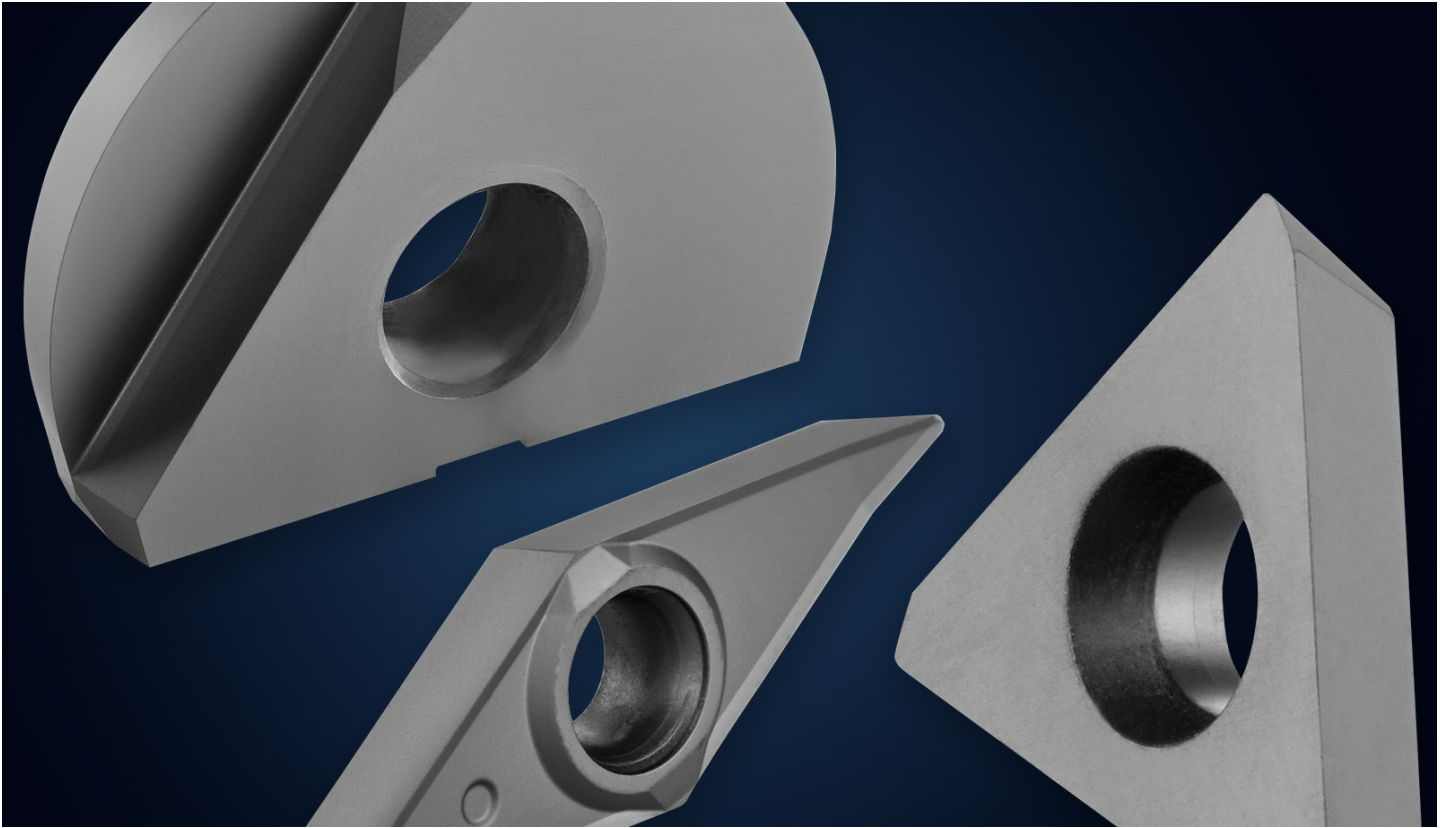


Increase performance with diamond



Multilayer diamond coatings on cutting inserts

Anyone who thinks that diamond coatings are only suitable for shank tools and that PCD is always required on cutting inserts in corresponding applications is mistaken: Diamond coatings can also be used excellently for cutting inserts. The tools achieve excellent results when cutting CFRP and GFRP, graphite, non-ferrous metals and plastics.

