

DE =	EN =	PT =	VN =
General turning 1/14			

Insert for general turning

Negative basic-shape inserts - T-Max P

Finishing

09-12	12	09-12	12	12	12	12	09-12	12-19	09-12	
A19	A19	A19	A19	A19	A19	A19	A19	A20	A20	
11-15	11-15	11-15	11-15	15	11-15	11	15	11-15	12	
A24	A24	A24	A24	A24	A24	A24	A25	A25	A28	
12	12	12-19	09-15	16	16-22	16	16	16	16-22	16-22
A28	A28	A28	A28	A31	A31	A31	A31	A31	A31	A31
16	11-22	16	16	16	16	16	16	06-08	06-08	06-08
A31	A32	A35	A35	A35	A35	A35	A35	A36	A36	A36
06-08	06-08	06-08	06-08	06-08						
A36	A36	A36	A36	A36						

Medium machining

12-16	12-16	09-19	12-19	12-19	09-19	16-19	12	12-16	11-15	
A20	A20	A20	A20	A20	A20	A21	A21	A21	A25	
11-15	11-15	11-15	11-15	15	10-32	09-25	09-15	12-19	09-19	
A25	A25	A25	A25	A26	A27	A27	A28	A28	A29	
9-19	12	15-19	16	16						
A29	A29	A29	A32	A32						

Dedicated geometry for finishing of gummy materials

gezeichnet:	HPW	Datum:		education project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A9
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =	EN =	PT =	VN =
General turning 2/14			

Insert for general turning

Negative basic-shape inserts - T-Max P

TNMG-PM	TNMG-MM	TNMG-KM	TNMG-QM	TNMG-SM	VNMG-PM	VNMG-MM	VNMG-KM	VNMG-QM	WNMG-WM	WNMG-WMx
16-22	16-22	16-22	11-27	16-22	16	16	16	16	06-08	06-08
A32	A32	A32	A32	A33	A35	A35	A35	A35	A37	A37

WNMG-PM	WNMG-MM	WNMG-KM	WNMG-QM	WNMG-SM
06-08	06-08	06-08	06-08	08
A37	A37	A37	A37	A37

Roughing

CNMM-WR	CNMG-PR	CNMM-PR	CNMG-MR	CNMM-MR	CNMG-KR	CNMA-KR	CNMM-QR	CNMG-SR	CNMM-HR
12-19	12-19	12-25	12-19	12-25	12-19	12-19	12-25	19	19-25
A21	A21	A22	A22	A22	A22	A23	A23	A23	A23

DNMG-MR*	DNMG-PR	DNMM-PR	DNMG-MR	DNMM-MR	DNMG-KR	DNMA-KR	DNMM-QR	DNMG-MR*	RNMG-SR	SNMG-PR
12-19	15	15	15	15	15	15	15	15	19	12-25
A23	A26	A26	A26	A26	A26	A26	A26	A26	A27	A29

SNMM-PR	SNMG-MR	SNMM-MR	SNMG-KR	SNMA-KR	SNMM-QR	SNMG-SR	SNMM-HR	SNMG-MR*	TNMX-WR	TNMG-PR
12-19	12-19	12-25	12-25	09-25	12-25	19	19-25	12-19	22	16-33
A30	A30	A30	A30	A30	A30	A30	A30	A30	A33	A33

TNMM-PR	TNMG-MR	TNMM-MR	TNMA-KR	TNMM-HR	TNMG-KR	TNMM-QR	TNMM-HR	TNMG-MR*	WNMG-PR	WNMG-MR
16-22	16-22	16-27	18-27	27	16-27	16-27	27	16-27	06-08	06-08
A33	A33	A33	A33	A33	A33	A33	A33	A33	A37	A37

WNMM-MR	WNMA-KR	WNMG-KR	WNMG-MR*
08	06-08	06-08	08
A37	A37	A37	A37

Negative basic-shape inserts - T-Max P

KNMX-71	KNUX
16	16
A39	A39

* Dedicated geometry for steel and stainless steel roughing.

gezeichnet:	HPW	Datum:		education project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A10
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =	EN =	PT =	VN =
General turning 3/14			

Insert s for general turning

Positive basic-shape inserts CoroTurn 107

Finishing

06-09	06-12	06-12	06-12	06-09	07-11	07-11	07-11	07-11	07-11	
A41	A41	A41	A41	A41	A43	A43	A43	A43	A43	
09	09	09-16	06-16	06-16	06-16	06-11	06-11	11	05-11	11-16
A46	A46	A48	A48	A48	A48	A48	A48	A49	A52	A52
11-16	11-16	11	11							
A52	A52	A52	A52							

Medium machining

06-12	06-12	06-12	06-12	06-12	06-12	06-12	06	11	07-11	
A41	A41	A41	A42	A42	A42	A42	A43	A43	A43	
07-11	07-11	07-11	07-11	07-11	07-11	05-32	08-16	09-12	09-12	09-12
A43	A43	A43	A43	A45	A44	A45	A45	A46	A46	A46
09-12	09	11-16	09-22	09-22	09-22	09-16	11-16	11	16	16
A49	A46	A46	A49	A49	A49	A49	A50	A50	A52	A52
16	16	11	11	11	16	16				
A52	A54	A52	A52	A54	A54	A54				

Roughing

06-12	06-12	06-12	09-12	11	11	11	11				
A42	A42	A42	A42	A44	A44	A44	A44				
9-12	09-12	09-12	09-12	11-22	11-22	11-22	11	16	16	16	16
A46	A46	A46	A46	A50	A51	A51	A51	A54	A54	A54	A54

gezeichnet:	HPW	Datum:		education project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A11
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =

