

Cutting tools for electric mobility and drivetrain production

Solid-carbide drills, PCD and PCBN milling tools, turning tools and boring tools with the complete EHWA range and its application examples.



EHWA Europe GmbH

www.ehwadia.de

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Design the tool around the component

Drilling, milling and turning for aluminium components, CV joints and housings

The EHWA range combines solid-carbide drills with PCD and PCBN tools for producing drivetrain components. It covers aluminium alloys, steel CV-joint components, transmission and differential gears, scroll compressors, battery housings and motor housings. Tool body, cutting material and workpiece material are selected to suit each process.

Application	Tool range
Aluminium alloys	Solid-carbide drills, XF face milling cutters and other face milling cutters
Steel drilling	ET220 solid-carbide drills with coating variants
CV joints	EBC52X PCBN turning grade; PCBN end mills with four or six flutes
Transmission and differential gears	Turning tools in grades EB419 and EB454
Aluminium scroll compressors	Customised PCD end mills
Aluminium battery housings	PCD end mills with a helical cutting-edge arrangement
Motor housings	Special boring tool with an aluminium/CFRP body concept

Solid-carbide drills for aluminium alloys

The aluminium drills belong to the ETDB family. The range contains the following six complete item-code and dimensional combinations:

Item code	D1	D2	L	FL	OAL
ETDB 43 60 025 080 2N	4.3	6.0	25	40	80
ETDB 51 80 025 080 2N	5.1	8.0	25	40	80
ETDB 69 100 030 100 2N	6.9	10.0	30	50	100
ETDB 86 120 035 105 2N	8.6	12.0	35	55	105
ETDB 104 140 040 110 2N	10.4	14.0	40	60	110
ETDB 140 160 040 110 2N	14.0	16.0	40	60	110



Six solid-carbide drills for aluminium alloys in different designs.

ET220 solid-carbide drills for steel

ET220 is described as an ultra-fine carbide with high hardness and fracture toughness. For steel, EHWA specifies helical drills with two to three coolant holes. The coating overview distinguishes TA as the conventional design and H1, H2 and H3 as coating variants for interrupted cutting.

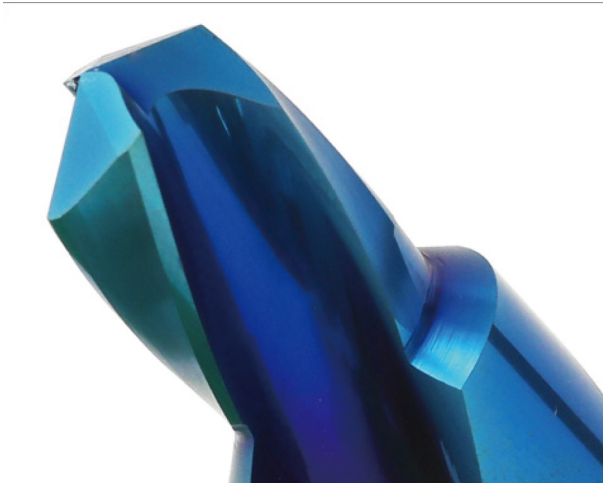
Coating designation	Range classification
TA	Conventional coating
H1	Coating for interrupted cutting
H2	Coating for interrupted cutting
H3	Coating for interrupted cutting



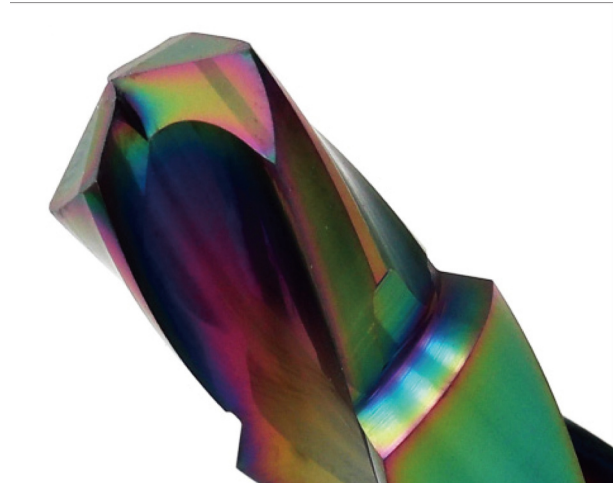
TA coating variant.



H1 coating variant.



H2 coating variant.



H3 coating variant.



Four coated solid-carbide drills as product examples.

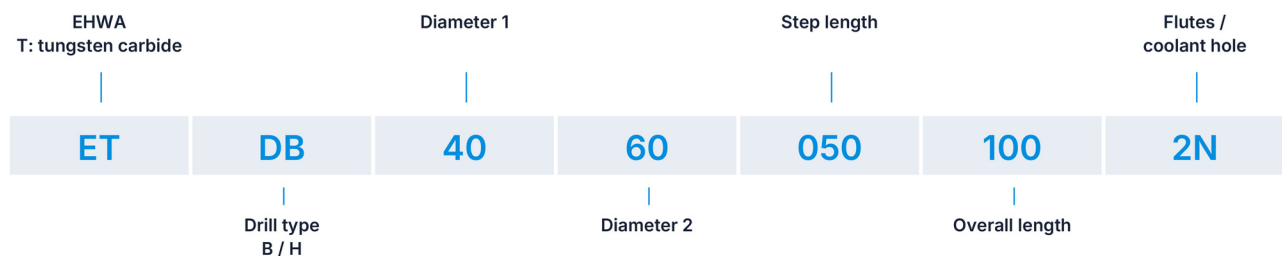
Item code	D1	D2	L	FL	OAL
ETDH 43 60 025 080 2N	4.3	6.0	25	40	80
ETDH 51 80 025 080 2N	5.1	8.0	25	40	80
ETDH 69 100 030 100 2N	6.9	10.0	30	50	100
ETDH 86 120 035 105 2N	8.6	12.0	35	55	105
ETDH 104 140 040 110 2N	10.4	14.0	40	60	110
ETDH 140 160 040 110 2N	14.0	16.0	40	60	110

Drill codes and dimensional drawings

The codes are explained using the illustrated examples **ET DB 40 60 050 100 2N** and **ET DH 40 60 050 100 2N H3**. The number blocks remain manufacturer designations; the associated dimensions are taken from the item table and tool drawing.

