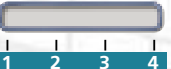


CNMG 120404 NN

Machining Conditions

Material Group	Group No	Material Examples*	Brinell hardness HB	d.o.c [mm]		feed [mm/rev]		A max [mm ²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck15 9SMnPb28	150	0.20	3.0	0.11	0.23	0.54	180	330	0.5 to 1.5	0.18
			180		3.0		0.23	0.54		280		
			210		3.0		0.20	0.45		250		
Alloy Steel	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.20	3.0	0.11	0.20	0.45	120	280	0.5 to 1.5	0.15
			230		3.0		0.20	0.36		250		
			280		3.0	0.09	0.18	0.36		210		
			320		3.0		0.18	0.30		180		
High Alloy Steel	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.20	3.0	0.09	0.20	0.36	70	190	0.5 to 1.5	0.12
			280		3.0		0.20	0.36		150		
			320		2.5		0.18	0.24		130		
			350		2.5		0.18	0.24		100		
Austenitic Stainless Steel	4	303 / 304 304 L	210 to 250	0.20	3.0	0.10	0.20	0.30	170	270	0.5 to 1.5	0.15
	5	316 / 316 L	230 to 270		2.5	0.09	0.18	0.24	160	210	0.5 to 1.5	0.15
	6	316 Ti 630 (F16PH)	-----	0.25	2.5	0.09	0.18	0.18	70	150	0.5 to 1.5	0.12
Ferritic Stainless Steel	7	430 / 439 / 444	Annealed	0.25	3.0	0.11	0.18	0.27	170	250	0.5 to 1.5	0.15
Martensitic Stainless Steel	8	410 / 420	Annealed	0.25	3.0	0.11	0.18	0.27	170	250	0.5 to 1.5	0.15
			Treated						120	190		
Grey Cast Iron	9	EN - GJL 200	140 to 230	0.20	3.0	0.08	0.30	0.60	170	250	0.5 to 1.5	0.18
		EN - GJL 250						0.54		230		
		EN - GJL 300						0.54		210		
Nodular Cast Iron	10	EN - GJS 400	210	0.20	3.0	0.08	0.25	0.45	120	230	0.5 to 1.5	0.15
		EN - GJS 600	260					0.39		190		
		EN - GJS 800	310					0.36		150		
Nickel Based Alloys	11	Inconel 625	-----	0.25	2.0	0.10	0.18	0.21	25	35	0.5 to 1.5	0.12
		Inconel 718						0.21	28	40		
		Hastello y C						0.24	40	65		
Titanium Based Alloys	12	TiAl 6 V4	-----	0.25	2.0	0.09	0.18	0.24	35	60	0.5 to 1.5	0.15
		T40					0.15	0.18	28	40	0.5 to 1.5	0.12

*For all material types and standards, see pages 240 to 245.

Insert designation	Super Finishing	Finishing	Semi Finishing	Roughing	Interrupted Cut
CNMG 120404 NN					
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4



Material Group	Group No.	Material Examples*	Brinell hardness HB	d.o.c [mm]		feed [mm/rev]		A max [mm²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck15 9SMnPb28	150	0.50	5.00	0.21	0.45	1.80	180	400	1.5 to 3	0.35
			180		5.00		0.45	1.80		350		
			210		4.00		0.40	1.50		200		
Alloy Steel	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	5.00	0.21	0.40	1.20	120	300	1.5 to 3	0.30
			230		4.00		0.40	1.20		250		
			280		4.00	0.18	0.35	1.20		210		
			320		3.50		0.35	1.00		180		
High Alloy Steel	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.50	4.00	0.18	0.40	1.20	70	190	1.5 to 3	0.28
			280		4.00		0.40	1.20		150		
			320		3.00		0.35	0.80		130		
			350		3.00		0.35	0.80		100		
Austenitic Stainless Steel	4	303 / 304 304 L	210 to 250	0.50	5.00	0.20	0.40	1.00	170	270	1.5 to 3	0.35
	5	316 / 316 L	230 to 270		4.00	0.18	0.35	0.80	170	210	1.5 to 3	0.32
	6	316 Ti 630 (F16PH)	-----		4.00	0.18	0.35	0.60	80	130	1.5 to 3	0.28
Ferritic Stainless Steel	7	430 / 439 / 444	Annealed	0.50	4.00	0.22	0.35	0.90	170	250	1.5 to 3	0.32
Martensitic Stainless Steel	8	410 / 420	Annealed	0.50	4.00	0.22	0.35	0.90	170	250	1.5 to 3	0.32
			Treated						120	210		
Grey Cast Iron	9	EN - GJL 200	140 to 230	0.50	5.00	0.15	0.60	2.00	170	280	1.5 to 3	0.35
		EN - GJL 250						1.80		250		
		EN - GJL 300						1.80		230		
Nodular Cast Iron	10	EN - GJS 400	210	0.50	5.00	0.15	0.50	1.50	120	230	1.5 to 3	0.30
		EN - GJS 600	260					1.30		190		
		EN - GJS 800	310					1.20		150		
Nickel Based Alloys	11	Inconel 625	-----	0.50	3.00	0.20	0.35	0.70	25	35	1.5 to 3	0.28
		Inconel 718						0.70		40		
		Hastelloy C						0.80		65		
Titanium Based Alloys	12	TiAl 6 V4	-----	0.50	3.00	0.18	0.35	0.80	35	60	1.5 to 3	0.30
		T40					0.30	0.60	28	40	1.5 to 3	0.28