EN =

PT =
















VN =

General turning 4/14

Inserts for general turning

Positive basic-shape inserts CoroTurn 111/107

Finishing

									
06	06-09	06	07	07	07	06-16	06-16	06-16	11 ¹¹
Page	A55	A55	A56	A56	A56	A57	A57	A57	A53
									
11 ¹¹	11 ¹¹	02-04	02-04	02-04					
A53	A53	A58	A58	A58					

Medium machining

									
06	06-09	06	07-11	07-11	07-11	09-16	09-16	09-16	1/4-1/2
Page	A55	A55	A56	A56	A56	A57	A57	A57	A57
									
11 ¹¹	11 ¹¹	11 ¹¹	04	04	04				
A53	A53	A53	A58	A58	A58				

Positive basic-shape inserts CoroTurn TR

		
13	13	13
Page	A149	A149

Positive basic-shape inserts for non-ferrous material

					
06-12	07-11	06-12	09	06-16	11-22
Page	A42	A44	A45	A46	A50

Polycrystalline diamond (PCD)

							
06-09	11	09-12	09-16	16	11-16	16	11-16
Page	A73	A74	A75	A78	A78	A78	A79

* CoroTurn 107 inserts with 7° clearance angle

gezeichnet:	HPW	Datum:		education project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A12
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =	EN =	PT =	VN =
General turning 5/14			

Inserts for general turning

Inserts for machining in advanced material
Ceramics, negative basic-shape inserts

Wiper	Wiper								
CNGA-WG	CNGQ-WG	CNGA	CNGQ	CNGN	DNGA	DNGQ	DNGN	RNGA	RNGN
12	12	12-19	12	12-16	15	15	15	12	09-25
A61	A61	A61	A61	A63	A64	A64	A65	A65	A66
					Wiper	Wiper			
SNGA	SNGQ	SNGN	TNGA	TNGN	WNGA-WG	WNGA-WA	WNGA	VNGA	
12	12	09-19	16-22	11-22	08	08	08	16	
A67	A67	A68	A69	A70	A71	A71	A71	A72	

Ceramics, positive basic-shape inserts

RPGN	RCGX	RPGX	SPGN	TPGN
09	06-25	06-12	12	11-16
A75	A75	A75	A76	A78

Cubic boron nitride (CBN); negative basic shape inserts








Wiper		Wiper							
CNGA-WG	CNMA	CNGA-WH	CNGX-AXA	CNGA	DNMA	DNGA	RNGA	RNGN	SNGA
09-12	12	09-12	12	09-12	15	11-15	09	11	09-12
A62	A62	A62	A62	A62	A64	A64	A65	A66	A67
					Wiper	Wiper			
DNMA	SNGN-FD	TNGA	TNMA	TNGN-FD	WNGA-WG	WNGA-WH	WNGA	VNGA	
2	12	11-16	16-22	22	06-08	06-08	06-08	16	
A67	A68	A69	A69	A70	A71	A71	A71	A72	

Cubic boron nitride (CBN), positive basic shape, CoroTurn 107





CCGW	CCGW-WH	DCMW	DCGW	TCMW	TCGW	VBMW	VBGW	TPGW
09	09	11	11	09-11	11	16	16	11
A73	A73	A74	A74	A77	A77	A79	A79	A77

gezeichnet:	HPW	Datum:		education project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A13
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

CoroTurn XS
Turning










						
	CXS-xxT 045	CXS-xxT 090	CXS-xxTE 98	CXS-xxT 098	CXS-xxG	CXS-xxR
	05-07	04-05	04-06	04-07	04-07	04-07
Page	A310	A310	A313	A311	A314	A316

Face grooving
Pre-parting
Threading

			
	CXS-xxF	CXS-xxGX	CXS-xxTH
	06	06	04-06
Page	A317	A317	A318

CoroCut XS

Parting off
Grooving
Turning
Back turning
Threading

								
	MAC-N	MAC-R	MAC-L	MAC-T	MAG	MAF	MAB	MAT
	3	3	3	3	3	3	3	3
Page	B83	B83	B83	B83	B84	B84	B84	B85

CoroCut MB

Grooving
Profiling
Pre-parting
Turning
Copying
Back boring
Threading

								
	MB-..G	MB-..R	MB-..GX	MB-..T045	MB-..T093	MB-..TE93	MB-..B	MB-..TH
	07-09	07-09	07-09	07	07	07	07	07
Page	B89	B92	B92	B90	B90	B90	B90	B93

Face grooving


MB-FA

09
Page
A317

gezeichnet:	HPW	Datum:		education project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A14
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =	EN =	PT =	VN =
General turning 7/14			

