INTERNATIONAL STANDARD

ISO 8830

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High-speed steel machine taps with ground threads — Technical specifications

Tarauds à machine, en acier rapide, à filets rectifiés — Spécifications techniques

Reference number
ISO 8830:1991(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 8830 was prepared by Technical Committee ISO/TC 29, *Small tools*, Sub-Committee SC 4, *Screwing taps and dies*.

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High-speed steel machine taps with ground threads — Technical specifications

1 Scope

This International Standard specifies characteristics for high-speed steel machine taps with ground threads.

It applies to standard taps in accordance with ISO 529, ISO 2283, ISO 2284, and ISO 2857. These specifications may be applied to non-standard taps by agreement between purchaser and supplier.

The terminology is derived from ISO 5967:1981, *Taps and thread cutting — Nomenclature of the main types and terminology*.

NOTE 1 The characteristics specified in this International Standard may also be applied to hand finishing taps.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were 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 editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 529:1975, *Short machine taps and hand taps*.

ISO 2283:1972, *Long shank machine taps with nominal diameters from 3 to 24 mm and 1/8 to 1 in*.

ISO 2284:1987, *Hand taps for parallel and taper pipe threads — General dimensions and marking*.

ISO 2857:1973, *Ground thread taps for ISO metric threads of tolerances 4H to 8H and 4G to 6G coarse and fine pitches — Manufacturing tolerances on the threaded portion*.

ISO 11054:—[1], *Cutting tools — Designation of high-speed steel groups*.

3 Material and hardness

3.1 Material

The codes of the most currently used high-speed steels are given in ISO 11054.

3.2 Hardness of threaded portion of taps

The hardness of the threaded portion of taps is given in table 1.

Table 1

Nominal tap diameter d mm	Minimum hardness
$d \leqslant 3$	750 HV5 or 61 HRC
$3 < d \leqslant 6$	780 HV10 or 62 HRC
$d > 6$	820 HV30 or 63 HRC

3.3 Hardness of the shank

Whatever the diameter and the conception (one-piece or with welded shank) of the tap, the hardness of the shank and of the square shall not be less than 30 HRC.

1) To be published.

4 Cutting geometry

4.1 Angle of helical flute, γ'_f

The angle of helical flute, γ'_f (see figure 1), is measured at the outside diameter. It is chosen from one of the series given in table 2. A variation of 2° is applied on the actual value chosen by the manufacturer and specified in his catalogue. The leads shall further be chosen from the R20 Renard series (see table 2).

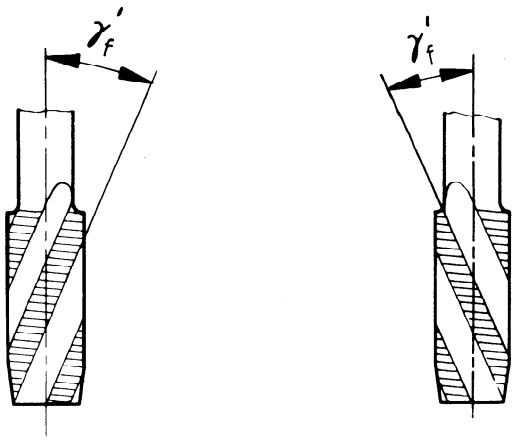

Figure 1

4.2 Rake angle

The rake angle shall be measured in a plane normal to the tap at the first complete thread level, after the chamfer lead.

This is the angle γ_p [see figure 2a)], as formed by the cutting face and a plane containing the centreline of the tap and the crest of the thread in question in the case of a straight face, or the angle γ_{pc} (hook angle) [see figure 2b)], as formed by the secant to the face (between the major diameter d_a and the minor diameter d_5) and a plane containing the centreline of the tap and the crest of the thread in question in the case of a curved face.

