CC

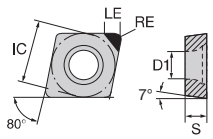
ISO - with hole

- The most popular insert shape due to high versatility
- Clearance angle 7°, effectively reduces the risk of chip jamming when boring
- 80° corner can be used for both turning and facing operations
- 3D Chip breaker type enables excellent chip flow and chip control
- Full edge and full face types allow maximum ap and special applications

DP: Polycristalline diamond

	DP	DP	DP	DP	DP	DP
	ND050	ND100	ND120	ND150	ND190	NDP010
Stable machining, light cut (● 1st choice ○ suitable)	○	●	●	●	●	●
General machining, medium cut (● 1st choice ○ suitable)	●	●	●	○		●
Unstable machining, heavy cut (● 1st choice ○ suitable)	○					

Dimensions

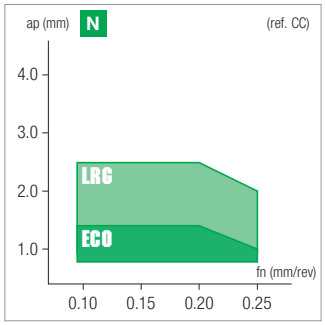


1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)					
P						
M						
K						
N	400 2000	450 2400	450 2400	350 800	400 1000	450 2400
S	40 100					
H						

	Designation		RE	IC	S	D1	LE	Stock					
SLANT TIP	eco N	CCGT060202	0.2	6.35	2.38	2.8	2.8		●				
		CCGT060204	0.4	6.35	2.38	2.8	2.8	○	●		○		
		CCGT060208	0.8	6.35	2.38	2.8	2.7		○				
		CCGT09T302	0.2	9.525	3.97	4.4	2.8		●				
	tip angle 7°	CCGT09T304	0.4	9.525	3.97	4.4	2.8	●	●		●	○	
		CCGT09T308	0.8	9.525	3.97	4.4	2.7	○	●		●	○	
		CCGT120404	0.4	12.7	4.76	5.5	2.8		●				
		CCGT120408	0.8	12.7	4.76	5.5	2.7		○				
SLANT TIP	LRG N	CCGT060204-LRG	0.4	6.35	2.38	2.8	3.2		○				
		CCGT09T304-LRG	0.4	9.525	3.97	4.4	4.3		●				
		CCGT09T308-LRG	0.8	9.525	3.97	4.4	4.2		●				
	large tip tip angle 7°	CCGT120404-LRG	0.4	12.7	4.76	5.5	4.3		○				
		CCGT120408-LRG	0.8	12.7	4.76	5.5	4.2		○				
FLAT TIP	eco N	CCGW060202	0.2	6.35	2.38	2.8	2.8	○	●		○		
		CCGW060204	0.4	6.35	2.38	2.8	2.8	●	●		●		
		CCGW060208	0.8	6.35	2.38	2.8	2.7	○	○		○		
		CCGW09T302	0.2	9.525	3.97	4.4	2.8		●				
		CCGW09T304	0.4	9.525	3.97	4.4	2.8	●	●		●	●	
		CCGW09T308	0.8	9.525	3.97	4.4	2.7	●	●		○	●	
		CCGW120404	0.4	12.7	4.76	5.5	2.8	○	○		○		
		CCGW120408	0.8	12.7	4.76	5.5	2.7	○	○		○		
FLAT TIP	LRG N	CCGW060204-LRG	0.4	6.35	2.38	2.8	3.2		○				
		CCGW09T304-LRG	0.4	9.525	3.97	4.4	4.3		●				
		CCGW09T308-LRG	0.8	9.525	3.97	4.4	4.2		○				
	large tip	CCGW120404-LRG	0.4	12.7	4.76	5.5	4.3		●				
		CCGW120408-LRG	0.8	12.7	4.76	5.5	4.2		○				

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion



PRODUCT SELECTION p. A143 | CUTTING CONDITIONS p. A163 | GRADES FEATURES p. A134 | EXTERNAL HOLDERS p. A214 | INTERNAL HOLDERS p. A218

CC

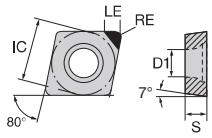
ISO - with hole

- The most popular insert shape due to high versatility
- Clearance angle 7°, effectively reduces the risk of chip jamming when boring
- 80° corner can be used for both turning and facing operations
- 3D Chip breaker type enables excellent chip flow and chip control
- Full edge and full face types allow maximum ap and special applications

DP: Polycristalline diamond

	DP	DP	DP	DP	DP	DP
	ND050	ND100	ND120	ND150	ND190	NDP010
Stable machining, light cut (● 1st choice ○ suitable)	○	●	●	●	●	●
General machining, medium cut (● 1st choice ○ suitable)	●	●	●	○		●
Unstable machining, heavy cut (● 1st choice ○ suitable)	○					

Dimensions

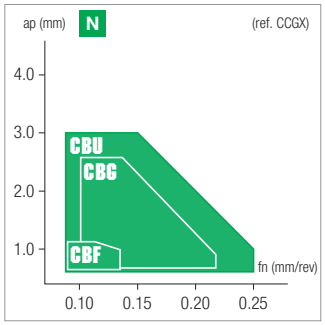


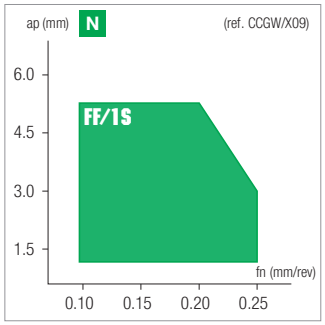
1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)					
P						
M						
K						
N	400 2000	450 2400	450 2400	350 800	400 1000	450 2400
S	40 100					
H						

	Designation		RE	IC	S	D1	LE	Stock						
3D CHIPBREAKER	CBU N	CCGX060202-CBU	0.2	6.35	2.38	2.8	3.3						●	
		CCGX060204-CBU	0.4	6.35	2.38	2.8	3.1						●	
		CCGX060208-CBU	0.8	6.35	2.38	2.8	2.6						●	
	universal use	CCGX09T304-CBU	0.4	9.525	3.97	4.4	3.5						●	
		CCGX09T308-CBU	0.8	9.525	3.97	4.4	3.3						●	
3D CHIPBREAKER	CBF N	CCGX060202-CBF	0.2	6.35	2.38	2.8	3.3			▽				
	finishing	CCGX060204-CBF	0.4	6.35	2.38	2.8	3.3			▽				
3D CHIPBREAKER	CBG N	CCGX09T308-CBG	0.8	9.525	3.97	4.4	4.2			▽				
	medium													
FULL EDGE	1S N	CCGX060204$^{1}/_{R}$-1S	0.4	6.35	2.38	2.8	6		○					
	high depth of cut right-hand shown	CCGX09T304$^{1}/_{R}$-1S	0.4	9.525	3.97	4.4	9.3		○					
FULL FACE	FF N	CCGW09T304-FF	0.4	9.525	3.97	4.4	9.3						●	
	high depth of cut													

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion





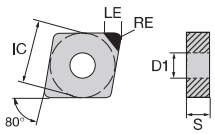
CN

ISO - with hole

- The most popular insert shape due to high versatility
- 80° corner can be used for both turning and facing operations
- Strong cutting edge with secure seating in the insert pocket creates good surface finishing
- Strong cutting edge with secure seating in the insert pocket creates good surface finishing
- Flat tip offers economical solution
- Large tip allows much bigger ap, available with both slant and flat style

DP: Polycristalline diamond

	DP	ND100
Stable machining, light cut	1st choice	suitable
General machining, medium cut	1st choice	suitable
Unstable machining, heavy cut	1st choice	suitable

