ARNO TOOL-TIP

ARNO®
WERKZEUGE

INSERTS GRADES **AM7010 / AM7020 / AM5015**

INNOVATIONS

IN MEDICAL AND AEROSPACE TURNING APPLICATIONS

AM7010, AM7020, and AM5015 are three NEW grades capable of machining difficult alloys. They are specifically designed for the challenging materials and high precision requirements demanded in the Medical and Aerospace machining market.

These three grades improve process stability due to their extreme wear resistance and achieve excellent results in Titanium, 300 series, 400 series, and PH Stainless Steels.

The AM7010 / AM7020 coating is made of 3 μm thick TiAlSiN and will withstand temperatures of up to 1,100°C.

The AM5015 coating is AlTiN coated and will withstand temperatures up to max. 1,000°C.

- **AM7020 features a tougher substrate for unstable or partially interrupted conditions.**
- **AM7010 features a wear resistant substrate for stable, continuous cuts.**
- **AM5015 for continuous cuts and stable conditions.**
- **All three grades are optimised for greater wear resistance.**

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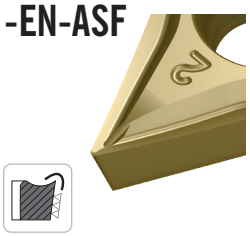
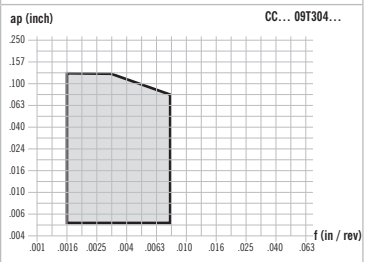
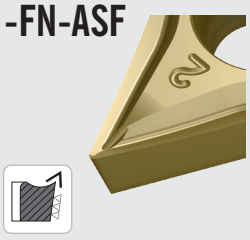
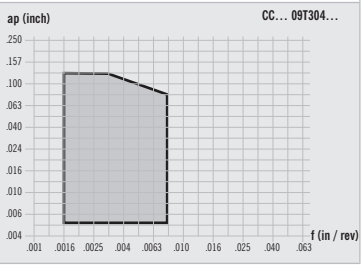
DESCRIPTION OF GRADES

HC – COATED CARBIDE

Grade	Coating color	Properties	Material group						Scope of application	
			P	M	K	N	S	H	WEAR RESISTANCE 5 10 15 20 25 30 35 40 45 TOUGHNES	
AM5015 PVD		• Titanium, 300 series, 400 series, and PH Stainless • Nickel based and High Temp alloys • Excellent wear resistance	●	●	○	○	●	○		●
AM7010 PVD		• Titanium, 300 series, 400 series, and PH Stainless • Cobalt Chrome alloys • Highly wear resistant	○	●			○	○		●
AM7020 PVD		• Titanium, 300 series, 400 series, and PH Stainless • Cobalt Chrome alloys • Tougher substrate for unstable conditions	○	●			○	○		●

PREFERRED GEOMETRY

HIGH POSITIVE MEDIUM MACHINING

Geometry	Properties	Material group						View/Cut	Basic cutting data diagram
		P	M	K	N	S	H		
-EN-ASF 	• Excellent for Swiss type machining • Peripheral ground for precision • Honed for a slightly stronger edge	●	●	○	●	●	○	Main cutting edge 	
-FN-ASF 	• Excellent for Swiss type machining • Peripheral ground for precision • Un-honed for a dead sharp edge • Recommended for very light cuts, low feed rates, or when using chip breaking cycles	●	●	○	●	●	○	Main cutting edge 	

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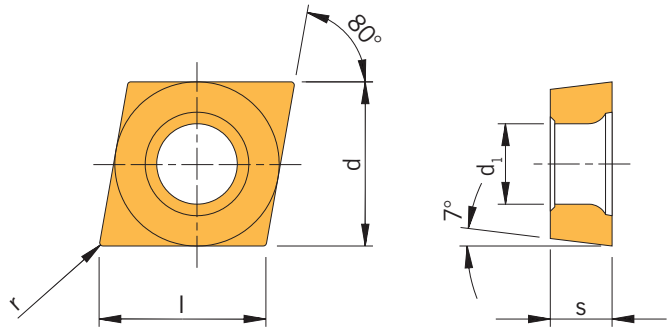
CCGT



