INTERNATIONAL STANDARD

ISO 10910

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Classification and designation of approximate chip control zones for indexable inserts with chipbreakers

Classification et désignation des zones de contrôle approximatives des copeaux pour plaquettes amovibles avec brise-copeaux

Reference number
ISO 10910:1995(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 10910 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with cutting edges made of hard cutting materials*.

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Classification and designation of approximate chip control zones for indexable inserts with chipbreakers

1 Scope

This International Standard establishes a graph format used to develop diagrams depicting chipbreaker indexable insert performance. Performance results may be derived from the cutting test described in clause 5.

Classification zones are established and coded in this International Standard. Suppliers of chipbreaker insert products may classify their products using the code of the zone within which the primary use of their product is indicated.

It is important to acknowledge that the relationships established by diagrams developed according to this International Standard may vary from one work material to another, as well as with other machining variables, and that it is not the purpose of this International Standard to serve as a specific guide to the practical application of chipbreaker insert products, but rather grant the user a sort of pre-selection, on a general level, that will allow him to look at only those items that have the best chance of satisfying his needs.

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 683-1:1987, *Heat-treatable steels, alloy steels and free-cutting steels — Part 1: Direct-hardening unalloyed and low-alloyed wrought steel in form of different black products.*

ISO 1832:1991, *Indexable inserts for cutting tools — Designation.*

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 3002-3:1984, *Basic quantities in cutting and grinding — Part 3: Geometric and kinematic quantities in cutting.*

ISO 3685:1993, *Tool-life testing with single-point turning tools.*

3 Graph

The axes of the graph format (see figure 1) shall be the feed (according to ISO 3002-3) and the depth of cut (according to ISO 3002-3). The limits of the feed and depth of cut shall be

f = 0,025 mm/rev to 2,5 mm/rev and

a_p = 0,1 mm to 16 mm.

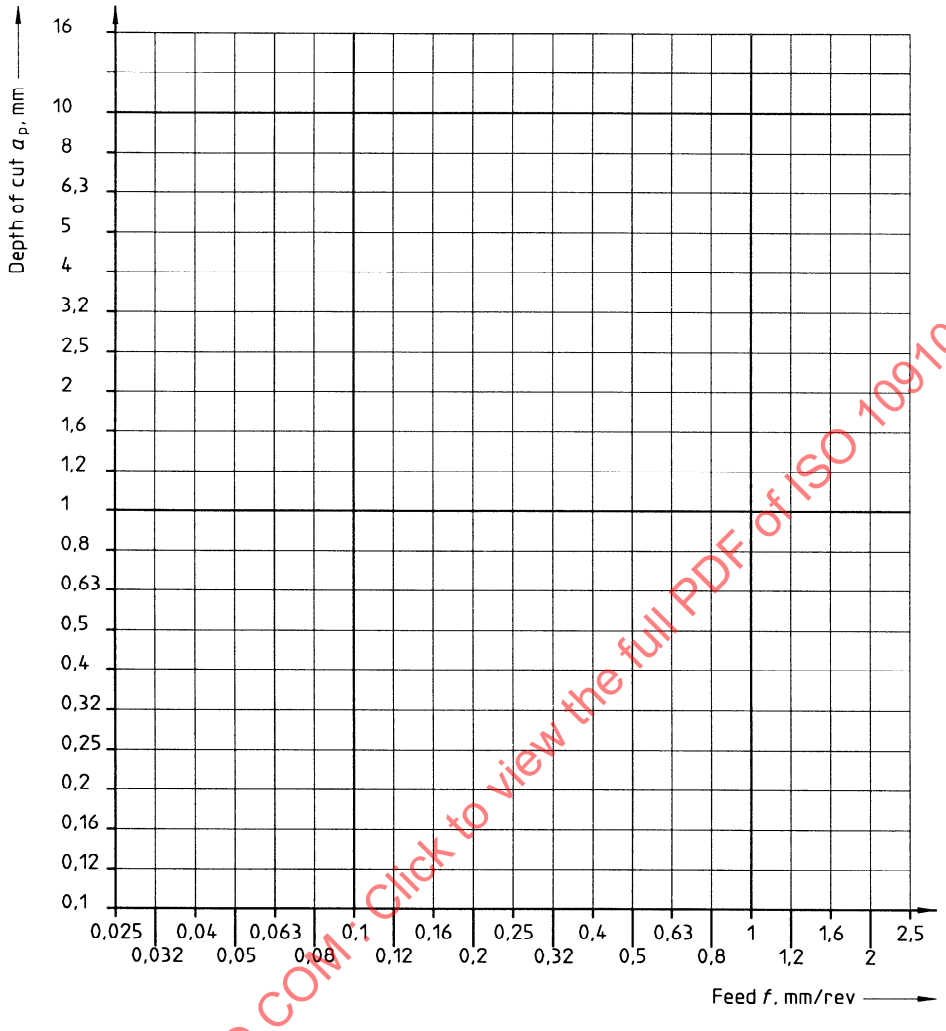

Figure 1

4 Diagrams

The graph (see figure 1) may be used to develop diagrams depicting chipbreaker insert performance resulting from the standard cutting test.

The diagram shall be constructed by connecting points on the graph and shall represent an area within which chips are controlled. Referring to chips as acceptable and/or unacceptable is not recommended due to the varied opinions from industry to industry. Recommended terms are: controlled and uncontrolled. Also, it would be acceptable to use chip form codes established in ISO 3685:1993, annex G, or to show the actual chips generated from the cutting test.