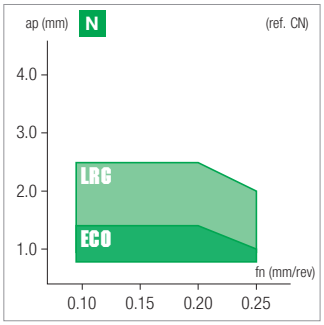


1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)
P	
M	
K	
N	450 2400
S	
H	

	Designation		RE	IC	S	D1	LE	Stock
SLANT TIP	eco N  tip angle 7°	CNGM120404	0.4	12.7	4.76	5.16	2.8	●
		CNGM120408	0.8	12.7	4.76	5.16	2.7	●
SLANT TIP	LRG N  large tip tip angle 7°	CNGM120404-LRG	0.4	12.7	4.76	5.16	4.3	○
		CNGM120408-LRG	0.8	12.7	4.76	5.16	4.2	○
FLAT TIP	eco N 	CNGA120404	0.4	12.7	4.76	5.16	2.8	○
		CNGA120408	0.8	12.7	4.76	5.16	2.7	●
FLAT TIP	LRG N  large tip	CNGA120404-LRG	0.4	12.7	4.76	5.16	4.3	○
		CNGA120408-LRG	0.8	12.7	4.76	5.16	4.2	○

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion



PRODUCT SELECTION p. A143 | CUTTING CONDITIONS p. A163 | GRADES FEATURES p. A134 | EXTERNAL HOLDERS p. A224 | INTERNAL HOLDERS p. A229

DC

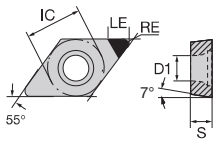
ISO - with hole

- Generally the 1st choice for profile/copy turning applications
- Able to "In-Copy" (plunge turn in small diameter) with 30° angle
- 7° clearance angle, less risk of chip-jamming in boring
- Chip breaker type enables excellent chip flow and chip control
- Full edge and full face types allow maximum ap and special applications

DP: Polycristalline diamond

	DP	DP	DP	DP	DP	DP
	ND050	ND100	ND120	ND150	ND190	NDP010
Stable machining, light cut (● 1st choice ◯ suitable)	◯	●	●	●	●	●
General machining, medium cut (● 1st choice ◯ suitable)	●	●	●	◯		●
Unstable machining, heavy cut (● 1st choice ◯ suitable)	◯					
ISO	**Vc(m/min) - suggested cutting speed range** (bold: 1st choice)					
P						
M						
K						
N	400 2000	450 2400	450 2400	350 800	400 1000	450 2400
S	40 100					
H						

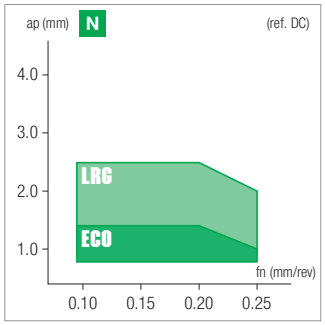
Dimensions



1 edge

Designation			RE	IC	S	D1	LE	Stock					
SLANT TIP	eco N	DCGT070202	0.2	6.35	2.38	2.8	2.5		●				
		DCGT070204	0.4	6.35	2.38	2.8	2.4		●				
		DCGT070208	0.8	6.35	2.38	2.8	2		●				
		DCGT11T302	0.2	9.525	3.97	4.4	2.5		●				
	tip angle 7°	DCGT11T304	0.4	9.525	3.97	4.4	2.4	●	●		●	○	
		DCGT11T308	0.8	9.525	3.97	4.4	2	●	●		○	○	
SLANT TIP	LRG N	DCGT070204-LRG	0.4	6.35	2.38	2.8	2.9		○				
		DCGT11T304-LRG	0.4	9.525	3.97	4.4	3.9		●				
	large tip tip angle 7°	DCGT11T308-LRG	0.8	9.525	3.97	4.4	3.5		●				
FLAT TIP	eco N	DCGW070202	0.2	6.35	2.38	2.8	2.5	●	●		○		
		DCGW070204	0.4	6.35	2.38	2.8	2.4	○	●		○		
		DCGW070208	0.8	6.35	2.38	2.8	2	○	○		○		
		DCGW11T302	0.2	9.525	3.97	4.4	2.5	○	●		○		
		DCGW11T304	0.4	9.525	3.97	4.4	2.4	●	●		●	○	
		DCGW11T308	0.8	9.525	3.97	4.4	2	●	●		●	●	
FLAT TIP	LRG N	DCGW070204-LRG	0.4	6.35	2.38	2.8	2.9		●				
		DCGW11T304-LRG	0.4	9.525	3.97	4.4	3.9		●				
	large tip	DCGW11T308-LRG	0.8	9.525	3.97	4.4	3.5		○				

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion



DC

ISO - with hole

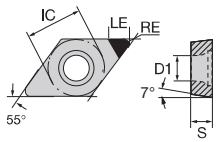
- Generally the 1st choice for profile/copy turning applications
- Able to "In-Copy" (plunge turn in small diameter) with 30° angle
- 7° clearance angle, less risk of chip-jamming in boring
- Chip breaker type enables excellent chip flow and chip control
- Full edge and full face types allow maximum ap and special applications

DP: Polycristalline diamond

	DP	DP	DP	DP	DP	DP
	ND050	ND100	ND120	ND150	ND190	NDP010
Stable machining, light cut	○	●	●	●	●	●
General machining, medium cut	●	●	●	◯		●
Unstable machining, heavy cut	✱					

● 1st choice ◯ suitable

Dimensions

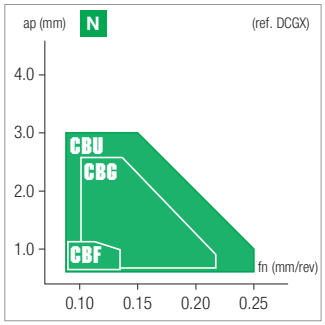


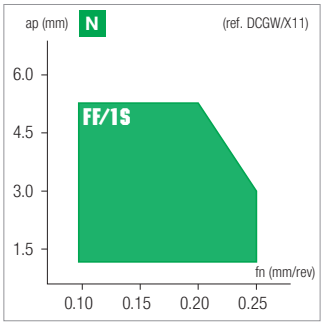
1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)					
P						
M						
K						
N	400 2000	450 2400	450 2400	350 800	400 1000	450 2400
S	40 100					
H						

	Designation		RE	IC	S	D1	LE	Stock						
3D CHIPBREAKER	CBU N	DCGX070202-CBU	0.2	6.35	2.38	2.8	3.4						●	
		DCGX070204-CBU	0.4	6.35	2.38	2.8	3.2						●	
		DCGX11T302-CBU	0.2	9.525	3.97	4.4	4.2						●	
	universal use	DCGX11T304-CBU	0.4	9.525	3.97	4.4	3.8						●	
		DCGX11T308-CBU	0.8	9.525	3.97	4.4	3.6						●	
3D CHIPBREAKER	CBF N	DCGX070202-CBF	0.2	6.35	2.38	2.8	3			▽				
	finishing	DCGX11T302-CBF	0.2	9.525	3.97	4.4	4			▽				
3D CHIPBREAKER	CBG N	DCGX11T308-CBG	0.8	9.525	3.97	4.4	3.5			▽				
	medium													
FULL EDGE	1S N	DCGX070204$^{L}/_{R}$-1S	0.4	6.35	2.38	2.8	7.4		●					
		DCGX11T304$^{L}/_{R}$-1S	0.4	9.525	3.97	4.4	11.2		○					
	high depth of cut right-hand shown	DCGX11T308$^{L}/_{R}$-1S	0.8	9.525	3.97	4.4	10.8		○					
FULL FACE	FF N	DCGW070204-FF	0.4	6.35	2.38	2.8	7.4						●	
		DCGW11T304-FF	0.4	9.525	3.97	4.4	11.2						●	
	high depth of cut	DCGW11T308-FF	0.8	9.525	3.97	4.4	10.8						●	