Similar to illustration

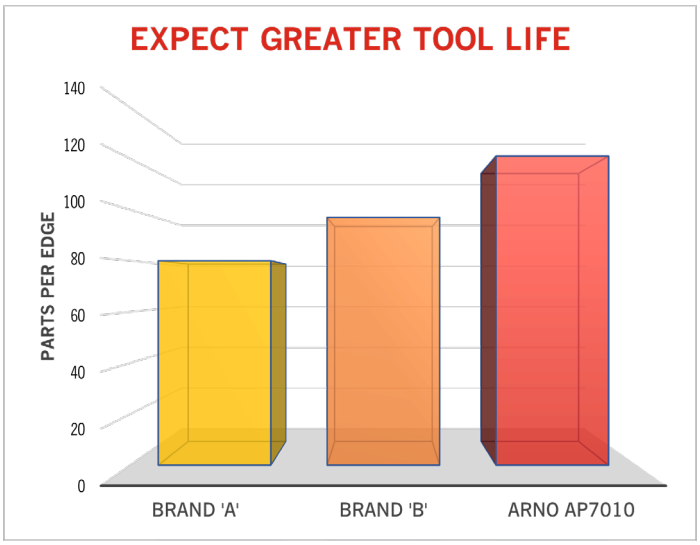
Designation ANSI ISO	r INCH mm	f_n	a_p	HC AM5015	HC AM7010	HC AM7020
CCGT 21.50(4)AN-ASF CCGT 060201EN-ASF	**0.004** 0,10	**.001 - .0025** 0,02 - 0,06	**.004 - .060** 0,1 - 1,5	◆		
CCGT 21.50.5AN-ASF CCGT 060202EN-ASF	**0.008** 0,20	**.002 - .0047** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0	◆		
CCGT 21.50.5FN-ASF CCGT 060202FN-ASF	**0.008** 0,20	**.002 - .0047** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0		◆	◆
CCGT 21.51AN-ASF CCGT 060204EN-ASF	**0.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5	◆		
CCGT 21.51FN-ASF CCGT 060204FN-ASF	**0.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5		◆	◆
CCGT 32.50.5AN-ASF CCGT 09T302EN-ASF	**.008** 0,20	**.002 - .0047** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0	◆		
CCGT 32.50.5FN-ASF CCGT 09T302FN-ASF	**0.008** 0,20	**.002 - .0047** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0		◆	◆
CCGT 32.51AN-ASF CCGT 09T304EN-ASF	**0.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5	◆		
CCGT 32.51FN-ASF CCGT 09T304FN-ASF	**0.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5		◆	◆

HC = Carbide coated

P	●	○	○
M	●	●	●
K	○		
N	○		
S	●	○	○
H	○	○	○

● Main application

○ Secondary application



Ti 6AL4V 210 SFM .010" / rev

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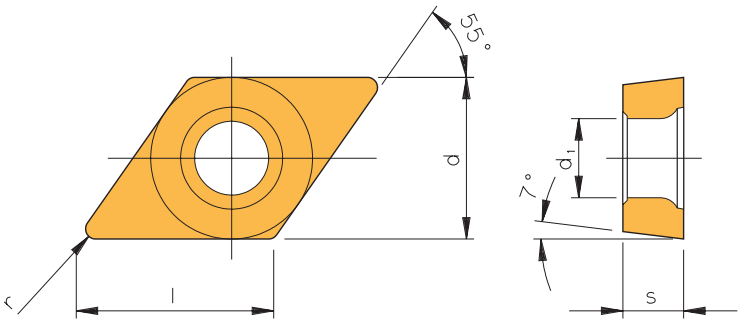
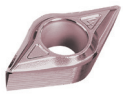
DCGT



