

BALDIA COMPACT & BALDIA COMPACT DC

Diamond coatings for machining highly
abrasive powder materials



Cutting Tools



Achieving the best cutting performance when machining highly abrasive powder materials

Machining highly abrasive, compacted and sintered powders such as graphite, ceramics and cemented carbide is a major challenge. The following aspects must be considered in order to achieve optimum tool life:

- Tool design and geometry
- Tool surface and edge preparation
- Tool substrate
- Tool pre-treatment for ultimate coating adhesion
- Optimum coating, tailored precisely to your application

Diamond has special properties: it is extremely wear-resistant due to its unsurpassed hardness, offers thermal conductivity and is chemically almost inert.

BALDIA® COMPACT and BALDIA® COMPACT DC by Oerlikon Balzers are diamond coatings which provide these indispensable properties and enable highly abrasive powder materials to be machined most efficiently. They allow parts to be manufactured with tightest tolerances resulting in excellent finishing accuracy.

BALDIA COMPACT and BALDIA COMPACT DC

Tailored precisely for your applications with compacted and sintered powders.

Graphite



Cemented carbides*



Ceramics



* Image source: ZECHA Hartmetall-Werkzeugfabrikation GmbH

Benefit from optimum machining results

Challenge

High abrasive wear



Extremely high geometry accuracy demands, especially for micro-tools



Perfect surface quality and optimum productivity



Expensive micro-tools can easily be damaged



Dust leads to high friction between workpiece material and tool



Ultra-high tool reliability for single-item and series production



Coating solutions from Oerlikon Balzers

Highest wear resistance due to superior hardness

Homogeneous coating thickness distribution on cutting tools and tight tolerances (on demand less than 10 µm achievable)

Combination of low friction and high wear resistance allows high cutting speeds

Professional handling and specific production processes

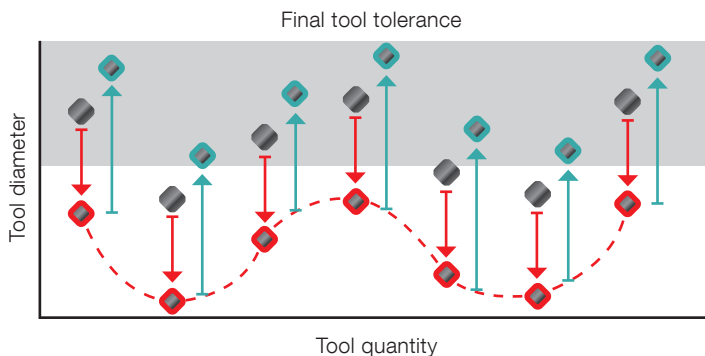
Very low friction coefficient and low dust adhesion

Controlled coating processes allow tightest tolerances and outstanding coating performance

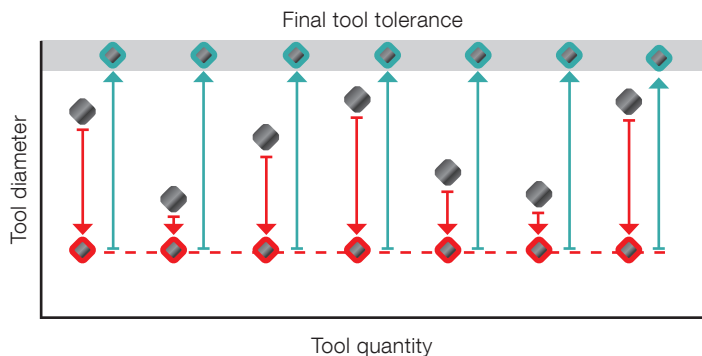
BALDIA® COMPACT and BALDIA® COMPACT DC allow optimum productivity when surface quality and accuracy matter most

