# INTERNATIONAL STANDARD

ISO 9269

First edition
1988-12-01

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
ORGANISATION INTERNATIONALE DE NORMALISATION
МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

# Implants for surgery — Metal bone plates — Holes and slots corresponding to screws with conical under-surface



*Implants chirurgicaux — Plaques métalliques pour os — Chambrages et alésages pour vis à embase conique*



Reference number
ISO 9269 : 1988 (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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.



International Standard ISO 9269 was prepared by Technical Committee ISO/TC 150, *Implants for surgery.*



This first edition of ISO 9269 cancels and replaces the first edition of ISO 5836-4 : 1984, of which it constitutes a minor revision.

Annexes A and B of this International Standard are for information only.



Printed in Switzerland

# Implants for surgery — Metal bone plates — Holes and slots corresponding to screws with conical under-surface

## 1 Scope

This International Standard specifies the dimensions and tolerances of holes and slots in bone plates used as surgical implants so as to facilitate correct fixing using screws complying with ISO 9268.

NOTES

1 This International Standard does not deal with the shape and dimensions of the plates or with the spacing (centre-to-centre distance) of the holes and slots.

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



## 2 Normative reference



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

ISO 9268 : [1], *Implants for surgery — Metal bone screws with conical under-surface of head — Dimensions.*

## 3 Dimensions and tolerances

### 3.1 Holes and slots in bone plates for use with screws of 2,9 mm nominal diameter (HC2,9 screw in accordance with ISO 9268)

Holes and slots in plates for HC2,9 screws shall be in accordance with figures 1 and 2 and table 1.

The depth of the countersink for holes or slots in flat plates having a thickness of 2 mm or greater shall be such that at least half of the parallel depth of the head of the HC2,9 screw shall be below the superficial surface of the plate.

The depth of the countersink for holes or slots in flat plates having a thickness of 1,6 mm or 1,4 mm shall be such as just to accommodate the countersunk surface of the screw head.

For bone plates having a curved surface, the depth of the countersink for holes or slots shall be such that the land of the HC2,9 screw lies between the upper and lower countersunk surfaces of the plates.

### 3.2 Holes and slots in bone plates for use with screws of 3,5 mm, 3,9 mm and 4,2 mm nominal diameters (HC3,5, HC3,9 and HC4,2 screws in accordance with ISO 9268)

Holes and slots in plates for HC3,5, HC3,9 and HC4,2 screws shall be in accordance with figures 1 and 2 and table 1.

The depth of the countersink for holes or slots in flat plates having a thickness of 2,8 mm or greater shall be such that at least half of the parallel depth of the head of the HC4,2 screw shall be below the external surface of the plate.

Dimension in millimetres

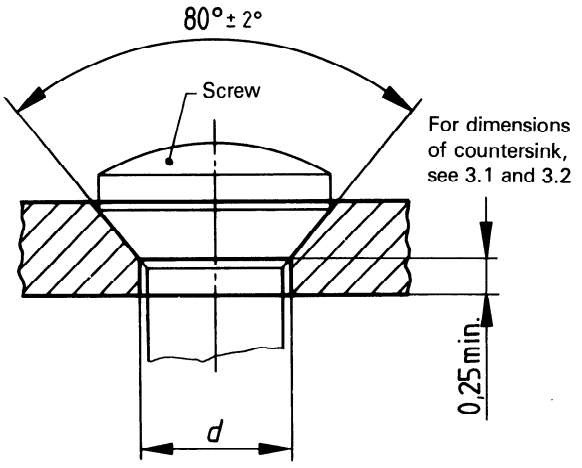



**Figure 1 — Hole for HC screws**

1) To be published; will cancel and replace ISO/DIS 5835-3 and ISO 5835-4 : 1983.