Similar to illustration



Designation ANSI ISO	r INCH mm	f_n	a_p	HC AM5015	HC AM7010	HC AM7020
DCGT 21.50(4)AN-ASF DCGT 070201EN-ASF	**.004** 0,10	**.001 - .0025** 0,02 - 0,06	**.004 - .060** 0,1 - 1,5	◆		
DCGT 21.50(4)FN-ASF DCGT 070201FN-ASF	**.004** 0,10	**.001 - .0025** 0,02 - 0,06	**.004 - .060** 0,1 - 1,5		◆	◆
DCGT 21.50(6)AN-ASF DCGT 0702015EN-ASF	**.006** 0,15	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0	◆		
DCGT 21.50.5AN-ASF DCGT 070202EN-ASF	**.008** 0,20	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0	◆		
DCGT 21.50.5FN-ASF DCGT 070202FN-ASF	**.008** 0,20	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0		◆	◆
DCGT 21.51AN-ASF DCGT 070204EN-ASF	**.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5	◆		
DCGT 21.51FN-ASF DCGT 070204FN-ASF	**.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5		◆	◆
DCGT 32.50(4)AN-ASF DCGT 11T301EN-ASF	**.004** 0,10	**.008 - .0025** 0,02 - 0,06	**.004 - .059** 0,1 - 1,5	◆		
DCGT 32.50(4)FN-ASF DCGT 11T301FN-ASF	**.004** 0,10	**.008 - .0025** 0,02 - 0,06	**.004 - .059** 0,1 - 1,5		◆	◆
DCGT 32.50(6)AN-ASF DCGT 11T3015EN-ASF	**.006** 0,15	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0	◆		
DCGT 32.50.5AN-ASF DCGT 11T302EN-ASF	**.008** 0,20	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0	◆		
DCGT 32.50.5FN-ASF DCGT 11T302FN-ASF	**.008** 0,20	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0		◆	◆
DCGT 32.50(14)AN-ASF DCGT 11T3035EN-ASF	**.014** 0,35	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5	◆		
DCGT 32.51AN-ASF DCGT 11T304EN-ASF	**.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5	◆		
DCGT 32.51FN-ASF DCGT 11T304FN-ASF	**.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5		◆	◆
DCGT 32.52AN-ASF DCGT 11T308EN-ASF	**.032** 0,80	**.004 - .012** 0,10 - 0,30	**.012 - .118** 0,3 - 3,0	◆		

HC = Carbide coated

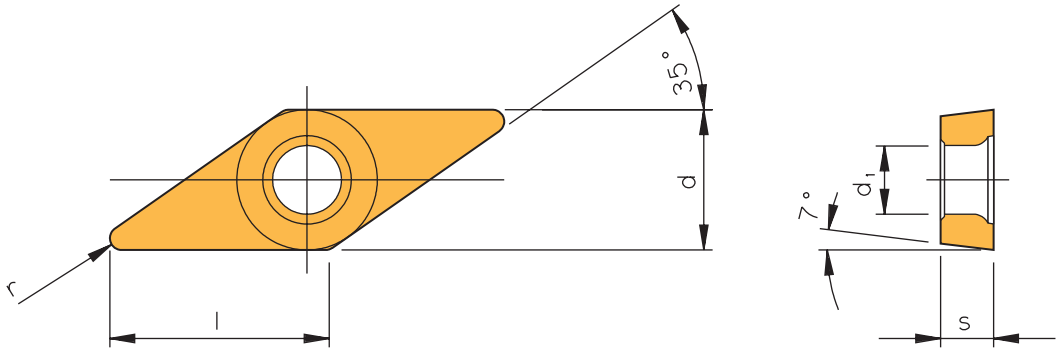
P	●	○	○
M	●	●	●
K	○		
N	○		
S	●	○	○
H	○	○	○

● Main application

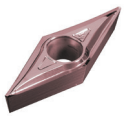
○ Secondary application

ARNO TOOL-TIP

VCGT



Similar to illustration



Designation ANSI ISO	r INCH mm	f_n	a_p	HC AM5015	HC AM7010	HC AM7020
VCGT 1.21.5(6)AN-ASF VCGT 0702015EN-ASF	**.006** 0,15	**.001 - .0025** 0,02 - 0,06	**.004 - .040** 0,1 - 1,0	◆		
VCGT 220(2)FN-ASF VCGT 1103005FN-ASF	**.002** 0,05	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0		◆	◆
VCGT 220(4)AN-ASF VCGT 110301EN-ASF	**.004** 0,10	**.001 - .0025** 0,02 - 0,06	**.004 - .060** 0,1 - 1,5	◆		
VCGT 220(4)FN-ASF VCGT 110301FN-ASF	**.004** 0,10	**.001 - .0025** 0,02 - 0,06	**.004 - .060** 0,1 - 1,5		◆	◆
VCGT 220(6)AN-ASF VCGT 1103015EN-ASF	**.006** 0,15	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0	◆		
VCGT 220.5AN-ASF VCGT 110302EN-ASF	**.008** 0,20	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0	◆		
VCGT 220.5FN-ASF VCGT 110302FN-ASF	**.008** 0,20	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0		◆	◆
VCGT 220(14)AN-ASF VCGT 1103035EN-ASF	**.014** 0,35	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5	◆		
VCGT 221AN-ASF VCGT 110304EN-ASF	**.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5	◆		
VCGT 221FN-ASF VCGT 110304FN-ASF	**.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5		◆	◆
VCGT 2.520.5AN-ASF VCGT 130302EN-ASF	**.008** 0,20	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0	◆		
VCGT 2.520.5FN-ASF VCGT 130302FN-ASF	**.008** 0,20	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0		◆	◆
VCGT 2.521AN-ASF VCGT 130304EN-ASF	**.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5	◆		
VCGT 2.521FN-ASF VCGT 130304FN-ASF	**.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5		◆	◆
VCGT 330.5AN-ASF VCGT 160402EN-ASF	**.008** 0,20	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0	◆		
VCGT 330.5FN-ASF VCGT 160402FN-ASF	**.008** 0,20	**.002 - .005** 0,05 - 0,12	**.008 - .080** 0,2 - 2,0		◆	◆
VCGT 331AN-ASF VCGT 160404EN-ASF	**.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5	◆		
VCGT 331FN-ASF VCGT 160404FN-ASF	**.016** 0,40	**.003 - .010** 0,08 - 0,25	**.008 - .100** 0,2 - 2,5		◆	◆
VCGT 332AN-ASF VCGT 160408EN-ASF	**.032** 0,80	**.004 - .012** 0,10 - 0,30	**.012 - .118** 0,3 - 3,0	◆		