5 Cutting test

The cutting test developed to establish chipbreaker insert performance and subsequent classification is described as follows:

— Operation: external (outside diameter) turning.

— Cutting edge angle (according to ISO 3002-1): $\kappa_r = 75°$ for insert shape S or $\kappa_r = 90°$ to 95° for insert shapes C, D, T and V.

— Workpiece material: C 45 (according to ISO 683-1:1987). Materials other than C 45 shall be indicated in the insert performance diagram.

— Normalized: 180 HB to 200 HB.

— Cutting Speed (according to ISO 3002-1): appropriate to cutting material. Cutting speed shall be indicated in the insert performance diagram.

— Minimum diameter of parts: 100 mm.

6 Classification

The term classification used in this International Standard is defined as the common ground on which suppliers can specify the primary use of their chipbreaker inserts. The range of use of a chipbreaker insert on the other hand is shown by a diagram generated on the graph, figure 1.

The diagram (see figure 2) is divided into 6 zones of classification. It is the responsibility of the supplier to classify his chipbreaker insert with the code of the zone that best represents the intended primary use of the insert being classified (only one letter shall be used). While the zones are specified by this International Standard, it should be noted that the decision to create the zones in this manner is arbitrary.

Each zone has its own code, either A, B, C, D, E or F which may be used at the discretion of the chipbreaker insert supplier. However, the classification codes defined here shall not be used as an addition to the existing insert identification systems (see ISO 1832) or as commercial designations for chipbreaker insert products.

NOTE 1 It is common practice in industry that manufacturers classify inserts with certain geometry features in "family geometry groups", designated by letters, numbers or a combination of both after the standard designation of the insert, e.g.:

CNMG 120408 — XX

Although those inserts ("XX") are grouped to belong to the same geometry family the chip control features can be different, depending on the size of the insert and the size of the corner radii.

This International Standard provides the possibility of giving information about chip breaking capabilities of insert sizes within a certain geometry family, for instance as follows:

Insert designation	Chip control zone
CNMG 120404 - XX	A
CNMG 160616 - XX	C
.... -..	.

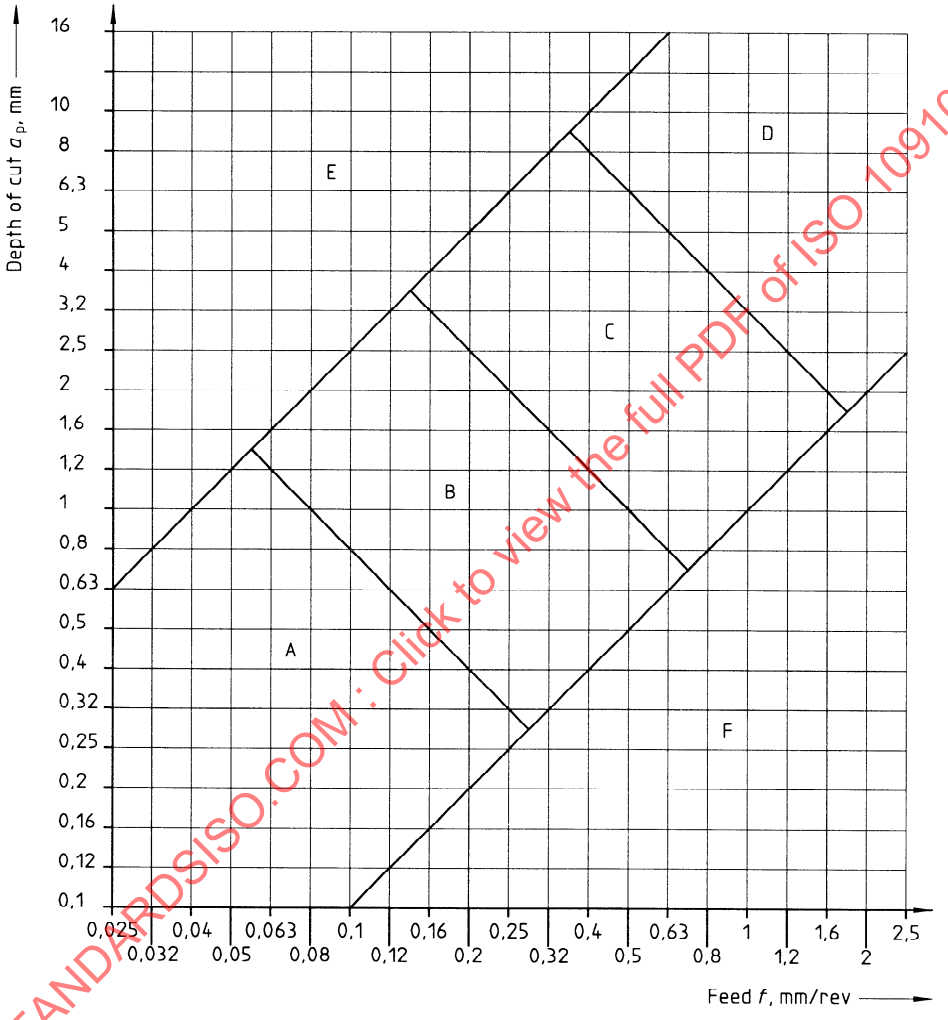

Figure 2