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion





PRODUCT SELECTION p. A143 | CUTTING CONDITIONS p. A163 | GRADES FEATURES p. A134 | EXTERNAL HOLDERS p. A232 | INTERNAL HOLDERS p. A236

DN

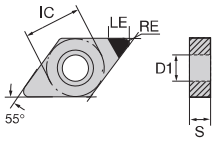
ISO - with hole

- Generally the 1st choice for profile/copy turning applications
- Able to "In-Copy" (plunge turn into a smaller diameter) at an angle of 30°
- 7° clearance angle, less risk of chip-jamming in boring
- Slant tip enables better chip flow and chip control
- Large tip allows much bigger ap, available with both slant and flat style

DP: Polycristalline diamond

	DP	ND100
Stable machining, light cut	● 1st choice ○ suitable	●
General machining, medium cut	● 1st choice ○ suitable	●
Unstable machining, heavy cut	● 1st choice ○ suitable	

Dimensions

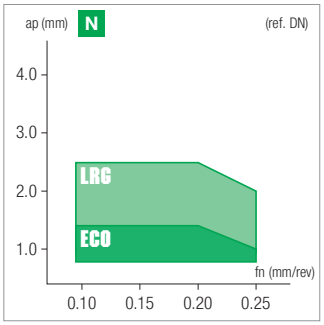


1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)	
P		
M		
K		
N	**450** **2400**	
S		
H		

	Designation		RE	IC	S	D1	LE	Stock
SLANT TIP	eco N  tip angle 7°	DNGM150604	0.4	12.7	6.35	5.16	2.4	○
		DNGM150608	0.8	12.7	6.35	5.16	2	○
SLANT TIP	LRG N  large tip tip angle 7°	DNGM150604-LRG	0.4	12.7	6.35	5.16	3.9	○
		DNGM150608-LRG	0.8	12.7	6.35	5.16	3.5	○
FLAT TIP	eco N 	DNGA150604	0.4	12.7	6.35	5.16	2.4	○
		DNGA150608	0.8	12.7	6.35	5.16	2	●
FLAT TIP	LRG N  large tip	DNGA150604-LRG	0.4	12.7	6.35	5.16	3.9	○
		DNGA150608-LRG	0.8	12.7	6.35	5.16	3.5	○

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion



MCC

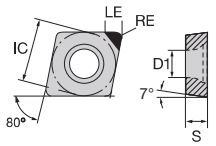
ISO - with hole

- 1st solution for micro-boring
- Precision brazed and ground insert for microboring operation, completing the micro CC family
- Micro boring bar with coolant both in steel (with Vortex technology) and in carbide

DP: Polycristalline diamond

	DP	DP	DP
	ND050	ND120	ND190
Stable machining, light cut (● 1st choice ○ suitable)	○	●	●
General machining, medium cut (● 1st choice ◔ suitable)	◔	◔	
Unstable machining, heavy cut (✱ 1st choice ✱ suitable)	✱		

Dimensions

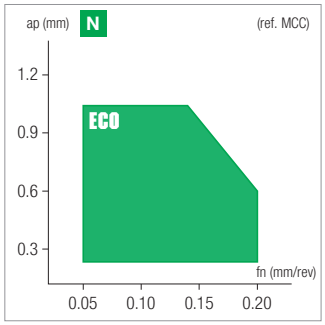


1 edge

ISO				**Vc(m/min) - suggested cutting speed range** (bold: 1st choice)
P				
M				
K				
N	400 2000	450 2400	400 1000	
S	40 100			
H				

	Designation	RE	IC	S	D1	LE				Stock
FLAT TIP	eco N									
	MCC.R02	0.2	3.5	1.4	1.9	1.5	●	○	○	
	MCC.R04	0.4	3.5	1.4	1.9	1.5	○	○	●	

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion



PRODUCT SELECTION p. A143 | CUTTING CONDITIONS p. A163 | GRADES FEATURES p. A134 | INTERNAL HOLDERS p. A249

MCN

MicroNega - with hole

- MicroNega system it serves as an alternative to positive conventional solutions
- Excellent economy for external small part machining or small boring application
- MicroNega family's PCD Solution, compatible with the entire holder range of MicroNega system
- Chip breaker type enables excellent chip flow and chip control, greatly improves the boring application
- Flat large tip offers economical solution allowing much bigger ap

DP: Polycristalline diamond

DP

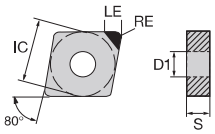
ND120

Stable machining, light cut ● 1st choice ○ suitable ●

General machining, medium cut ● 1st choice ○ suitable ●

Unstable machining, heavy cut ● 1st choice ○ suitable

Dimensions

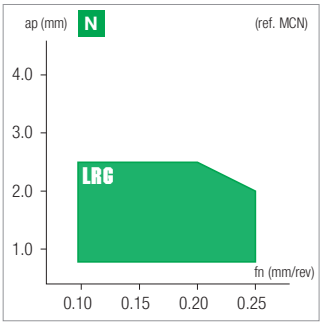


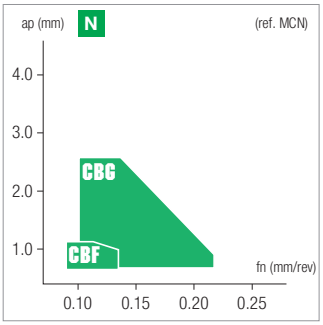
1 edge

ISO		Vc(m/min) - suggested cutting speed range (bold: 1st choice)
P		
M		
K		
N	450 2400	
S		
H		

	Designation		RE	IC	S	D1	LE		Stock
FLAT TIP	LRG N  large tip	MCN.R02G-LRG	0.2	7.5	3.18	3.6	3.3	●	
		MCN.R04G-LRG	0.4	7.5	3.18	3.6	3.3	●	
		MCN.R08G-LRG	0.8	7.5	3.18	3.6	3.2	●	
3D CHIPBREAKER	CBF N  finishing	MCN.R02G-CBF	0.2	7.5	3.18	3.6	3.3	●	
		MCN.R04G-CBF	0.4	7.5	3.18	3.6	3.3	●	
3D CHIPBREAKER	CBG N  medium	MCN.R04G-CBG	0.4	7.5	3.18	3.6	3.3	●	
		MCN.R08G-CBG	0.8	7.5	3.18	3.6	3.2	●	

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion





MDN

MicroNega - with hole

- MicroNega system it serves as an alternative to positive conventional solutions
- Excellent economy for external small part machining or small boring application
- MicroNega family's PCD Solution, compatible with the entire holder range of MicroNega system
- Chip breaker type enables excellent chip flow and chip control, greatly improves the boring application
- Flat large tip offers economical solution allowing much bigger ap

DP: Polycristalline diamond

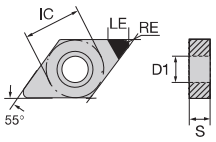
DP

ND120

Stable machining, light cut — 1st choice ● suitable ○ ●

General machining, medium cut — 1st choice ● suitable ○ ●

Unstable machining, heavy cut — 1st choice ● suitable ○

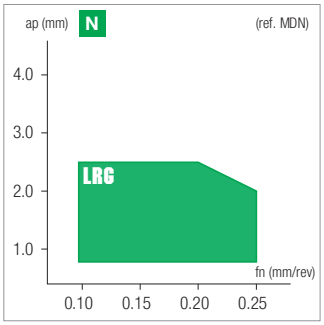


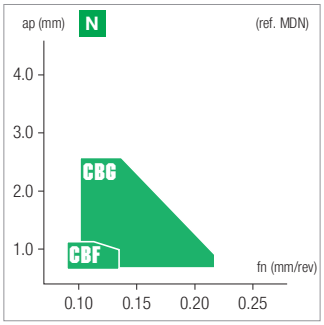
1 edge

Dimensions	ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)
	P	
	M	
	K	
	N	450 2400
	S	
	H	