Code element	Meaning
ET	EHWA; T denotes tungsten carbide
DB / DH	Drill type: B = Burnishing Drill; H = Helical
40	Diameter 1
60	Diameter 2
050	Step length
100	Overall length
2N	Designation block for flute count / coolant hole
H3	Coating designation in the coated example

EHWA drill code: aluminium design

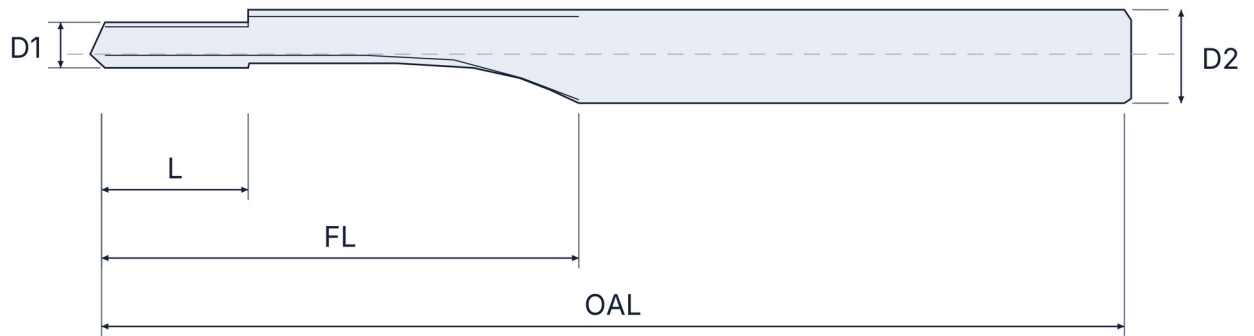


B: Burnishing Drill · H: Helical

Code blocks follow the manufacturer designation.

Drill-code structure in the aluminium example.

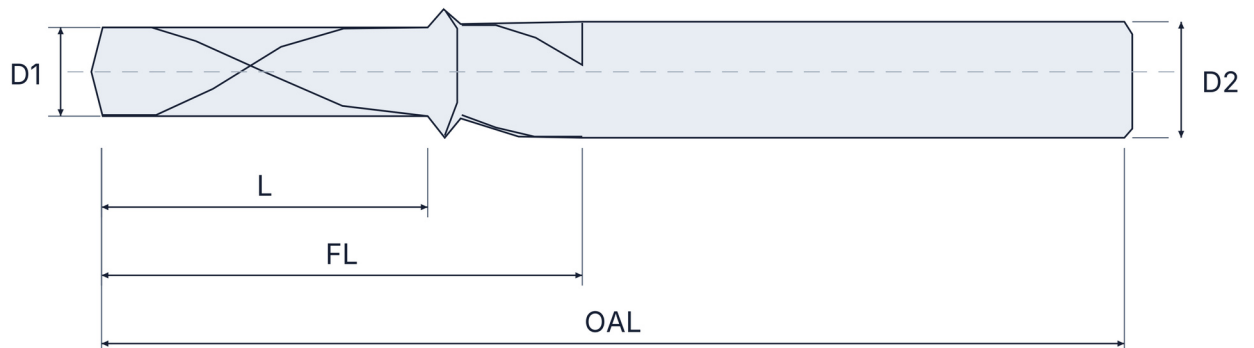
Type B drill: dimensional designations



Schematic dimensional drawing.

Type B dimensional drawing with D1, D2, L, FL and OAL.

Helical drill: dimensional designations



Schematic dimensional drawing.

Helical-drill dimensional drawing with D1, D2, L, FL and OAL.

EHWA drill code: coated design

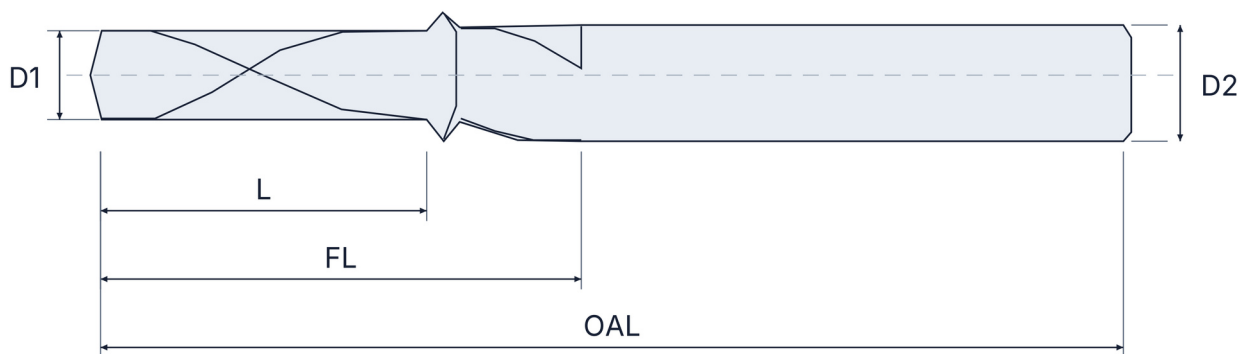
EHWA T: tungsten carbide		Diameter 1		Step length		Flutes / coolant hole	
ET	DH	40	60	050	100	2N	H3
	Drill type B / H		Diameter 2		Overall length		Coating

B: Burnishing Drill · H: Helical

Code blocks follow the manufacturer designation.

Coated drill-code structure including H3.

Helical drill: dimensional designations



Schematic dimensional drawing.

Helical-drill dimensional drawing from the ET220 range.

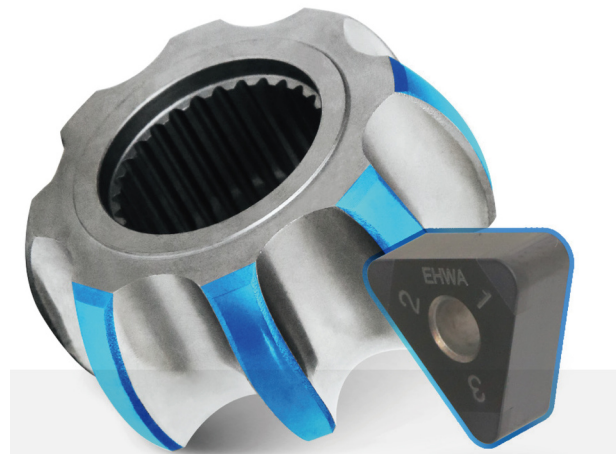
D1 and D2 denote the two diameters; L, FL and OAL remain the drawings' length designations. The dimensional tables do not state an explicit unit. The binding dimensional definitions and units are agreed using the tool drawing.

EBC52X: PCBN turning for CV joints

EBC52X is a high-CBN-content PCBN grade for continuous and interrupted machining of heat-treated steel CV-joint components. EHWA describes the grade as capable under demanding machining conditions. The two examples show different cutting data for outer and inner components.



CV-joint outer component with highlighted machining surfaces and an insert.

