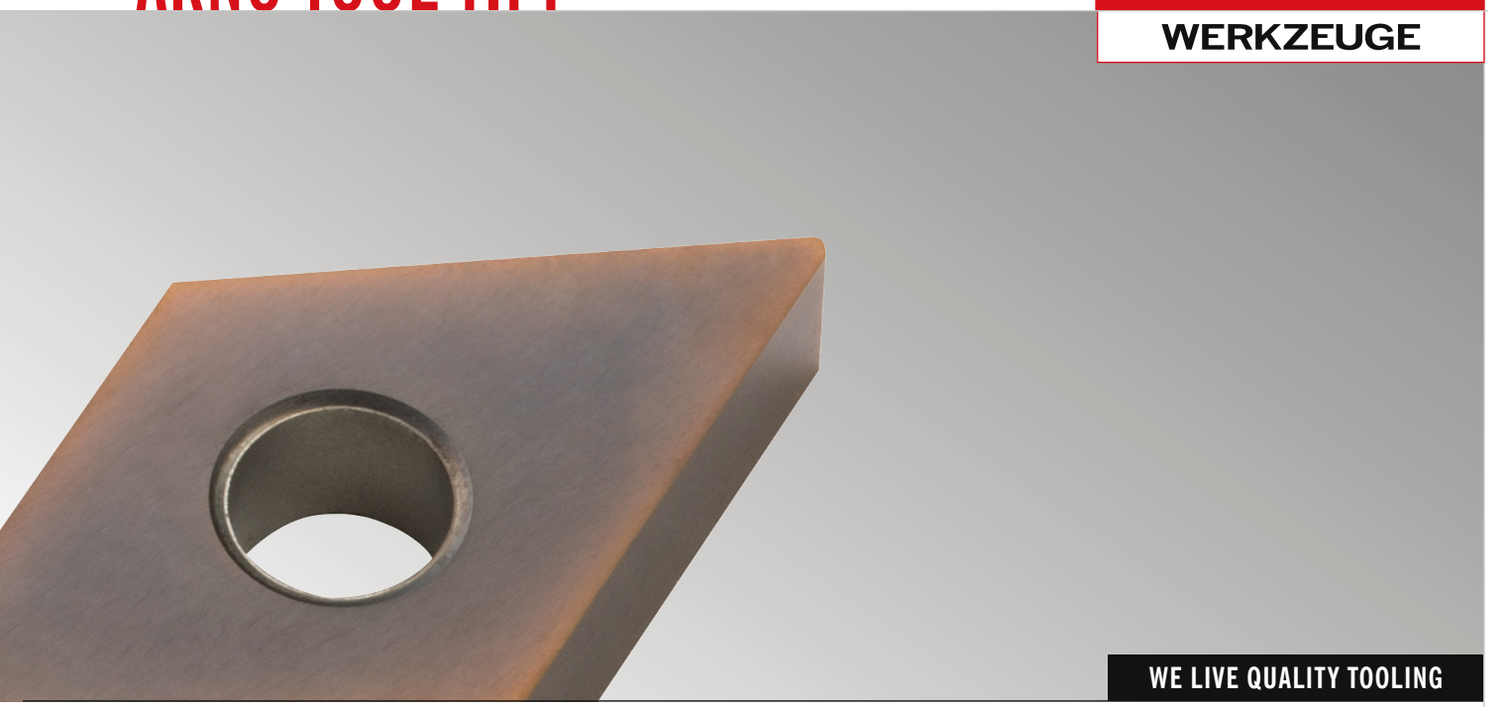
ARNO TOOL-TIPP

ARNO®
WERKZEUGE



OPTIMAL FOR MACHINING HARDENED STEEL UP TO 62 HRC

CARBIDE GRADE AH4205 - THE ECONOMICAL ALTERNATIVE TO CBN

YOUR BENEFITS

Grade AH4205

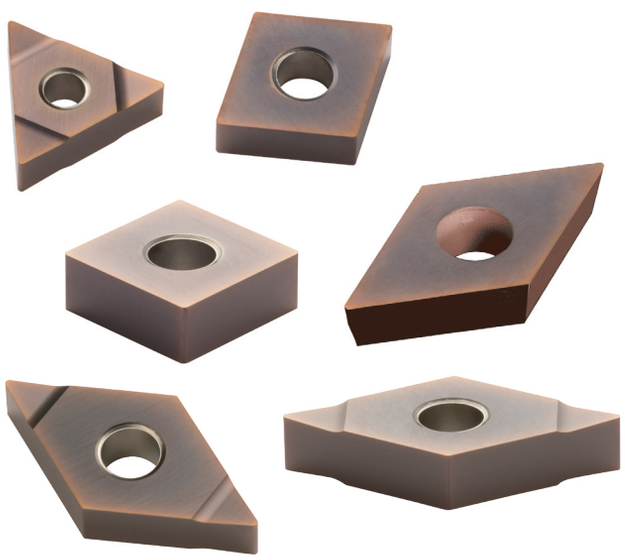
Lower acquisition costs - carbide instead of CBN