	Designation		RE	IC	S	D1	LE	Stock
FLAT TIP	LRG N  large tip	MDN.R02G-LRG	0.2	7	3.18	3.6	3.1	●
		MDN.R04G-LRG	0.4	7	3.18	3.6	2.9	●
		MDN.R08G-LRG	0.8	7	3.18	3.6	2.5	●
3D CHIPBREAKER	CBF N  finishing	MDN.R02G-CBF	0.2	7	3.18	3.6	3.1	●
		MDN.R04G-CBF	0.4	7	3.18	3.6	2.9	●
3D CHIPBREAKER	CBG N  medium	MDN.R04G-CBG	0.4	7	3.18	3.6	2.9	●
		MDN.R08G-CBG	0.8	7	3.18	3.6	2.5	●

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion





PRODUCT SELECTION p. A143 | CUTTING CONDITIONS p. A163 | GRADES FEATURES p. A134 | EXTERNAL HOLDERS p. A253 | INTERNAL HOLDERS p. A254

TC

ISO - with hole

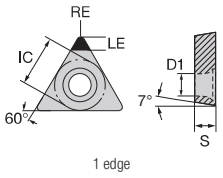
- Very versatile insert shape
- Excellent choice for general boring due to very stable seating of the insert in the boring bar pocket
- 3D Chip breaker type enables excellent chip flow and chip control
- Full edge and full face types allow maximum ap and special applications

DP: Polycristalline diamond

	DP	DP	DP	DP	DP
	ND050	ND100	ND120	ND150	NDP010
Stable machining, light cut	○	●	●	●	●
General machining, medium cut	●	●	●	◯	●
Unstable machining, heavy cut	✱				

● 1st choice ◯ suitable

Dimensions

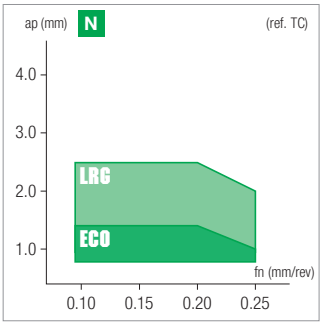


1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)					
P						
M						
K						
N	**400 2000**	**450 2400**	**450 2400**	**350 800**	**450 2400**	
S	**40 100**					
H						

	Designation		RE	IC	S	D1	LE	Stock					
SLANT TIP	eco N	TCGT090202	0.2	5.56	2.38	2.5	2.6		○				
		TCGT090204	0.4	5.56	2.38	2.5	2.5		○				
		TCGT110202	0.2	6.35	2.38	2.8	2.6		○				
		TCGT110204	0.4	6.35	2.38	2.8	2.5		●				
		TCGT110208	0.8	6.35	2.38	2.8	2.2		○				
		TCGT16T304	0.4	9.525	3.97	4.4	2.5		○				
		TCGT16T308	0.8	9.525	3.97	4.4	2.2		○				
SLANT TIP	LRG N	TCGT110204-LRG	0.4	6.35	2.38	2.8	4		○				
		TCGT110208-LRG	0.8	6.35	2.38	2.8	3.7		○				
		TCGT16T304-LRG	0.4	9.525	3.97	4.4	4		○				
	large tip	TCGT16T308-LRG	0.8	9.525	3.97	4.4	3.7		○				
FLAT TIP	eco N	TCGW090202	0.2	5.56	2.38	2.5	2.6		○				
		TCGW090204	0.4	5.56	2.38	2.5	2.5		●				
		TCGW110202	0.2	6.35	2.38	2.8	2.6		○				
		TCGW110204	0.4	6.35	2.38	2.8	2.5	●	●		○		
		TCGW110208	0.8	6.35	2.38	2.8	2.2	○	○		○		
		TCGW16T304	0.4	9.525	3.97	4.4	2.5		●				
		TCGW16T308	0.8	9.525	3.97	4.4	2.2	●	●		○		
FLAT TIP	LRG N	TCGW110204-LRG	0.4	6.35	2.38	2.8	4		○				
		TCGW110208-LRG	0.8	6.35	2.38	2.8	3.7		●				
		TCGW16T304-LRG	0.4	9.525	3.97	4.4	4		●				
	large tip	TCGW16T308-LRG	0.8	9.525	3.97	4.4	3.7		●				

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion



TC

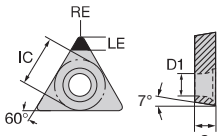
ISO - with hole

- Very versatile insert shape
- Excellent choice for general boring due to very stable seating of the insert in the boring bar pocket
- 3D Chip breaker type enables excellent chip flow and chip control
- Full edge and full face types allow maximum ap and special applications

DP: Polycristalline diamond

	DP	DP	DP	DP	DP
	ND050	ND100	ND120	ND150	NDP010
Stable machining, light cut (● 1st choice ○ suitable)	○	●	●	●	●
General machining, medium cut (● 1st choice ◔ suitable)	●	●	●	◔	●
Unstable machining, heavy cut (✱ 1st choice ✱ suitable)	✱				

Dimensions

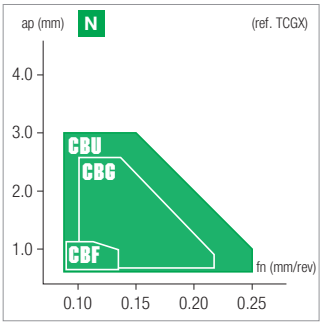


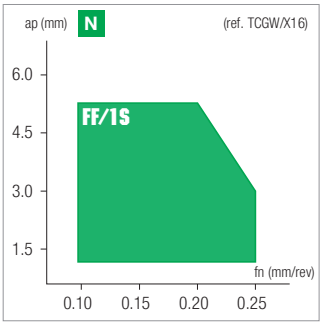
1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)					
P						
M						
K						
N	400 2000	450 2400	450 2400	350 800	450 2400	
S	40 100					
H						

	Designation		RE	IC	S	D1	LE	Stock					
3D CHIPBREAKER	CBU N	TCGX110204-CBU	0.4	6.35	2.38	2.8	3.4					●	
		TCGX16T304-CBU	0.4	9.525	3.97	4.4	4.5					●	
	universal use	TCGX16T308-CBU	0.8	9.525	3.97	4.4	4.1					●	
3D CHIPBREAKER	CBF N	TCGX090202-CBF	0.2	5.56	2.38	2.5	3.6			▽			
		TCGX110202-CBF	0.2	6.35	2.38	2.8	4.1			▽			
		TCGX110204-CBF	0.4	6.35	2.38	2.8	4			▽			
	finishing	TCGX16T304-CBF	0.4	9.525	3.97	4.4	4			▽			
3D CHIPBREAKER	CBG N	TCGX090204-CBG	0.4	5.56	2.38	2.5	3.5			▽			
		TCGX110204-CBG	0.4	6.35	2.38	2.8	4			▽			
		TCGX110208-CBG	0.8	6.35	2.38	2.8	3.7			▽			
		TCGX16T304-CBG	0.4	9.525	3.97	4.4	4			▽			
	medium	TCGX16T308-CBG	0.8	9.525	3.97	4.4	3.7			▽			
FULL EDGE	1S N	TCGX090204-1S	0.4	5.56	2.38	2.5	9		●				
		TCGX110204-1S	0.4	6.35	2.38	2.8	10.3		●				
	high depth of cut	TCGX16T304-1S	0.4	9.525	3.97	4.4	16.1		●				
FULL FACE	FF N	TCGW110204-FF	0.4	6.35	2.38	2.8	10.3					●	
	high depth of cut	TCGW16T304-FF	0.4	9.525	3.97	4.4	16.1					●	

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion





PRODUCT SELECTION p. A143 | CUTTING CONDITIONS p. A163 | GRADES FEATURES p. A134 | EXTERNAL HOLDERS p. A264 | INTERNAL HOLDERS p. A267