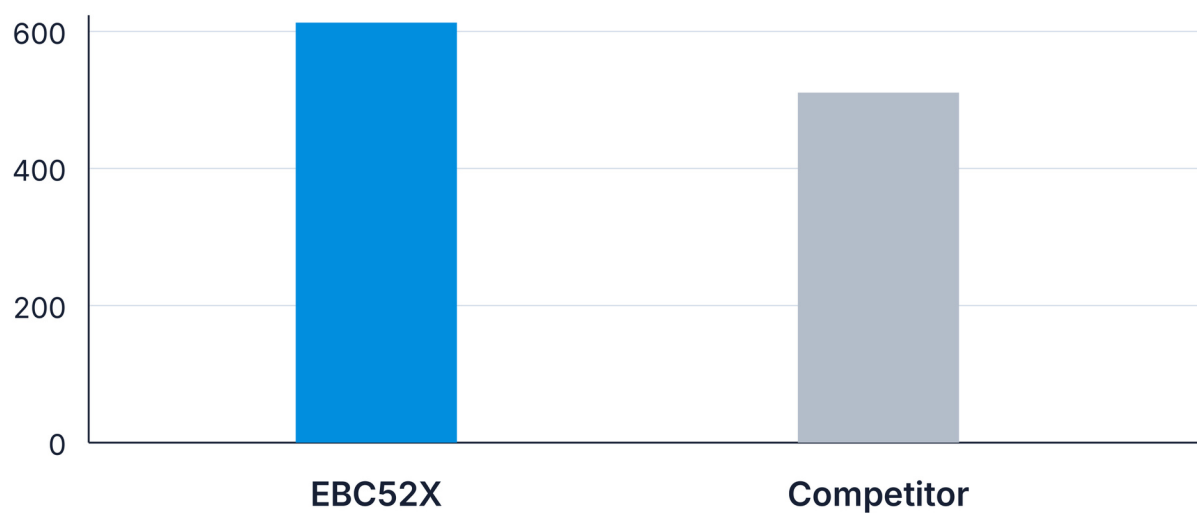


CV-joint inner component with highlighted machining surfaces and an insert.

Trial specification	Outer Race Turning	Inner Race Turning
Workpiece	Forged steel	Forged steel
Cutting speed	120 m/min	200 m/min
Feed rate	0.10-0.12 mm/rev	0.20 mm/rev
Depth of cut ap	0.10-0.20 mm	0.09-0.15 mm
Coolant	Dry machining	Dry machining
Cutting mode	Interrupted cutting	Interrupted cutting

CV joint: outer component

Comparison scale (unit not specified)

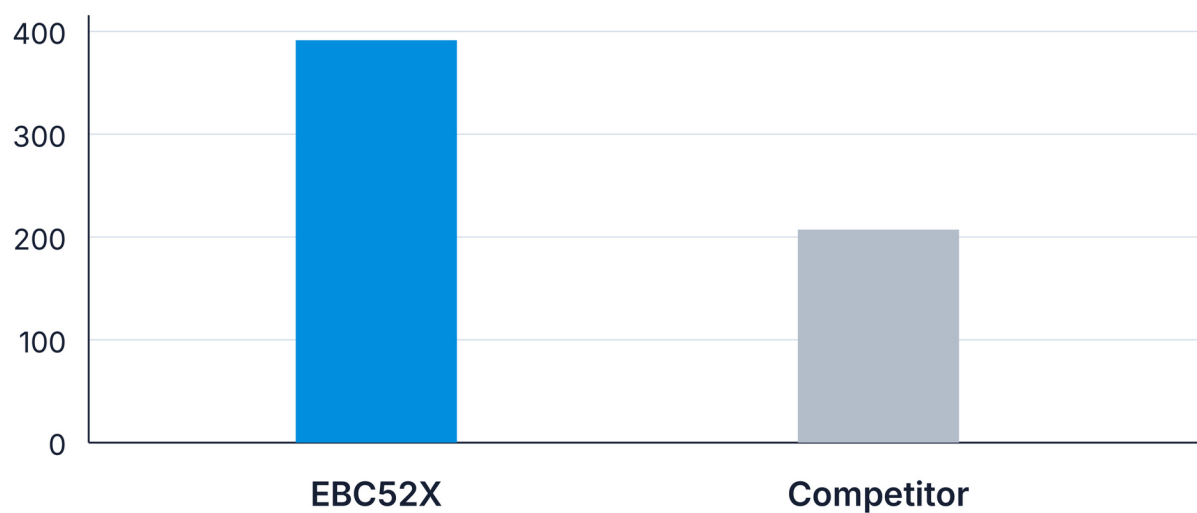


Illustrated application example.

EBC52X comparison for the outer component with the complete original scale.

CV joint: inner component

Comparison scale (unit not specified)



Illustrated application example.

EBC52X comparison for the inner component with the complete original scale.

The bars compare EBC52X with a competitor's tool under the stated conditions. The diagrams do not identify the unit of their comparison scale; neither part count nor machining time is derived as an additional value.



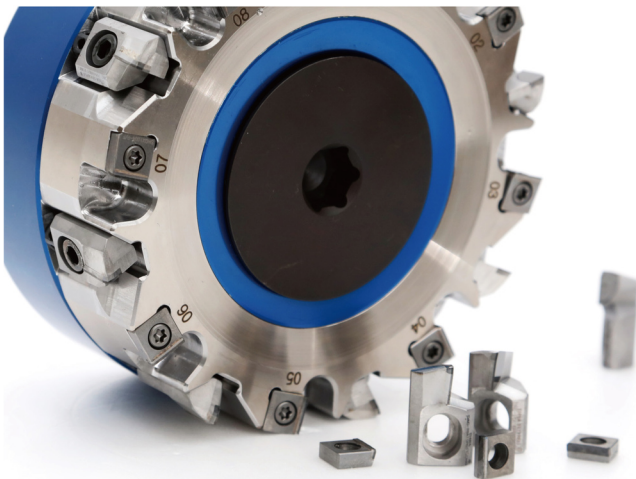
CV joint in the suspension and drivetrain context.



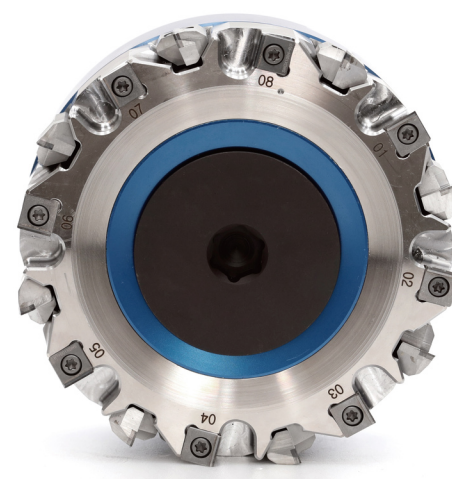
Another drivetrain example with a CV joint.

XF face milling cutters for aluminium alloys

XF face milling cutters are offered for roughing and finishing. The range combines cutter bodies, inserts, cartridges and arbors; dimensions can be customised.



XF face milling cutter with separate cartridges and inserts.



XF face milling cutter in a complete front view.

Dimensions and tooth count

Type	ØD	Ød	A	B	H	Teeth
XF 10050 -16R (L)	100	31.75	12.7	8	50	16
XF 12563 -16R (L)	125	38.1	15.9	10	63	16
XF 16063 -16R (L)	160	50.8	19.0	11	63	16
XF 20063 -18R (L)	20	47.625	25.4	14	63	18
XF 25063 -18R (L)	250	47.625	25.4	14	63	18

For type XF 20063 -18R (L), the item table gives ØD as **20**, while the separate cutting-data table contains **ØD 200**. The additional EHWA XF data sheet checked contains the same discrepancy; the diameter is confirmed before tool design.

For all five types, the table specifies the **XF10 - SN** insert and **XF CF / XF SD** cartridge designs.

