

Indexable inserts for cutting tools — Designation

ICS 25.100.01

National foreword

This British Standard reproduces verbatim ISO 1832:2004 and implements it as the UK national standard. It supersedes the dual numbered standard BS 4193-1:1993, ISO 1832:1991 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MTE/18, Tools, tips and inserts for cutting applications, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

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Summary of pages

This document comprises a front cover, an inside front cover, the ISO title page, pages ii to iv, pages 1 to 21 and a back cover.

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Amendments issued since publication

Amd. No.	Date	Comments
15736 Corrigendum No. 1	March 2006	Example b) in Table 8 and heading in Table 9 amended

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INTERNATIONAL STANDARD

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Indexable inserts for cutting tools — Designation

Plaquettes amovibles pour outils coupants — Désignation



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 1832 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with cutting edges made of hard cutting materials*.

This fourth edition cancels and replaces the third edition (ISO 1832:1991), which has been technically revised. It also incorporates Amendment ISO 1832:1991/Amd. 1:1999.

Indexable inserts for cutting tools — Designation

1 Scope

This International Standard establishes a code for the designation of the usual types of indexable inserts for cutting tools, in hard cutting materials or any other cutting materials, in the interests of simplifying orders and specifications for such inserts. It also specifies the designation symbols for cubic boron nitride (BL, BH, BC) inserts, tipped and solid as well as polycrystalline diamond (DP) inserts, tipped.

2 Normative references

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

ISO 513, *Classification and application of hard cutting materials for metal removal with defined cutting edges — Designation of the main groups and groups of application*

ISO 3002-1:1982, *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*

ISO 3002-1:1982/Amd. 1:1992, *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*

ISO 16462, *Cubic boron nitride inserts, tipped or solid — Dimensions, types*

ISO 16463, *Polycrystalline diamond inserts, tipped — Dimensions, types*

3 Explanation of designation code

For indexable inserts the designation code comprises nine symbols for designating the dimensions and other characteristics; the first seven symbols (symbols ① to ⑦) shall be used in every designation. Symbols ⑧ and ⑨ may be used when necessary.

For tipped inserts in accordance with ISO 16462 and ISO 16463 the designation code comprises twelve symbols for designating the dimensions and other characteristics; symbols ① to ⑦ as well as ⑪ and ⑫ shall be used in every designation. Symbols ⑧, ⑨ and ⑩ may be used when necessary. Symbols ⑪ and ⑫ shall be separated from symbol ⑨ by a dash as shown in example 2 of this clause.

In addition to the standardized designation for indexable inserts and tipped inserts, a supplementary symbol ⑬, consisting of one or two characters, may be added by the manufacturer for a better description of his product (e.g., different chip breakers), provided that this symbol is separated from the standardized designation by a dash and that it does not contain letters specific for references ⑧, ⑨ and ⑩.

No addition to or extension of the designation specified in this International Standard shall be made without consulting Technical Committee ISO/TC 29 and receiving its agreement. Rather than adding symbols not provided for in this system, it is preferable to add to the designation, in accordance with this International Standard, all necessary explanations in the form of detailed sketches or specifications.

However, if the symbol "X" is used in position 4 of the designation, it is possible to use, in positions 5, 6 and 7, symbols representing values not appearing in this International Standard but which shall be described explicitly by the sketch or the detailed specifications given in 4.4.

The significance of the symbols constituting the designation is as follows:

①	Letter symbol identifying	insert shape (see 4.1)	Compulsory symbols for indexable inserts	Compulsory symbols for tipped inserts in accordance with ISO 16462 and ISO 16463, except as noted
②	Letter symbol identifying	normal clearance (see 4.2)		
③	Letter symbol identifying	tolerance class (see 4.3)		
④	Letter symbol indicating	fixing and/or chip breakers (see 4.4)		
⑤	Number symbol identifying	insert size (see 4.5)		
⑥	Number of symbol identifying	insert thickness (see 4.6)		
⑦	Letter or number symbol identifying	insert corner configuration (see 4.7)		
⑧ ^a	Letter symbol indicating	cutting edge condition (see 5.2)		
⑨ ^a	Letter symbol indicating	cutting direction (see 5.3)		
⑩ ^b	Number symbol identifying	size of cutting edge condition	(see 6.2)	
⑪	Letter symbol identifying	style of tipped or solid cutting edge and number of tipped corners	(see 6.3)	
⑫	Letter or number symbol identifying	length of tipped cutting edge	(see 6.4)	
⑬	Manufacturer's symbol or cutting material designation in accordance with ISO 513			

^a Optional symbols for indexable and tipped inserts.
^b Optional symbols for tipped inserts.

EXAMPLE 1 General designation

	①	②	③	④	⑤	⑥	⑦	⑧	⑨		⑬
Metric dimensions:	T	P	G	N	16	03	08	E	N	–	...
Inch dimensions:	T	P	G	N	3	2	2	E	N	–	...

EXAMPLE 2 Designation of inserts in accordance with ISO 16462 and ISO 16463

	①	②	③	④	⑤	⑥	⑦	⑧	⑩	⑨		⑪	⑫	⑬
Designation of insert for turning	S	N	M	A	15	06	08	E		(N)	–	B	L	– ...
Designation of insert for milling	T	P	G	T	16	T3	AP	S	01520	R	–	M	028	– ...

NOTE The designations and symbols of the different angles allowing geometrical definition of the indexable inserts are in conformity with ISO 3002-1, with the following conventions:

- the insert is considered in the tool-in-hand system;
- the reference plane P_r is parallel to the base of the insert;
- the assumed working plane P_f is perpendicular to the reference plane P_r and is parallel to the assumed direction of feed motion. This plane is defined only in the case of inserts having one or more wiper edges.

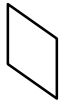
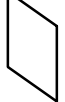
The assumed direction of feed motion is taken parallel to the considered wiper edge (see Note 1 of Table 9).

4 Symbols

4.1 Symbol for insert shape — Reference ①

See Table 1.

Table 1

Type	Letter symbol	Description of shape	Included angle, ε_r	Figure
I Equilateral and equiangular inserts	H	Hexagonal inserts	120°	
	O	Octagonal inserts	135°	
	P	Pentagonal inserts	108°	
	S	Square inserts	90°	
	T	Triangular inserts	60°	
II Equilateral but non-equiangular inserts	C	Rhombic inserts	80° ^a	
	D		55° ^a	
	E		75° ^a	
	M		86° ^a	
	V		35° ^a	
	W	Trigon inserts	80° ^a	
III Non-equilateral but equiangular inserts	L	Rectangular inserts	90°	
IV Non-equilateral and non-equiangular inserts	A	Parallelogram-shaped inserts	85° ^a	
	B		82° ^a	
	K		55° ^a	
V Round inserts	R	Round inserts	—	
^a The included angle considered is always the smaller angle.				