HC = Carbide coated

P	●	○	○
M	●	●	●
K	○		
N	○		
S	●	○	○
H	○	○	○

● Main application

○ Secondary application

ARNO TOOL-TIP

ARNO® WERKZEUGE

RECOMMENDED CUTTING DATA

Material group	Structure of the material groups and identification letters			Brinell hardness HB	Tensile strength Rm (N/mm²)	Chipping group	Cutting speed Vc (ft / min) HC AM5015	AM7010	AM7020
P	Unalloyed steel	C ≤ 0,25 %	annealed	125	428	P1	721 - 1050	-	-
		C > 0,25 ... ≤ 0,55 %	annealed	190	639	P2	590 - 950	-	-
		C > 0,25 ... ≤ 0,55 %	hardened & tempered	210	708	P3	590 - 950	-	-
		C > 0,55 %	annealed	190	639	P4	490 - 820	-	-
		C > 0,55 %	hardened & tempered	300	1013	P5	490 - 820	-	-
		Machinig steel (short-clipping)	annealed	220	745	P6	490 - 820	-	-
	Low alloyed steel	annealed		175	591	P7	590 - 920	-	-
		hardened and tempered		300	1013	P8	560 - 820	560 - 890	490 - 720
		hardened and tempered		380	1282	P9	490 - 720	490 - 790	260 - 620
		hardened and tempered		430	1477	P10	490 - 720	490 - 790	260 - 620
	High alloyed steel and high alloyed tool steel	annealed		200	675	P11	260 - 520	260 - 590	260 - 490
		hardened		300	1013	P12	130 - 425	130 - 460	130 - 425
		hardened		400	1361	P13	130 - 425	130 - 460	130 - 425
	Stainless steel	ferretic / martensitic, annealed		200	675	P14	200 - 590	130 - 590	130 - 490
		martensitic, hardened and tempered		330	1114	P15	130 - 460	130 - 525	130 - 460
M	Stainless steel	austenitic, chilled		200	675	M1	260 - 525	260 - 590	260 - 525
		austenitic, precipitation- hardened (PH)		300	1013	M2	130 - 425	130 - 460	130 - 425
		austenitic-ferritic, Duplex		230	778	M3	130 - 425	130 - 460	130 - 425
K	Malleable cast iron	ferritic		200	675	K1	490 - 690	-	-
		pearlitic		260	867	K2	490 - 690	-	-
	Cast iron	low tensile strength		180	602	K3	590 - 985	-	-
		high tensile strength / austenitic		245	825	K4	390 - 790	-	-
	Cast iron with nodular graphite	ferritic		155	518	K5	460 - 750	-	-
		pearlitic		265	885	K6	390 - 560	-	-
	GGV (CGI)			200	675	K7	590 - 985	-	-
N	Aluminium alloys long chipping	not heat treatable		30	-	N1	-	-	-
		heat treatable, heat treated		100	343	N2	-	-	-
	Casted aluminium alloys	≤ 12 % Si, not heat treatable		75	260	N3	-	-	-
		≤ 12 % Si, heat treatable, heat treated		90	314	N4	-	-	-
		> 12 % Si, not heat treatable		130	447	N5	-	-	-
	Magnesium alloys	> 12 % Si, not heat treatable		70	250	N6	-	-	-
	Copper and copper alloys (Brass / Bronze)	Unalloyed, elektrolyte copper		100	343	N7	330 - 1050	-	-
		Brass, Bronze		90	314	N8	650 - 1640	-	-
		Cu-alloys, short-chipping		110	382	N9	650 - 1640	-	-
				300	1013	N10	-	-	-
	Non-ferrous materials	Lead alloys (without abrasive filling material)		-	-	N11	525 - 1970	-	-
		Duroplastic (without abrasive filling material)		-	-	N12	525 - 1970	-	-
		Plastic glas fibre reinforced GFRP		-	-	N13	330 - 985	-	-
		Plastic carbon fibre reinforced CFRP		-	-	N14	330 - 985	-	-
		Plastic aramid fibre reinforced AFRP		-	-	N15	330 - 985	-	-
		Graphite (tech.)		80 Shore	-	N16	-	-	-
S	High temperature resistant alloys	Fe-based	annealed	200	675	S1	65 - 197	-	-
		Fe-based	heat treated	280	943	S2	65 - 197	-	-
		Ni- or Co-alloyed	annealed	250	839	S3	50 - 164	-	-
		Ni- or Co-alloyed	heat treated	350	1177	S4	50 - 130	-	-
		Ni- or Co-alloyed	casting	320	1076	S5	50 - 130	-	-
	Titanium alloys	Pure titan		200	675	S6	300 - 590	330 - 690	300 - 590
		α- and β-alloys, heat treated		375	1262	S7	130 - 265	130 - 295	130 - 265
		β-alloys		410	1396	S8	130 - 265	130 - 295	130 - 265
	Wolfram alloys			300	1013	S9	-	-	-
	Molybdän alloys			300	1013	S10	-	-	-
H	Hardened steel	hardened		50 HRC	-	H1	100 - 164	100 - 180	100 - 164
		hardened		55 HRC	-	H2	33 - 82	50 - 82	33 - 82
		hardened		60 HRC	-	H3	33 - 82	50 - 82	33 - 82
	Hardened cast iron	hardened		55 HRC	-	H4	33 - 82	50 - 82	33 - 82