Recommended depth of cut and cutting feed

Inserts for advanced materials, positive basic-shape

Insert	Rec. depth of cut a _p = mm			Rec. cutting feed f _n = mm/r		
	Min	Max		Min	Max	
CCGW09T304T01020FWH	0,10	0,07	0,40	0,18	0,05	0,25
CCGW09T308T01020FWH	0,20	0,07	0,80	0,28	0,05	0,35
CCGW09T304S01020FWH	0,10	0,07	0,40	0,18	0,05	0,25
CCGW09T308S01020FWH	0,20	0,07	0,80	0,28	0,05	0,35
CCGW09T312S01020FWH	0,20	0,07	1,20	0,32	0,05	0,40
VBMW1640404S01020E	0,25	0,10	0,30	0,25	0,05	0,27
VBMW1640408S01020E	0,25	0,10	0,30	0,15	0,05	0,27
CCGW09T304S01020F	0,10	0,07	0,40	0,10	0,05	0,20
CCGW09T308S01020F	0,20	0,07	0,80	0,15	0,05	0,30
CCGW09T312S01020F	0,20	0,07	1,20	0,20	0,05	0,30
DCGW11T304S01020F	0,10	0,07	0,40	0,10	0,05	0,20
DCGW11T308S01020F	0,20	0,07	0,80	0,15	0,05	0,30
TCGW090202S01020F	0,07	0,04	0,20	0,07	0,08	0,10
TCGW090204S01020F	0,10	0,07	0,40	0,10	0,05	0,20
TCGW110204S01020F	0,10	0,07	0,40	0,10	0,05	0,20
TCGW110208S01020F	0,20	0,07	0,80	0,15	0,05	0,30
TCGW110304S01020F	0,10	0,07	0,40	0,1	0,05	0,20
TCGW110308S01020F	0,20	0,07	0,80	0,15	0,05	0,30
TCMW11T304601020E	1,10	0,10	3,30	0,07	0,06	0,12
TCMW08204S01020E	0,90	0,10	2,70	0,07	0,05	0,12
TCMW110204S01020E	1,10	0,10	3,30	0,07	0,05	0,12
TCMW110208S01020E	1,10	0,10	3,30	0,07	0,05	0,12
TCMW110304S01020E	1,10	0,10	3,30	0,07	0,05	0,12
TCMW110308S01020E	1,10	0,10	3,30	0,10	0,05	0,24
VBGW160404S01020F	0,10	0,07	0,40	0,10	0,05	0,20
VBGW160408S01020F	0,20	0,07	0,80	0,15	0,05	0,30
RCGX060600E	0,60	0,10	1,60	0,16	0,07	0,30
RCGX060600E	1,25	1,00	1,50	0,40	0,30	0,50
RCGX080700E	0,80	0,10	2,70	0,20	0,07	0,40
RCGX090700E	1,63	1,00	2,25	0,40	0,30	0,50
RCGX120700E	1,20	0,10	3,60	0,25	0,07	0,50
RCGX120700E	2,00	1,00	3,00	0,40	0,30	0,50
RCGX060600T01020	0,60	0,10	1,80	0,15	0,07	0,30
RCGX060600T01020	1,25	1,00	1,50	0,40	0,30	0,50
RCGX090700T0120	0,90	0,10	2,70	0,20	0,07	0,40
RCGX090700T0120	1,63	1,00	2,25	0,40	0,30	0,50
RCGX120700T0120	1,20	0,10	3,60	0,25	0,07	0,50
RCGX120700T0120	2,00	1,00	3,00	0,40	0,30	0,50
RCGX120700T02520	1,20	0,10	3,60	0,25	0,07	0,50
RCGX120700T02520	2,00	1,00	3,00	0,40	0,30	0,50
RCGX120700T15015	1,20	0,10	3,60	0,25	0,07	0,50
RCGX120700T15015	2,00	1,00	3,00	0,40	0,30	0,50

Insert	Rec. depth of cut a _p = mm			Rec. depth of cut f _n = mm/r		
	Min.	Max.		Min.	Max.	
RCGX161000T20015	1,50	0,10	4,50	0,26	0,07	0,60
RCGX151000T20015	4,50	0,10	6,00	0,30	0,10	0,70
RCGX191000T20015	1,90	0,10	5,70	0,30	0,07	0,60
RCGX191000T20015	5,70	0,10	7,60	0,40	0,10	0,80
RCGX251200T20015	2,50	0,10	7,50	0,30	0,07	0,60
RCGX251200T20015	7,50	0,10	10,00	0,40	0,10	0,80
RCGX120700K15015	1,20	0,10	8,60	0,25	0,07	0,50
RCGX120700K15015	3,60	0,10	4,80	0,30	0,10	0,70
RCGX19000K20016	1,90	0,10	6,70	0,30	0,07	0,60
RCGX19000K20015	5,70	0,10	7,60	0,40	0,10	0,80
RCGX251200K20016	2,50	0,10	7,50	0,30	0,07	0,60
RCGX251200K20015	7,50	0,10	10,00	0,40	0,10	0,80
RPGX090700T01020	0,90	0,10	2,70	0,20	0,07	0,40
RPGX120700T01020	1,20	0,10	3,60	0,25	0,07	0,50
RPGN090300T01020	0,90	0,10	2,70	0,20	0,07	0,40
RPGN090300T01020	1,63	1,00	2,25	0,20	0,10	0,50
SPGN120408T01020	1,20	0,10	3,60	0,10	0,05	0,24
SPGN120408T01020	3,60	0,10	6,00	0,20	0,05	0,36
SPGN120412T01020	1,20	0,1	3,60	0,14	0,05	0,36
SPGN120412T01020	3,60	0,10	6,00	0,30	0,05	0,54
TPGN110304T01020	1,10	0,10	3,80	0,07	0,05	0,12
TPGN110304T01020	3,30	0,10	5,50	0,10	0,05	0,18
TPGN110308T01020	1,10	0,10	3,30	0,10	0,05	0,24
TPGN110308T01020	3,30	0,10	5,50	0,20	0,05	0,36
TPGN1160304T01020	1,60	0,10	4,60	0,07	0,05	0,12
TPGN1160304T01020	4,80	0,10	8,00	0,10	0,05	0,18
TPGN1160308T01020	1,60	0,10	4,80	0,10	0,05	0,24
TPGN1160308T01020	2,00	1,00	3,00	0,20	0,10	0,50
TPGN1160312T01020	1,60	0,10	4,60	0,14	0,05	0,36
TPGN1160312T01020	2,00	1,00	3,00	0,20	0,10	0,50

gezeichnet:	HPW	Datum:		eduction project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A423
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =	EN =	PT =	VN =
General turning 8/14			