Dimension in millimetres

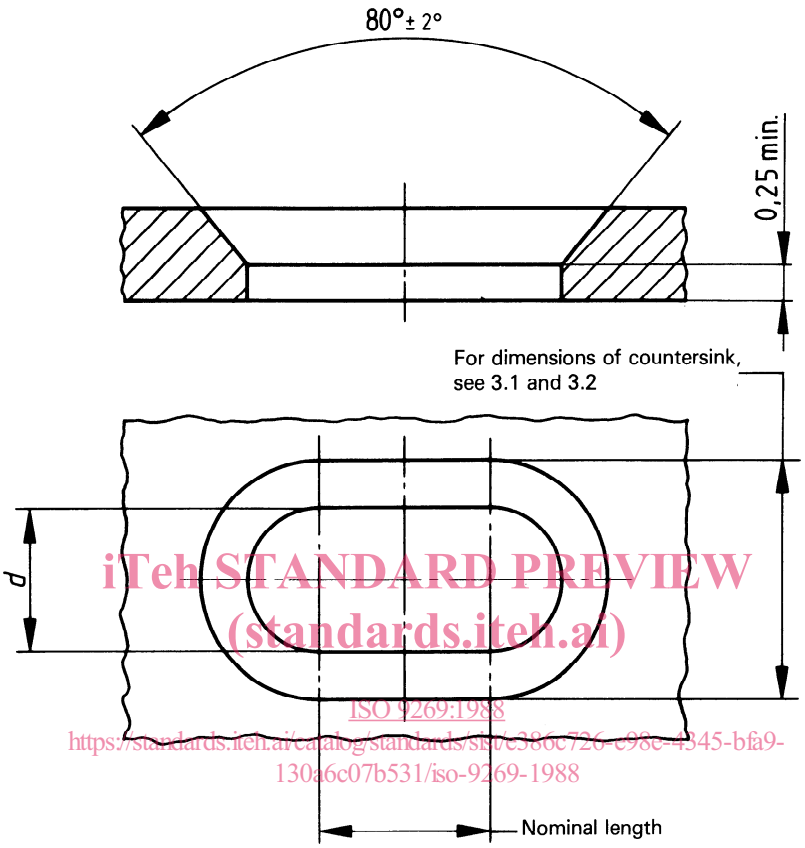





**Figure 2 — Slot for HC screws**

**Table 1 — Dimensions of holes and slots for HC screws**

Dimensions in millimetres

| $d$ $^{+0,1}_{0}$ | **Screws in accordance with ISO 9268** (Code and nominal diameter of thread) |
|---|---|
| 3 | HC2,9 |
| 4,3 | HC3,5 |
| | HC3,9 |
| | HC4,2 |

The depth of the countersink for holes or slots in flat plates having a thickness of 2 mm, 2,2 mm or 2,5 mm shall be such as just to accommodate the countersunk surface of the screw head.

For bone plates having a curved surface, the depth of the countersink for holes or slots shall be such that the land of the HC4,2 screw lies between the upper and lower countersunk surfaces of the plate.

### 3.3 Holes and slots in bone plates for use with screws of 4,0 and 4,5 mm nominal diameters (HD4 and HD4,5 screws in accordance with ISO 9268)

Holes and slots in plates for HD4 screws and HD4,5 screws shall be in accordance with figures 3 and 4 and table 2.

The depth of the countersink for holes or slots in flat plates having a thickness of 2,8 mm or greater shall be such that at least half of the parallel depth of the head of the HD4 screw shall be below the external surface of the plate.

The depth of the countersink for holes or slots in flat plates having a thickness of 2 mm, 2,2 mm or 2,5 mm shall be such as just to accommodate the countersunk surface of the screw head.

For bone plates having a curved surface, the depth of the countersink for holes or slots shall be such that the land of the HD4 screw lies between the upper and lower countersunk surfaces of the plate.

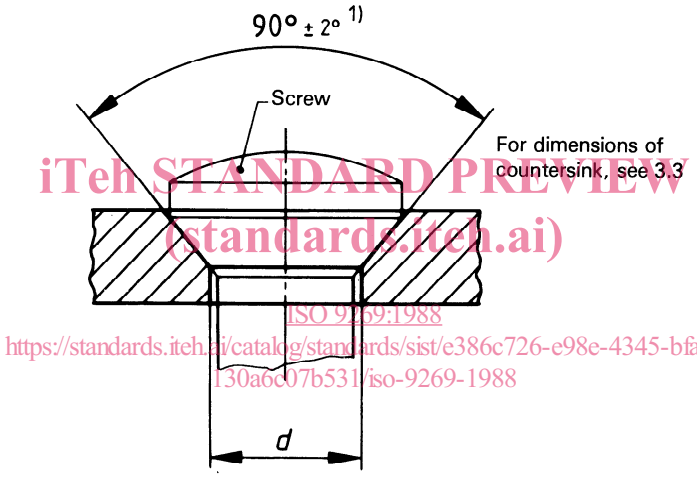





**Figure 3 — Hole for HD screws**

1) In practice, countersinks of 90° and 80° are, at present, manufactured and appear acceptable.

