INTERNATIONAL STANDARD

ISO 3002-1

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AMENDMENT 1
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Basic quantities in cutting and grinding —

Part 1 :
Geometry of the active part of cutting tools — General terms, reference systems, tool and working angles, chip breakers

AMENDMENT 1

Grandeurs de base pour la coupe et la rectification —

Partie 1 : Géométrie de la partie active des outils coupants — Notions générales, système de référence, angles de l'outil et angles en travail, brise-copeaux

AMENDEMENT 1

Reference number
ISO 3002-1 : 1982/Amd.1 : 1992 (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.

Amendment 1 to International Standard ISO 3002-1 : 1982 was prepared by Technical Committee ISO/TC 29, *Small tools*.

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AMENDMENT 1

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Add the following clause 8 and figures 36 to 41 to ISO 3002-1.

8 Direction of the helix and cutting direction (see figures 36 to 41)

To define a rotating tool, it may be necessary to specify its cutting direction and, except for straight-toothed tools, the direction of its helix.

The direction of the helix and the cutting direction are independent of each other.

Figures 36 to 41 provide examples of the direction of the helix and the cutting direction. The arrow perpendicular to the flutes indicates the cutting direction.

8.1 Direction of the helix (figures 36, 37, 38 and 41)

The concept of "direction of the helix" applies only to rotating tools with flutes, whatever their design: solid tools, brazed cutting edge tools or tools with indexable inserts.

A tool with flutes can be "straight-toothed" or "helical-toothed". A helical-toothed tool is termed

- a "right-hand helix" if the helix winds in a clockwise direction moving from an axially-oriented observer (definition same as that of right-hand thread);
- a "left-hand helix" if the helix winds in a counterclockwise direction in the same conditions.

NOTES

1 Staggered-tooth tools exist.

2 Clause 5 of this International Standard gives a clear definition of the angles of the active part of cutting tools and of their signs (see 5.3).

When the flutes define the major or minor cutting edge position, the direction of the helix is in direct relation with the sign of the major cutting edge inclination (λ_s) or the minor cutting edge inclination (λ_s'), subject to the following conventions (see 5.3.1.3).

- the selected point on the cutting edge is taken at the tool corner which is farthest from the tool drive part;
- the observation direction is oriented from the selected corner to the tool drive part.

Tools whose cutting edge inclinations are positive are of right-hand helix (see figure 37), and, conversely, tools whose cutting edge inclinations are negative are of left-hand helix (see figure 38).

When the flutes do not define the major or minor cutting edge position, there is no direct relation between the direction of the helix and the sign of the major cutting edge inclination (λ_s) or the minor cutting edge inclination (λ_s').

8.2 Cutting direction

Generally speaking, a tool is termed:

- a "right-hand tool" if it rotates in a clockwise direction when cutting, for an observer at the drive side;
- a "left-hand tool" if it rotates in a counterclockwise direction when cutting, for an observer at the drive side.

If tools can be fitted only in one direction, the drive side is defined without ambiguity (see figure 36).

On the contrary, if there is a doubt about the drive side (tool which can be fitted in either direction), the drive side from which the indicated cutting direction is defined (see figures 39 and 40) shall be specified with an arrow.

However, unless otherwise specified, the drive side for tools which can be fitted in either direction is considered by convention as being:

— the side of the boss (opposite to the cutting surface) in the case of end-working tools (for example counterbore tools which can work by pulling);

— the side of the larger surface or, if both surfaces are equal, the side of the shorter cutting edge, in the case of non-symmetrical tools other than end-working tools.

In the particular case of a tool which remains identical, excepting teeth, when turned over, this tool is completely defined by its shape and additionally by the direction of its helix. Such a tool is a neutral (right-hand or left-hand) cutting tool (see figure 41).

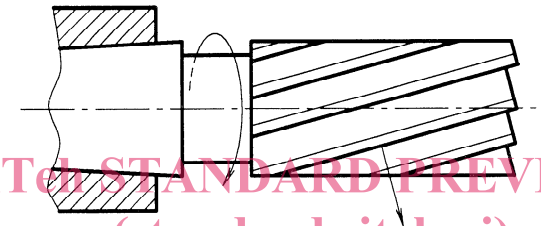

Figure 36 — Machine-fitted right-hand tool, left-hand helix

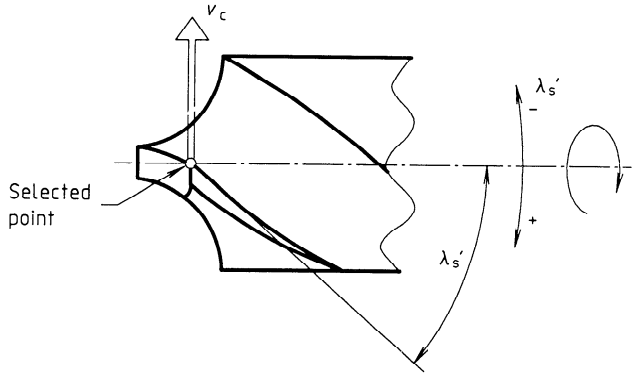

Figure 37 — Twist drill, right-hand helix ($\lambda_s' > 0$)