In many industries such as aerospace or tool and mold making, shank tools with multilayer diamond coatings from CemeCon are now indispensable. With their nanocrystalline, extremely smooth and hard surfaces, they are often superior to other solutions in terms of performance, quality and precision. And even with diamond-coated cutting inserts, graphite, non-ferrous metals or fiber-reinforced plastics can be machined excellently.

Complex geometries, more cutting edges and high feedings

“On the way to optimized machining, the numerous advantages of diamond coatings can also be used profitably for cutting inserts. Extraordinary cutting edge geometries, multi-bladed cutting edges and high feed rates are keywords that make diamond-coated inserts a good alternative to PCD tools,” explains Inka Harrand, Product Manager Cutting Inserts at CemeCon.

Especially positive insert geometries with bore can be coated with diamond in a particularly economical way. The chip shape geometry is not changed, as the diamond coatings grow directly on the substrate surface and thus precisely reproduce the geometry. In addition, a diamond-coated carbide cutting edge is

stable and very robust. This enables high feed rates and is particularly advantageous for roughing operations.

Three multilayer diamond coatings from CemeCon are particularly suitable for cutting inserts: CCDia®CarbonSpeed is the ideal solution for graphite as well as carbide and ceramic green bodies, CDia®FiberSpeed for fiber-reinforced plastics and CCDia®MultiSpeed for AlSi alloys and composites. Whether in Germany, China, USA or Japan – in all CemeCon coating centers, users can have their tools coated in the same quality with the same coating specification. Nobody has to make any concessions here.

10 times tool life

Diamond-coated cutting inserts have already proven themselves in practice, for example when drilling CFRP: Compared to uncoated inserts, CCDia®MultiSpeed increases tool life tenfold (see graph). “Such values are not peak values from test series, but are achieved by our customers on a daily basis in normal everyday production. And this with stable machining processes,” says Inka Harrand happily.