The recommended cutting data are only approximate values.
It may be necessary to adjust them to each individual machining application.

HC = Carbide coated

ACHIEVE AN IMMEDIATE INCREASE IN TOOL LIFE

Innovate your turning process even further by utilizing the ARNO 3D HYBRID through coolant tool holders

- Increase tool life... 150% or more over conventional tool holders
- Improve chip control with targeted coolant to the rake face and flank
- Achieve better surface finishes
- Fewer failures, reliable process stability

ARNO 3D printed tool holders: Innovation inside and out

https://arnousa.com/solutions/through-coolant-iso-turn

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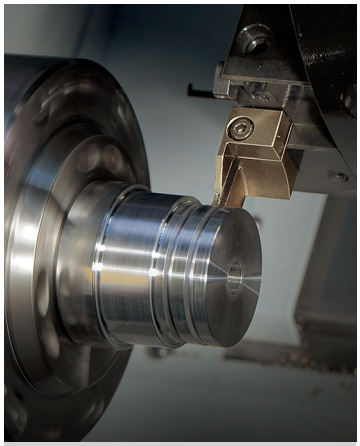
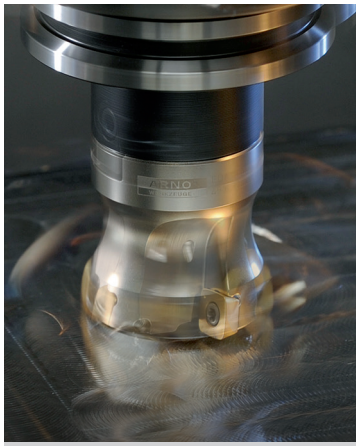
ARNO®-Werkzeuge

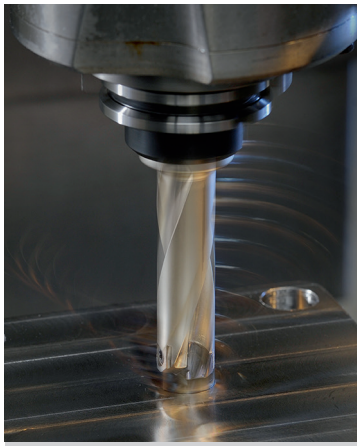


Tools and inserts for parting and grooving

Tooling and indexable inserts for turning and threading



Milling cutters and indexable inserts for milling and thread milling



Drilling tools and indexable inserts for drilling

For further information please ask for our complete catalogue.

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