





























## Recommended depth of cut and cutting feed

### CoroTurn® 107 positive basic-shape inserts









Insert	Rec. depth of cut		Rec. cutting feed					
	a <sub>p</sub> = mm		f <sub>n</sub> = mm/r					
	Min	Max	Min	Max	Max			
 <b>VCEX</b>  <sup>1)</sup>    	VC EX110300L-F	1.00	0.03	4.00	0.05	0.05	0.20	
	VC EX110300R-F	1.00	0.03	4.00	0.05	0.05	0.20	
	VC EX110301L-F	1.00	0.05	4.00	0.10	0.05	0.30	
	VC EX110301R-F	1.00	0.05	4.00	0.10	0.05	0.30	
 <b>TCGT</b>  <sup>1)</sup>    	TCGT06T102L-K	0.30	0.10	1.00	0.05	0.03	0.15	
	TCGT06T102R-K	0.30	0.10	1.00	0.05	0.03	0.15	
	TCGT06T104L-K	0.50	0.20	1.00	0.07	0.03	0.20	
	TCGT06T104R-K	0.50	0.20	1.00	0.07	0.03	0.20	
	TCGT090202L-K	0.30	0.10	1.20	0.05	0.03	0.15	
	TCGT090202L-K	0.30	0.10	1.20	0.05	0.05	0.15	
	TCGT090202R-K	0.30	0.10	1.20	0.05	0.03	0.15	
	TCGT090204L-K	0.50	0.20	1.20	0.10	0.03	0.20	
	TCGT090204L-K	0.50	0.20	1.20	0.10	0.05	0.20	
	TCGT090204R-K	0.50	0.20	1.20	0.10	0.03	0.20	
	TCGT110202L-K	0.30	0.10	1.50	0.05	0.05	0.15	
	TCGT110202R-K	0.30	0.10	1.50	0.05	0.03	0.15	
	TCGT110204L-K	0.50	0.20	1.50	0.10	0.03	0.25	
	TCGT110204R-K	0.50	0.20	1.50	0.10	0.03	0.25	
	TCGT110302L-K	0.30	0.10	1.50	0.05	0.03	0.15	
	TCGT110302R-K	0.30	0.10	1.50	0.05	0.03	0.15	
	TCGT110304L-K	0.50	0.20	1.50	0.10	0.03	0.25	
	TCGT110304R-K	0.50	0.20	1.50	0.10	0.03	0.25	
	 <b>.CMW</b>  <sup>1)</sup>	CCMW060204	1.50	0.10	3.00	0.20	0.08	0.30
		CCMW09T304	2.00	0.10	4.00	0.20	0.08	0.30
DCMW11T304		2.00	0.10	4.00	0.20	0.08	0.30	
SCMW09T304		2.00	0.10	4.00	0.20	0.08	0.30	
SCMW09T308		2.00	0.10	4.00	0.30	0.10	0.50	
SCMW120408		2.50	0.10	5.00	0.30	0.10	0.50	
TCMW110204		1.50	0.10	3.00	0.20	0.08	0.30	
TCMW110304		1.50	0.10	3.00	0.20	0.05	0.30	
TCMW16T304		2.00	0.10	4.00	0.20	0.08	0.30	
TCMW16T308		2.00	0.10	4.00	0.30	0.10	0.50	
VBMW160404		2.00	0.10	4.00	0.20	0.08	0.30	
 <b>RCMT</b>  <sup>1)</sup>    		RCMT0502M0	1.00	0.50	2.00	0.25	0.05	0.50
		RCMT0602M0	1.50	0.50	2.40	0.30	0.06	0.60
		RCMT0803M0	2.00	0.80	3.20	0.40	0.08	0.80
	RCMT10T3M0	2.50	1.00	4.00	0.50	0.10	1.00	
	RCMT120400-M0	3.00	1.20	4.80	0.60	0.12	1.20	
	RCMT1204M0	3.00	1.20	4.80	0.60	0.12	1.20	
	RCMT1606M0	3.50	1.60	6.40	0.80	0.16	1.60	
	RCMT190600-M0	4.00	2.00	8.00	1.00	0.20	2.00	
	RCMT2006M0	4.00	2.00	8.00	1.00	0.20	2.00	
	RCMT2507M0	5.00	2.50	10.0	1.25	0.25	2.50	
RCMT3209M0	6.00	3.20	12.8	1.60	0.32	3.20		
 <b>RCMX</b>  <sup>1)</sup>  	RCMX100300	2.50	1.00	4.00	0.32	0.10	1.00	
	RCMX120400	3.00	1.20	4.80	0.38	0.12	1.20	
	RCMX160600	4.00	1.60	6.40	0.51	0.16	1.60	
	RCMX200600	5.00	2.00	8.00	0.63	0.20	2.00	
	RCMX250700	6.30	2.50	10.0	0.79	0.25	2.50	
	RCMX320900	8.00	3.20	12.8	1.01	0.32	3.20	





<sup>1)</sup> Above recommendations are valid for first choice grade in main ISO area

Insert	Rec. depth of cut		Rec. cutting feed				
	a <sub>p</sub> = mm		f <sub>n</sub> = mm/r				
	Min	Max	Min	Max	Max		
 <b>RCMX</b>  <sup>1)</sup>	RCMX100300E	2.50	1.00	4.00	0.32	0.10	1.00
	RCMX120400E	3.00	1.20	4.80	0.38	0.12	1.20
	RCMX160600E	4.00	1.60	6.40	0.50	0.16	1.58
 <b>AL</b>  <sup>1)</sup>	DCGX11T302-AL	1.00	0.30	5.50	0.12	0.05	0.15
	DCGX11T304-AL	1.50	0.50	5.50	0.20	0.10	0.30
	CCGX060202-AL	1.00	0.30	3.00	0.12	0.05	0.15
	CCGX060204-AL	1.50	0.50	3.00	0.20	0.10	0.30
	CCGX09T304-AL	1.50	0.50	5.00	0.20	0.10	0.30
	CCGX09T308-AL	1.50	0.50	5.00	0.30	0.15	0.60
	CCGX120404-AL	1.50	0.50	7.00	0.20	0.10	0.30
	CCGX120408-AL	1.50	0.50	7.00	0.30	0.15	0.60
	DCGX070202-AL	1.00	0.30	4.00	0.12	0.05	0.15
	DCGX070204-AL	1.50	0.50	4.00	0.20	0.10	0.30
	DCGX11T308-AL	1.50	0.50	5.50	0.30	0.15	0.60
	SCGX09T308-AL	1.50	0.50	5.00	0.30	0.15	0.60
	TCGX06T104-AL	1.00	0.50	2.00	0.20	0.10	0.30
	TCGX090202-AL	1.00	0.30	4.00	0.12	0.05	0.15
	TCGX090204-AL	1.50	0.50	4.00	0.20	0.10	0.30
	TCGX110202-AL	1.00	0.30	5.00	0.12	0.05	0.15
	TCGX110204-AL	1.50	0.50	5.00	0.20	0.10	0.30
	TCGX110208-AL	1.50	0.50	5.00	0.30	0.15	0.60
	TCGX110302-AL	1.00	0.30	5.00	0.12	0.05	0.15
	TCGX110304-AL	1.50	0.50	5.00	0.20	0.10	0.30
	TCGX110308-AL	1.50	0.50	5.00	0.30	0.15	0.60
	TCGX16T304-AL	1.50	0.50	7.00	0.20	0.10	0.30
	TCGX16T308-AL	1.50	0.50	7.00	0.30	0.15	0.60
	VCGX110202-AL	1.00	0.30	3.00	0.12	0.05	0.15
	VCGX110204-AL	1.50	0.50	3.00	0.20	0.10	0.30
	VCGX110302-AL	1.00	0.30	3.00	0.12	0.05	0.15
	VCGX110304-AL	1.50	0.50	3.00	0.20	0.10	0.30
VCGX160404-AL	1.50	0.50	5.00	0.20	0.10	0.30	
VCGX160408-AL	1.50	0.50	5.00	0.30	0.15	0.60	
VCGX160412-AL	1.50	0.50	5.00	0.40	0.15	0.80	
VCGX220520-AL	1.50	0.50	7.00	0.60	0.25	1.00	
VCGX220530-AL	1.50	0.50	7.00	0.60	0.25	1.00	