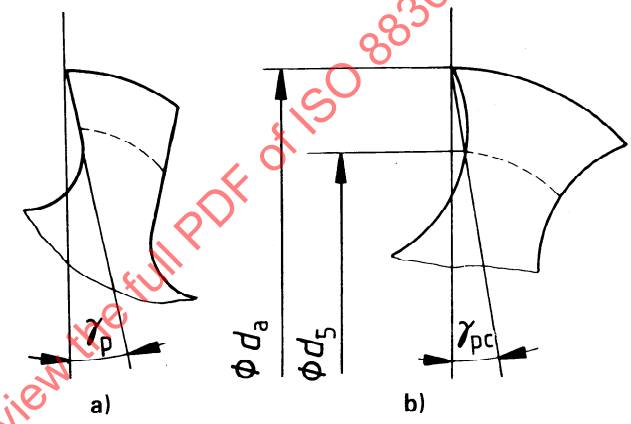

Figure 2

Table 2

Name	Symbols for taps Right-hand	Left-hand	Range of values γ'_f	Variation on the chosen value	Lead
Slow	R15	L15	$10° \leqslant \gamma'_f \leqslant 20°$	±2°	Chosen from R20 series
Medium	R35	L35	$20° < \gamma'_f \leqslant 40°$		
Fast	R45	L45	$\gamma'_f > 40°$		
Slow	L15	R15	$10° \leqslant \gamma'_f \leqslant 20°$		

4.3 Characteristics of the point and types of flutes

The point diameter d_3 (see figure 3) is calculated from the formula

$$d_{3max} = d - 1{,}13 \text{ pitch}$$

The above formula does not apply to pipe thread taps.

Table 3 gives the number of threads on the chamfer lead, the flute types, and the corresponding designation.

Table 3

Symbol	Number of threads on the chamfer lead	Flute types
A	⩾ 6	Straight
B	3,5 to 5,5	Straight with spiral point
C	2 to 3	Straight or helix
D	3,5 to 5,5	
E[1]	< 2	

1) For very short blind holes and should be avoided.

5 Circular run-out tolerances

The circular run-out shall be checked when the tap is mounted between centres at the following locations (see figure 3):

— in the middle of the chamfer length (t_1);

— on the first complete thread after the point on the flank (t_2);

— on the shank, at twice the driving square length (t_3).

The circular run-out tolerances t_1, t_2 and t_3 are given in table 4 in relation to the nominal diameter of the tap, d.

Table 4

d	t_1	t_2	t_3
mm	μm		
$d < 10$	18	18	30
$10 \leqslant d < 18$	22		
$18 \leqslant d < 30$	26	22	40
$30 \leqslant d < 40$	30		
$40 \leqslant d$	36	26	

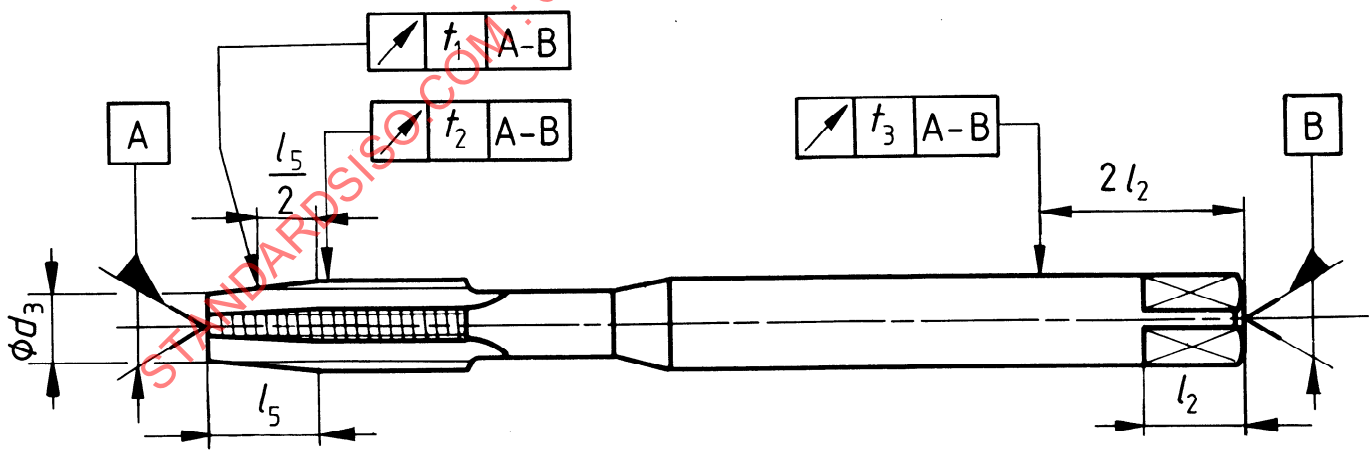

Figure 3

6 Marking

The following information should be marked on the tap:

a) the thread designation;

b) the tolerance grade of the tap;

c) the code of the high-speed steel;

d) a clear mark (the letter L for example) for left-hand threads;

e) the name or trade mark of the manufacturer or supplier.