ISO	CMC No.	Material	Specific cutting force k_c , 0,4 N/mm ²	Hardness Brinell HB	<<<< WEAR RESISTANCE		
					CT5005	CT5015	GC1525
					h_{ex} , mm \approx feed f_r , mm/r	0,05-0,1-0,2	
					Cutting speed (v_c), m/min		
P	01,1	Unalloyed steel C = 0.1-0.25% C = 0.25-0.55% C = 0.55-0.80%	2000	125	730-590-485	650-540-440	560-465-380
	01,2		2100	150	650-530-420	570-480-385	495-415-335
	01,3		2200	170	-	510-425-340	430-365-295
Steel	02,1	Low-alloy steel (alloying elements $\leq 5\%$) Non-hardened Ball bearing steel Hardened and tempered Hardened and tempered	2150	180	530-450-360	480-400-320	375-320-255
	02,12		2300	210	-	-	-
	02,2		2550	275	395-325-250	285-235-190	200-165-135
	02,2		2850	350	320-260-200	230-190-150	160-135-110
	03,11	High-alloy steel (alloying elements $>5\%$) Annealed Hardened tool steel	2500	200	-	395-330-250	260-215-175
	03,21		3900	325	-	195-165-130	145-115-90
	06,1	Steel castings Unalloyed Low-alloy (alloying elements $\leq 5\%$) High-alloy (alloying elements $>5\%$)	2000	180	-	260-215-175	225-185-145
06,2	2100		200	-	270-225-170	175-145-105	
06,3	2650		225	-	200-165-125	140-115-85	
ISO	CMC No.	Material	Specific cutting force k_c , 0,4 N/mm ²	Hardness Brinell HB	<<<< WEAR RESISTANCE		
					CT1525	CT1005	GC1105
					h_{ex} , mm \approx feed f_r , mm/r	0,1-0,2	
					Cutting speed (v_c), m/min		
M	05,11	Ferritic/martensitic Non-hardened PH-hardened Hardened	2300	200	290-240	380-305-245	380-305-245
	05,12		3550	330	170-150	350-280-225	350-280-225
	05,13		2850	330	170-150	245-195-160	245-195-160
	5,21	Austenitic Austenitic PH-hardened Super austenitic PH-hardened Super austenitic	2300	180	220-195	410-330-265	410-330-265
	05,22		3550	330	195-170	220-175-145	220-175-145
	05,23		2950	200	145-130	245-200-160	245-200-160
	05,51	Austenitic-ferritic (Duplex) Non-weldable $\geq 0.05\%C$ Weldable $< 0.05\%C$	2550	230	-	315-255-205	315-255-205
	05,52		3050	260	-	280-225-185	280-225-185
	15,11	Ferritic/martensitic Non-hardened PH-hardened Hardened	2100	200	-	-	-
	15,12		3150	330	-	-	-
	15,13		2650	330	-	-	-
	15,21	Austenitic Austenitic PH-hardened Super austenitic	2200	180	-	-	-
	15,22		3150	330	-	-	-
	15,23		2700	200	-	-	-
	15,51	Austenitic-ferritic (Duplex) Non-weldable $\geq 0.05\%C$ Weldable $< 0.05\%C$	2250	230	-	-	-
15,52	2750		260	-	-	-	
ISO	CMC No.	Material	Specific cutting force k_c , 0,4 N/mm ²	Hardness Brinell HB	<<<< WEAR RESISTANCE		
					CB7050/CB50	CC620	CC650
					h_{ex} , mm \approx feed f_r , mm/r	0,1-0,25-0,4	
					Cutting speed (v_c), m/min		
K	07,1	Malleable cast iron Ferritic (short chipping) Pearlitic (long chipping)	940	130	-	800-700-600	800-700-600
	07,2		1100	230	-	700-590-500	700-600-500
	08,1	Low tensile strength High tensile strength	1100	180	1700-1450-1200	800-700-600	800-700-600
	08,2		1150	220	1450-1250-1050	760-650-540	760-650-540
	09,1	Nodular SG iron Ferritic Pearlitic Martensitic	1050	160	-	-	610-550-450
	09,2		1750	250	-	-	510-450-350
09,3	2700		380	-	-	350-305-260	

Cutting speed recommendations
The recommendations are valid for use with cutting fluid.
Note: Most cutting speeds are recommended for a tool life of 15 minutes. To increase lifetime, see information in Metalcutting TechnicalGuide.

gezeichnet:	HPW	Datum:		eduction project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A424
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =	EN =	PT =	VN =
General turning 9/14			