Optimal for transitions between hard and soft material areas

Fine finishing of materials up to 62 HRC

Turning istead of cylindrical grinding with surfaces Ra = 0,2 μm and better

Various available instert types:
CC..., CN..., DC..., DN..., SN..., TN..., VC...



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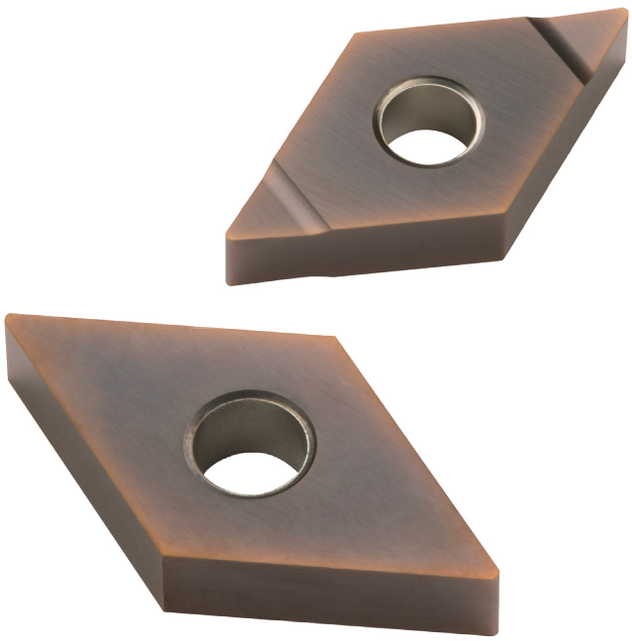
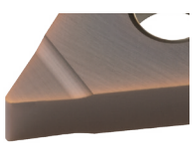


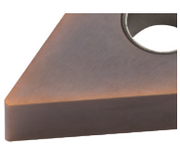
Features

- K01 carbide substrate in combination with the TiAlN/AlCrN coating ensures high reliability and long tool life
- Extra sharp cutting edge for excellent surfaces of Ra = 0.2 µm or better
- ARNO -NFS geometry enables medium machining up to an infeed of max .118 in
- Both with geometry -NFS for medium machining and without geometry for finishing machining
- Application range 50 - 62 HRC



With ARNO -NFS Geometry

- Wide, neutral chipbreaker for optimum chip formation
- Reduced heat development enables machining of hardened steel with
- Significantly lower cutting forces ensure better tool life



No Chipbreaker

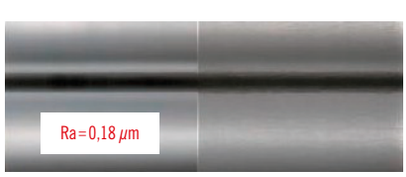
- Indexable insert for finishing up to AP: < .039 in
- Excellent cutting edge stability for long tool life
- High surface finishes possible: Ra < 0,2 µm
- Positive inserts for internal turning applications

Example	
Material	X153CrMo12 (1.2379)
HRC	61
VC	262 ft/min
FN	.002 in/rev
AP	.118 in
DRY	

Example	
Material	HS6-5-2C (1.3343)
HRC	62
VC	262 ft/min
FN	.00118 in/rev
AP	.00118 in
DRY	

With -NFS Geometry

No Geometry



AH4205 Standard

MORE PRODUCTIVITY IMMEDIATELY

AH4205: Turning - Die & Mold

Grade AH4205 in practical test

Result	Turning contour

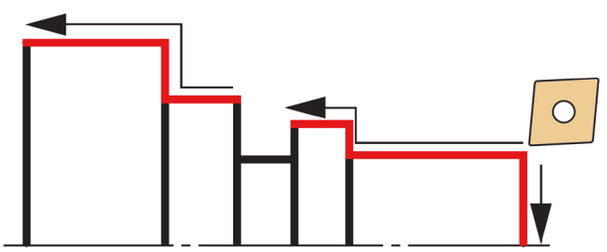
Material: X40CrMoV5-1 (1.2344)