Material: **CFK**

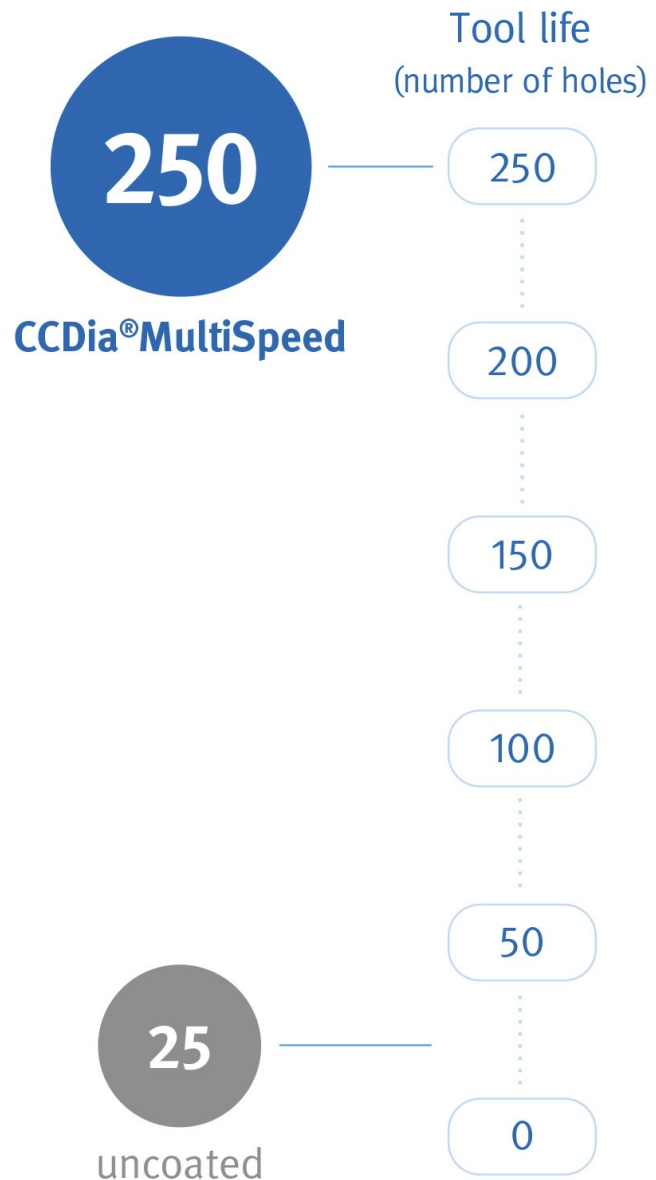
Tool: **Cutting insert for drilling**

Cut length: **35 mm**

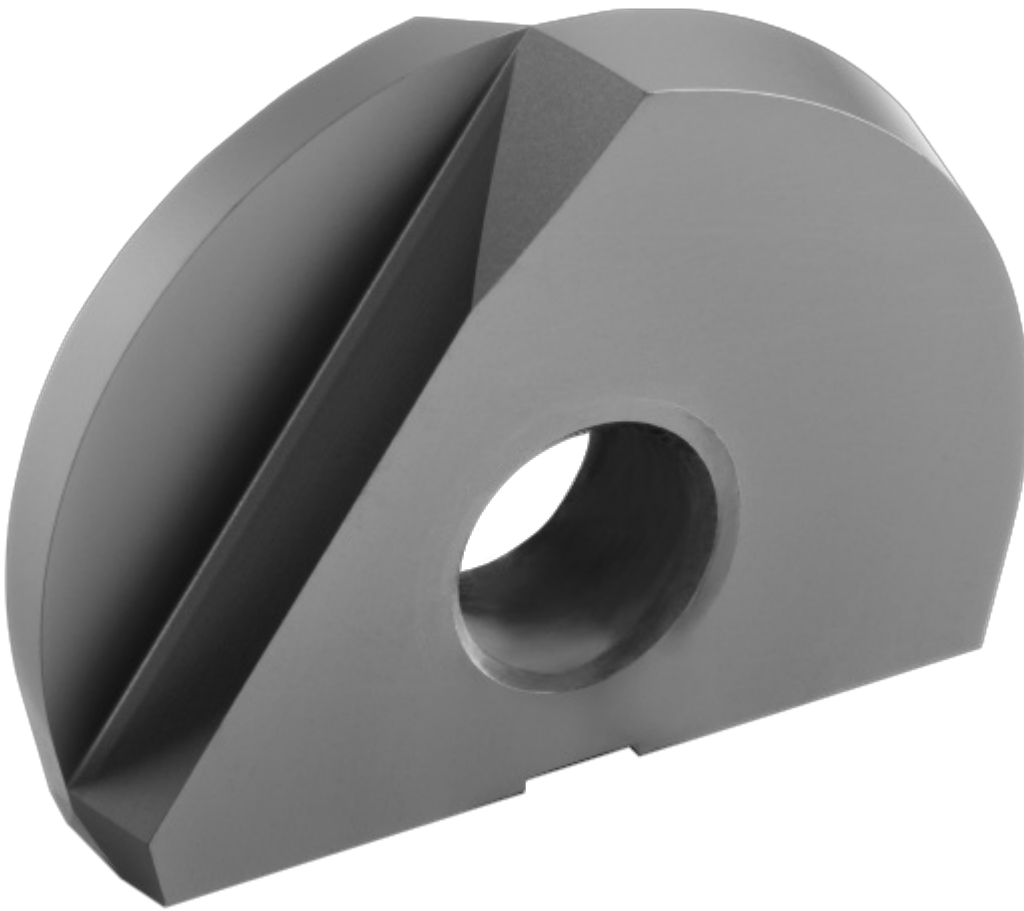
$v_c = 150$ m/min

$f = 0.15$ mm/rev

Without cooling



Diamond coating materials for cutting inserts



CCDia®CarbonSpeed

for graphite, carbide green bodies and ceramic green bodies

Coating material

Diamond

Coating structure

Multilayer, sp³

Color

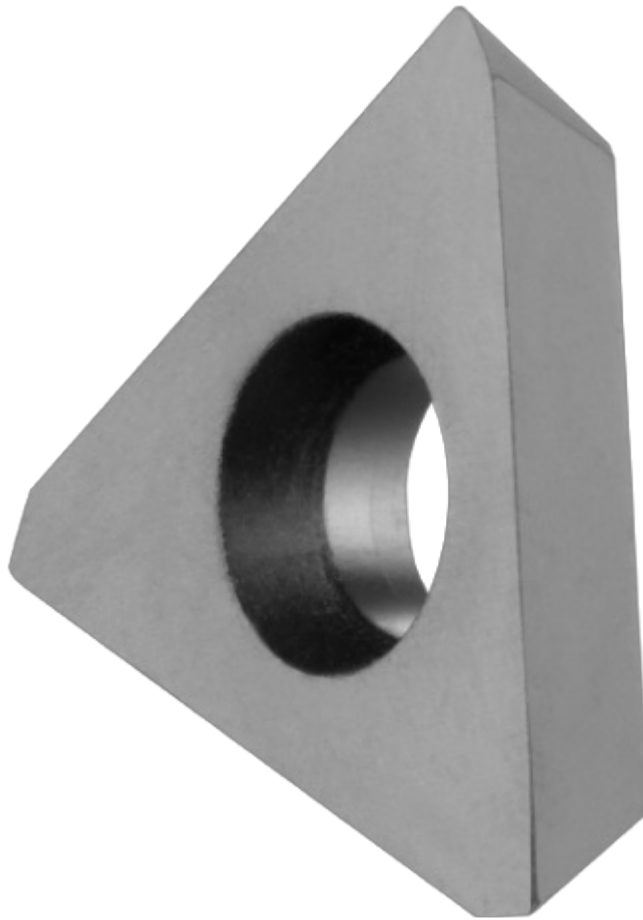
Grey

Microhardness

10,000 HV_{0,05}

Coating thickness

7 μm



CCDia®FiberSpeed

for fibre reinforced plastics, aluminum with high Si content and ceramics

Coating material

Diamond