Type	Arbor
XF 10050 -16R (L)	FMA 31.75
XF 12563 -16R (L)	FMA 38.1
XF 16063 -16R (L)	FMA 50.8
XF 20063 -18R (L)	FMA 47.625
XF 25063 -18R (L)	FMA 47.625

Stated maximum cutting conditions

ØD	Maximum speed (min ⁻¹)	Depth of cut ap (mm)
100	11 000	3
125	9 000	3
160	7 000	3
200	5 500	3

These cutting data belong to the tool designs shown. The sheet does not specify an additional maximum speed for ØD 250.

PCBN end mills for CV joints

EHWA develops precise PCBN end mills as a cutting solution for suitable CV-joint processes. The range includes four- and six-flute designs. The six-flute design is intended for high durability in high-speed machining. Customised designs and tooling solutions complement its cutting performance.

Feature	Design
Body type	HFS12
Cutting material	PCBN
Flutes	4 F and 6 F



Four-flute PCBN end mill.



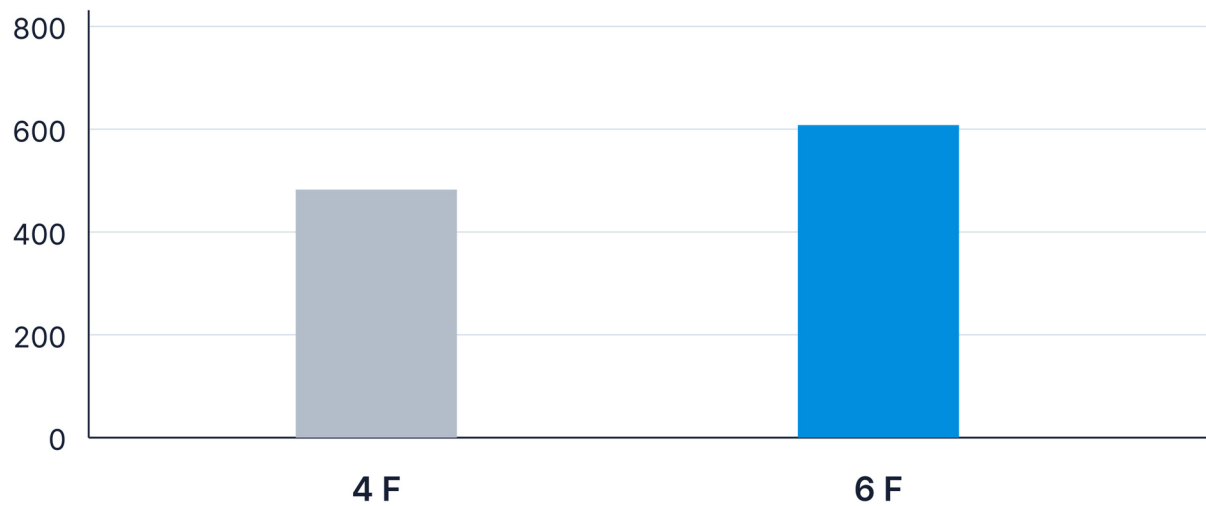
Six-flute PCBN end mill.



Both PCBN end-mill designs in detail.

PCBN end mills: tool life

Tool life (unit not specified)



Illustrated application example.

Tool-life comparison of the four- and six-flute designs.

The chart shows higher tool life for the six-flute design in the illustrated comparison. The scale is labelled TOOL LIFE but does not state a unit; no additional trial conditions are added here.



CV-joint components as workpieces.

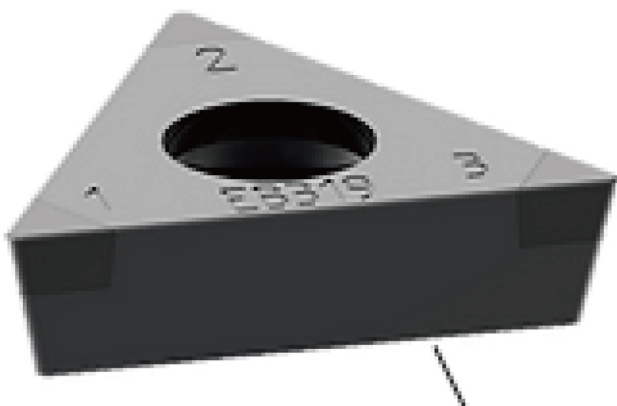


Vehicle illustration for the drivetrain application.

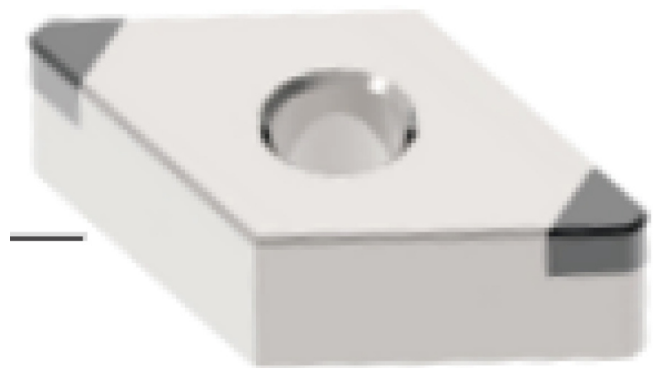
Turning for transmission and differential gears

For the illustrated internal and taper turning, EHWA specifies grades **EB419** and **EB454**. The insert designations are assigned to the two applications shown:

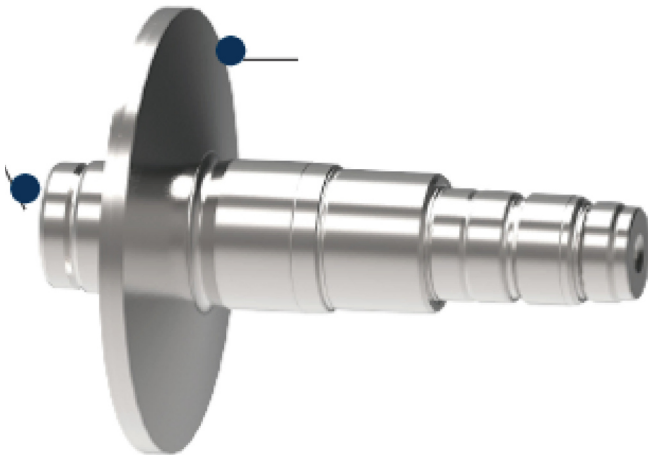
Application	Insert designation
Inner-diameter turning	TCGW090204
Taper turning	DNGA150408



TCGW090204 insert for inner-diameter turning.



DNGA150408 insert for taper turning.