## Recommended depth of cut and cutting feed

### CoroTurn® 111 positive basic-shape inserts

Insert	Rec. depth of cut			Rec. cutting feed			
	$a_p = \text{mm}$			$f_n = \text{mm/r}$			
	Min	Max		Min	Max		
	CPMT060202-PF	0.30	0.07	1.50	0.06	0.03	0.12
	CPMT060204-PF	0.30	0.10	1.50	0.09	0.04	0.18
	DPMT070204-PF	0.30	0.09	1.30	0.09	0.04	0.18
<b>PF</b> 	TPMT06T102-PF	0.30	0.06	1.30	0.06	0.03	0.12
<b>P</b> <sup>1)</sup>	TPMT06T104-PF	0.30	0.09	1.30	0.09	0.04	0.18
	TPMT090202-PF	0.30	0.07	1.50	0.07	0.03	0.13
	TPMT090204-PF	0.30	0.10	1.50	0.10	0.05	0.20
	TPMT110302-PF	0.30	0.07	1.50	0.07	0.03	0.13
	TPMT110304-PF	0.30	0.10	1.50	0.10	0.05	0.20
	TPMT16T304-PF	0.40	0.10	1.80	0.12	0.06	0.24
	VCMT110302-PF	0.30	0.07	1.50	0.07	0.03	0.13
	VCMT110304-PF	0.30	0.10	1.50	0.10	0.05	0.20
	WPMT020102-PF	0.20	0.04	0.90	0.03	0.02	0.07
	WPMT020104-PF	0.20	0.06	0.90	0.05	0.03	0.10
	WPMT040202-PF	0.30	0.06	1.30	0.05	0.02	0.10
	WPMT040204-PF	0.30	0.09	1.30	0.08	0.04	0.15
	CPMT060204-PM	0.70	0.30	2.40	0.13	0.09	0.22
	CPMT060208-PM	0.70	0.60	2.40	0.18	0.12	0.29
<b>PM</b> 	DPMT070204-PM	0.70	0.30	2.30	0.13	0.09	0.22
<b>P</b> <sup>1)</sup>	DPMT070208-PM	0.70	0.50	2.30	0.18	0.12	0.29
	DPMT11T304-PM	0.90	0.40	3.00	0.18	0.12	0.30
	DPMT11T308-PM	0.90	0.70	3.00	0.24	0.16	0.39
	TPMT090204-PM	0.70	0.30	2.30	0.13	0.09	0.22
	TPMT090208-PM	0.70	0.50	2.30	0.18	0.12	0.29
	TPMT110304-PM	0.80	0.30	2.50	0.15	0.10	0.25
	TPMT110308-PM	0.80	0.60	2.50	0.20	0.13	0.33
	TPMT16T304-PM	0.90	0.40	3.00	0.18	0.12	0.30
	TPMT16T308-PM	0.90	0.70	3.00	0.24	0.16	0.39
	TPMT16T312-PM	0.90	0.90	3.00	0.28	0.19	0.47
	WPMT040204-PM	0.70	0.30	2.30	0.13	0.09	0.22
	WPMT040208-PM	0.70	0.50	2.30	0.18	0.12	0.29
	CPMT060202-MF	0.30	0.07	1.50	0.06	0.03	0.12
	CPMT060204-MF	0.30	0.10	1.50	0.09	0.04	0.18
	DPMT070202-MF	0.30	0.06	1.30	0.06	0.03	0.12
	DPMT070204-MF	0.30	0.09	1.30	0.09	0.04	0.18
<b>MF</b> 	TPMT06T102-MF	0.30	0.06	1.30	0.06	0.03	0.12
<b>M</b> <sup>1)</sup>	TPMT06T104-MF	0.30	0.09	1.30	0.09	0.04	0.18
<b>S</b>	TPMT090202-MF	0.30	0.07	1.50	0.07	0.03	0.13
	TPMT090204-MF	0.30	0.10	1.50	0.10	0.05	0.20
	TPMT110302-MF	0.30	0.07	1.50	0.07	0.03	0.13
	TPMT110304-MF	0.30	0.10	1.50	0.10	0.05	0.20
	TPMT16T304-MF	0.40	0.10	1.80	0.12	0.06	0.24
	VCMT110302-MF	0.30	0.07	1.50	0.07	0.03	0.13
	VCMT110304-MF	0.30	0.10	1.50	0.10	0.05	0.20
	WPMT020104-MF	0.20	0.06	0.90	0.05	0.03	0.10
	WPMT040202-MF	0.30	0.06	1.30	0.05	0.02	0.10
	WPMT040204-MF	0.30	0.09	1.30	0.08	0.04	0.15
	CPMT060204-MM	0.70	0.30	2.40	0.13	0.09	0.22
	CPMT060208-MM	0.70	0.60	2.40	0.18	0.12	0.29
	DPMT070204-MM	0.70	0.30	2.30	0.13	0.09	0.22
	DPMT070208-MM	0.70	0.50	2.30	0.18	0.12	0.29
<b>MM</b> 	DPMT11T304-MM	0.90	0.40	3.00	0.18	0.12	0.30
<b>M</b> <sup>1)</sup>	DPMT11T308-MM	0.90	0.70	3.00	0.24	0.16	0.39
<b>S</b>	TPMT090204-MM	0.70	0.30	2.30	0.13	0.09	0.22
	TPMT090208-MM	0.70	0.50	2.30	0.18	0.12	0.29
	TPMT110304-MM	0.80	0.30	2.50	0.15	0.10	0.25
	TPMT110308-MM	0.80	0.60	2.50	0.20	0.13	0.33
	TPMT16T304-MM	0.90	0.40	3.00	0.18	0.12	0.30
	TPMT16T308-MM	0.90	0.70	3.00	0.24	0.16	0.39
	TPMT16T312-MM	0.90	0.90	3.00	0.28	0.19	0.47
	VCMT110304-MM	0.80	0.30	2.60	0.15	0.10	0.25

Insert	Rec. depth of cut			Rec. cutting feed			
	$a_p = \text{mm}$			$f_n = \text{mm/r}$			
	Min	Max		Min	Max		
	VCMT110308-MM	0.80	0.60	2.60	0.20	0.13	0.33
	WPMT040204-MM	0.70	0.30	2.30	0.13	0.09	0.22
	WPMT040208-MM	0.70	0.50	2.30	0.18	0.12	0.29
	CPMT060204-KF	0.30	0.10	1.50	0.09	0.04	0.18
	DPMT070204-KF	0.30	0.09	1.30	0.09	0.04	0.18
	TPMT06T104-KF	0.30	0.09	1.30	0.09	0.04	0.18
<b>KF</b> 	TPMT090204-KF	0.30	0.10	1.50	0.10	0.05	0.20
<b>K</b> <sup>1)</sup>	TPMT110304-KF	0.30	0.10	1.50	0.10	0.05	0.20
	TPMT16T304-KF	0.40	0.10	1.80	0.12	0.06	0.24
	VCMT110304-KF	0.30	0.10	1.50	0.10	0.05	0.20
	WPMT020104-KF	0.20	0.06	0.90	0.05	0.03	0.10
	WPMT040204-KF	0.30	0.09	1.30	0.08	0.04	0.15
	CPMT060204-KM	0.70	0.30	2.40	0.13	0.09	0.22
	CPMT060208-KM	0.70	0.60	2.40	0.18	0.12	0.29
	DPMT070204-KM	0.70	0.30	2.30	0.13	0.09	0.22
<b>KM</b> 	DPMT070208-KM	0.70	0.50	2.30	0.18	0.12	0.29
<b>K</b> <sup>1)</sup>	DPMT11T304-KM	0.90	0.40	3.00	0.18	0.12	0.30
	DPMT11T308-KM	0.90	0.70	3.00	0.24	0.16	0.39
	TPMT090204-KM	0.70	0.30	2.30	0.13	0.09	0.22
	TPMT090208-KM	0.70	0.50	2.30	0.18	0.12	0.29
	TPMT110304-KM	0.80	0.30	2.50	0.15	0.10	0.25
	TPMT110308-KM	0.80	0.60	2.50	0.20	0.13	0.33
	TPMT16T304-KM	0.90	0.40	3.00	0.18	0.12	0.30
	TPMT16T308-KM	0.90	0.70	3.00	0.24	0.16	0.39
	TPMT16T312-KM	0.90	0.90	3.00	0.28	0.19	0.47
	VCMT110304-KM	0.80	0.30	2.60	0.15	0.10	0.25
	VCMT110308-KM	0.80	0.60	2.60	0.20	0.13	0.33
	WPMT040204-KM	0.70	0.30	2.30	0.13	0.09	0.22
	WPMT040208-KM	0.70	0.50	2.30	0.18	0.12	0.29