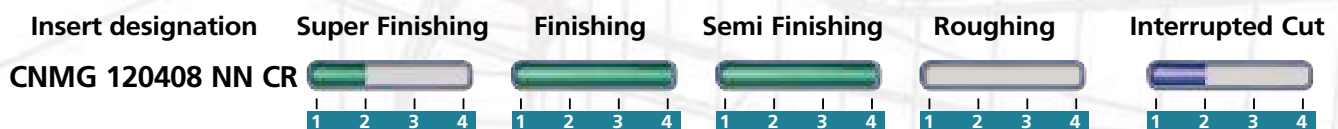
*For all material types and standards, see pages 240 to 245.

Insert designation	Super Finishing	Finishing	Semi Finishing	Roughing	Interrupted Cut
CNMG 120408 NN					
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4

CNMG 120408 NN LT-10 CR Machining Conditions

Material Group	Group No	Material Examples*	Brinell hardness HB	d.o.c [mm]		feed [mm/rev]		A max [mm²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck15 9SMnPb28	150	0.50	5.0	0.21	0.45	1.8	120	450	1.5 to 3	0.35
			180		5.0		0.45	1.8		380		
			210		4.0		0.40	1.5		250		
Alloy Steel	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	5.0	0.21	0.40	1.5	100	350	1.5 to 3	0.30
			230		4.0		0.40	1.2		300		
			280		4.0	0.18	0.35	1.2		250		
			320		3.5		0.35	1.0		210		
High Alloy Steel	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.50	4.0	0.18	0.40	1.2	70	230	1.5 to 3	0.28
			280		4.0		0.40	1.2		190		
			320		3.0		0.35	0.8		170		
			350		3.0		0.35	0.8		130		
Austenitic Stainless Steel	4	303 / 304 304 L	210 to 250	0.50	5.0	0.20	0.40	1.0	100	270	1.5 to 3	0.32
	5	316 / 316 L	230 to 270		4.0	0.18	0.35	0.8	80	210	1.5 to 3	0.29
	6	316 Ti 630 (F16PH)	-----		4.0	0.18	0.35	0.6	70	120	1.5 to 3	0.25
Ferritic Stainless Steel	7	430 / 439 / 444	Annealed	0.50	4.0	0.22	0.35	0.9	170	250	1.5 to 3	0.32
Martensitic Stainless Steel	8	410 / 420	Annealed	0.50	4.0	0.22	0.35	0.9	170	250	1.5 to 3	0.32
			Treated						120	210		
Grey Cast Iron	9	EN - GJL 200	140 to 230	0.50	5.0	0.15	0.60	2.0	170	380	1.5 to 3	0.35
		EN - GJL 250						1.8		320		
		EN - GJL 300						1.8		270		
Nodular Cast Iron	10	EN - GJS 400	210	0.50	5.0	0.15	0.50	1.5	120	300	1.5 to 3	0.30
		EN - GJS 600	260					1.3		250		
		EN - GJS 800	310					1.2		210		
Nickel Based Alloys	11	Inconel 625	-----	0.50	3.0	0.20	0.35	0.7	25	35	1.5 to 3	0.28
		Inconel 718						0.7	28	40		
		Hastello y C						0.8	40	65		
Titanium Based Alloys	12	TiAl 6 V4	-----	0.50	3.0	0.18	0.35	0.8	35	60	1.5 to 3	0.30
		T40					0.30	0.6	28	40	1.5 to 3	0.28

*For all material types and standards, see pages 240 to 245.