Cutting speed recommendations

TOUGHNESS>>>>

GC1515	GC1025	GC11250	GC3005	GC4205	GC4215	GC4225	GC2015	GC4235	GC2025	GC235
0,1-0,2-0,3	0,1-0,2-0,3	0,1-0,2-0,3	0,1-0,3-0,5	0,1-0,4-0,8	0,1-0,4-0,8	0,1-0,4-0,8	0,1-0,4-0,8	0,1-0,4-0,8	0,1-0,4-0,8	0,1-0,4-0,8
310-290-255	310-290-255	310-290-255	520-415-340	620-450-330	570-405-300	510-345-245	440-300-210	425-275-200	295-200-145	185-135-95
310-280-245	280-255-225	280-255-225	470-370-305	560-405-295	510-365-265	455-305-215	400-270-190	380-245-180	265-180-130	165-120-85
285-260-230	260-235-210	260-235-210	445-355-290	530-385-275	460-330-240	425-290-205	370-250-175	365-235-170	250-170-120	155-115-80
295-200-125	-	-	500-375-300	610-410-285	560-370-260	460-305-215	395-265-190	300-185-135	220-145-100	155-110-70
-	-	-	-	530-350-250	460-305-215	395-265-190	350-230-160	250-155-110	195-125-85	-
195-100-40	-	-	275-215-175	330-230-175	300-210-155	255-180-140	260-180-140	185-120-85	145-95-65	110-70-50
160-80-34	-	-	225-170-140	265-185-140	240-170-125	205-145-110	210-145-115	150-95-70	115-75-50	85-55-39
-	-	-	370-275-225	445-295-215	405-270-200	300-205-150	260-180-130	240-155-105	185-125-85	145-100-65
-	-	-	180-130-105	220-140-105	200-130-95	135-95-75	115-85-65	110-70-50	85-55-38	65-45-30
-	-	-	275-220-185	355-235-185	300-215-170	240-180-130	210-155-110	185-140-100	140-105-80	100-80-60
-	-	-	270-200-170	290-205-155	260-185-140	210-140-100	210-140-85	165-100-70	125-80-55	95-65-45
-	-	-	205-155-130	225-150-115	205-135-105	185-125-90	160-110-75	145-95-65	110-75-50	80-60-39
GC1515	GC1025	GC11250	GC4225	GC2015	GC4235	GC2025	GC2035	GC235		
0,1-0,2-0,3	0,1-0,2-0,3	0,1-0,2-0,3	0,2-0,4-0,6	0,2-0,4-0,6	0,2-0,4-0,6	0,2-0,4-0,6	0,2-0,4-0,6	0,2-0,4-0,6		
305-235-185	280-215-170	280-215-170	280-235-210	260-220-200	235-200-180	230-175-135	180-160-130	130-110-90		
170-135-110	155-125-100	155-125-100	130-105-80	125-100-80	90-65-55	110-70-50	85-65-45	70-55-45		
180-150-130	165-135-120	165-135-120	160-130-95	145-120-85	105-75-50	120-80-55	95-70-50	75-60-50		
245-195-150	220-180-135	220-180-135	295-235-200	290-240-190	205-160-125	240-175-130	170-145-155	115-100-85		
170-135-110	155-125-100	155-125-100	130-100-85	130-100-80	100-75-60	100-70-55	85-65-45	70-55-45		
205-175-145	185-160-130	185-160-130	180-160-115	160-135-100	140-110-85	130-100-75	100-90-70	85-70-60		
230-185-145	210-170-130	210-170-130	250-215-170	220-185-145	190-145-115	190-150-110	160-135-105	105-95-80		
210-155-120	190-140-110	190-140-110	210-175-135	190-150-120	135-120-110	150-120-90	130-110-85	95-80-70		
290-240-185	265-220-170	265-220-170	270-225-185	250-210-170	205-170-155	220-160-120	170-145-115	115-100-85		
150-120-90	135-110-80	135-110-80	110-80-65	100-70-55	75-55-45	85-55-40	70-50-40	60-45-35		
160-130-100	145-120-90	145-120-90	120-100-70	110-90-60	90-65-50	120-80-55	75-60-50	65-50-40		
255-205-160	230-185-145	230-185-145	220-180-150	220-180-140	165-125-100	200-155-115	120-120-95	100-90-75		
150-120-90	135-110-80	135-110-80	110-80-65	105-80-60	75-55-45	85-55-40	70-50-40	65-45-33		
195-165-135	175-150-125	175-150-125	170-130-110	145-115-95	120-90-75	130-90-65	100-80-60	80-65-55		
210-155-110	190-140-100	190-140-100	215-175-150	185-150-135	170-130-105	150-120-90	130-110-85	95-80-70		
185-145-110	170-130-90	170-130-90	185-165-120	160-140-105	120-105-100	125-105-80	105-95-75	90-75-65		
CC6090	GC1690	CT50105	GC3205	GC3210	GC3215	GC23005	GC4205	GC4215	GC4225	H13A
0,2-0,4-0,6	0,2-0,4-0,6	0,1-0,2-0,3	0,2-0,4-0,6	0,2-0,4-0,6	0,2-0,4-0,6	0,2-0,4-0,6	0,2-0,4-0,6	0,2-0,4-0,6	0,2-0,4-0,6	0,1-0,3-0,5
740-600-500	740-600-500	200-165-135	460-380-325	385-315-265	260-215-185	250-210-185	365-295-250	325-265-225	275-235-205	140-125-110
640-500-400	640-500-400	140-115-95	375-310-265	315-255-215	210-175-150	235-190-150	295-245-200	265-220-185	195-150-115	125-110-90
740-600-500	740-600-500	320-260-220	530-435-375	445-360-305	300-250-210	275-245-225	400-335-290	370-305-260	345-260-200	180-145-110
690-540-435	690-540-435	280-235-205	425-350-300	355-290-245	240-200-170	260-225-200	320-275-240	285-245-220	235-175-135	140-115-95
-	580-450-345	255-200-160	390-330-275	360-305-250	240-195-165	265-215-180	330-280-240	280-230-195	235-185-150	135-125-95
-	480-350-250	230-195-170	350-300-250	325-275-225	215-175-150	240-195-160	280-230-195	260-210-175	170-130-105	125-115-90
-	325-260-220	115-95-85	265-225-190	245-210-170	165-135-115	185-140-100	220-170-135	205-160-125	120-90-75	100-85-65

gezeichnet:	HPW	Datum:		eduction project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A425
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =	EN =	PT =	VN =
General turning 10/14			