<sup>1)</sup> Above recommendations are valid for first choice grade in main ISO area



**Recommended depth of cut and cutting feed**

**Inserts for advanced materials, negative basic-shape**

Insert	Rec. depth of cut		Rec. cutting feed			Insert	Rec. depth of cut		Rec. cutting feed				
	$a_p = \text{mm}$ Min Max		$f_n = \text{mm/r}$ Min Max				$a_p = \text{mm}$ Min Max		$f_n = \text{mm/r}$ Min Max				
TNGN220408T01020	2.20	0.10	6.60	0.10	0.10	0.24	RNGN190700T01020	1.90	0.10	5.70	0.95	0.18	5.52
TNGN220712T01020	2.20	0.10	6.60	0.14	0.10	0.36	RNGN190700K20015	1.90	0.10	5.70	0.95	0.13	3.45
TNGN110308T01020	1.10	0.10	3.30	0.10	0.05	0.24	RNGN190700T20015	1.90	0.10	5.70	0.95	0.13	3.45
TNGN110312T01020	1.10	0.10	3.30	0.14	0.05	0.25	RNGN250700K20015	2.50	0.10	7.50	0.96	0.13	3.98
CNGN120408T02520	3.60	0.10	6.00	0.20	0.15	0.36	RNGN250700T20015	2.50	0.10	7.50	0.96	0.13	3.98
CNGN120412T02520	3.60	0.10	6.00	0.30	0.15	0.54	CNGA090304T01020AWH	0.10	0.07	0.40	0.18	0.05	0.25
CNGN120416T02520	3.60	0.10	6.00	0.40	0.15	0.60	CNGA090308T01020AWH	0.10	0.07	0.80	0.28	0.05	0.30
CNGN120708T02520	3.60	0.10	6.00	0.20	0.15	0.36	CNGA120404T01020AWH	0.10	0.07	0.40	0.18	0.05	0.25
CNGN120712T02520	3.60	0.10	6.00	0.30	0.15	0.54	CNGA120408T01020AWH	0.10	0.07	0.80	0.28	0.05	0.30
CNGN120716T02520	3.60	0.10	6.00	0.40	0.15	0.60	WNGA060404T01020AWH	0.10	0.07	0.40	0.18	0.05	0.25
CNGN120716T02520	3.60	0.10	6.00	0.40	0.15	0.60	WNGA060408T01020AWH	0.10	0.07	0.80	0.28	0.05	0.30
CNGN160712T02520	4.80	0.10	8.00	0.30	0.15	0.54	WNGA080408T01020AWH	0.10	0.07	0.80	0.28	0.05	0.30
CNGN160716T02520	4.80	0.10	8.00	0.40	0.15	0.60	WNGA080404T01020AWH	0.10	0.07	0.40	0.18	0.05	0.25
DNGN150708T02520	4.50	0.10	7.50	0.20	0.15	0.36	CNGA090304T01020AWG	0.10	0.07	0.40	0.18	0.05	0.25
DNGN150712T02520	4.50	0.10	7.50	0.30	0.15	0.54	CNGA090308T01020AWG	0.10	0.07	0.80	0.28	0.05	0.35
DNGN150716T02520	4.50	0.10	7.50	0.40	0.15	0.60	CNGA120404T01020AWG	0.10	0.07	0.40	0.18	0.05	0.25
SNGN120408T02520	3.60	0.10	6.00	0.20	0.15	0.36	CNGA120408T01020AWG	0.10	0.07	0.80	0.28	0.05	0.35
SNGN120412T02520	3.60	0.10	6.00	0.30	0.15	0.54	WNGA060404T01020AW	0.10	0.07	0.40	0.18	0.05	0.25
SNGN120416T02520	3.60	0.10	6.00	0.40	0.15	0.60	WNGA060408T01020AW	0.10	0.07	0.80	0.28	0.05	0.35
SNGN120708T02520	3.60	0.10	6.00	0.20	0.15	0.36	WNGA080408T01020AW	0.10	0.07	0.80	0.28	0.05	0.35
SNGN120712T02520	3.60	0.10	6.00	0.30	0.15	0.54	WNGA080404T01020AW	0.10	0.07	0.40	0.18	0.05	0.25
SNGN120716T02520	3.60	0.10	6.00	0.40	0.15	0.60	CNGA120404T01030AWH	0.10	0.07	0.40	0.18	0.05	0.25
SNGN150716T02520	4.50	0.10	7.50	0.40	0.15	0.60	CNGA120408T01030AWH	0.10	0.07	0.80	0.28	0.05	0.35
SNGN190724T02520	5.70	0.10	9.50	0.48	0.15	0.60	CNGA120404S01030A	0.10	0.07	0.40	0.10	0.05	0.20
TNGN160412T02520	4.80	0.10	8.00	0.30	0.15	0.54	CNGA120408S01030A	0.20	0.07	0.80	0.15	0.05	0.30
CNGQ120708T02520WG	3.60	0.10	6.00	0.30	0.15	0.36	CNGA120412S01030A	0.20	0.07	1.20	0.20	0.05	0.30
CNGQ120712T02520WG	3.60	0.10	6.00	0.45	0.15	0.54	DNGA150404S01030A	0.10	0.07	0.40	0.10	0.05	0.20
CNGQ120716T02520WG	3.60	0.10	6.00	0.60	0.15	0.60	DNGA150408S01030A	0.20	0.07	0.80	0.15	0.05	0.30
CNGQ120708T02520	3.60	0.10	6.00	0.20	0.15	0.36	DNGA150412S01030A	0.20	0.07	1.20	0.20	0.05	0.30
CNGQ120712T02520	3.60	0.10	6.00	0.30	0.15	0.54	CNGA090304S01020A	0.10	0.07	0.40	0.10	0.05	0.20
CNGQ120716T02520	3.60	0.10	6.00	0.40	0.15	0.60	CNGA090308S01020A	0.20	0.07	0.80	0.15	0.05	0.30
CNGQ160712T02520	4.80	0.10	8.00	0.30	0.15	0.54	CNGA120404S01020A	0.10	0.07	0.40	0.10	0.05	0.20
CNGQ160716T02520	4.80	0.10	8.00	0.40	0.15	0.60	CNGA120408S01020A	0.20	0.07	0.80	0.15	0.05	0.30
DNGQ150708T02520	4.50	0.10	7.50	0.20	0.15	0.36	CNGA120412S01020A	0.20	0.07	1.20	0.20	0.05	0.30
DNGQ150712T02520	4.50	0.10	7.50	0.30	0.15	0.54	CNGN120404S01020A	0.10	0.07	1.20	0.10	0.05	0.20
DNGQ150716T02520	4.50	0.10	7.50	0.40	0.15	0.60	CNGA110404S01020A	0.10	0.07	0.40	0.10	0.05	0.20
DNGQ150716T02520	4.50	0.10	7.50	0.40	0.15	0.60	DNGA110408S01020A	0.20	0.07	0.80	0.15	0.05	0.30
SNGQ120708T02520	3.60	0.10	6.00	0.20	0.15	0.36	SNGA090304S01020A	0.10	0.07	0.40	0.10	0.05	0.20
SNGQ120712T02520	3.60	0.10	6.00	0.30	0.15	0.54	SNGA090308S01020A	0.20	0.07	0.80	0.15	0.05	0.30
SNGQ120716T02520	3.60	0.10	6.00	0.40	0.15	0.60	SNGA120408S01020A	0.20	0.07	0.80	0.15	0.05	0.30
SNGQ120716T02520	3.60	0.10	6.00	0.40	0.15	0.60	SNGA120412S01020A	0.20	0.07	1.20	0.20	0.05	0.30
RNGA120400T01020	1.20	0.10	3.60	0.81	0.13	2.82	TNGA110304S01020A	0.10	0.07	0.40	0.10	0.05	0.20
RNGA120400T02520	3.60	0.10	4.80	0.56	0.24	6.76	TNGA110308S01020A	0.20	0.07	0.80	0.15	0.05	0.30
RNGA090300T01020	0.90	0.10	2.70	0.65	0.13	2.44	TNGA160404S01020A	0.10	0.07	0.40	0.10	0.05	0.20
RNGA							TNGA160412S01020A	0.20	0.07	0.60	0.20	0.05	0.30
RNGA							TNGN160404S01020A	0.10	0.07	1.20	0.10	0.05	0.20
RNGA							WNGA060404S01020A	0.10	0.07	0.40	0.10	0.05	0.20
RNGA							WNGA060408S01020A	0.20	0.07	0.80	0.15	0.05	0.30
RNGN							WNGA080404S01020A	0.10	0.07	0.40	0.10	0.05	0.20
RNGN							TNGA160408S01020A	0.20	0.07	0.80	0.15	0.05	0.30
RNGN							WNGA080408S01020A	0.20	0.07	0.80	0.15	0.05	0.30
RNGN							WNGA080412S01020A	0.20	0.07	1.20	0.20	0.05	0.30
RNGN							CNGA090304T01020A	0.10	0.07	0.40	0.10	0.05	0.20
RNGN							CNGA090308T01020A	0.20	0.07	0.80	0.15	0.05	0.30
RNGN							CNGA120404T01020A	0.10	0.07	0.40	0.10	0.05	0.20
RNGN							CNGA120408T01020A	0.20	0.07	0.80	0.15	0.05	0.30
RNGN							CNGA120412T01020A	0.20	0.07	1.20	0.20	0.05	0.40
RNGN							DNGA110404T01020A	0.10	0.07	0.40	0.10	0.05	0.20
RNGN							DNGA110408T01020A	0.20	0.07	0.80	0.15	0.05	0.30
RNGN							SNGA090304T01020A	0.10	0.07	0.40	0.10	0.05	0.20