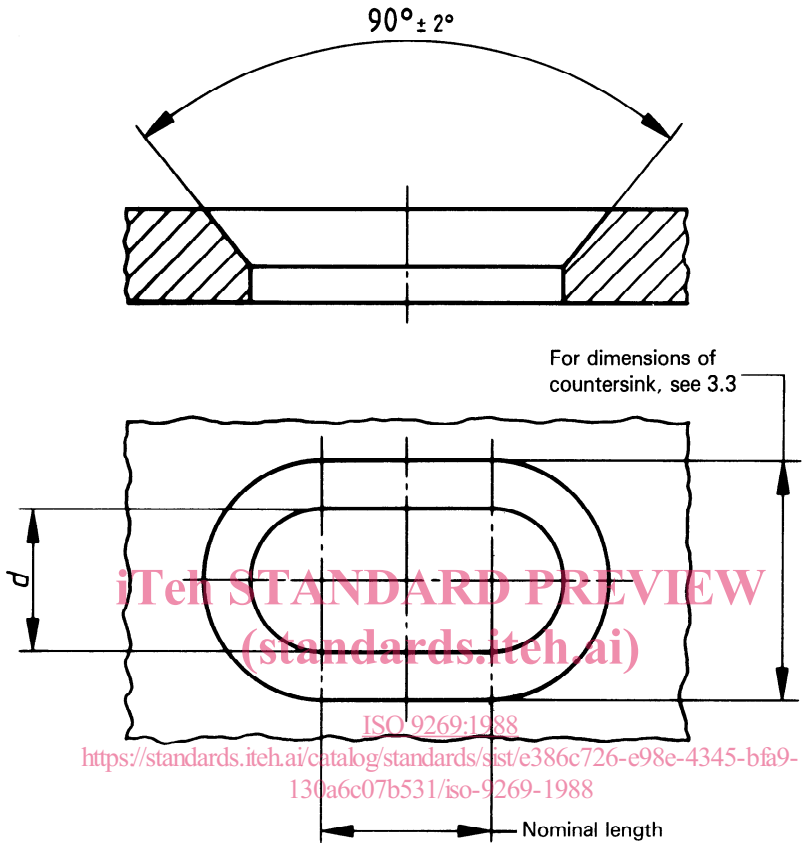





**Figure 4 — Slot for HD screws**

**Table 2 — Dimensions of holes and slots for HD screws**

Dimensions in millimetres

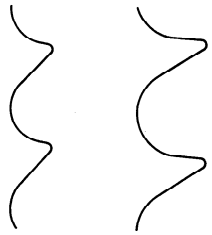
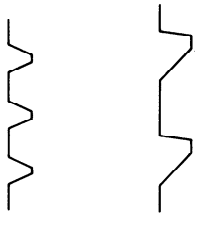
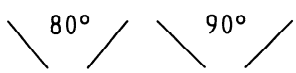
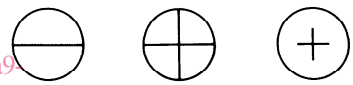
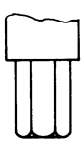
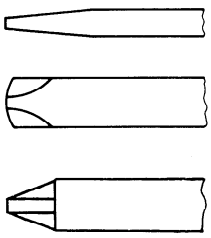
| $d$ $^{+0,1}_{0}$ | **Screws in accordance with ISO 9268** (Code and nominal diameter of thread) |
|---|---|
| 4,4 | HD4 |
| 5 | HD4,5 |

# 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 two parallel series of International Standards is given below.

<table>
<tr><td rowspan="4">Screws</td><td>Thread</td><td>ISO 5835<br>  <br>HA HB</td><td>ISO 9268<br>  <br>HC HD</td></tr>
<tr><td>Head under-surface</td><td>  <br>Spherical</td><td>  <br>80° 90°<br>Conical</td></tr>
<tr><td>Drive connection</td><td>  </td><td>  <br>Single slot | Cruciate slot | Cross-recessed head<br><br>Combined drive connections<br>  <br>Single slot and cross-recessed head | Cruciate slot and cross-recessed head</td></tr>
<tr><td>Mechanical requirements</td><td>ISO 6475<br>Breaking torque/ angle of rotation</td><td>In preparation</td></tr>
<tr><td rowspan="2">Plates</td><td>Holes and slots</td><td>ISO 5836</td><td>ISO 9269</td></tr>
<tr><td>Mechanical requirements</td><td>ISO 9585</td><td>ISO 9585</td></tr>
<tr><td rowspan="2">Driving tools</td><td>Keys and screwdrivers</td><td>ISO 8319-1<br>  <br>Hexagon keys</td><td>ISO 8319-2<br>  <br>Screwdrivers</td></tr>
<tr><td>Drill bits, taps, countersink cutters</td><td>ISO 9714-1</td><td>In preparation</td></tr>
</table>

# Annex B
(informative)

## Bibliography: International Standards referred to in table of annex A

ISO 5835 : — [1], *Implants for surgery — Metal bone screws with hexagonal drive connection — Spherical under-surface of head — Dimensions.*

ISO 5836 : — [2], *Implants for surgery — Metal bone plates — Holes corresponding to screws with asymmetrical thread and spherical under-surface.*

ISO 6475 : — [3], *Implants for surgery — Metal bone screws with asymmetrical thread and spherical under-surface — Mechanical requirements and test methods.*

ISO 8319-1 : 1986, *Orthopaedic instruments — Drive connections — Part 1 : Keys for use with screws with hexagon socket heads.*

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.*

ISO 9268 : — [2], *Implants for surgery — Metal bone screws with conical under-surface of head — Dimensions.*

ISO 9269 : 1988, *Implants for surgery — Metal bone plates — Holes and slots corresponding to screws with conical under-surface.*

ISO 9585 : — [2], *Implants for surgery — Method for testing bending strength and stiffness of bone plates.*

ISO 9714-1 : — [2], *Orthopaedic instruments — Drilling instruments — Part 1 : Drill bits, taps and countersink cutters.*



1) Will cancel and replace ISO 5835-1 at next revision stage. (ISO 5835-1 cancelled and replaced ISO 5835-1 : 1978 and ISO 5835-2 : 1978.)

2) To be published.

3) Will cancel and replace ISO 6475-1 : 1980 and ISO 6475-2 : 1980.

**UDC 616.71-77 : 669-41 : 621.882.15**

**Descriptors** : medical equipment, surgical implants, surgical plates, holes, slots, dimensions, dimensional tolerances.

Price based on 6 pages