
CVD diamond tools — Categorization

Outils diamant CVD — Catégorisation



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Published in Switzerland

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with defined cutting edges, holding tools, cutting items, adaptive items and interfaces*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

CVD diamond tools — Categorization

1 Scope

This document deals with diamond tools whose cutting edges are made of CVD diamond, either as a solid single piece or as a coating. The tool specifications are differentiated into CVD diamond-coated tools (CVD diamond thin-film coatings) and tools with a CVD diamond cutting insert.

According to ISO 513, CVD diamond tools can be classified under “hard coatings of hard metal and ceramic” and “binder-free polycrystalline diamond”. In order to differentiate the CVD diamond tools from tools with monocrystalline synthetic or natural diamond (MCD or monocrystalline diamond) or with sintered diamond with a binder phase (PCD or polycrystalline diamond), the structure and characteristics of MCD and PCD tools with binder phase are also briefly described.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

active brazing

process of joining diamond to a metallic substrate by means of a brazing alloy

Note 1 to entry: The brazing alloy contains so-called active elements (titanium, for example) which form unsaturated carbides with the carbon atoms of the diamond and in this way bond the diamond to the braze material. Brazing of this kind is carried out in a vacuum or in shielding gas atmosphere.

3.2

chemical vapour deposition

CVD

process for manufacturing diamond in most cases at low-pressure and deposition temperatures of 600 °C to 1 000 °C

Note 1 to entry: Polycrystalline, binder-free diamond coatings and even monocrystals can be produced.

3.3

high-pressure high-temperature synthesis

HPHT synthesis

method of manufacturing diamond at a pressure of approximately 6 GPa and temperatures, T , between 1 400 °C and 1 800 °C

Note 1 to entry: It is only possible to manufacture monocrystals by HPHT synthesis.

3.4

monocrystalline diamond

MCD

cutting material made of diamond in natural or synthetic modification [from *HPHT synthesis* (3.3)]