<sup>1)</sup> Above recommendations are valid for first choice grade in main ISO area

Continued

## Recommended depth of cut and cutting feed

### Inserts for advanced materials, negative basic-shape

Insert	Rec. depth of cut			Rec. cutting feed		
	a <sub>p</sub> = mm			f <sub>n</sub> = mm/r		
	Min		Max	Min		Max
SNGA090308T01020A	0.20	0.07	0.80	0.15	0.05	0.30
SNGA120408T01020A	0.20	0.07	0.80	0.15	0.05	0.30
SNGA120412T01020A	0.20	0.07	1.20	0.20	0.05	0.40
TNGA110304T01020A	0.10	0.07	0.40	0.10	0.05	0.20
TNGA110308T01020A	0.20	0.07	0.80	0.15	0.05	0.30
TNGA160404T01020A	0.10	0.07	0.40	0.10	0.05	0.20
WNGA060404T01020A	0.10	0.07	0.40	0.10	0.05	0.20
TNGA160412T01020A	0.20	0.07	0.60	0.20	0.05	0.40
WNGA060408T01020A	0.20	0.07	0.80	0.15	0.05	0.30
WNGA080408T01020A	0.20	0.07	0.80	0.15	0.05	0.30
WNGA080404T01020A	0.10	0.07	0.40	0.10	0.05	0.20
WNGA080412T01020A	0.20	0.07	1.20	0.20	0.05	0.40
TNGA160408T01020A	0.20	0.07	0.80	0.15	0.05	0.30
CNMA120404S01020	1.20	0.10	3.60	0.07	0.05	0.12
CNMA120404S01020E	0.20	0.10	2.80	0.15	0.08	0.20
CNMA120408S01020	1.20	0.10	3.60	0.10	0.05	0.24
CNMA120408S01020E	0.20	0.10	2.80	0.20	0.10	0.24
CNMA120412S01020	1.20	0.10	3.60	0.14	0.05	0.30
CNMA120412S01020E	0.20	0.10	2.70	0.20	0.10	0.25
DNMA150404S01020	1.50	0.10	4.50	0.07	0.05	0.12
DNMA150408S01020	1.50	0.10	4.50	0.10	0.05	0.24
DNMA150412S01020	1.50	0.10	4.50	0.14	0.05	0.30
RNGA090300S01020	0.90	0.10	2.70	0.65	0.13	2.93
SNMA120404S01020	1.20	0.10	3.60	0.07	0.05	0.12
SNMA120404S01020E	0.20	0.10	3.40	0.15	0.08	0.20
SNMA120408S01020	1.20	0.10	3.60	0.10	0.05	0.24
SNMA120408S01020E	0.20	0.10	3.40	0.20	0.10	0.24
SNMA120412S01020	1.20	0.10	3.60	0.14	0.05	0.30
SNMA120412S01020E	0.20	0.10	3.40	0.20	0.10	0.25
TNMA160404S01020	1.60	0.10	4.80	0.07	0.05	0.12
TNMA160404S01020E	0.20	0.10	3.60	0.12	0.08	0.15
TNMA160408S01020	1.60	0.10	4.80	0.10	0.05	0.24
TNMA160408S01020E	0.20	0.10	3.30	0.15	0.10	0.18
TNMA160412S01020	1.60	0.10	4.80	0.14	0.05	0.30
TNMA160412S01020E	0.20	0.10	3.00	0.18	0.10	0.23
TNMA220408S01020	2.20	0.10	6.60	0.10	0.05	0.24
TNMA220408S01020E	0.20	0.10	3.20	0.15	0.10	0.18
TNMA220412S01020	2.20	0.10	6.60	0.14	0.05	0.30
TNMA220412S01020E	0.20	0.10	2.90	0.18	0.10	0.23



