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

*Classification et application des matériaux durs de coupe pour
enlèvement de métal avec arêtes coupantes définies — Définition des
groupes principaux et des groupes d'application*



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Foreword

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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.

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ISO 513 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with cutting edges made of hard cutting materials*.

This third edition cancels and replaces the second edition (ISO 513:1991) as well as ISO/TR 11255:1994 of which it constitutes a technical revision. It also incorporates the Technical Corrigendum ISO 513:1991/Cor. 1:1994.

Introduction

The variety of ways in which different manufacturers produce hard cutting materials having differing characteristics makes it currently impossible to standardize hard cutting materials graded in accordance with those characteristics.

This International Standard is therefore limited to a classification of hard cutting materials based on their application and to a method of designation (colour marking and distinguishing symbols) for the main groups of application and the groups of application which constitute this classification.

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

1 Scope

This International Standard specifies the classification and application of hard cutting materials including hard metals (carbides), ceramics, diamond and boron nitride, for machining by chip removal, and establishes their application.

It is not applicable for other uses (e.g., mining and other percussion tools, wire-drawing dies, tools operating by deformation of the metal, comparator contact tips, etc.).

2 Designation

The designation of groups of application for hard cutting materials includes the letter symbols in accordance with Tables 1 to 4, followed by a dash and the designation of the main group of chip removal and of the group of application, as specified in Clause 3.

Table 1 — Carbides

Identification letters	Material group
HW	Uncoated carbide, main content tungsten carbide (WC) with grain size $\geq 1 \mu\text{m}$
HF	Uncoated carbide, main content tungsten carbide (WC) with grain size $< 1 \mu\text{m}$
HT^a	Uncoated carbide, main content TiC or TiN or both
HC	Carbides as above, but coated

^a These grades are also called "Cermets".

Table 2 — Ceramics

Identification letters	Material group
CA	Ceramic, main content Al_2O_3
CM	Mixed ceramic, main content Al_2O_3 plus components other than oxides
CN	Silicon nitride ceramic, main content Si_3N_4
CR	Ceramic, main content Al_2O_3 , reinforced
CC	Ceramics as above, but coated

Table 3 — Diamond

Identification letters	Material group
DP	Polycrystalline diamond
DM	Monocrystalline diamond