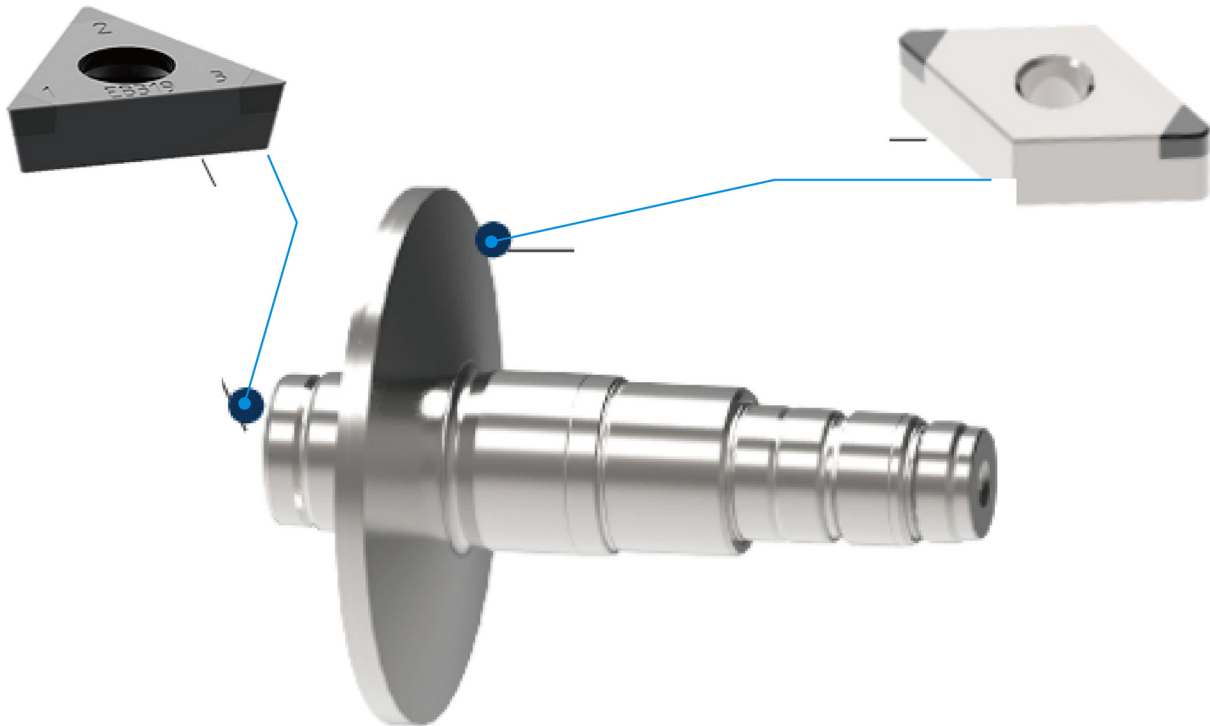


Shaft/transmission component as a machining example.

Transmission: inserts and machining regions

Inner-diameter turning
TCGW090204

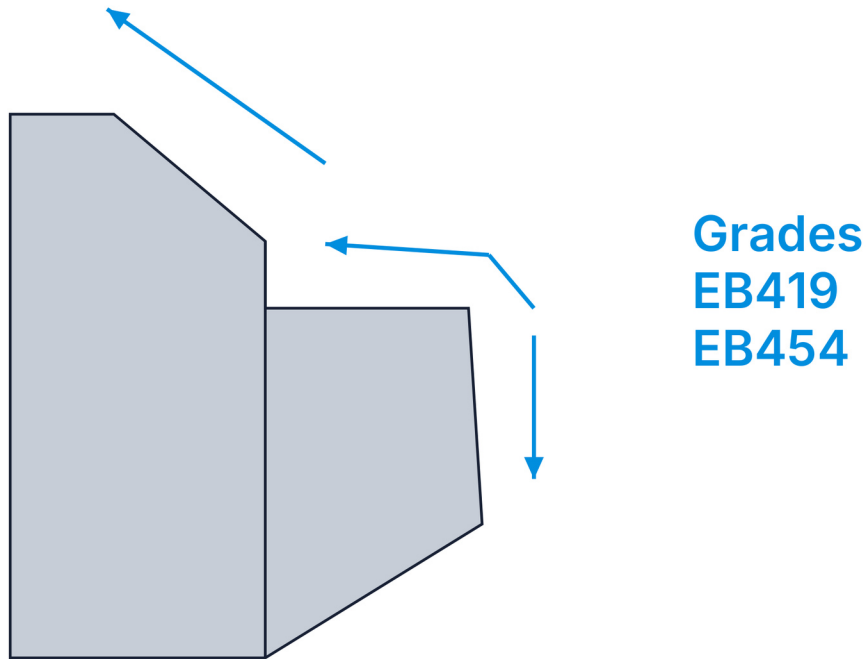
Taper turning
DNGA150408



Assignments follow the original application illustration.

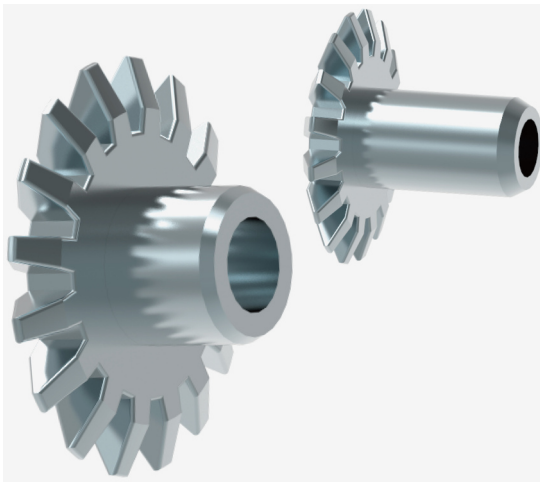
The two inserts assigned to their machining regions.

Transmission profile: illustrated machining directions



Schematic illustration.

Profile schematic with the illustrated machining directions for EB419 and EB454.

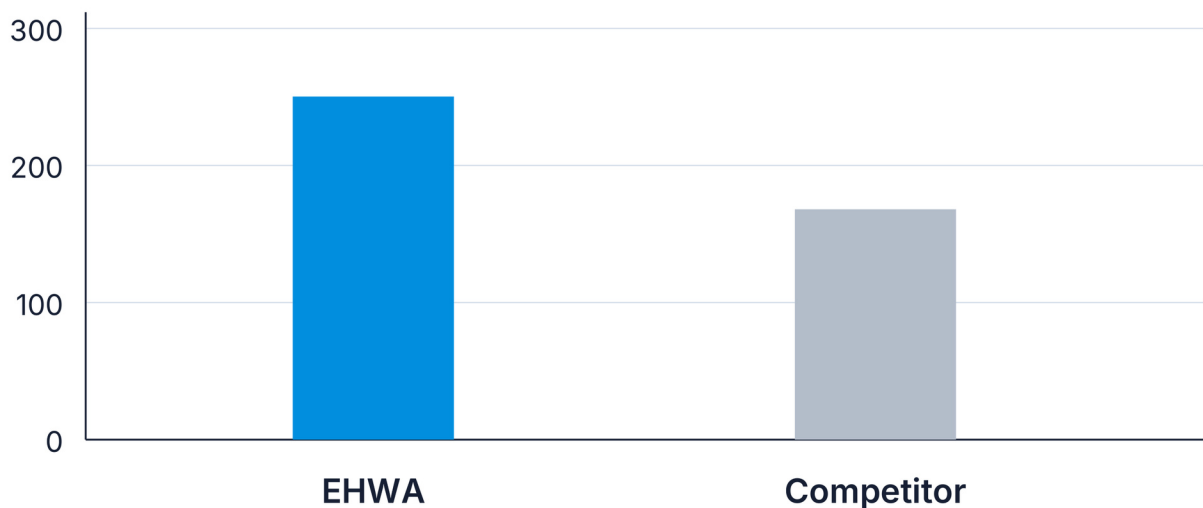


Transmission gears as workpiece illustrations.