ISO	CMC No.	Material	Specific cutting force k_c , 0,4 N/mm ²	Hardness Brinell HB	<<<< WEAR RESISTANCE		
					CD10	CD1810	H10
h_{exr} , mm \approx feed f_n , mm/r							
0,05-0,4							
0,15-0,8							
0,15-0,8							
Cutting speed (v_c), m/min							
N	30,11	Aluminium alloys Wrought or wrought and coldworked, non-aging	500	60	2 000 (2500-250) ¹	2 000 (2500-250) ¹	2 000 (2500-250) ¹
	30,12	Wrought or wrought and aged	800	100	2 000 (2500-250) ¹	2 000 (2500-250) ¹	2 000 (2500-250) ¹
Non-ferrous metals	30,21	Aluminium alloys Cast, non-aging	750	75	2 000 (2500-250) ¹	2 000 (2500-250) ¹	2 000 (2500-250) ¹
	30,22	Cast or cast and aged	900	90	2 000 (2500-250) ¹	2 000 (2500-250) ¹	2 000 (2500-250) ¹
	30,41	Aluminium alloys Cast, 13-15% Si	950	130	1550 (1950-195) ¹	770 (960 - 95) ¹	450 (560 - 55) ¹
	30,42	Cast, 16-22% Si	950	130	770 (960 - 95) ¹	510 (640 - 65) ¹	300 (375 - 38) ¹
	33,1	Copper and copper alloys Free cutting alloys, ≥ 1 % Pb	700	110	500 (630 - 65) ¹	500 (630 - 65) ¹	500 (630 - 65) ¹
	33,2	Brass, leaded bronzes, ≤ 1 % Pb	700	90	500 (630 - 65) ¹	500 (630 - 65) ¹	500 (630 - 65) ¹
	33,3	Bronze and non-leadad copper incl. electrolytic copper	1750	100	300 (375 - 38) ¹	300 (375 - 38) ¹	300 (375 - 38) ¹
	ISO	CMC No.	Material	Specific cutting force k_c , 0,4 N/mm ²	Hardness Brinell HB	<<<< WEAR RESISTANCE	
h_{exr} , mm \approx feed f_n , mm/r							
0,1-0,2							
0,1-0,2-0,3							
0,1-0,2-0,3							
Cutting speed (v_c), m/min							
S	20,11	Heat resistant super alloys Iron base Annealed or solution treated	3000	200	-	-	-
	20,12	Aged or solution treated and aged	3050	280	-	-	-
	20,21	Nickel base Annealed or solution treated	3300	250	400-320	400-325-270	330-255-200
	20,22	Aged or solution treated and aged	3600	350	340-265	300-235-190	240-175-130
	20,24	Cast or cast and aged	3700	320	220-160	240-205-175	215-180-150
	20,31	Cobalt base Annealed or solution treated	3300	200	345-260	-	-
	20,32	Solution treated and aged	3700	300	300-225	-	-
	20,33	Cast or cast and aged	3800	320	285-225	-	-
	23,1	Titanium alloys ²⁾ Commercial pure (99,5% Ti)	1550	Rm ³⁾ 400	H10 0,1-0,2-0,3	H10A 0,1-0,3-0,5	H13A 0,1-0,3-0,5
	23,21	α , near α and $\alpha + \beta$ alloys, annealed	1700	950	205-170-145	195-160-135	75-60-50
23,22	$\alpha + \beta$ alloys in aged conditions, β alloys, annealed or aged	1700	1050	85-70-55 80-60-50	80-65-55 80-60-50	70-55-45	
ISO	CMC No.	Material	Specific cutting force k_c , 0,4 N/mm ²	Hardness Brinell HB	<<<< WEAR RESISTANCE		
h_{exr} , mm \approx feed f_n , mm/r							
0,5-0,15-0,25							
0,5-0,15-0,25							
0,5-0,15-0,25							
Cutting speed (v_c), m/min							
H	04,1	Hard steel Hardened and tempered	3250	45 HRC	-	-	-
	04,1		3950	50 HRC	350-265-225	250-210-185	260-230-205
	04,1		4700	55 HRC	295-225-185	210-175-155	215-195-170
	04,1	Extra hard steel Hardened and tempered	5550	60 HRC	250-190-160	180-150-135	185-165-145
	04,1		6450	65 HRC	215-165-135	155-130-115	160-140-125
	10,1	Chilled cast iron Cast or cast and aged	2800	400	-	-	-

Cutting speed recommendations
The recommendations are valid for use with cutting fluid.
Note: Most cutting speeds are recommended for a tool life of 15 minutes. To increase lifetime, see information in Metalcutting TechnicalGuide.

1) The cutting speeds, shown in the table, are valid for all feeds within the feed range.
2) 45-60° entering angle, positive cutting geometry and coolant should be used.
3) Rm = ultimate tensile strength measured in MPa.
For material cross reference list, see page 16.

gezeichnet:	HPW	Datum:		education project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A426
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =	EN =	PT =	VN =
General turning 11/14			