Material Group	Group No	Material Examples*	Brinell hardness HB	d.o.c [mm]		feed [mm/rev]		A max [mm²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck 15 9SMnPb28	150	0.5	5.0	0.21	0.70	1.2	180	330	1.5 to 3	0.35
			180		5.0		0.45(0.70)	1.2		280		
			210		4.0		0.40(0.60)	1.2		250		
Alloy Steel	2	42 CrMo 4	180	0.5	5.0	0.21	0.65	1.0	120	280	1.5 to 3	0.30
		100 Cr 6	230		4.0		0.40(0.60)	1.0		250		
		32 NiCrMo 14.5	280		4.0	0.18	0.35(0.60)	1.0		210		
			320		3.5		0.35(0.50)	1.0		180		
High Alloy Steel	3	X38 CrMoV 5	220	0.5	4.0	0.18	0.60	0.8	70	190	1.5 to 3	0.28
		X210 CrW 12	280		4.0		0.40(0.60)	0.8		150		
		X90 CrMoV 8	320		3.0		0.35(0.60)	0.8		130		
			350		3.0		0.35(0.50)	0.8		100		
Austenitic Stainless Steel	4	303 / 304 304 L	210 to 250	Wiper inserts are not recommended for austenitic stainless								
	5	316 / 316 L	230 to 270									
	6	316 Ti 630 (F16PH)	-----									
Ferritic Stainless Steel	7	430 / 439 / 444	Annealed	0.5	4.0	0.22	0.50	0.8	170	250	1.5 to 3	0.32
Martensitic Stainless Steel	8	410 / 420	Annealed	0.5	4.0	0.22	0.50	0.8	170	250	1.5 to 3	0.32
			Treated						120	190		
Grey Cast Iron	9	EN - GJL 200	140 to 230	0.5	5.0	0.15	0.70	1.2	170	250	1.5 to 3	0.35
		EN - GJL 250						1.2		230		
		EN - GJL 300						1.2		210		
Nodular Cast Iron	10	EN - GJS 400	210	0.5	5.0	0.15	0.60	1.0	120	230	1.5 to 3	0.30
		EN - GJS 600	260					1.0		190		
		EN - GJS 800	310					1.0		150		
Nickel Based Alloys	11	Inconel 625	-----	Wiper inserts are not recommended for exotic materials								
		Inconel 718										
		Hastello y C										
Titanium Based Alloys	12	TiAl 6 V4	-----									
		T40										

*For all material types and standards, see pages 240 to 245.

Insert designation	Super Finishing	Finishing	Semi Finishing	Roughing	Interrupted Cut
CNMG 120408 WM					
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4