When every micron counts – available with a choice of two tolerances

BALDIA COMPACT



BALDIA COMPACT DC



Features of BALDIA COMPACT

- Tolerance range same as after grinding
- Tighter tolerances can be achieved by adjusting the coating thickness (may result in variations in tool life)

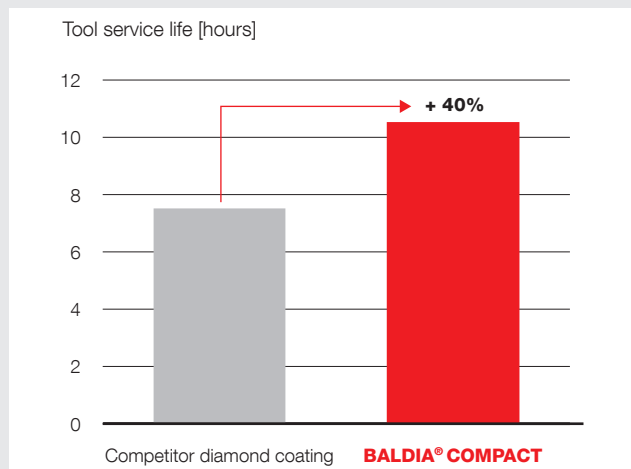
Features of BALDIA COMPACT DC

- Tightest possible tolerances for both tool diameter **and** coating thickness
- Consistent high tool performance with tight bore tolerances

When minimum tolerances for both tool diameter and coating thickness are required, **BALDIA® COMPACT DC** offers an improved, consistent tool performance and service life.

BALDIA COMPACT – increased tool life when machining graphite

Using BALDIA® COMPACT for machining graphite, a European tool manufacturer increased its tool service life by 40% compared to the competition.



Tool Solid end mill Ø 6, EMT100 carbide

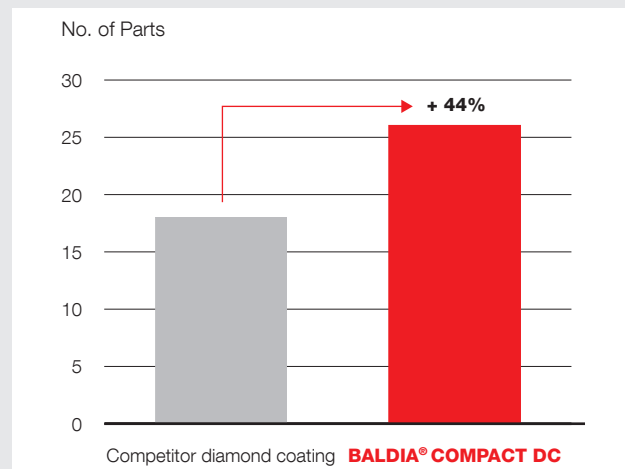
Workpiece Graphite

Cutting parameters
 $f = 22,000$ mm/min
 $\text{rpm} = 42,000$ 1/min
 $a_p = 6$ mm

Source European tool manufacturer

BALDIA COMPACT DC for graphite milling

Using BALDIA® COMPACT DC for milling graphite, a European tool manufacturer benefitted from high accuracy, an excellent surface finish and an increased productivity of 44%.



Tool Ball nose end mill, 3 × 20 mm (2 teeth)

Workpiece Graphite R8650

Cutting parameters
 $v_c = 283$ m/min
 $\text{rpm} = 30,027$ 1/min
 $ft = 0.050$ mm/Z

Source European tool manufacturer

Coating properties of BALDIA COMPACT and BALDIA COMPACT DC at a glance

BALDIA®	Coating material	Coating temperature [°C]	Max. service temperature [°C]	Coating hardness H _{IT} [GPa]	Available coating thicknesses [µm]*	Coating colour
COMPACT	Carbon-based	< 900	600	80 – 100	6 – 12	grey
COMPACT DC					4 – 15	

*additional coating thicknesses on request

Benefit from our competence centres for diamond coatings around the world. Contact us now for your optimum BALDIA coating!

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