TN

ISO - with hole

- Very versatile insert shape
- Excellent choice for general boring due to very stable seating of the insert in the boring bar pocket
- Slant tip enables better chip flow and chip control
- Large tip allows much bigger ap, available with both slant and flat style

DP: Polycristalline diamond

DP

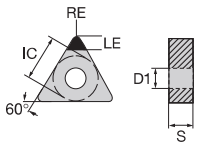
ND100

Stable machining, light cut ● 1st choice ◯ suitable ●

General machining, medium cut ● 1st choice ◯ suitable ●

Unstable machining, heavy cut ● 1st choice ◯ suitable

Dimensions

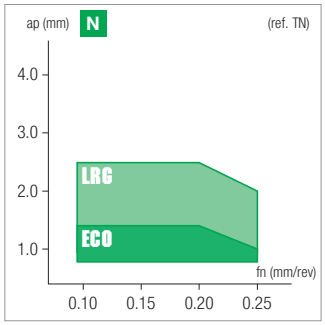


1 edge

ISO		Vc(m/min) - suggested cutting speed range (bold: 1st choice)
P		
M		
K		
N	450 2400	
S		
H		

	Designation		RE	IC	S	D1	LE		Stock
SLANT TIP	eco N  tip angle 7°	TNGM160404	0.4	9.525	4.76	3.81	2.5	●	
		TNGM160408	0.8	9.525	4.76	3.81	2	○	
SLANT TIP	LRG N  large tip tip angle 7°	TNGM160404-LRG	0.4	9.525	4.76	3.81	4	○	
		TNGM160408-LRG	0.8	9.525	4.76	3.81	3.7	○	
FLAT TIP	eco N 	TNGA160404	0.4	9.525	4.76	3.81	2.5	○	
		TNGA160408	0.8	9.525	4.76	3.81	2	○	
FLAT TIP	LRG N  large tip	TNGA160404-LRG	0.4	9.525	4.76	3.81	4	○	
		TNGA160408-LRG	0.8	9.525	4.76	3.81	3.7	○	

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion



TP

ISO - with hole

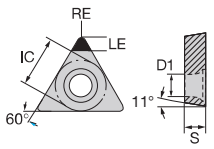
- Very versatile insert shape
- Excellent choice for general boring due to very stable seating of the insert in the boring bar pocket
- Slant tip enables better chip flow and chip control
- Large tip allows much bigger ap, available with both slant and flat style

DP: Polycristalline diamond

	DP	DP	DP
	ND050	ND100	ND120
Stable machining, light cut	○	●	●
General machining, medium cut	●	●	●
Unstable machining, heavy cut	●		

● 1st choice ○ suitable

Dimensions

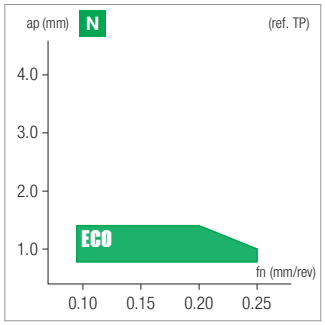


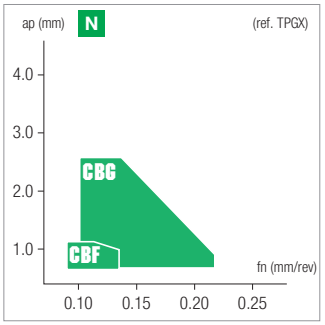
1 edge

ISO				**Vc(m/min) - suggested cutting speed range** (bold: 1st choice)
P				
M				
K				
N	400 2000	450 2400	450 2400	
S	40 100			
H				

		Designation	RE	IC	S	D1	LE	Stock			
SLANT TIP	eco N	TPGT080202	0.2	4.76	2.38	2.3	2.6	○	○		
		TPGT080204	0.4	4.76	2.38	2.3	2.5		●		
		TPGT090202	0.2	4.76	2.38	2.3	2.6		○		
		TPGT090204	0.4	4.76	2.38	2.3	2.5		○		
		TPGT110302	0.2	4.76	2.38	2.3	2.6		●		
	tip angle 7°	TPGT110304	0.4	4.76	2.38	2.3	2.2		●		
FLAT TIP	eco N	TPGW080202	0.2	4.76	2.38	2.3	2.6		○		
		TPGW080204	0.4	4.76	2.38	2.3	2.5		○		
		TPGW090202	0.2	5.56	2.38	3	2.6		○		
		TPGW090204	0.4	5.56	2.38	3	2.5		●		
		TPGW110302	0.2	6.35	3.18	3.3	2.6		○		
		TPGW110304	0.4	6.35	3.18	3.3	2.2		○		
3D CHIPBREAKER	CBF N	TPGX090204-CBF	0.4	5.56	2.38	3	3.1			▽	
		TPGX110302-CBF	0.2	6.35	3.18	3.3	4.1			▽	
	finishing	TPGX110304-CBF	0.4	6.35	3.18	3.3	4			▽	
3D CHIPBREAKER	CBG N	TPGX090204-CBG	0.4	5.56	2.38	3	3.1			▽	
	medium	TPGX110304-CBG	0.4	6.35	3.18	3.3	4			▽	

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion





PRODUCT SELECTION p. A143 | CUTTING CONDITIONS p. A163 | GRADES FEATURES p. A134

VB

ISO - with hole

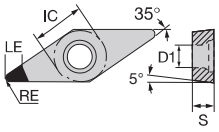
- 1st choice for intricate shape copy turning
- Can "In-Copy" (plunge turn into a smaller diameter) at an angle up to 49°
- Can work extremely close to the tailstock/ live center
- 3D Chip breaker type enables excellent chip flow and chip control
- Large tip allows much bigger ap, available with both slant and flat style

DP: Polycristalline diamond

	DP	DP	DP	DP	DP
	ND050	**ND100**	**ND120**	**ND150**	**ND190**
Stable machining, light cut	○	●	●	●	●
General machining, medium cut	●	●	●	◯	
Unstable machining, heavy cut	✱				

● 1st choice ○ suitable

Dimensions

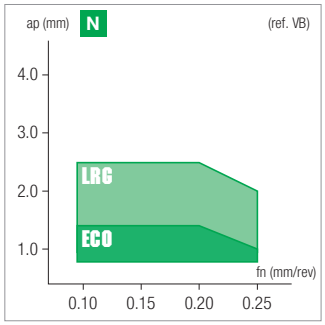


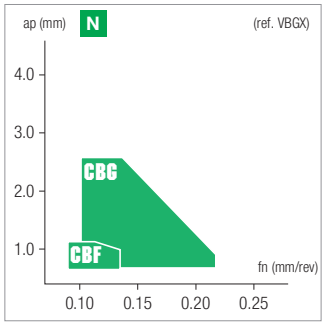
1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)					
P						
M						
K						
N	400 2000	450 2400	450 2400	350 800	400 1000	
S	40 100					
H						

	Designation		RE	IC	S	D1	LE	Stock				
SLANT TIP	eco N	VBGT110302	0.2	6.35	3.18	2.8	3		●		●	
		VBGT110304	0.4	6.35	3.18	2.8	2.5		●			
		VBGT160404	0.4	9.525	4.76	4.4	2.5	●	●		○	○
	tip angle 7°	VBGT160408	0.8	9.525	4.76	4.4	2.2	●	●		●	○
SLANT TIP	LRG N	VBGT160404-LRG	0.4	9.525	4.76	4.4	4.5		●			
	large tip tip angle 7°	VBGT160408-LRG	0.8	9.525	4.76	4.4	3.7		●			
FLAT TIP	eco N	VBGW110302	0.2	6.35	3.18	2.8	3	●	●		○	
		VBGW110304	0.4	6.35	3.18	2.8	2.5	○	●		○	
		VBGW160404	0.4	9.525	4.76	4.4	2.5	○	●		○	○
		VBGW160408	0.8	9.525	4.76	4.4	2.2	○	○		○	○
FLAT TIP	LRG N	VBGW160404-LRG	0.4	9.525	4.76	4.4	4.5		●			
	large tip	VBGW160408-LRG	0.8	9.525	4.76	4.4	3.7		●			
3D CHIPBREAKER	CBF N	VBGX110302-CBF	0.2	6.35	3.18	2.8	5			▽		
		VBGX110304-CBF	0.4	6.35	3.18	2.8	4.5			▽		
	finishing	VBGX160404-CBF	0.4	9.525	4.76	4.4	4.5			▽		