Tool: -

Insert: CNGA 120404EN

Grade: AH4205

	Competition	ARNO Werkzeuge
D	.984 - 2.362 in	.984 - 2.362 in
VC	262 ft/min	262 ft/min
FN	.00276 in	.00276 in
AP	.0118 in	.0118 in
Machining	Turining	Turning
HRC	55	55
Cooling	Emulsion	Emulsion



Components Competition		6 pcs
Components ARNO		13 pcs

Benefits:

- More stable machining process
- Improved surface finish
- 2,2x tool life

ARNO TOOL-TIPP

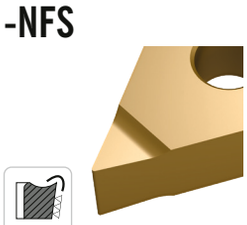
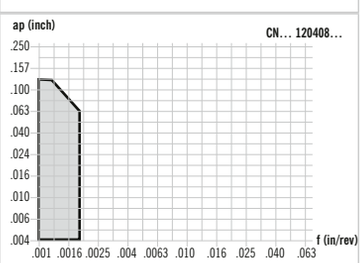
GRADE DESCRIPTION

HC – CARBIDE COATED

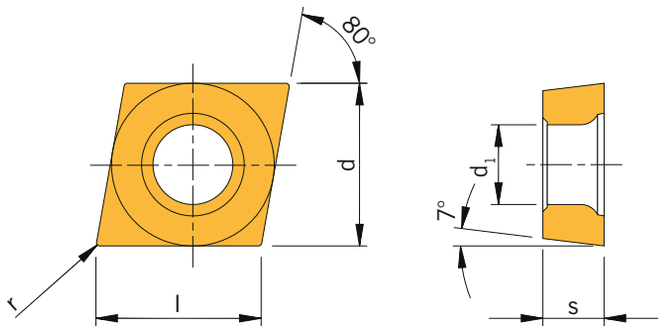
Grade	Coating colour	Properties	Material group						Scope of application	
			P	M	K	N	S	H	WEAR RESISTANCE 5 10 15 20 25 30 35 40 45 TOUGHNESS	
AH4205 PVD		• Especially for hard machining • Excellent wear and temperature resistance • Very good tool life compared to previous cutting materials						●		●

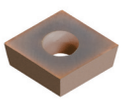
GEOMETRY DESCRIPTION

NEGATIVE FINISH MACHINING

Geometry	Properties	Material group						View/Cut	Base cutting data diagram
		P	M	K	N	S	H		
-NFS 	• Especially for machining hardened steels • Very good chip removal • Improved chip breaking						●		

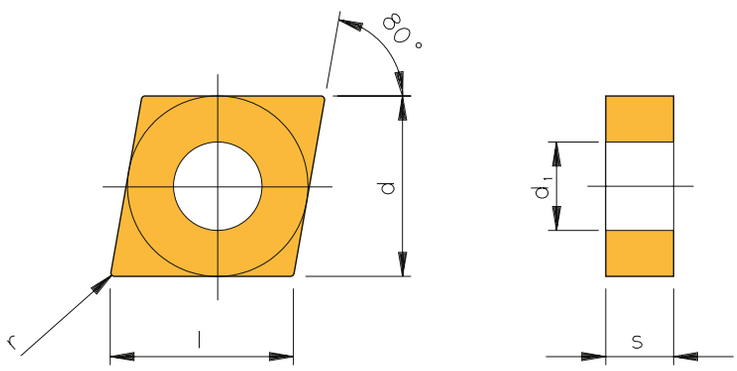
CCGW...





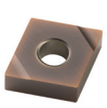
Designation **ANSI** ISO	r **INCH** mm	f_n **INCH** mm	a_p **INCH** mm	HC / (EDP-No.) **AH4205**
CCGW 21.50.5AN CCGW 060202EN	**0.008** 0,2	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108711
CCGW 21.51AN CCGW 060204EN	**0.016** 0,4	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108721
CCGW 32.51AN CCGW 09T304EN	**0.016** 0,4	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108723
CCGW 32.52AN CCGW 09T308EN	**0.32** 0,8	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108725

CNGA...