Trial specification	Value
Workpiece	SCM418H
Cutting speed	80-120 m/min
Feed rate	0.07-0.10 mm/rev
Depth of cut ap	0.05-0.06 mm

Gear machining: comparison

Comparison scale (unit not specified)



Illustrated application example.

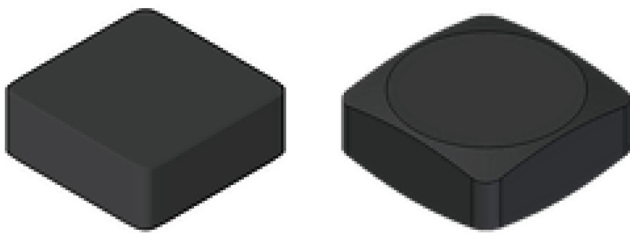
EHWA/competitor comparison for the illustrated gear-machining application.

The complete comparison scale is retained. It does not name a unit or measured quantity; the bar-chart advantage is therefore presented as the application result shown.

AF, BF, CF and XF face milling families

The face milling families have different priorities in surface quality, tool life, burr-free machining and universal design. XF complements the range for roughing and finishing.

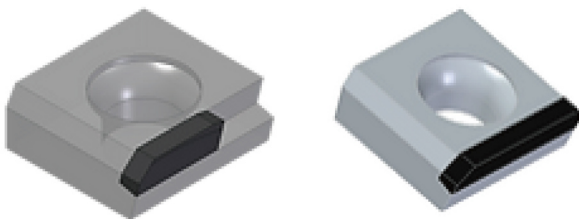
Family	Size designation	Design and associated inserts
AF	80D-250D	Surface quality and tool life; SNGN 1204, SNGX 1204
BF	125D-250D	Designed for burr-free machining and long tool life; SNGX 1004-R, SNGX 1004-F
CF	50D-250D	Universal EHWA design; CFR, CFW
XF	See the XF range table	Roughing and finishing; SNGX 1004-R, SNGX 1004-F and CFR, CFW



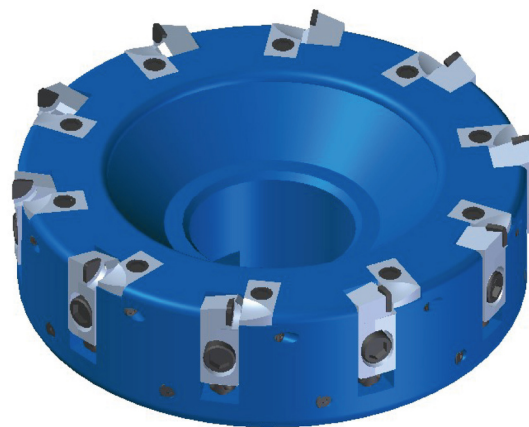
AF inserts SNGN 1204 and SNGX 1204.



AF face milling cutter.



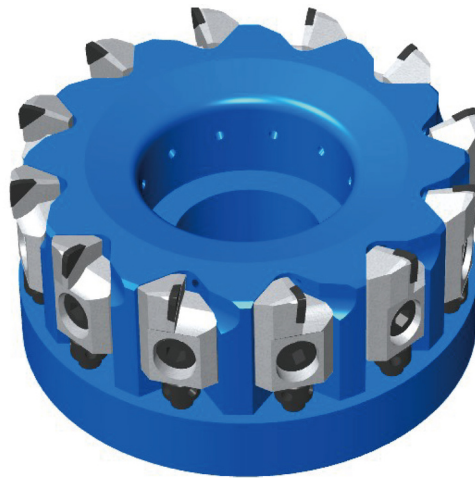
BF inserts SNGX 1004-R and SNGX 1004-F.



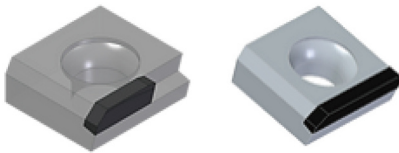
BF face milling cutter.



CF inserts CFR and CFW.



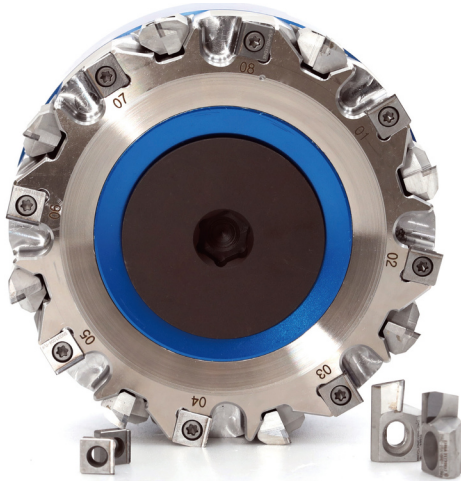
CF face milling cutter.



SNGX 1004-R and SNGX 1004-F in the XF range.



CFR and CFW in the XF range.



XF face milling cutter with separate components.

PCD end mills for aluminium scroll compressors

EHWA offers customer-optimised PCD end mills for scroll compressors. Precise machining supports production efficiency and compressor-component quality. The illustrated designs show different cutting-edge and step geometries for this aluminium application.



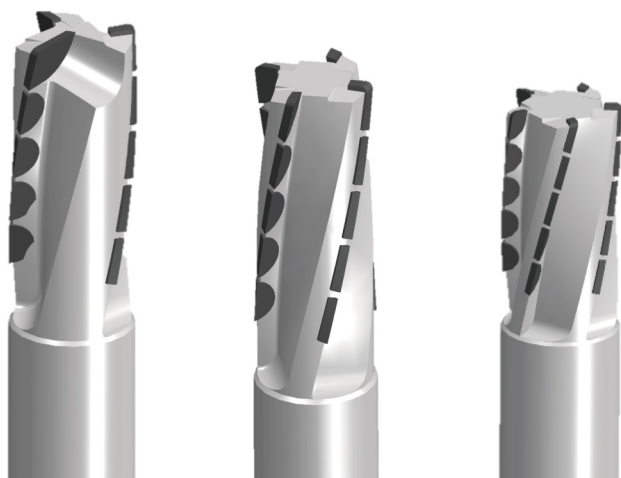
Five PCD end-mill designs for scroll compressors.



Compressor application in the vehicle context.

PCD end mills for aluminium battery housings

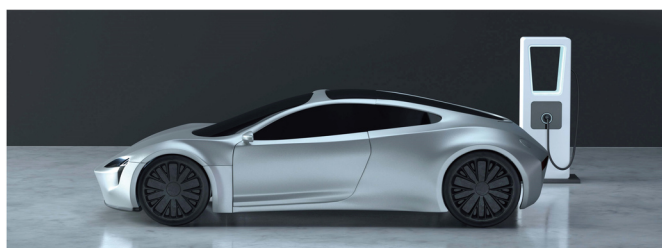
The helical cutting-edge arrangement of the PCD end mills is designed for high material removal rates. EHWA specifies burr-free machining through a high rake angle, high machining speed and efficiency, and improved surface roughness as the aims of this design.



