [1] ISO 5835:1991, *Implants for surgery — Metal bone screws with hexagonal drive connection, spherical under-surface of head, asymmetrical thread — Dimensions.*
- [2] ISO 5836:1988, *Implants for surgery — Metal bone plates — Holes corresponding to screws with asymmetrical thread and spherical under-surface.*
- [3] ISO 6475:1989, *Implants for surgery — Metal bone screws with asymmetrical thread and spherical under-surface — Mechanical requirements and test methods.*
- [4] ISO 8319-1:1986, *Orthopaedic instruments — Drive connections — Part 1: Keys for use with screws with hexagon socket heads.*
- [5] ISO 8319-2:1986, *Orthopaedic instruments — Drive connections — Part 2: Screwdrivers for single slot head screws, screws with cruciate slot and cross-recessed head screws.*
- [6] ISO 9268:1988, *Implants for surgery — Metal bone screws with conical under-surface of head — Dimensions.*
- [7] ISO 9269:1988, *Implants for surgery — Metal bone plates — Holes and slots corresponding to screws with conical under-surface.*
- [8] ISO 9585:1990, *Implants for surgery — Determination of bending strength and stiffness of bone plates.*
- [9] ISO 9714-1:1991, *Orthopaedic drilling instruments — Part 1: Drill bits, taps and countersink cutters.*

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