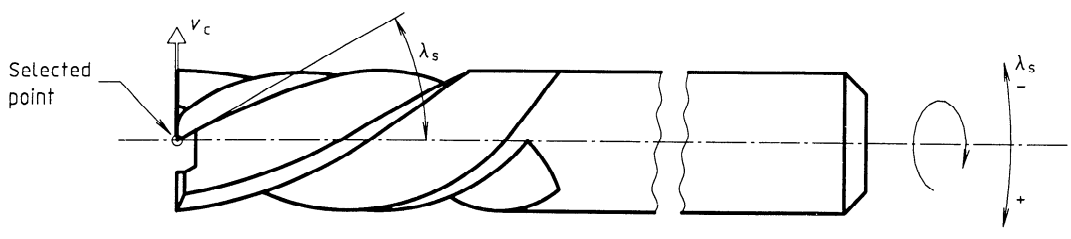

Figure 38 — Milling cutter, left-hand helix ($\lambda_s < 0$)

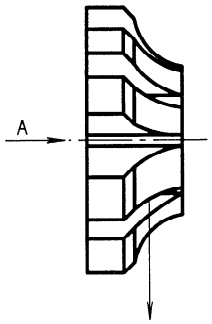

Figure 39 — Right-hand tool when viewed in the direction of the arrow A

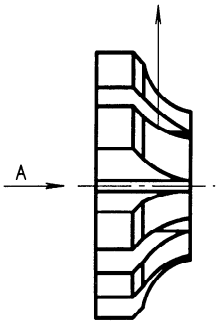

Figure 40 — Left-hand tool when viewed in the direction of the arrow A

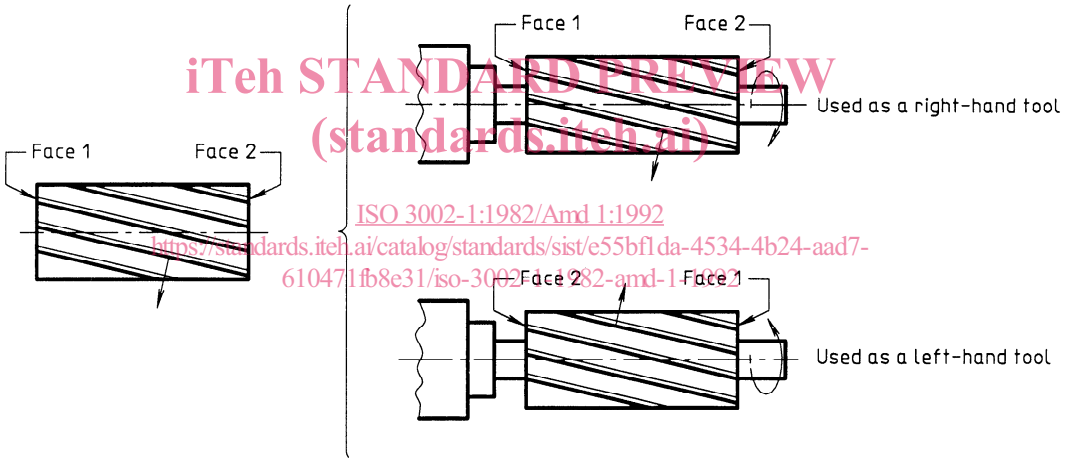

Figure 41 — Cylindrical neutral (right-hand or left-hand) helix tool

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Add the following terms to the annex:

No.	Symbol	English	Français	Русский	Deutsch	Italiano	Nederlands
8		Direction of the helix and cutting direction	Sens d'hélice et sens de coupe	Направление винтовой линии и направление резания	Drallrichtung und Schneidrichtung	Senso dell'elica e direzione di taglio	richting v.d. spiraalhoek en snijrichting
8.1		Direction of helix	Sens d'hélice	Направление винтовой линии	Drallrichtung	Senso dell'elica	richting v.d. spiraalhoek
8.2		Cutting direction	Sens de coupe	Направление резания	Schneidrichtung	Direzione di taglio	snijrichting

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Descriptors : tools, cutting tools, cutting angle, geometrical characteristics, basic concepts, vocabulary.

Price based on 3 pages