.NMA

**H**<sup>1)</sup>

1) Above recommendations are valid for first choice grade in main ISO area


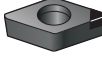























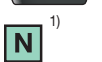



## Recommended depth of cut and cutting feed

B

### Inserts for advanced materials, positive basic-shape

Parting and Grooving

Insert	Rec. depth of cut			Rec. cutting feed			Insert	Rec. depth of cut			Rec. cutting feed		
	$a_p = \text{mm}$			$f_n = \text{mm/r}$				$a_p = \text{mm}$			$f_n = \text{mm/r}$		
	Min	Max		Min	Max		Min	Max	Min	Max	Min	Max	
 RPGN090300T01020	0.10	0.90	2.70	0.13	0.65	2.44		0.50	0.10	2.30	0.10	0.05	0.20
 <sup>1)</sup>							 <sup>1)</sup>	0.50	0.10	2.30	0.10	0.05	0.20
 H							 N	0.50	0.10	3.40	0.10	0.05	0.20
 K S								0.50	0.10	3.40	0.10	0.05	0.20
 RCGX060600E	0.60	0.10	1.80	0.49	0.13	1.99		1.00	0.10	3.40	0.15	0.05	0.40
 RCGX060600T01020	0.60	0.10	1.80	0.49	0.13	1.99		1.00	0.10	3.40	0.15	0.05	0.40
 RCGX090700E	0.90	0.10	2.70	0.65	0.13	2.44		0.50	0.10	3.30	0.10	0.05	0.20
 RCGX090700T01020	0.90	0.10	2.70	0.65	0.13	2.44		1.00	0.10	3.00	0.15	0.05	0.40
 RCGX090700T07015	0.90	0.10	2.70	0.65	0.13	2.44		1.00	0.10	3.00	0.15	0.05	0.40
 RCGX120700E	1.20	0.10	3.60	0.81	0.19	4.51		0.50	0.10	3.30	0.10	0.05	0.20
 RCGX120700K15015	1.20	0.10	3.60	0.81	0.13	2.82		1.00	0.10	3.00	0.15	0.05	0.40
 RCGX120700T01020	1.20	0.10	3.60	0.81	0.13	2.82		0.50	0.10	3.00	0.10	0.05	0.20
 RCGX120700T02520	1.20	0.10	3.60	0.81	0.13	2.82		1.00	0.10	3.00	0.15	0.05	0.40
 RCGX120700T15015	1.20	0.10	3.60	0.81	0.13	2.82		0.50	0.10	3.30	0.10	0.05	0.20
 RCGX151000T20015	1.50	0.10	4.50	0.81	0.13	3.15		1.00	0.10	2.80	0.15	0.05	0.40
 RCGX191000K20015	1.90	0.10	5.70	0.95	0.13	3.45		1.00	0.10	2.10	0.15	0.05	0.40
 RCGX191000T20015	1.90	0.10	5.70	0.95	0.13	3.45							
 RCGX251200K20015	2.50	0.10	7.50	0.96	0.13	3.98							
 RCGX251200T20015	2.50	0.10	7.50	0.96	0.13	3.98							
 RGPX090700T01020	0.10	0.90	2.70	0.19	0.65	3.90		0.50	0.10	2.50	0.10	0.05	0.20
 RGPX120700T01020	0.10	1.20	3.60	0.19	0.81	4.51	 <sup>1)</sup>	0.50	0.10	2.20	0.10	0.05	0.20
 H								0.50	0.10	2.20	0.10	0.05	0.20
K S								0.50	0.10	2.20	0.10	0.05	0.20
SPGN120408T01020	0.10	1.20	3.60	0.05	0.10	0.24		0.50	0.10	7.00	0.10	0.05	0.20
SPGN120412T01020	0.10	1.20	3.60	0.05	0.14	0.25		0.50	0.10	7.00	0.10	0.05	0.20
SPGN120416T01020	0.10	1.20	3.60	0.05	0.19	0.25		0.50	0.10	7.00	0.10	0.05	0.20
TPGN110304T01020	0.10	1.10	3.30	0.05	0.07	0.12		0.50	0.10	7.00	0.10	0.05	0.20
TPGN110308T01020	0.10	1.10	3.30	0.05	0.10	0.24		0.50	0.10	7.00	0.10	0.05	0.20
TPGN160304T01020	0.10	1.60	4.80	0.05	0.07	0.12		0.50	0.10	7.00	0.10	0.05	0.20
TPGN160308E	0.10	1.60	4.80	0.05	0.10	0.24		0.50	0.10	7.00	0.10	0.05	0.20
TPGN160308T01020	0.10	1.60	4.80	0.05	0.10	0.24		0.50	0.10	7.00	0.10	0.05	0.20
TPGN160312T01020	0.10	1.60	4.80	0.05	0.14	0.25		0.50	0.10	7.00	0.10	0.05	0.20
DCMW11T304S01020	1.10	0.10	3.30	0.07	0.05	0.12							
DCMW11T304S01020	1.10	0.10	3.30	0.07	0.05	0.12							
DCMW11T308S01020	1.10	0.10	3.30	0.10	0.05	0.24							
DCMW11T308S01020	1.10	0.10	3.30	0.10	0.05	0.24							
TCMW090204S01020	0.90	0.10	2.70	0.07	0.05	0.12							
TCMW090204S01020E	0.90	0.10	2.70	0.07	0.05	0.12							
TCMW110204S01020	1.10	0.10	3.30	0.07	0.05	0.12							
TCMW110208S01020	1.10	0.10	3.30	0.10	0.05	0.24							
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							
VBMW160404S01020	0.30	0.10	0.30	0.15	0.05	0.27							
VBMW160404S01020E	0.30	0.10	0.30	0.25	0.05	0.27							
VBMW160408S01020	0.30	0.10	0.30	0.15	0.05	0.27							
VBMW160408S01020E	0.30	0.10	0.30	0.15	0.05	0.27							

<sup>1)</sup> Above recommendations are valid for first choice grade in main ISO area



## Cutting speed recommendations

The recommendations are valid for use with cutting fluid.

ISO	CMC No.	Material	Specific cutting force $k_c$ 0.4 N/mm <sup>2</sup>	Hardness Brinell HB	<<<< WEAR RESISTANCE			
					CT5005	CT5015	GC1525	
					$h_{ex}, \text{mm} = \text{feed } f_n, \text{mm/r at } \kappa_r 90^\circ - 95^\circ$			
					Cutting speed ( $V_c$ ), m/min			
P	01.1 01.2 01.3	<b>Unalloyed steel</b> C = 0.1–0.25% C = 0.25–0.55% C = 0.55–0.80%	2000 2100 2200	125 150 170	730-590-440	650-540-440	560-465-380	
					650-530-420	570-480-385	495-415-335	
					-	510-425-340	430-365-295	
	Steel	02.1 02.12 02.2 02.2	<b>Low-alloy steel</b> (alloying elements $\leq 5\%$ ) Non-hardened Ball bearing steel Hardened and tempered Hardened and tempered	2150 2300 2550 2850	180 210 275 350	530-450-360	480-400-320	375-320-255
						-	-	-
						395-325-250	285-235-190	200-165-135
						320-260-200	230-190-150	160-135-110
						-	-	-
		03.11 03.21	<b>High-alloy steel</b> (alloying elements $> 5\%$ ) Annealed Hardened tool steel	2500 3900	200 325	-	395-330-250	260-215-175
						-	195-165-130	145-115-90
		06.1 06.2 06.3	<b>Steel castings</b> Unalloyed Low-alloy (alloying elements $\leq 5\%$ ) High-alloy (alloying elements $> 5\%$ )	2000 2100 2650	180 200 225	-	260-215-175	225-185-145
						-	270-225-170	175-145-105
						-	200-165-125	140-115-85

ISO	CMC No.	Material	Specific cutting force $k_c$ 0.4 N/mm <sup>2</sup>	Hardness Brinell HB	<<<< WEAR RESISTANCE		
					GC1525	GC1005	GC1025
					$h_{ex}, \text{mm} = \text{feed } f_n, \text{mm/r at } \kappa_r 90^\circ - 95^\circ$		
					Cutting speed ( $V_c$ ), m/min		
M	05.11 05.12 05.13	<b>Ferritic/martensitic Bars/forged</b> Non-hardened PH-hardened Hardened	2300 3550 2850	200 330 330	290-240	380-305-245	280-215-170
					170-150	350-280-225	155-125-100
					170-150	245-195-160	165-135-120
	05.21 05.22 05.23	<b>Austenitic Bars/forged</b> Austenitic PH-hardened Super austenitic	2300 3550 2950	180 330 200	220-195	410-330-265	265-220-170
					195-170	220-175-145	155-125-100
					145-130	245-200-160	185-160-130
					-	-	-
					-	-	-
	05.51 05.52	<b>Austenitic-ferritic (Duplex) Bars/forged</b> Non-weldable $\geq 0.05\%C$ Weldable $< 0.05\%C$	2550 3050	230 260	-	315-255-205	210-170-130
					-	280-225-185	190-140-110
	15.11 15.12 15.13 15.21 15.22 15.23 15.51 15.52	<b>Ferritic/martensitic Cast</b> Non-hardened PH-hardened Hardened	2100 3150 2650	200 330 330	-	-	265-220-170
					-	-	135-110-80
					-	-	145-120-90
<b>Austenitic Cast</b> Austenitic PH-hardened Super austenitic		2200 3150 2700	180 330 200	-	-	235-180-150	
				-	-	135-110-80	
				-	-	175-150-125	
<b>Austenitic-ferritic (Duplex) Cast</b> Non-weldable $\geq 0.05\%C$ Weldable $< 0.05\%C$	2250 2750	230 260	-	-	190-140-100		
			-	-	170-130-90		

ISO	CMC No.	Material	Specific cutting force $k_c$ 0.4 N/mm <sup>2</sup>	Hardness Brinell HB	<<<< WEAR RESISTANCE		
					CB7050/CB50	CC620	CC650
					$h_{ex}, \text{mm} = \text{feed } f_n, \text{mm/r at } \kappa_r 90^\circ - 95^\circ$		
					Cutting speed ( $V_c$ ), m/min		
K	07.1 07.2	<b>Malleable cast iron</b> Ferritic (short chipping) Pearlitic (long chipping)	940 1100	130 230	-	800-700-600	800-700-600
					-	700-590-500	700-600-500
	08.1 08.2	<b>Grey cast iron</b> Low tensile strength High tensile strength	1100 1150	180 220	1700-1450-1200	800-700-600	800-700-600
					1450-1250-1050	760-650-540	760-650-540
	09.1 09.2 09.3	<b>Nodular SG iron</b> Ferritic Pearlitic Martensitic	1050 1750 2700	160 250 380	-	-	610-550-450
					-	-	510-450-350
					-	-	350-305-260