Cutting speed recommendations

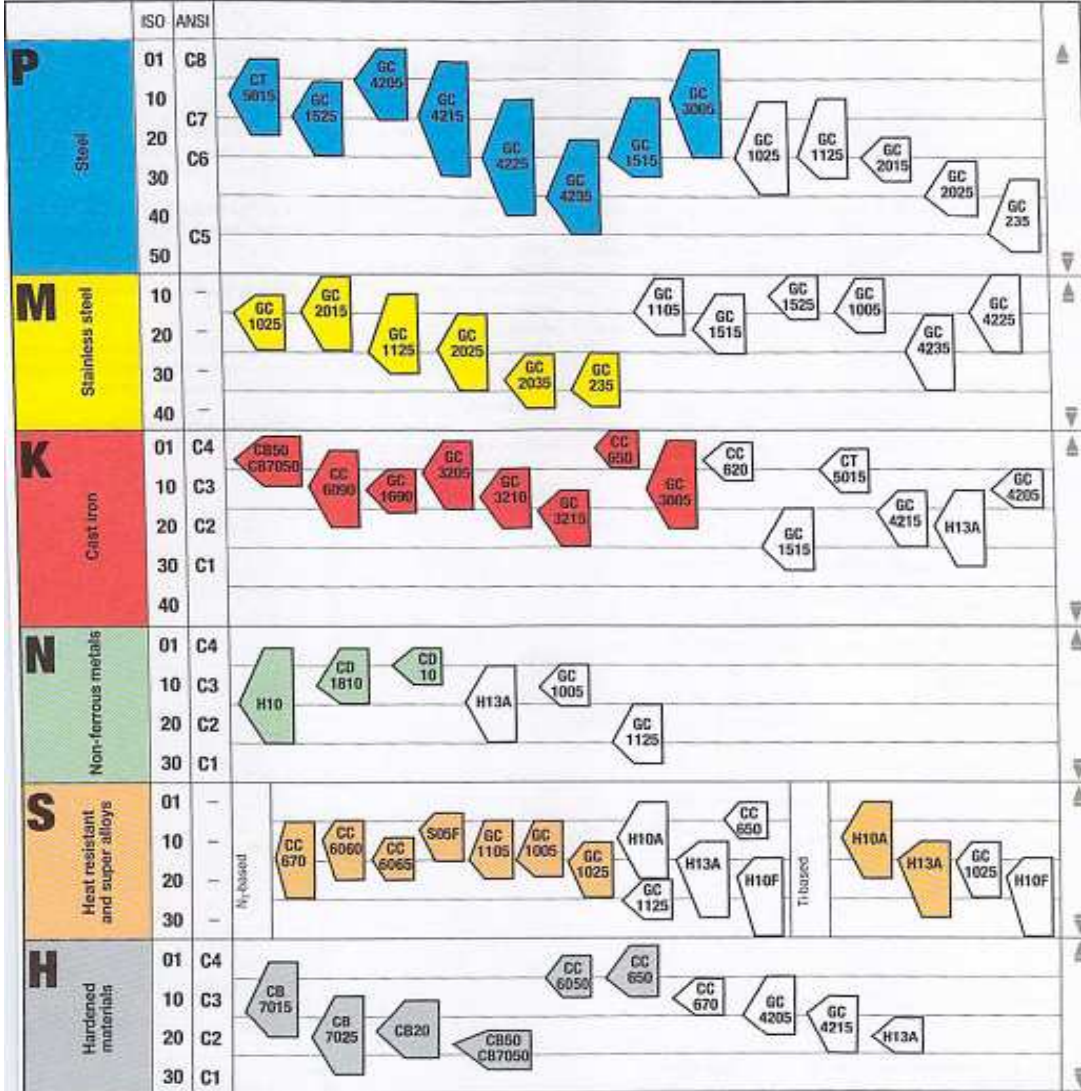
										TOUGNESS>>>>>
H13A	GC1025	GC1125								
0,15-0,8	0,15-0,8	0,15-0,8								
1 900 (2400 - 240) ¹⁾	770 (960 - 95) ¹⁾	770 (960 - 95) ¹⁾								
1 900 (2400 - 240) ¹⁾	300 (375 - 38) ¹⁾	300 (375 - 38) ¹⁾								
1 900 (2400 - 240) ¹⁾	770 (960 - 95) ¹⁾	770 (960 - 95) ¹⁾								
1 900 (2400 - 240) ¹⁾	510 (640 - 65) ¹⁾	510 (640 - 65) ¹⁾								
400 (500-50) ¹⁾	300 (375-38) ¹⁾	300 (375-38) ¹⁾								
250 (315-31) ¹⁾	210 (265 - 26) ¹⁾	210 (265 - 26) ¹⁾								
450 (560 - 55) ¹⁾	200 (250 - 25) ¹⁾	200 (250 - 25) ¹⁾								
450 (560 - 55) ¹⁾	120 (150-15) ¹⁾	120 (150-15) ¹⁾								
270 (340 - 34) ¹⁾	85 (105-11) ¹⁾	85 (105-11) ¹⁾								

											TOUGNESS>>>>>
CC670	S05F	GC1005	GC1105	H10A	H13A	GC1025	GC1125	H10F	H10F	GC1025	
0,1-0,2-0,3	0,1-0,2-0,3	0,1-0,3-0,5	0,1-0,3-0,5	0,1-0,3-0,5	0,1-0,3-0,5	0,1-0,3-0,5	0,1-0,3-0,5	0,1-0,3-0,5	0,1-0,3-0,5	0,1-0,3-0,5	
-	160-135-110	150-100-70	150-100-70	85-70-55	80-65-50	75-60-45	75-60-45	70-55-40			
-	125-105-85	120-80-60	120-80-60	65-55-40	60-50-40	55-45-35	55-45-35	50-40-30			
385-315-270	100-85-70	90-55-30	90-55-30	55-40-32	50-40-30	45-35+-25	45-35+-25	40-30-20			
325-270-230	90-75-60	80-50-27	80-50-27	40-32-21	40-30-20	35-25-15	35-25-15	30-20-10			
295-245-210	80-65-55	70-45-24	70-45-24	26-21-16	25-20-15	23-17-12	23-17-12	20-15-10			
345-255-205	100-85-70	90-60-30	90-60-30	55-40-32	50-40-30	45-35-25	45-35-25	40-30-20	160-135-115	160-135-115	
300-225-175	90-75-60	50-50-27	50-50-27	40-32-21	40-30-20	35-25-15	35-25-15	30-20-10	65-55-45	65-55-45	
285-225-170	80-65-55	70-45-24	70-45-24	26-21-16	25-20-15	23-17-12	23-17-12	20-15-10	65-50-40	65-50-40	
CB7050/CB50	CC6050	CC650	CC670	H13A	GC4205	GC4215					
0,1-0,25-0,4	0,05-0,15-0,25	0,1-0,25-0,4	0,1-0,25-0,4	0,1-0,3-0,6	0,1-0,3-0,6	0,1-0,3-0,6					
-	290-235-175	205-155-100	205-155-100	45-25-16	70-45-29	65-40-26					
205-165-135	240-195-145	170-125-85	170-125-85	-	-	-					
175-140-110	200-165-120	140-105-70	140-105-70	-	-	-					
145-120-95	170-140-105	120-90-60	120-90-60	-	-	-					
125-100-80	145-120-90	105-80-50	105-80-50	-	-	-					
180-150-120	-	120-90-60	120-90-60	35-20-11	50-29-17	45-26-15					

gezeichnet:	HPW	Datum:		education project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A427
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =	EN =	PT =	VN =
General turning 13/14			

Grades for general turning



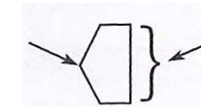
The position and form of the grade symbols indicate the suitable field of application.



