

End mill – NM series

Material group	Composition / structure / heat treatment	Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
				NM-2E 5502R402NM NM-4E NM-2EP				NM-2B NM-4BP				
				Slot milling		Shoulder milling						
				\emptyset [mm]	a_p max	\emptyset [mm]	a_e max					
$0 < x < 12$	$0.5 \times D$	$0 < x \leq 20$	$< 0.5 \times D$									
$12 \leq x \leq 20$	$1.0 \times D$											
KMG309				KMG309								
a_e / D				a_e / D								
1/1	1/2	1/10	f-group	1/1	1/10	1/20	f-group					
P Unalloyed steel	ca. 0,15 % C	annealed	125	1								
	ca. 0,45 % C	annealed	190	2								
	ca. 0,45 % C	tempered	250	3								
	ca. 0,75 % C	annealed	270	4								
	ca. 0,75 % C	tempered	300	5								
P Low-alloyed steel		annealed	180	6								
		tempered	275	7								
		tempered	300	8								
		tempered	350	9								
High-alloyed steel and high-alloyed tool steel		annealed	200	10								
		hardened and tempered	325	11								
M Stainless steel	ferritic/martensitic	annealed	200	12								
	martensitic	tempered	240	13								
	austenitic	quench hardened	180	14								
	austenitic-ferritic		230	15								
K Grey cast iron	perlitic/ferritic		180	16								
	perlitic (martensitic)		260	17								
K Cast iron with spheroidal graphite	ferritic		160	18								
	perlitic		250	19								
K Malleable cast iron	ferritic		130	20								
	perlitic		230	21								
N Aluminium wrought alloys	cannot be hardened		60	22	920	1100	1200	4	1400	1550	4	
	hardenable	hardened	100	23	555	660	720	4	840	930	4	
	$\leq 12\% \text{ Si}$, cannot be hardened		75	24	370	440	480	4	560	620	4	
	$\leq 12\% \text{ Si}$, hardenable	hardened	90	25	460	550	600	4	700	775	4	
	$> 12\% \text{ Si}$, cannot be hardened		130	26	140	165	180	4	210	235	4	
N Cast aluminium alloys	$\leq 12\% \text{ Si}$, cannot be hardened		75	24	370	440	480	4	560	620	4	
	$\leq 12\% \text{ Si}$, hardenable	hardened	90	25	460	550	600	4	700	775	4	
	$> 12\% \text{ Si}$, cannot be hardened		130	26	140	165	180	4	210	235	4	
N Copper and copper alloys (bronze/brass)	machining steel, PB > 1%		110	27	280	330	360	4	420	465	4	
	CuZn, CuSnZn		90	28	325	385	420	4	490	545	4	
	CuSn, Pb-free copper, electrolytic copper		100	29	280	330	360	4	420	465	4	
S Heat-resistant alloys	Fe-based alloys	annealed	200	30								
		hardened	280	31								
	Ni or Co base	annealed	250	32								
		hardened	350	33								
		cast	320	34								
Titanium alloys	pure titanium		R_m 400	35								
	α and β alloys	hardened	R_m 1050	36								
H Hardened steel		hardened and tempered	55 HRC	37								
		hardened and tempered	60 HRC	38								
H Hard cast iron		cast	400	39								
H Hardened cast iron		hardened and tempered	55 HRC	40								
X Non-metallic materials	Thermoplasts			41								
	Thermosetting plastics			42								
	Plastic, glass-fibre reinforced GFRP			43								
	Plastic, carbon fibre reinforced CFRP			44								
	Graphite			45								
	Wood			46								

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B444.
 For examples of material for cutting tool groups view page D22.