## Cutting speed recommendations

TOUGHNESS >>>>									
GC1025	GC4005	GC4015	GC4025	GC2015	GC4035	GC2025	GC235		
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		
310-255-195 280-225-180 260-210-170	590-430-315 530-385-280 510-365-265	540-390-285 485-350-255 460-330-240	485-330-230 430-290-205 405-275-195	440-300-210 390-265-185 370-250-175	405-260-190 365-235-170 345-220-160	295-200-145 265-180-130 250-170-120	185-135-95 165-120-85 155-115-80		
-	580-390-270	530-355-245	435-290-205	395-265-185	285-175-130	220-145-100	155-110-70		
-	510-335-235	460-305-215	380-255-180	345-230-160	250-155-110	195-125-85	-		
-	315-220-165	285-200-150	255-180-140	255-180-140	175-115-80	145-95-65	110-70-50		
-	250-175-135	230-160-120	205-145-115	205-145-115	140-90-65	115-75-50	85-55-39		
-	425-280-205	385-255-190	285-195-145	260-180-130	225-145-100	185-125-85	145-100-65		
-	210-135-100	190-120-90	130-90-70	115-85-65	105-65-45	85-55-338	65-45-30		
-	320-225-175	285-205-160	230-170-125	210-255-110	175-130-95	140-105-80	100-80-60		
-	275-195-150	250-175-135	200-135-95	180-120-85	155-95-65	125-80-55	95-65-45		
-	210-145-110	195-130-100	175-120-85	160-110-75	135-90-65	110-75-50	80-60-39		
TOUGHNESS >>>>									
GC4025	GC2015	GC4035	GC2025	GC2035	GC235				
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				
265-225-200 125-100-75 150-125-90	240-205-185 115-90-70 135-115-80	225-190-170 85-65-50 100-70-50	210-175-135 100-70-50 110-80-55	180-160-130 85-65-45 95-70-50	130-110-90 70-55-45 75-60-50				
280-225-190 125-95-80 170-150-110	255-205-175 115-90-75 155-135-100	195-155-120 95-70-55 130-105-80	200-160-120 100-70-55 120-100-75	170-145-115 85-65-45 100-90-70	115-100-85 70-55-45 85-70-60				
240-205-160 200-165-130	220-185-145 180-150-120	180-140-110 130-115-105	190-150-110 150-120-90	160-135-105 130-110-85	105-95-80 95-80-70				
255-215-175 105-75-60 115-95-65	230-195-160 95-70-55 105-85-60	195-160-150 75-55-40 85-60-45	200-160-120 80-55-40 90-60-45	170-145-115 70-50-40 75-60-50	115-100-85 60-45-35 65-50-40				
220-180-150 105-75-60 160-125-105	200-165-135 95-70-55 145-115-95	155-120-95 75-55-40 115-90-70	175-135-100 80-55-40 120-90-65	150-120-95 70-50-40 100-80-60	100-90-75 65-45-33 80-65-55				
205-165-145 175-155-115	185-150-135 160-140-105	165-125-100 115-100-95	150-120-90 125-105-80	130-110-85 105-95-75	95-80-70 90-75-65				
TOUGHNESS >>>>									
CC6090	GC1690	CT5005	CT5015	GC3205	GC3210	GC4005	GC4015	GC3215	H13A
0.2-0.4-0.6	0.2-0.4-0.6	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	0.1-0.3-0.5
740-600-500 640-500-400	740-600-500 640-500-400	- -	200-165-135 140-115-95	460-380-325 375-310-265	385-315-265 315-255-215	345-285-235 280-230-190	310-255-215 250-210-175	260-215-185 210-175-150	140-125-110 125-110-90
740-600-500 690-540-435	740-600-500 690-540-435	- -	320-260-220 280-235-205	530-435-375 425-350-300	445-360-305 355-290-245	380-320-275 305-260-230	350-295-250 270-235-210	300-250-210 240-200-170	180-145-110 140-115-95
-	580-450-345	320-250-200	255-200-160	390-330-275	360-305-250	315-265-230	270-220-185	240-195-165	135-15-95
-	480-350-250	245-200-175	230-195-170	350-300-250	325-275-225	265-215-185	245-200-165	215-175-150	125-115-90
-	325-260-220	-	115-95-85	265-225-190	245-210-170	210-165-130	195-150-120	165-135-115	100-85-65

## Cutting speed recommendations

The recommendations are valid for use with cutting fluid.

ISO	CMC No.	Material	Specific cutting force $k_c$ 0.4 N/mm <sup>2</sup>	Hardness Brinell HB	<<<< WEAR RESISTANCE		
					CD10	1810	H10
					$h_{ex}, \text{mm} \approx \text{feed } f_n, \text{mm/r at } \kappa_r 90^\circ - 95^\circ$		
					0.05-0.4	0.15-0.8	0.15-0.8
					Cutting speed ( $V_c$ ), m/min		
N Non-ferrous metals	30.11	Aluminium alloys Wrought or wrought and coldworked, non-aging	500	60	2 000 (2500-250) <sup>1)</sup>	2 000 (2500-250) <sup>1)</sup>	2 000 (2500-250) <sup>1)</sup>
	30.12	Wrought or wrought and aged	800	100	2 000 (2500-250) <sup>1)</sup>	2 000 (2500-250) <sup>1)</sup>	2 000 (2500-250) <sup>1)</sup>
	30.21	Aluminium alloys Cast, non-aging	750	75	2 000 (2500-250) <sup>1)</sup>	2 000 (2500-250) <sup>1)</sup>	2 000 (2500-250) <sup>1)</sup>
	30.22	Cast or cast and aged	900	90	2 000 (2500-250) <sup>1)</sup>	2 000 (2500-250) <sup>1)</sup>	2 000 (2500-250) <sup>1)</sup>
	30.41	Aluminium alloys Cast, 13-15% Si	950	130	1 550 (1950-195) <sup>1)</sup>	770 (960-95) <sup>1)</sup>	450 (560-55) <sup>1)</sup>
	30.42	Cast, 16-22% Si	950	130	770 (960-95) <sup>1)</sup>	510 (640-65) <sup>1)</sup>	300 (375-38) <sup>1)</sup>
	33.1	Copper and copper alloys Free cutting alloys, $\geq 1\%$ Pb	700	110	500 (630-65) <sup>1)</sup>	500 (630-65) <sup>1)</sup>	500 (630-65) <sup>1)</sup>
	33.2	Brass, leaded bronzes, $\leq 1\%$ Pb	700	90	500 (630-65) <sup>1)</sup>	500 (630-65) <sup>1)</sup>	500 (630-65) <sup>1)</sup>
	33.3	Bronze and non-leadad copper incl. electrolytic copper	1750	100	300 (375-38) <sup>1)</sup>	300 (375-38) <sup>1)</sup>	300 (375-38) <sup>1)</sup>
						<<<< WEAR RESISTANCE	
					CC650	CC6080	CC670
					$h_{ex}, \text{mm} \approx \text{feed } f_n, \text{mm/r at } \kappa_r 90^\circ - 95^\circ$		
					0.1 - 0.2	0.1-0.2-0.3	0.1-0.2-0.3
					Cutting speed ( $V_c$ ), m/min		
S Heat resistant material	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	420-350-295	385-315-270
	20.22	Aged or solution treated and aged	3600	350	340-265	355-295-250	325-270-230
	20.24	Cast or cast and aged	3700	320	220-160	325-270-230	295-245-210
	20.31	Cobalt base Annealed or solution treated	3300	200	345-260	-	345-255-205
	20.32	Solution treated and aged	3700	300	300-225	-	300-225-175
	20.33	Cast or cast and aged	3800	320	285-225	-	285-225-170
	23.1	Titanium alloys <sup>2)</sup> Commercial pure (99.5% Ti)	1550	Rm <sup>3)</sup> 400	0.1-0.2-0.3	0.1-0.3-0.5	0.1-0.3-0.5
	23.21	$\alpha$ , near $\alpha$ and $\alpha+\beta$ alloys, annealed $\alpha+\beta$ alloys in aged cond.	1700	950	205-170-145	195-160-135	180-150-125
	23.22	$\beta$ alloys, annealed or aged	1700	1050	85-70-55	80-65-55	75-60-50
					80-60-50	80-60-50	70-55-45
						<<<< WEAR RESISTANCE	
					CB7020/CB20	CB7050/CB50	CC6050
					$h_{ex}, \text{mm} \approx \text{feed } f_n, \text{mm/r at } \kappa_r 90^\circ - 95^\circ$		
					0.05-0.15-0.25	0.1-0.25-0.4	0.05-0.15-0.25
					Cutting speed ( $V_c$ ), m/min		
H Hardened material	04.1	Hard steel Hardened and tempered	3250	45HRC	-	-	290-235-175
	04.1		3950	50HRC	260-230-205	205-165-135	240-195-145
	04.1		4700	55HRC	215-195-170	175-140-110	200-165-120
	04.1	Extra hard steel Hardened and tempered	5550	60HRC	185-165-145	145-120-95	170-140-105
	04.1		6450	65HRC	160-140-125	125-100-80	145-120-90
	10.1	Chilled cast iron Cast or cast and aged	2800	400	-	180-150-120	-

<sup>1)</sup> The cutting speeds, shown in the table, are valid for all feeds within the feed range.