= Basic grades

= Complementary grades

Center of the field of application.



Recommended field of application.



Wear resistance



Toughness

gezeichnet:	HPW	Datum:		education project	Allgemeine Drehung	translate/en_ds/p_ct/vn_ro	origin: Sandvik, S. A429
Aenderung:	an	Datum:	12.05.2015	WIAP KFKOK	General turning	r4	datei_wi_8_f_1_4_e1_r4_Sandvik_Turn_Tool
Aenderung:	control 2	Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from

DE =	EN =	PT =	VN =
General turning 14/14			

Grades for general turning

Steel, cast steel, long chipping malleable iron



Basic grades

CT5015 (HT) - P10 (P01-P20)

An uncoated cermet with excellent resistance to built-up-edge and plastic deformation. New formula with improved toughness. For finishing of low alloy and alloy steels when high surface quality and/or low cutting force are required. $v_r \times a_p < 0.35 \text{ mm}^2$

GC1515 (HC) - P25 (P10-P30)

A thin CVD-coated micro-grain carbide. Recommended for finishing of low carbon- to low alloy steels, and other "sticky" steel alloys using medium to low cutting speed. Excellent when surface finish or sharp cutting action is needed. Great resistance to thermal shock makes it also suitable for light intermittent cuts.

GC1525 (HC) - P15 (P05-P25)

A PVD coated cermet. Very high wear resistance and good edge toughness. For finishing and semi-finishing of low carbon and low alloyed steels.

To be used when good surface quality is demanded at medium to high cutting speeds. $v_r \times a_p < 0.35 \text{ mm}^2$

GC4205 (HC) - P05 (P01-P15)

A CVD coated grade with excellent resistance against craterwear and plastic deformation. Recommended for stable conditions when higher metal removal rate is needed in medium to rough steel applications. Is able to withstand high temperatures without sacrificing edge line security in wet and dry machining.

GC4215 (HC) - P15 (P01-P30)

CVD-coated carbide grade for finishing to roughing in applications with continuous cut to light intermittence of steel and steel castings. A gradient substrate optimized in hardness and toughness with a wear resistant coating. Is able to withstand high temperatures without sacrificing edge line security in wet and dry applications.

GC4225 (HC) - P25 (P10 -

CVD-coated carbide grade for finishing to roughing of steel and steel castings.

A gradient substrate with optimized hardness and toughness for steel turning in combination with a thick wear resistant coating. This grade can handle continuous cuts as well as interrupted, a grade for a broad application area.

GC4235 (HC) • P35 (P20-P45)

CVD-coated carbide grade for roughing of steel and steel castings under unfavorable conditions. A gradient substrate with optimized hardness and toughness for steel turning in combination with a thick wear resistant coating.

The edge line security enables the grade to handle interrupted cuts at high metal removal rates.

GC3005 (HC) - P10 (P01-P25)

CVD coated carbide consisting of a wear resistant coating with very good adhesion to a hard substrate, capable of withstanding high temperatures. For finishing and semi-finishing at high cutting speed in high alloy steels.

Complementary grades

GC1025 (HC) - P25 (P10-P35)

PVD coated micro-grain carbide. Recommended for finishing of low carbon steel and other 'sticky' steel alloys when excellent surface finish or sharp cutting action is needed. Great resistance to thermal shock also makes it suitable for intermittent cuts

GC2015 (HC) - P25 (P20-P30)

CVD-coated carbide grade. Combined with geometries providing sharp cutting action, this grade is recommended for finishing to light roughing of carbon steels and other 'sticky' alloy:

GC2025 (HC) - P35 (P25-P40)

CVD coated carbide grade. Alternative choice for toughness demanding steel applications

GC235 (HC) - P45 (P30-P50)

CVD-coated carbide grade for roughing of steel and steel castings under the most unfavorable conditions. The tough substrate provides extremely good edge security which allows the grade to handle heavy interrupted cuts at low speeds.

GC1125 (HC) - P25 (P10-P30)

Recommended as a complement to GC1515 when finishing low carbon steels at low feed rates or low cutting speeds.

Letter symbols specifying the designation of hard cutting materials:

Hardmetals:

HW	Uncoated hardmetal containing primarily tungsten carbide (WC)
HT	Uncoated hardmetal, also called cermet, containing primarily titanium carbides (TiC) or titanium nitrides (TiN) or both.
HC	Hardmetals as above, but coated

Ceramics:

CA	Oxide ceramics containing primarily aluminium oxide (Al ₂ O ₃).
CM	Mixed ceramics containing primarily aluminium oxide (Al ₂ O ₃) but containing components other than oxides
CN	Nitride ceramics containing primarily silicon nitride (Si ₃ N ₄).
CC	Ceramics as above, but coated.

Diamond:

DP Polycrystalline diamond ¹⁾

Boron nitride:

BN Polycrystalline boron nitride ¹⁾

¹⁾ Polycrystalline diamond and polycrystalline boron nitride are also named superhard cutting materials.

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