Designation **ANSI** ISO	r **INCH** mm	f_n **INCH** mm	a_p **INCH** mm	HC / (EDP-No.) **AH4205**
CNGA 430.5AN CNGA 120402EN	**0.008** 0,2	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108665
CNGA 431AN CNGA 120404EN	**0.016** 0,4	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108663
CNGA 432AN CNGA 120408EN	**0.32** 0,8	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108667

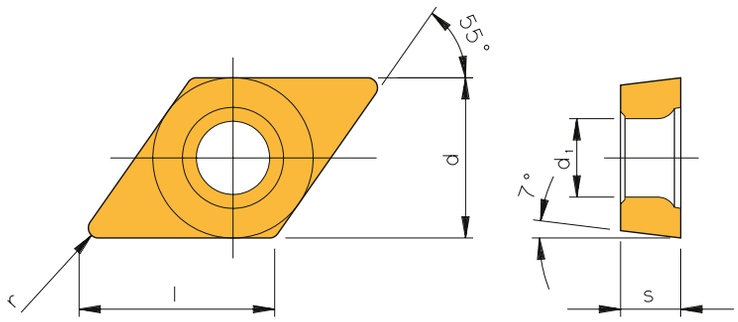
CNGG...

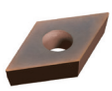


Designation **ANSI** ISO	r **INCH** mm	f_n **INCH** mm	a_p **INCH** mm	HC / (EDP-No.) **AH4205**
CNGG 430.5AN-NFS CNGG 120402EN-NFS	**0.008** 0,2	**.001 - .002** 0,02 - 0,05	**.001 - .002** 1 - 3	108691
CNGG 431AN-NFS CNGG 120404EN-NFS	**0.016** 0,4	**.001 - .002** 0,02 - 0,05	**.001 - .002** 1 - 3	108693
CNGG 432AN-NFS CNGG 120408EN-NFS	**0.32** 0,8	**.001 - .002** 0,02 - 0,05	**.001 - .002** 1 - 3	108695

ARNO TOOL-TIPP

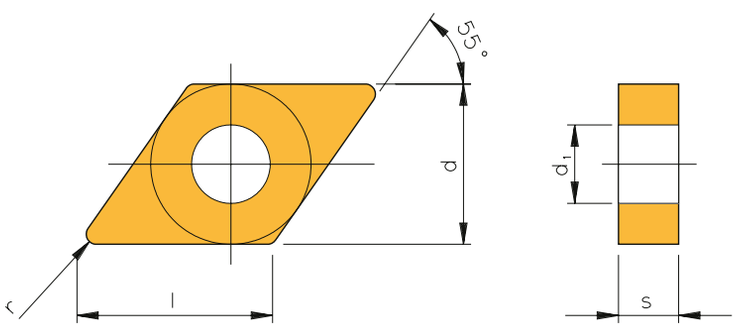
DCGW...

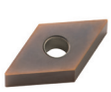




Designation **ANSI** ISO	r **INCH** mm	f_n **INCH** mm	a_p **INCH** mm	HC / (EDP-No.) **AH4205**
DCGW 21.50.5AN DCGW 070202EN	**0.008** 0,2	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108727
DCGW 21.51AN DCGW 070204EN	**0.016** 0,4	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108729
DCGW 21.52AN DCGW 070208EN	**0.32** 0,8	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	116314
DCGW 32.50.5AN DCGW 11T302EN	**0.008** 0,2	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108731
DCGW 32.51AN DCGW 11T304EN	**0.016** 0,4	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108733
DCGW 32.52AN DCGW 11T308EN	**0.32** 0,8	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	116316

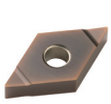
DNGA...





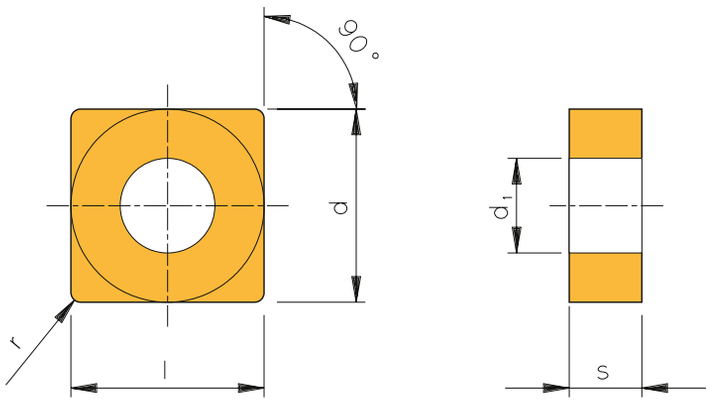
Designation **ANSI** ISO	r **INCH** mm	f_n **INCH** mm	a_p **INCH** mm	HC / (EDP-No.) **AH4205**
DNGA 440.5AN DNGA 150602EN	**0.008** 0,2	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108669
DNGA 441AN DNGA 150604EN	**0.016** 0,4	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108671
DNGA 442AN DNGA 150608EN	**0.32** 0,8	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108679

DNGG...