<sup>2)</sup> 45-60° entering angle, positive cutting geometry and coolant should be used.

<sup>3)</sup> Rm = ultimate tensile strength measured in MPa.

## Cutting speed recommendations

TOUGHNESS >>>>						
H13A						
0.15-0.8						
1 900 (2400-240) <sup>1)</sup>						
1 900 (2400-240) <sup>1)</sup>						
1 900 (2400-240) <sup>1)</sup>						
1 900 (2400-240) <sup>1)</sup>						
400 (500-50) <sup>1)</sup> 250 (315-31) <sup>1)</sup>						
450 (560-55) <sup>1)</sup> 450 (560-55) <sup>1)</sup> 270 (340-34) <sup>1)</sup>						
TOUGHNESS >>>>						
S05F	GC1005	H10A	H13A	GC1025	H10F	
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	
160-135-110 125-105-85	175-120-80 150-100-70	85-70-55 65-55-40	80-65-50 60-50-40	75-60-45 55-45-35	70-55-40 50-40-30	
100-85-70 90-75-60 80-65-55	90-55-30 80-50-27 70-45-24	55-40-32 40-32-21 26-21-16	50-40-30 40-30-20 25-20-15	45-35-25 35-25-15 23-17-12	40-30-20 30-20-10 20-15-10	
100-85-70 90-75-60 80-65-55	90-60-30 80-50-27 70-45-24	55-40-32 40-32-21 26-21-16	50-40-30 40-30-20 25-20-15	45-35-25 35-25-15 23-17-12	40-30-20 30-20-10 20-15-10	
<b>H10F</b>	<b>1025</b>					
0.1-0.3-0.5	0.1-0.3-0.5					
160-135-115 65-55-45 65-50-40	160-135-115 65-55-45 65-50-40					
TOUGHNESS >>>>						
CC650	CC670	H13A	GC4005			
0.1-0.25-0.4	0.1-0.25-0.4	0.1-0.3-0.6	0.1-0.3-0.6			
205-155-100 170-125-85 140-105-70	205-170-135 165-140-110 140-115-95	45-25-16 - -	65-45-28 - -			
120-90-60 105-80-50	120-100-80 105-85-70	- -	- -			
120-90-60	120-90-60	35-20-11	32-29-15			

Grades for general turning

	ISO	ANSI		
<b>P</b> Steel	01	C8	CT 5005	▲
	10	C7	CT 5015	
	20	C6	GC 1525	
	30	C6	GC 4005	
	40	C5	GC 4015	
	50	C5	GC 4025	▼
<b>M</b> Stainless steel	10	-	GC 1025	▲
	20	-	GC 2015	
	30	-	GC 2025	
	40	-	GC 2035	▼
<b>K</b> Cast iron	01	C4	CC650	▲
	10	C3	CB50 CB7050	
	20	C2	CC 6090	
	30	C1	GC 1690	
	40	C1	GC 3205	▼
<b>N</b> Non-ferrous metals	01	C4	H10	▲
	10	C3	CD 1810	
	20	C2	CD 10	
	30	C1	H13A	▼
<b>S</b> Heat resistant and super alloys	01	-	CC 670	▲
	10	-	H10	
	20	-	S05F	
	30	-	H10A	▼
<b>H</b> Hardened materials	01	C4	GC 1005	▲
	10	C3	CC 650	
	20	C2	GC 670	
	30	C1	GC 4015	
	40	C1	H13A	▼

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

Centre of the field of application.



Recommended field of application.

▲ Wear resistance

▼ Toughness

## Grades for general turning

**P**

Steel, cast steel, long chipping malleable iron.

### Basic grades

#### **GC5005 (HC)** – P05 (P01-P10)

An uncoated cermet for superfinishing of steels. The substrate is very hard and wear resistant. High resistance against plastic deformation and built up edge. For high quality surfaces, tight tolerances and low cutting forces.  $f_n \times a_p < 0.35 \text{ mm}^2$

#### **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.  $f_n \times a_p < 0.35 \text{ mm}^2$

#### **GC1525 (HC)** – P15 (P05-P25)

A PVD coated cermet. Very high wear resistance and good edge toughness. For finishing and semifinishing of low carbon and low alloyed steels. To be used when good surface quality is demanded at medium to high cutting speeds.  $f_n \times a_p < 0.35 \text{ mm}^2$ .

#### **GC4005 (HC)** – O15 (P01 – P15)

A CVD coated grade with excellent resistance against craterwear and plastic deformation. A very good choice when machining dry, long time in cut or with high speeds. To be used in medium to rough steel applications.

#### **GC4015 (HC)** – P15 (P0-P30)

CVD-coated carbide grade for finishing to light roughing of steel and steel castings at high cutting speeds in wet and dry applications. Is able to withstand high temperatures without sacrificing edge security.

#### **GC4025 (HC)** – P25 (P10-P35)

CVD-coated carbide grade for finishing to roughing of steel and steel castings. The combination of a wear resistant coating and a tough substrate allows the grade to handle continuous cuts as well as interrupted cuts at high metal removal rates.

#### **GC4035 (HC)** – P35 (P20-P45)

CVD-coated carbide grade for roughing of steel and steel castings under unfavorable conditions. The tough substrate allows the grade to handle interrupted cuts at high metal removal rates.

### 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" alloys

#### **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.



## Grades for general turning



**Austenitic/ferritic/martensitic stainless steel, cast steel, manganese steel, alloy cast iron, malleable iron, free cutting steel.**

### Basic grades

#### **GC1025 (HC)** – M15 (M10-M25)

PVD-coated micro-grain carbide. Recommended for finishing of stainless steels when close tolerances, excellent surface finish or sharp cutting action is needed. Great resistance to thermal shock also makes it suitable for intermittent cuts.

#### **GC2015 (HC)** – M15 (M05-M25)

CVD-coated carbide grade for finishing and light roughing of stainless steels. A substrate, which can handle high temperatures, combined with a wear resistant coating makes this grade a first choice for continuous cuts at moderate to high cutting speeds.

#### **GC2025 (HC)** – M25 (M15-M35)

CVD-coated carbide optimized for semi-finishing to roughing of austenitic stainless and duplex stainless steels at moderate cutting speeds. Good resistance to thermal shock and mechanical shock provides excellent edge security also for interrupted cuts.

#### **GC2035 (HC)** – M35 (M25-M40)

PVD-coated carbide. Recommended for semi-finishing to roughing of austenitic stainless and duplex stainless steels at low to moderate cutting speeds. Great resistance to thermal shock makes it ideal for applications with fast intermittent cuts.

### Complementary grades

#### **GC1525 (HC)** – M10 (M05-M15)

A PVD coated cermet. Very high wear resistance and good edge toughness. Low smearing tendency. Excellent for finishing of stainless steel under favorable conditions. To be used at high speeds and relatively low feeds.

$$f_n \times a_p < 0.35 \text{ mm}^2$$

#### **GC1005 (HC)** – M15 (M05-M20)

PVD-coated carbide. The combination of a hard fine grain substrate with good plastic deformation resistance and a coating with high wear resistance at high temperatures, makes this grade suitable for finishing of stainless steels at high speeds.

#### **GC4025 (HC)** – M15 (M05-M20)

CVD-coated carbide grade for finishing to light roughing of stainless steels. The combination of a wear resistant coating and a tough substrate makes the grade suitable for stainless steel castings.

#### **GC4035 (HC)** – M25 (M15-M30)

CVD-coated carbide grade, which may be used for semi-finishing to roughing of stainless steels at moderate cutting speeds. Good resistance to thermal shock and mechanical shock provides excellent edge security also for interrupted cuts.