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion





VB

ISO - with hole

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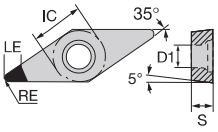
DP: Polycristalline diamond

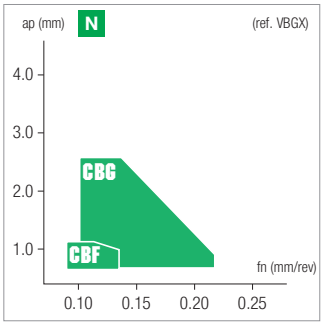
		DP	DP	DP	DP	DP	
		ND050	ND100	ND120	ND150	ND190	
Stable machining, light cut	● 1st choice ○ suitable	○	●	●	●	●	
General machining, medium cut	● 1st choice ◔ suitable	◔	◔	◔	◔		
Unstable machining, heavy cut	✱ 1st choice ✱ suitable	✱					
Dimensions	**ISO**	**Vc(m/min) - suggested cutting speed range** (bold: 1st choice)					
	P						
	M						
	K						
	N	400 2000	450 2400	450 2400	350 800	400 1000	
	S	40 100					
	H						



1 edge

Designation		RE	IC	S	D1	LE	Stock					
3D CHIPBREAKER	CBG N											
	 medium	VBGX110304-CBG	0.4	6.35	3.18	2.8	4.5			▽		
		VBGX160404-CBG	0.4	9.525	4.76	4.4	4.5			▽		
		VBGX160408-CBG	0.8	9.525	4.76	4.4	3.7			▽		

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion



A - TURNING
B - THREADING
C - GROOVING
D - MILLING
E - DRILLING
F - ACCESSORIES
G - SPARE PARTS

VC

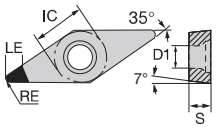
ISO - with hole

- 1st choice for intricate shape copy turning
- Can "In-Copy" (plunge turn into a smaller diameter) at an angle up to 49°
- Can work extremely close to the tailstock/ live center
- 3D Chip breaker type enables excellent chip flow and chip control
- Full edge type allows max. ap and special applications

DP: Polycristalline diamond

	DP	DP	DP	DP	DP	DP
	ND050	ND100	ND120	ND150	ND190	NDP010
Stable machining, light cut (● 1st choice ○ suitable)	○	●	●	●	●	●
General machining, medium cut (● 1st choice ○ suitable)	●	●	●	○		●
Unstable machining, heavy cut (● 1st choice ○ suitable)						

Dimensions

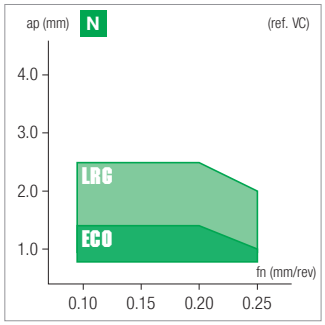


1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)					
P						
M						
K						
N	400 2000	450 2400	450 2400	350 800	400 1000	450 2400
S	40 100					
H						

	Designation		RE	IC	S	D1	LE	Stock					
SLANT TIP	eco N  tip angle 7°	VCGT110302	0.2	6.35	3.18	2.8	3	○	●				
		VCGT110304	0.4	6.35	3.18	2.8	2.5		○				
		VCGT160402	0.2	9.525	4.76	4.4	3		●				
		VCGT160404	0.4	9.525	4.76	4.4	2.5	○	●		●	○	
		VCGT160408	0.8	9.525	4.76	4.4	2.2	●	●		●	○	
SLANT TIP	LRG N  large tip tip angle 7°	VCGT160404-LRG	0.4	9.525	4.76	4.4	4.5		●				
		VCGT160408-LRG	0.8	9.525	4.76	4.4	3.7		●				
FLAT TIP	eco N 	VCGW110302	0.2	6.35	3.18	2.8	3	●	●				
		VCGW110304	0.4	6.35	3.18	2.8	2.5		●				
		VCGW160404	0.4	9.525	4.76	4.4	2.5	○	●		○	○	
		VCGW160408	0.8	9.525	4.76	4.4	2.2	●	●		○	○	
FLAT TIP	LRG N  large tip	VCGW110304-LRG	0.4	6.35	3.18	2.8	4.5		●				
		VCGW160404-LRG	0.4	9.525	4.76	4.4	4.5		●				
		VCGW160408-LRG	0.8	9.525	4.76	4.4	3.7		●				
		VCGW160412-LRG	1.2	9.525	4.76	4.4	3.3		○				

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion



VC

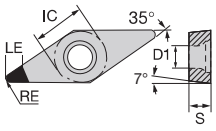
ISO - with hole

- 1st choice for intricate shape copy turning
- Can "In-Copy" (plunge turn into a smaller diameter) at an angle up to 49°
- Can work extremely close to the tailstock/ live center
- 3D Chip breaker type enables excellent chip flow and chip control
- Full edge type allows max. ap and special applications

DP: Polycristalline diamond

	DP	DP	DP	DP	DP	DP
	ND050	ND100	ND120	ND150	ND190	NDP010
Stable machining, light cut (● 1st choice ○ suitable)	○	●	●	●	●	●
General machining, medium cut (● 1st choice ○ suitable)	●	●	●	○		●
Unstable machining, heavy cut (● 1st choice ○ suitable)	○					

Dimensions

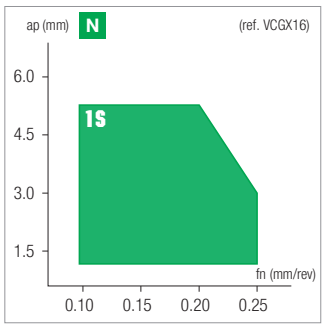


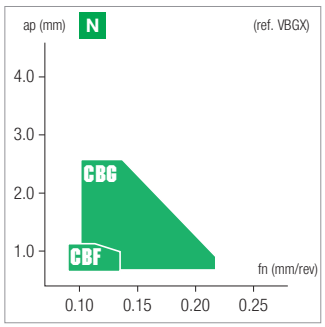
1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)					
P						
M						
K						
N	400 2000	450 2400	450 2400	350 800	400 1000	450 2400
S	40 100					
H						

	Designation		RE	IC	S	D1	LE	Stock					
3D CHIPBREAKER	CBU N  universal use	VCGX110302-CBU	0.2	6.35	3.18	2.8	4.5						●
		VCGX110304-CBU	0.4	6.35	3.18	2.8	4						●
		VCGX160404-CBU	0.4	9.525	4.76	4.4	5						●
		VCGX160408-CBU	0.8	9.525	4.76	4.4	4.4						●
3D CHIPBREAKER	CBF N  finishing	VCGX110302-CBF	0.2	6.35	3.18	2.8	5			▽			
		VCGX110304-CBF	0.4	6.35	3.18	2.8	4.5			▽			
3D CHIPBREAKER	CBG N  medium	VCGX110304-CBG	0.4	6.35	3.18	2.8	4.5			▽			
FULL EDGE	1S N  high depth of cut right-hand shown	VCGX110304$^{L}/_{R}$-1S	0.4	6.35	3.18	2.8	10.7		●				
		VCGX160404$^{L}/_{R}$-1S	0.4	9.525	4.76	4.4	16.2		●				

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion





PRODUCT SELECTION p. A143 | CUTTING CONDITIONS p. A163 | GRADES FEATURES p. A134 | EXTERNAL HOLDERS p. A283 | INTERNAL HOLDERS p. A287