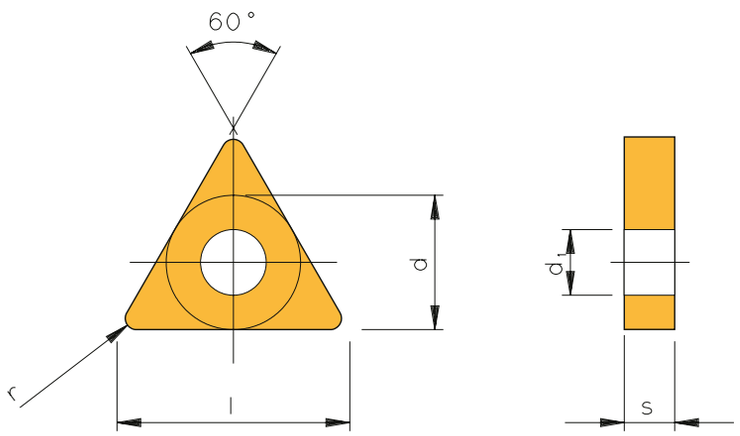
Designation **ANSI** ISO	r **INCH** mm	f_n **INCH** mm	a_p **INCH** mm	HC / (EDP-No.) **AH4205**
DNGG 440.5AN-NFS DNGG 150602EN-NFS	**0.008** 0,2	**.001 - .002** 0,02 - 0,05	**.04 - .118** 1 - 3	108698
DNGG 441AN-NFS DNGG 150604EN-NFS	**0.016** 0,4	**.001 - .002** 0,02 - 0,05	**.001 - .002** 1 - 3	108700
DNGG 442AN-NFS DNGG 150608EN-NFS	**0.32** 0,8	**.001 - .002** 0,02 - 0,05	**.001 - .002** 1 - 3	108703

SNGA...



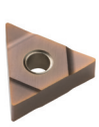
Designation **ANSI** ISO	r **INCH** mm	f_n **INCH** mm	a_p **INCH** mm	HC / (EDP-No.) **AH4205**
SNGA 431AN SNGA 120404EN	**0.016** 0,4	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108681
SNGA 432AN SNGA 120408EN	**0.32** 0,8	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108683

TNGA...



Designation **ANSI** ISO	r **INCH** mm	f_n **INCH** mm	a_p **INCH** mm	HC / (EDP-No.) **AH4205**
TNGA 330.5AN TNGA 160402EN	**0.008** 0,2	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108685
TNGA 331AN TNGA 160404EN	**0.016** 0,4	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108687
TNGA 332AN TNGA 160408EN	**0.32** 0,8	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	108689

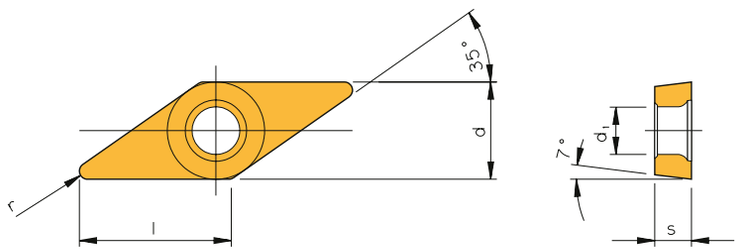
TNGG...

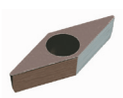


Designation **ANSI** ISO	r **INCH** mm	f_n **INCH** mm	a_p **INCH** mm	HC / (EDP-No.) **AH4205**
TNGG 330.5AN-NFS TNGG 160402EN-NFS	**0.008** 0,2	**.001 - .002** 0,02 - 0,05	**.001 - .002** 1 - 3	108705
TNGG 331AN-NFS TNGG 160404EN-NFS	**0.016** 0,4	**.001 - .002** 0,02 - 0,05	**.001 - .002** 1 - 3	108707
TNGG 332AN-NFS TNGG 160408EN-NFS	**0.32** 0,8	**.001 - .002** 0,02 - 0,05	**.001 - .002** 1 - 3	108709

ARNO TOOL-TIPP

VCGW...