#### **GC235 (HC)** – M40 (M25-M40)

CVD-coated carbide grade for roughing of stainless steels and stainless steel castings with difficult skin. The tough substrate provides extremely good edge security which allows the grade to handle heavy interrupted cuts at low to moderate speeds.

## Grades for general turning



### Cast iron, chilled cast iron, short chipping malleable iron.

#### Basic grades

##### **CC650 (CM)** – K01 (K01-K05)

Mixed Al<sub>2</sub>O<sub>3</sub>-based ceramic. Recommended for high speed finishing of grey cast irons and hardened cast irons under stable conditions.

##### **CB7050/CB50 (BN)** – K05 (K01-K10)

An extremely hard Cubic Boron Nitride grade. High edge toughness and good wear resistance makes it optimal for high speed finishing of grey cast iron under continuous as well as interrupted conditions.

##### **CC6090 (CC)** – K10 (K01-K20)

Pure silicon nitride based ceramic providing good wear resistance at high temperatures. Recommended for high speed roughing to finishing of cast irons under good conditions. Is able to handle some interruptions.

##### **GC1690 (CC)** – K10 (K05-K15)

A CVD coated silicon nitride ceramic grade. The properties of GC1690 makes it highly recommendable for light roughing, medium and finishing applications in cast iron.

##### **GC5005 (HC)** – K05 (K01-K05)

An uncoated cermet for superfinishing of nodular cast iron. The grade is our most wear- and PD resistant cermet. It is very good against built up edge. When high quality surface, low cutting forces and /or tight tolerances are needed.  $f_n \times a_p < 0.35 \text{ mm}^2$

##### **GC3205 (HC)** – K05 (K01-K15)

CVD-coated carbide consisting of a thick, smooth, wear resistant coating and a very hard substrate. Recommended for high speed turning of Grey Cast Iron (GCI).

##### **GC3210 (HC)** – K05 (K01-K20)

CVD-coated carbide consisting of a thick, smooth, wear resistant coating and a very hard substrate. Recommended for high speed turning of Nodular Cast Iron (NCI).

**GC3215 (HC)** – K05 (K01-K25) CVD-coated carbide consisting of a thick, smooth, wear resistant coating and a very hard substrate, capable of withstanding demanding interrupted cutting conditions. Recommended as general choice for roughing of all cast irons at low to medium cutting speeds.

#### Complementary grades

##### **CC620 (CA)** – K01 (K01-K05)

"Pure" Al<sub>2</sub>O<sub>3</sub>-based ceramic. Recommended for high speed finishing of grey cast irons under stable and dry conditions.

##### **CT5015 (HT)** – K05 (K01-K10)

An uncoated cermet grade with excellent resistance to built-up-edge and plastic deformation. For finishing of nodular cast irons when high surface quality, close tolerances and/or low cutting forces are required.

$f_n \times a_p < 0.35 \text{ mm}^2$

##### **GC4015 (HC)** – K15 (K05-K25)

CVD-coated carbide grade for finishing to roughing of grey and nodular cast irons at high cutting speeds. Is able to withstand high temperatures without sacrificing edge security.

##### **H13A (HW)** – K20 (K10-K30)

Uncoated carbide grade. Combines good abrasive wear resistance and toughness. For moderate to low speeds and high feeds in cast iron.



### Non ferrous metals

#### Basic grades

##### **H10 (HW)** – N15 (N01-N25)

Uncoated carbide grade. Combines excellent abrasive wear resistance and edge sharpness. For rough to finish turning of Aluminum alloys.

##### **CD1810 (HC)** – N10 (N01-N15)

A diamond-coated grade for finishing to roughing of aluminium, magnesium, copper, brass, plastics etc. The diamond-coating gives excellent wear-resistance and less built-up-edge, which results in high surface quality.

##### **CD10 (DP)** – N05 (N01-N10)

A polycrystalline diamond grade for finishing and semi-finishing of non-ferrous and non-metallic materials. Gives long tool life, clean cut and good finish.

#### Complementary grades

##### **H13A (HW)** – N15 (N05-N25)

Uncoated carbide grade. Combines good abrasive wear resistance and toughness for medium to rough turning of aluminum alloys.

## Grades for general turning

**S**

### Heat resistant and super alloys

#### Basic grades

##### CC670 (CA) – S15 (S05-S25)

A silicon carbide whisker reinforced aluminium oxide based ceramic with excellent bulk toughness. Primarily recommended for heat resistant alloys under unfavourable conditions.

##### S05F– S05 (S05-S15)

CVD-coated carbide. For high speed finishing in HRSA, or long cuts at lower speeds. For applications where notch is not a significant problem, ie round inserts, large entry angle and softer materials, this grade can also be used in roughing applications.

##### GC1005 (HC)– S15 (S10-S25)

PVD-coated carbide. The combination of a hard fine grain substrate with good plastic deformation resistance and a coating with high wear resistance at high temperatures, makes this grade most suitable for Ni, Fe or Co-based heat resistant super alloys.

##### GC1025 (HC) – S15 (S10-S25)

PVD-coated micro-grain carbide. Recommended for heat resistant super alloys and Titanium alloys at low speeds. Great resistance to thermal shock and notch wear makes it suitable for long cuts or intermittent cuts.

#### Complementary grades

##### CC650 (CA) – S05 (S01-S10)

Mixed Al<sub>2</sub>O<sub>3</sub>-based ceramic. Could be used in semi-finishing operations of high-temp alloys in applications with low demand on edge security.

##### H10 (HW) – S10 (S01-S15)

Uncoated carbide grade. Combines excellent abrasive wear resistance and edge sharpness. For finish turning of heat resistant steels and titanium alloys

##### H10A (HW) – S10 (S01-S20)

Uncoated carbide grade. Combines good abrasive wear resistance and toughness for medium to rough turning of heat resistant steels and titanium alloys.

##### H10F (HW) – S15 (S10-S30)

Uncoated fine-grain carbide grade. Recommended for heat resistant super alloys or Titanium alloys at very low speeds. Great resistance to thermal shock and notch wear makes it suitable for long cuts or intermittent cuts.

##### H13A (HW) – S15 (S10-S30)

Uncoated carbide grade. Combines good abrasive wear resistance and toughness for medium to rough turning of heat resistant steels and Titanium alloys.

**H**

### Hardened materials

#### Basic grades

##### CB 7015 (BN) - H15 (H01 - H 25)

High performance, low content Cubic Boron Nitride grade. First choice for continuous and light interrupted cuts at high speed in case hardened steels.

##### CB7020/CB20(BN) – H01 (H01-H10)

High performance Cubic Boron Nitride grade. First choice for continuous and light interrupted cuts in hardened steel.

##### CB7050/CB50 (BN) – H05 (H05-H15)

An extremely hard Cubic Boron Nitride Grade. High edge toughness and good wear resistance makes it first choice for interrupted cuts in hardened steel.

##### CC650 (CM) – H05 (H05-H10)

Mixed Al<sub>2</sub>O<sub>3</sub>-based ceramic. Good thermal properties and wear resistance. Primarily recommended for light continuous finishing.

#### Complementary grades

##### CC670 (CA) – H10 (H05-H15)

A silicon carbide whisker reinforced aluminium oxide based ceramic with excellent bulk toughness. Recommended for hard part turning under unfavourable conditions.

##### GC 4015 (HC) – H15 (H05-H25)

CVD-coated carbide grade for finishing to roughing of hardened materials. Is able to withstand high temperatures without sacrificing edge security.

##### H13A (HW) – H20 (H15-H25)

Uncoated carbide grade. Combines good abrasive wear resistance and toughness for turning of hardened materials at low 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<sub>2</sub>O<sub>3</sub>).

CM Mixed ceramics containing primarily aluminium oxide (Al<sub>2</sub>O<sub>3</sub>) but containing components other than oxides.

CN Nitride ceramics containing primarily silicon nitride (Si<sub>3</sub>N<sub>4</sub>).

CC Ceramics as above, but coated.

##### Diamond:

DP Polycrystalline diamond<sup>1)</sup>

##### Boron nitride:

CN Polycrystalline boron nitride<sup>1)</sup>

<sup>1)</sup> Polycrystalline diamond and polycrystalline boron nitride are also named superhard cutting materials.