WN

ISO - with hole

- Generally used on more moderate depths of cut and feedrates than 80° C shape inserts
- Slant tip enables better chip flow and chip control
- Large tip allows much bigger ap, available with both slant and flat style

DP: Polycristalline diamond

DP

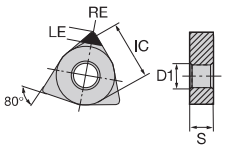
ND100

Stable machining, light cut — 1st choice ○ suitable

General machining, medium cut — 1st choice ○ suitable

Unstable machining, heavy cut — 1st choice ○ suitable

Dimensions

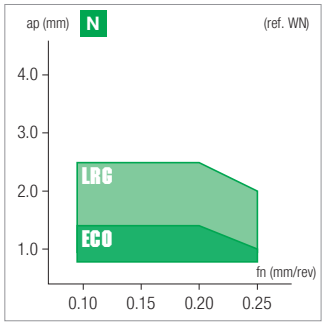


1 edge

ISO	Vc(m/min) - suggested cutting speed range (bold: 1st choice)
P	
M	
K	
N	450 2400
S	
H	

	Designation		RE	IC	S	D1	LE	Stock
SLANT TIP	eco N  tip angle 7°	WNGM080404	0.4	12.7	4.76	5.16	2.8	●
		WNGM080408	0.8	12.7	4.76	5.16	2.7	●
SLANT TIP	LRG N  large tip tip angle 7°	WNGM080404-LRG	0.4	12.7	4.76	5.16	4.3	○
		WNGM080408-LRG	0.8	12.7	4.76	5.16	4.2	○
FLAT TIP	eco N 	WNGA080404	0.4	12.7	4.76	5.16	2.8	●
		WNGA080408	0.8	12.7	4.76	5.16	2.7	○
FLAT TIP	LRG N  large tip	WNGA080404-LRG	0.4	12.7	4.76	5.16	4.3	○
		WNGA080408-LRG	0.8	12.7	4.76	5.16	4.2	○

● stock standard, ○ non-standard stock, ▲ upcoming introduction, ▽ stock exhaustion



ISO 513	MATERIAL		ND050 (NDP001)			ND100 / ND120 (NDP010)			ND150 (NDP302)			ND190 (NDP025)		
			min	start	max	min	start	max	min	start	max	min	start	max
N1	Aluminium alloys Si ≤ 12% (ex. 3.4365/AlZn5.5MgCu/ERGAL)	◯	600	**1300**	2000	600	**1500**	2400						
		●	450	**1100**	1750	450	**1300**	2150						
		⛭	400	**1000**	1600									
N2	Aluminium alloys Si > 12% (ex. 3.2382/G-AlSi12)	●				300	**500**	700	400	**600**	800	400	**700**	1000
		●				250	**400**	550	◯ 350	**500**	650			
N3	Copper alloy (ex. 2.0060/E-Cu57)	◯	400	**800**	1200	400	**900**	1400						
		●	350	**700**	1050	350	**800**	1250						
		⛭	300	**600**	900									
S4 - S5	Titanium alloys (ex. TiAl2Sn4Zr2MoSi)	◯	50	**75**	100									
		●	45	**60**	75									
		⛭	40	**50**	60									

Complete workpiece materials p. **H**1.

DESIGNATION	DEPTH OF CUT ap (mm)			FEED RATE fn (mm/rev)		
	min	start	max	min	start	max
CCGT060202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
CCGT060204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
CCGT060204-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
CCGT060208	0.40	**1.00**	1.60	0.15	**0.20**	0.25
CCGT09T302	0.40	**1.00**	1.60	0.05	**0.10**	0.15
CCGT09T304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
CCGT09T304-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
CCGT09T308	0.40	**1.00**	1.60	0.15	**0.20**	0.25
CCGT09T308-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
CCGT120404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
CCGT120404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
CCGT120408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
CCGT120408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
CCGW060202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
CCGW060204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
CCGW060204-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
CCGW060208	0.40	**1.00**	1.60	0.15	**0.20**	0.25
CCGW09T302	0.40	**1.00**	1.60	0.05	**0.10**	0.15
CCGW09T304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
CCGW09T304-FF	0.50	**3.00**	5.50	0.10	**0.15**	0.20
CCGW09T304-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
CCGW09T308	0.40	**1.00**	1.60	0.15	**0.20**	0.25
CCGW09T308-FF	0.50	**3.00**	5.50	0.15	**0.20**	0.25
CCGW09T308-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
CCGW120404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
CCGW120404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
CCGW120408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
CCGW120408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
CCGX060202-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12
CCGX060202-CBU	0.20	**1.50**	2.80	0.04	**0.08**	0.12
CCGX060204-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
CCGX060204-CBG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
CCGX060204-CBU	0.20	**1.50**	2.80	0.04	**0.12**	0.20
CCGX060204$^{1}/_{R}$-1S	0.50	**2.00**	3.50	0.10	**0.15**	0.20
CCGX060208-CBU	0.20	**1.50**	2.80	0.08	**0.18**	0.26
CCGX09T304-CBG	0.50	**1.50**	2.50	0.10	**0.15**	0.20
CCGX09T304-CBU	0.20	**1.50**	2.80	0.04	**0.12**	0.20
CCGX09T304$^{1}/_{R}$-1S	0.50	**3.00**	5.50	0.10	**0.15**	0.20
CCGX09T308-CBG	0.50	**1.50**	2.50	0.15	**0.20**	0.25
CCGX09T308-CBU	0.20	**1.50**	2.80	0.08	**0.18**	0.26
CNGA120404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
CNGA120404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
CNGA120408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
CNGA120408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
CNGM120404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
CNGM120404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
CNGM120408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
CNGM120408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
DCGT070202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
DCGT070204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
DCGT070204-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
DCGT070208	0.40	**1.00**	1.60	0.15	**0.20**	0.25
DCGT11T302	0.40	**1.00**	1.60	0.05	**0.10**	0.15
DCGT11T304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
DCGT11T304-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
DCGT11T308	0.40	**1.00**	1.60	0.15	**0.20**	0.25