Three PCD end-mill designs with a helical cutting-edge arrangement.



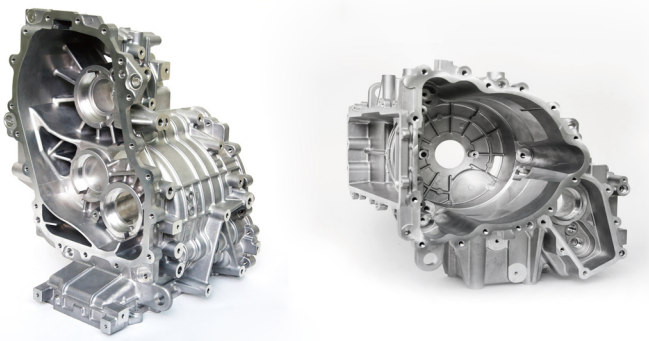
Aluminium battery housing as a workpiece example.



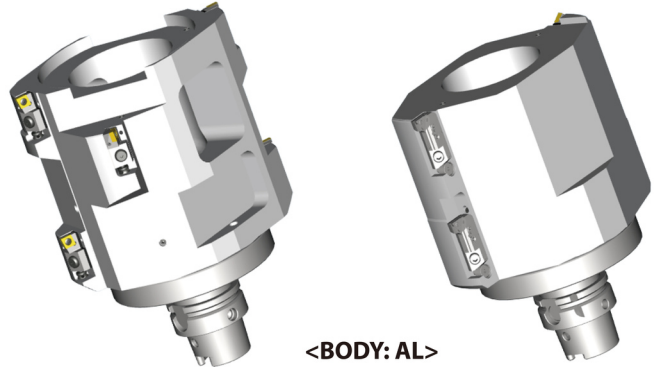
Electric vehicle as the application context.

Special boring tool for motor housings

Electric motors are designed for high power, efficiency and capacity with low weight. For machining their housings, EHWA describes a tooling concept combining aluminium and carbon-fibre-reinforced polymer (CFRP). The material combination concerns the tool body and is intended to improve vibration damping.



Two motor housings as workpiece examples.



Two tool-body designs with the manufacturer's BODY: AL designation.



Special boring tool from the aluminium/CFRP concept.

The section drawing shows the machining arrangement with housing, tool body and mounting interface. All stated dimensions and cutting-edge-count designations are retained:

Drawing specification	Value
Diameter with tolerance	Ø201.7 ±0.05; Z = 2
Additional diameter with tolerance	Ø199.5 ±0.1; Z = 2
Interface diameter	Ø140
Axial dimensions	60; 140; 70; 210

Motor housing: section example of the machining arrangement

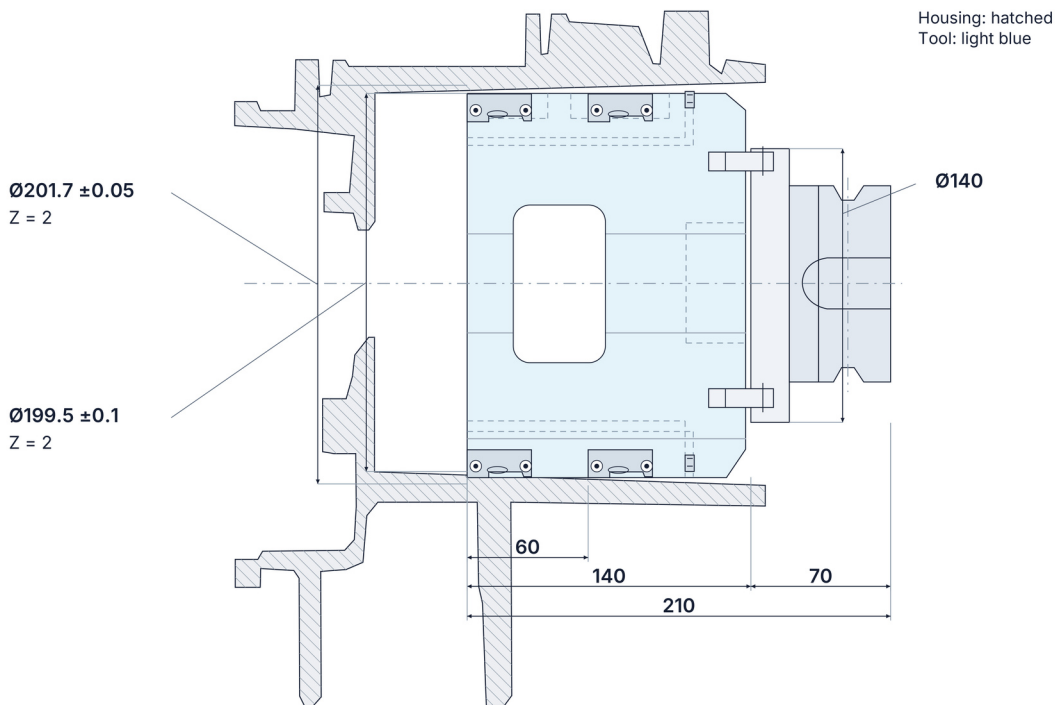


Illustration follows the source example; agree dimensional definitions and units using the tool drawing.

Completely redrawn section example with both tolerances, cutting-edge-count designations and axial dimensions.

The drawing describes the example design shown. Dimensional definitions and units are established for the particular motor housing using the agreed tool drawing.

Stripping blades for hairpin motor windings

Rectangular copper conductors with defined corner radii place specific demands on insulation stripping. EHWA develops precision blades made from superhard cutting materials with a contour matched to the conductor profile. They are intended to remove PEEK and PAI insulation from hairpin conductors.

The design aims to produce a clean copper surface while minimising damage to the conductor. This supports preparation of the electrical connection and subsequent laser welding. Tool contour, conductor dimensions, insulation and the NC machining sequence are specified together. The source describes long tool life and consistent machining accuracy as development objectives; the actual result is checked in the relevant process.

Design feature	Application context
Conductor	Rectangular copper conductor / hairpin
Profile	Straight faces and their associated corner radii
Insulation	PEEK and PAI
Tool	Precision stripping blade with a matched contour
Subsequent step	Preparation of the electrical connection and laser welding



Precision stripping blades for rectangular hairpin conductors.



Hairpin copper conductors with stripped ends as an application example.



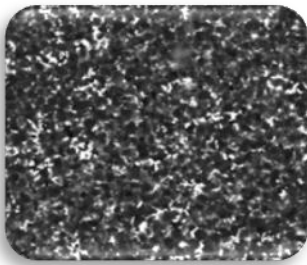
Motor stator with hairpin windings as a component example.