Coating structure

Multilayer, sp³

Color

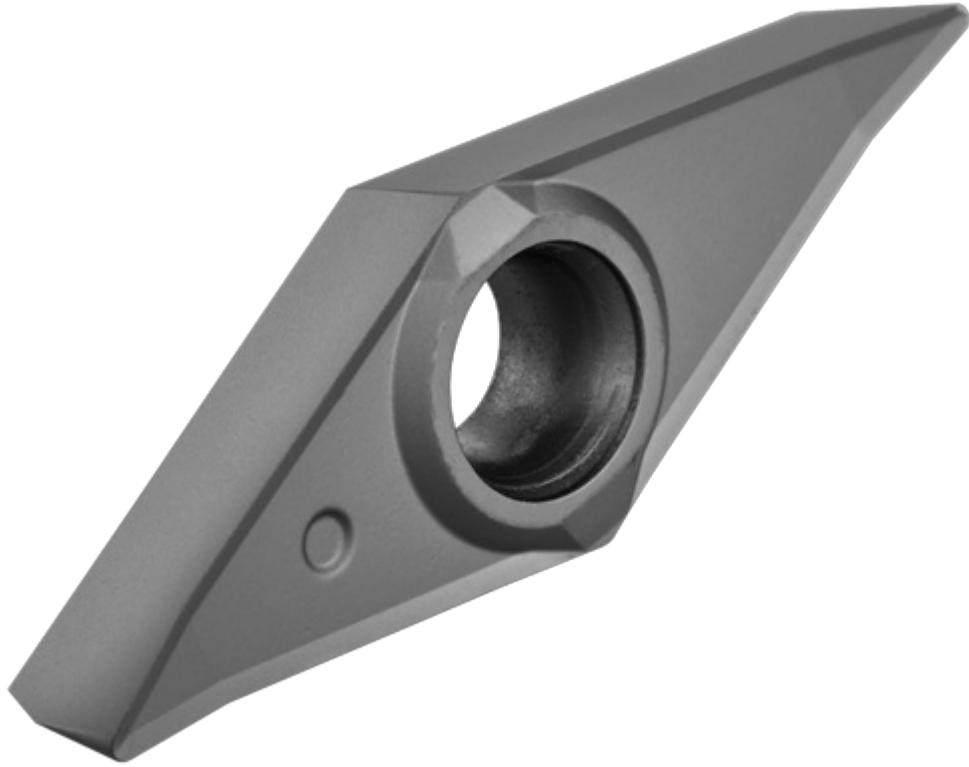
Grey

Microhardness

10,000 HV_{0,05}

Coating thickness

9 μm



CCDia®MultiSpeed

for fibre reinforced plastics, aluminum with high Si content and ceramics

Coating material

Diamond

Coating structure

Multilayer, sp³

Color

Grey

Microhardness

10,000 HV_{0,05}

Coating thickness

14 µm

[Aerospace](#)

[CRFP](#)

Cutting inserts

GFRP

multilayer diamond coatings

Graphit

non-ferrous materials

plastics

Tool and mould making

nanocrystalline

complex geometrie

Cutting edge geometries

multi-edge cutting

high feed rate

Roughing

Tool life