DESIGNATION	DEPTH OF CUT ap (mm)			FEED RATE fn (mm/rev)		
	min	start	max	min	start	max
DCGT11T308-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
DCGW070202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
DCGW070204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
DCGW070204-FF	0.50	**2.00**	3.50	0.10	**0.15**	0.20
DCGW070204-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
DCGW070208	0.40	**1.00**	1.60	0.15	**0.20**	0.25
DCGW11T302	0.40	**1.00**	1.60	0.05	**0.10**	0.15
DCGW11T304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
DCGW11T304-FF	0.50	**3.00**	5.50	0.10	**0.15**	0.20
DCGW11T304-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
DCGW11T308	0.40	**1.00**	1.60	0.15	**0.20**	0.25
DCGW11T308-FF	0.50	**3.00**	5.50	0.15	**0.20**	0.25
DCGW11T308-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
DCGX070202-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12
DCGX070202-CBU	0.20	**1.50**	2.80	0.04	**0.08**	0.12
DCGX070204-CBU	0.20	**1.50**	2.80	0.04	**0.12**	0.20
DCGX070204$^{1}/_{R}$-1S	0.50	**2.00**	3.50	0.10	**0.15**	0.20
DCGX11T302-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12
DCGX11T302-CBU	0.20	**1.50**	2.80	0.04	**0.08**	0.12
DCGX11T304-CBG	0.50	**1.50**	2.50	0.10	**0.15**	0.20
DCGX11T304-CBU	0.20	**1.50**	2.80	0.04	**0.12**	0.20
DCGX11T304$^{1}/_{R}$-1S	0.50	**3.00**	5.50	0.10	**0.15**	0.20
DCGX11T308-CBG	0.50	**1.50**	2.50	0.15	**0.20**	0.25
DCGX11T308-CBU	0.20	**1.50**	2.80	0.08	**0.18**	0.26
DCGX11T308$^{1}/_{R}$-1S	0.50	**3.00**	5.50	0.15	**0.20**	0.25
DNGA150604	0.40	**1.00**	1.60	0.10	**0.15**	0.20
DNGA150604-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
DNGA150608	0.40	**1.00**	1.60	0.15	**0.20**	0.25
DNGA150608-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
DNGM150604	0.40	**1.00**	1.60	0.10	**0.15**	0.20
DNGM150604-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
DNGM150608	0.40	**1.00**	1.60	0.15	**0.20**	0.25
DNGM150608-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
MCC.R02	0.20	**0.60**	1.00	0.05	**0.10**	0.15
MCC.R04	0.20	**0.60**	1.00	0.10	**0.15**	0.20
MCN.R02G-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12
MCN.R02G-LRG	0.40	**1.20**	2.00	0.05	**0.10**	0.15
MCN.R04G-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
MCN.R04G-CBG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
MCN.R04G-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
MCN.R08G-CBG	0.40	**1.20**	2.00	0.15	**0.20**	0.25
MCN.R08G-LRG	0.40	**1.20**	2.00	0.15	**0.20**	0.25
MDN.R02G-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12
MDN.R02G-LRG	0.40	**1.20**	2.00	0.05	**0.10**	0.15
MDN.R04G-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
MDN.R04G-CBG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
MDN.R04G-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
MDN.R08G-CBG	0.40	**1.20**	2.00	0.15	**0.20**	0.25
MDN.R08G-LRG	0.40	**1.20**	2.00	0.15	**0.20**	0.25
TCGT090202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
TCGT090204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TCGT110202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
TCGT110204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TCGT110204-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
TCGT110208	0.40	**1.00**	1.60	0.15	**0.20**	0.25
TCGT110208-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20

DESIGNATION	DEPTH OF CUT			FEED RATE		
	ap (mm)			fn (mm/rev)		
	min	start	max	min	start	max
TCGT16T304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TCGT16T304-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
TCGT16T308	0.40	**1.00**	1.60	0.15	**0.20**	0.25
TCGT16T308-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
TCGW090202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
TCGW090204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TCGW110202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
TCGW110204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TCGW110204-FF	0.50	**2.00**	3.50	0.10	**0.15**	0.20
TCGW110204-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
TCGW110208	0.40	**1.00**	1.60	0.15	**0.20**	0.25
TCGW110208-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
TCGW16T304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TCGW16T304-FF	0.50	**3.00**	5.50	0.10	**0.15**	0.20
TCGW16T304-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
TCGW16T308	0.40	**1.00**	1.60	0.15	**0.20**	0.25
TCGW16T308-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
TCGX090202-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12
TCGX090204-1S	0.50	**1.50**	2.50	0.10	**0.15**	0.20
TCGX090204-CBG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
TCGX110202-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12
TCGX110204-1S	0.50	**2.00**	3.50	0.10	**0.15**	0.20
TCGX110204-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
TCGX110204-CBG	0.50	**1.50**	2.50	0.10	**0.15**	0.20
TCGX110204-CBU	0.20	**1.50**	2.80	0.04	**0.12**	0.20
TCGX110208-CBG	0.50	**1.50**	2.50	0.15	**0.20**	0.25
TCGX16T304-1S	0.50	**3.00**	5.50	0.10	**0.15**	0.20
TCGX16T304-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
TCGX16T304-CBG	0.50	**1.50**	2.50	0.10	**0.15**	0.20
TCGX16T304-CBU	0.20	**1.50**	2.80	0.04	**0.12**	0.20
TCGX16T308-CBG	0.50	**1.50**	2.50	0.15	**0.20**	0.25
TCGX16T308-CBU	0.20	**1.50**	2.80	0.08	**0.18**	0.26
TNGA160404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TNGA160404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
TNGA160408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
TNGA160408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
TNGM160404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TNGM160404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
TNGM160408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
TNGM160408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
TPGT080202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
TPGT080204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TPGT090202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
TPGT090204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TPGT110302	0.40	**1.00**	1.60	0.05	**0.10**	0.15
TPGT110304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TPGW080202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
TPGW080204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TPGW090202	0.40	**1.00**	1.60	0.05	**0.10**	0.15
TPGW090204	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TPGW110302	0.40	**1.00**	1.60	0.05	**0.10**	0.15
TPGW110304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
TPGX090202-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12
TPGX090204-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
TPGX090204-CBG	0.50	**1.50**	2.50	0.10	**0.15**	0.20
TPGX110302-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12

DESIGNATION	DEPTH OF CUT			FEED RATE		
	ap (mm)			fn (mm/rev)		
	min	start	max	min	start	max
TPGX110304-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
TPGX110304-CBG	0.50	**1.50**	2.50	0.10	**0.15**	0.20
TPGX110308-CBF	0.20	**0.60**	1.00	0.10	**0.15**	0.20
VBGT110302	0.40	**1.00**	1.60	0.05	**0.10**	0.15
VBGT110304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
VBGT160404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
VBGT160404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
VBGT160408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
VBGT160408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
VBGW110302	0.40	**1.00**	1.60	0.05	**0.10**	0.15
VBGW110304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
VBGW160404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
VBGW160404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
VBGW160408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
VBGW160408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
VBGX110302-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12
VBGX110304-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
VBGX110304-CBG	0.50	**1.50**	2.50	0.10	**0.15**	0.20
VBGX160404-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
VBGX160404-CBG	0.50	**1.50**	2.50	0.10	**0.15**	0.20
VBGX160408-CBG	0.50	**1.50**	2.50	0.15	**0.20**	0.25
VCGT110302	0.40	**1.00**	1.60	0.05	**0.10**	0.15
VCGT110304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
VCGT160402	0.40	**1.00**	1.60	0.05	**0.10**	0.15
VCGT160404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
VCGT160404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
VCGT160408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
VCGT160408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
VCGW110302	0.40	**1.00**	1.60	0.05	**0.10**	0.15
VCGW110304	0.40	**1.00**	1.60	0.10	**0.15**	0.20
VCGW110304-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
VCGW160404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
VCGW160404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
VCGW160408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
VCGW160408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
VCGW160412-LRG	0.40	**1.50**	2.60	0.20	**0.25**	0.30
VCGX110302-CBF	0.20	**0.60**	1.00	0.04	**0.08**	0.12
VCGX110302-CBU	0.20	**1.50**	2.80	0.04	**0.08**	0.12
VCGX110304-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
VCGX110304-CBG	0.50	**1.50**	2.50	0.10	**0.15**	0.20
VCGX110304-CBU	0.20	**1.50**	2.80	0.04	**0.12**	0.20
VCGX110304$^{L}/_{R}$-1S	0.50	**2.00**	3.50	0.10	**0.15**	0.20
VCGX160404-CBF	0.20	**0.60**	1.00	0.05	**0.10**	0.15
VCGX160404-CBG	0.50	**1.50**	2.50	0.10	**0.15**	0.20
VCGX160404-CBU	0.20	**1.50**	2.80	0.04	**0.12**	0.20
VCGX160404$^{L}/_{R}$-1S	0.50	**3.00**	5.50	0.10	**0.15**	0.20
VCGX160408-CBG	0.50	**1.50**	2.50	0.15	**0.20**	0.25
VCGX160408-CBU	0.20	**1.50**	2.80	0.08	**0.18**	0.26
WNGA080404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
WNGA080404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
WNGA080408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
WNGA080408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20
WNGM080404	0.40	**1.00**	1.60	0.10	**0.15**	0.20
WNGM080404-LRG	0.40	**1.20**	2.00	0.10	**0.15**	0.20
WNGM080408	0.40	**1.00**	1.60	0.15	**0.20**	0.25
WNGM080408-LRG	0.40	**1.50**	2.60	0.10	**0.15**	0.20