PCBN grades for bearing components

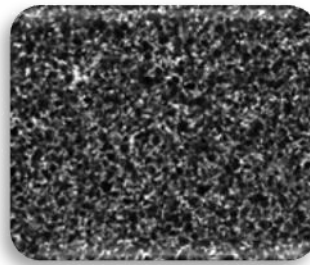
The additional grade overview distinguishes EBC57S, EBC16S, EBC190 and EBC100X. The following grain sizes and applications refer to the 2026 Automotive source edition. Selection depends on bearing design, material, interrupted cutting and machining stage.

Grade	Grain size [µm]	Listed applications	Described emphasis
EBC57S	1-2	Shaft bearings	Wear resistance; solid form
EBC16S	1-4	Shaft bearings, hub bearings, tapered roller bearings	Wear and chemical resistance; solid form
EBC190	2-4	Shaft bearings, hub bearings, tapered roller bearings	Wear and friction resistance
EBC100X	2-10	Roller bearings, tapered roller bearings	Wear, friction and impact resistance; solid form

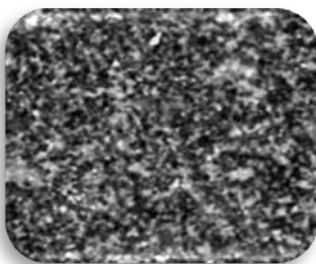
The source also compares toughness, wear resistance and cost benefit qualitatively. These selection criteria are shown without a numerical test scale. The four micrographs show the respective grades at the source's stated magnification of 1,000×.



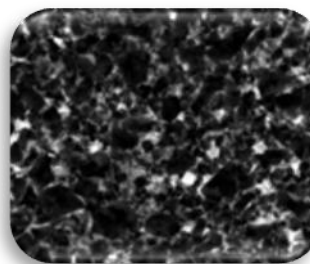
Microstructure of PCBN grade EBC57S, source magnification 1,000×.



Microstructure of PCBN grade EBC16S, source magnification 1,000×.



Microstructure of PCBN grade EBC190, source magnification 1,000×.



Microstructure of PCBN grade EBC100X, source magnification 1,000×.

The original table labels its percentage row "Diamond vol (%)", although the table concerns PCBN grades. The material attribution of that row is unresolved, so it is not used as a confirmed diamond or CBN volume content. All clearly identified grade, grain-size and application data are retained.

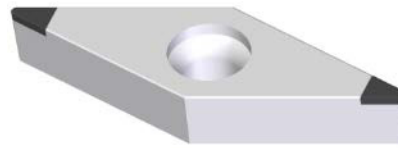
Inserts and machining locations on a bearing

The bearing illustration assigns three insert designations to specific machining areas: the outer race, inner race, hub shaft and inner diameter. The designation identifies the illustrated insert form; the grade and cutting-edge preparation are selected for the machining task.

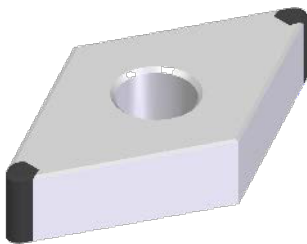
Machining area	Source insert designation
Outer race	VBGW160408
Inner race	VBGW160408
Hub shaft	DNGA150408
Inner diameter	CCGW09T304



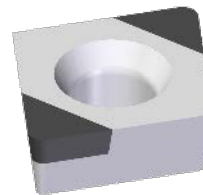
Bearing assembly cross-section illustrating the machining areas.



VBGW160408 insert example for the outer and inner race.

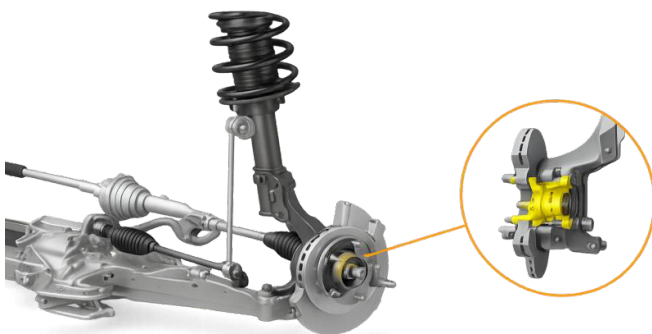


DNGA150408 insert example for the hub shaft.

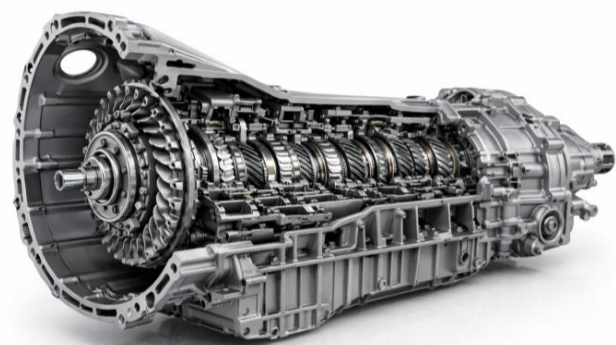


CCGW09T304 insert example for the inner diameter.

The additional component examples place the PCBN programme in hub-bearing and transmission-bearing applications. They illustrate the assembly context of the machined bearing parts.



Hub bearing and suspension assembly as an application context.



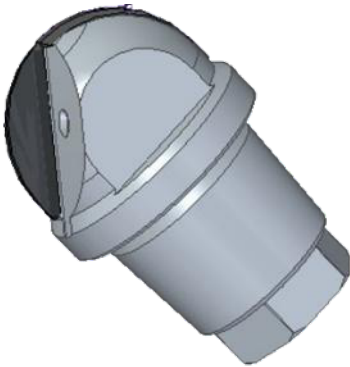
Transmission as an application context for bearing components.

PCBN ball endmills for ball tracks

For hard milling of ball tracks, EHWA shows PCBN ball endmills in HFS and normal forms. The associated grade overview distinguishes EB510 and EB10X. The cutter form is matched to the track contour and machining strategy.

Grade	Grain size [μm]	Described property
EB510	1.0-1.5	Good wear, friction and impact resistance
EB10X	1.0	Excellent wear, friction and impact resistance

The source labels the micrographs as 500 $\times$ magnification. The illustrated parts and tracks show the application area. The additional bar comparison has no identified measurement or unit and therefore provides no transferable performance factor.



PCBN ball endmill in HFS form.



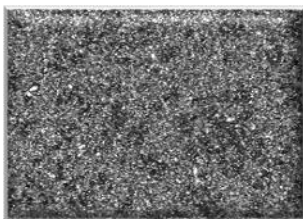
PCBN ball endmill in normal form.



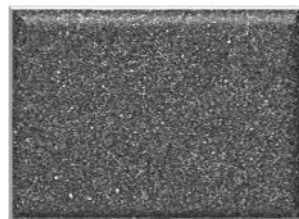
Components with ball tracks as application examples.



Ball track and enlarged track detail from the source.



Microstructure of grade EB510, source magnification 500x.



Microstructure of grade EB10X, source magnification 500x.

Discuss your machining process

Specify the component and material, the required machining operation, and dimensional, tolerance and surface requirements. Add the machine, mounting interface, drawing, current tool and coolant. For an existing process, cutting data, tool life, cutting-edge wear and the production target are useful.

EHWA Europe connects tool design with the application and customised geometry. The information available is sufficient to start; further details can be added during the technical discussion.

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