Designation **ANSI** ISO	r **INCH** mm	f_n **INCH** mm	a_p **INCH** mm	HC / (EDP-No.) **AH4205**
VCGW 222AN VCGW 110308EN	**0.32** 0,8	**.001 - .0039** 0,02 - 0,1	**0.002 - .0354** 0,05 - 0,9	116414

RECOMMENDED CUTTING DATA - GRADE AH4205

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 AH4205
P	Unalloyed steel	C ≤ 0.25 %	annealed	125	428	P1	-
		C > 0.25 ... ≤ 0.55 %	annealed	190	639	P2	-
		C > 0.25 ... ≤ 0.55 %	hardened and tempered	210	708	P3	-
		C > 0.55 %	annealed	190	639	P4	-
		C > 0.55 %	hardened and tempered	300	1013	P5	-
		Machinig steel (short-clipping)	annealed	220	745	P6	-
	Low alloyed steel	annealed		175	591	P7	-
		hardened and tempered		300	1013	P8	-
		hardened and tempered		380	1282	P9	-
		hardened and tempered		430	1477	P10	-
	High alloyed steel and high alloyed tool steel	annealed		200	675	P11	-
		hardened		300	1013	P12	-
		hardened		400	1361	P13	-
	Stainless steel	ferretic / martensitic, annealed		200	675	P14	-
		martensitic, hardened and tempered		330	1114	P15	-
M	Stainless steel	austenitic, chilled		200	675	M1	-
		austenitic, precipitation-hardened (PH)		300	1013	M2	-
		austenitic-ferritic, Duplex		230	778	M3	-
K	Malleable cast iron	ferritic		200	675	K1	-
		pearlitic		260	867	K2	-
	Cast iron	low tensile strength		180	602	K3	-
		high tensile strength / austenitic		245	825	K4	-
	Cast iron with nodular graphite	ferritic		155	518	K5	-
		pearlitic		265	885	K6	-
	GGV (CGI)			200	675	K7	-
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	-
		Brass, Bronze		90	314	N8	-
		Cu-alloys, short-chipping		110	382	N9	-
				300	1013	N10	-
	Non-ferrous materials	Lead alloys (without abrasive filling material)		-	-	N11	-
		Duroplastic (without abrasive filling material)		-	-	N12	-
		Plastic glas fibre reinforced GFRP		-	-	N13	-
		Plastic carbon fibre reinforced CFRP		-	-	N14	-
		Plastic aramid fibre reinforced AFRP		-	-	N15	-
		Graphite (tech.)		80 Shore	-	N16	-
S	High temperature resistant alloys	Fe-based	annealed	200	675	S1	-
		Fe-based	heat treated	280	943	S2	-
		Ni- or Co-alloyed	annealed	250	839	S3	-
		Ni- or Co-alloyed	heat treated	350	1177	S4	-
		Ni- or Co-alloyed	casting	320	1076	S5	-
	Titanium alloys	Pure titan		200	675	S6	-
		α- and β-alloys, heat treated		375	1262	S7	-
		β-alloys		410	1396	S8	-
	Wolfram alloys			300	1013	S9	-
	Molybdän alloys			300	1013	S10	-
H	Hardened steel	hardened		50 HRC	-	H1	-
		hardened		55 HRC	-	H2	131 - 262
		hardened		60 HRC	-	H3	131 - 262
	Hardened cast iron	hardened		55 HRC	-	H4	262 - 328

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

ARNO®
WERKZEUGE

OUTSTANDING VERSATILE AND INNOVATIVE.

Turning or Swiss type turning, grooving, drilling or milling: whatever your requirements are, it's worth your while to take a look at ARNO. We have a solution for almost every metal-working application. We have the right mix of experience, pioneering spirit and quality to ensure that you get the best out of your production with the right tool systems, tool management solutions and clever innovations.

For more details on our innovative systems, go to www.arno-tools.co.uk / www.arnousa.com

ARNO USA LLC
1101 W. DIGGINS ST-
HARVARD, IL 60033

Phone: 800-943-4426
info@arnousa.com
www.arnousa.com

Karl-Heinz Arnold GmbH
Karlsbader Str. 4 | D-73760 Ostfildern | Tel +49 (0)711 34 8020 | Fax +49 (0)711 34 802 130 | anfrage@arno.de | bestellung@arno.de