CNMG 120412 NN

Machining Conditions

Material Group	Group No	Material Examples*	Brinell hardness HB	d.o.c [mm]		feed [mm/rev]		A max [mm ²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck15 9SMnPb28	150	0.50	5.0	0.27	0.68	3.1	180	330	2 to 5	0.50
			180		5.0		0.68	3.1		280		
			210		5.0		0.60	2.6		250		
Alloy Steel	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	5.0	0.27	0.60	2.6	120	280	2 to 5	0.45
			230		5.0		0.60	2.0		250		
			280		5.0	0.23	0.53	2.0		210		
			320		4.0		0.53	1.7		180		
High Alloy Steel	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.50	5.0	0.23	0.60	2.0	70	190	2 to 5	0.40
			280		5.0		0.60	2.0		150		
			320		4.0		0.53	1.4		130		
			350		4.0		0.53	1.4		100		
Austenitic Stainless Steel	4	303 / 304 304 L	210 to 250	0.50	5.0	0.26	0.52	1.7	170	270	2 to 5	0.40
	5	316 / 316 L	230 to 270		5.0	0.23	0.46	1.4	160	210	2 to 5	0.36
	6	316 Ti 630 (F16PH)	-----		5.0	0.23	0.46	1.0	70	150	2 to 5	0.32
Ferritic Stainless Steel	7	430 / 439 / 444	Annealed	0.50	5.0	0.29	0.46	1.5	170	250	2 to 5	0.35
Martensitic Stainless Steel	8	410 / 420	Annealed	0.50	5.0	0.29	0.46	1.5	170	250	2 to 5	0.35
			Treated						120	190		
Grey Cast Iron	9	EN - GJL 200	140 to 230	0.50	5.0	0.20	0.90	3.0	170	250	2 to 5	0.60
		EN - GJL 250						2.7		230		
		EN - GJL 300						2.7		210		
Nodular Cast Iron	10	EN - GJS 400	210	0.50	5.0	0.20	0.70	2.3	120	230	2 to 5	0.50
		EN - GJS 600	260					2.0		190		
		EN - GJS 800	310					1.8		150		
Nickel Based Alloys	11	Inconel 625	-----	0.50	5.0	0.26	0.46	1.4	25	35	2 to 5	0.38
		Inconel 718						1.4	28	40		
		Hastello y C						1.6	40	65		
Titanium Based Alloys	12	TiAl 6 V4	-----	0.50	5.0	0.23	0.46	1.6	35	60	2 to 5	0.38
		T40					0.39	1.2	28	40	2 to 5	0.32

*For all material types and standards, see pages 240 to 245.

Insert designation	Super Finishing	Finishing	Semi Finishing	Roughing	Interrupted Cut
CNMG 120412 NN					

CNMG 120412 NN LT-10 CR Machining Conditions



CNMG

Material Group	Group No	Material Examples*	Brinell hardness HB	d.o.c [mm]		feed [mm/rev]		A max [mm²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck15 9SMnPb28	150	0.50	5.0	0.27	0.68	3.1	120	450	2 to 5	0.50
			180		5.0		0.68	3.1		380		
			210		5.0		0.60	2.6		250		
Alloy Steel	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	5.0	0.27	0.60	2.6	100	350	2 to 5	0.45
			230		5.0		0.60	2.0		300		
			280		5.0	0.23	0.53	2.0		250		
			320		4.0		0.53	1.7		210		
High Alloy Steel	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.50	5.0	0.23	0.60	2.0	70	230	2 to 5	0.40
			280		5.0		0.60	2.0		190		
			320		4.0		0.53	1.4		170		
			350		4.0		0.53	1.4		130		
Austenitic Stainless Steel	4	303 / 304 304 L	210 to 250	0.50	5.0	0.26	0.52	1.7	100	270	2 to 5	0.40
	5	316 / 316 L	230 to 270		5.0	0.23	0.46	1.4	80	210	2 to 5	0.36
	6	316 Ti 630 (F16PH)	-----		5.0	0.23	0.46	1.0	70	120	2 to 5	0.32
Ferritic Stainless Steel	7	430 / 439 / 444	Annealed	0.50	5.0	0.29	0.46	1.5	170	250	2 to 5	0.35
Martensitic Stainless Steel	8	410 / 420	Annealed	0.50	5.0	0.29	0.46	1.5	170	250	2 to 5	0.35
			Treated						120	210		
Grey Cast Iron	9	EN - GJL 200	140 to 230	0.50	5.0	0.20	0.90	3.0	170	380	2 to 5	0.60
		EN - GJL 250						2.7		320		
		EN - GJL 300						2.7		270		
Nodular Cast Iron	10	EN - GJS 400	210	0.50	5.0	0.20	0.70	2.3	120	300	2 to 5	0.50
		EN - GJS 600	260					2.0		250		
		EN - GJS 800	310					1.8		210		
Nickel Based Alloys	11	Inconel 625	-----	0.50	5.0	0.26	0.46	1.4	25	35	2 to 5	0.38
		Inconel 718						1.4	28	40		
		Hastello y C						1.6	40	65		
Titanium Based Alloys	12	TiAl 6 V4	-----	0.50	5.0	0.23	0.46	1.6	35	60	2 to 5	0.38
		T40					0.39	1.2	28	40	2 to 5	0.32

*For all material types and standards, see pages 240 to 245.

Insert designation	Super Finishing	Finishing	Semi Finishing	Roughing	Interrupted Cut
CNMG 120412 NN CR					
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4