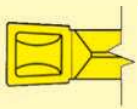
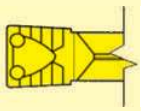
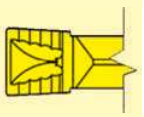
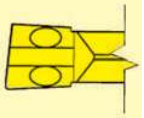
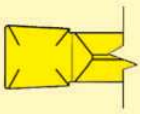
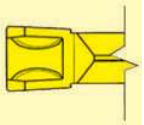
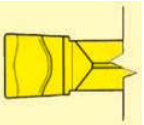
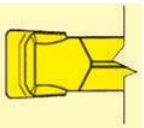
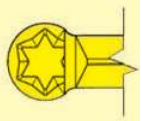
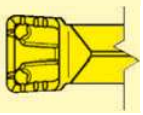
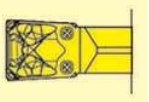
Geometries and feed rates type S224

Geometry	Applications	Feed rate	mm/rev	in/rev
.3. 	grooving, side turning, profiling of grooves, suitable for materials with high tensile strength	↓	0.15 - 0.25	.006 - .010
		↔	0.15 - 0.40*	.008 - .016*
.5. 	grooving, side turning, profiling of grooves, excellent reduction of chip width in materials with medium tensile strength	↓	0.10 - 0.45	.004 - .018
		↔	0.15 - 0.60*	.006 - .024*
.A. 	grooving, side turning, finishing or profiling of grooves, excellent chip breaking in materials with medium tensile strength	↓	0.05 - 0.30	.002 - .012
		↔	0.10 - 0.30*	.004 - .012*
.C. 	parting off, for long chipping materials	↓	0.02 - 0.10	.0008 - .004
.D. 	grooving, finishing of grooves, for long chipping materials, low feed rates	↓	0.05 - 0.15	.002 - .006
		↔	0.05 - 0.20	.002 -.008
.E. .EN. 	grooving, side turning, profiling of grooves, suitable for materials with high tensile strength	↓	0.08 - 0.30	.003 - .012
.F. .FY. 	grooving, finishing of grooves, for long chipping materials, low feed rates	↓	0.03 - 0.15	.001 - .006
.H. 	grooving in "pecking process", profiling in partial cut, for long chipping	↓	0.15 - 0.25	.006 - .010
		↔	0.10 - 0.25	.004 - .010
.K. .KF. 	grooving, side turning, finishing or profiling of grooves	↓	0.05 - 0.25	.002 - .010
		↔	0.05 - 0.25	.002 -.010
.L. 	grooving in full and partial cut with excellent chip control	↓	0.10 - 0.22	.004 - .009
		↔	0.05 - 0.20	.002 - .008
.ZG. 	grooving, side turning, profiling of grooves	↓	0.10 - 0.22	.004 - .009
		↔	0.05 - 0.20	.002 - .008

* dependent upon insert width, edge radii and material

↓ Grooving ↔ Side turning

Cutting data Grooving and parting off

Material			Hardness Brinell (HB)	Cutting speed v_c (m/min)										
				K10	MG12	P20	TI22 TN32	TI25 TN35	TF45 TA45 TH35	TF46 TA46	AS62	AL96 AS66	H20	H54
P	Carbon steel	0.2% C	140			180-120	200-160	180-130	200-160	280-180	250-180	300-180	230-170	200-140
		0.4% C	180			160-110	180-150	170-120	180-150	250-140	230-170	270-150	220-160	180-120
		0.6% C	200			140-90	180-140	150-100		230-120	220-160	250-120	210-150	160-100
	Alloyed steel (<5%)	annealed	180			140-100	180-140	160-110	180-140	230-100	200-150	250-100	210-150	180-120
		quenched	280			110-90	160-110	130-90		190-90	160-110	220-90	170-120	160-100
		quenched	350			80	140-90	100-70		170-80	130-100	200-80	140-80	120-80
	high alloyed steel (>5%)	annealed	200			120-80	120-90			200-140	180-120	220-140	120-100	100-90
		hardened	-											
	Cast steel	unalloyed	180				130-100				200-150	200-150	180-120	
		alloyed	220				110-80				160-100	150-90	140-90	
M	Stainless steel	martensitic, ferritic	200		90-70		130-100	120-60		180-120	170-120	190-140	190-120	
		austenitic	180		90-60			100-70		140-110		140-110	170-120	
K	Cast iron	low tensile strength	180	90-60	80-60				130-90	180-120	180-120	200-120		
		high tensile strength	250	90-60	80-60				90-70	140-100	140-100	160-120		
	Spheroidal graphite cast iron	ferritic	160				90-70	90-70	120-80	170-90	170-90	180-130		
		perlitic	250				70-60	70-60	110-80	180-80	150-80	160-120		
	Malleable cast iron	ferritic	125		100-80		140-120	100-70		120-100	190-140	220-120		
		perlitic	225		70-50		100-80	80-60		90-80	140-100	190-100		
N	Al-alloy	not heat treatable	30-80	1000-600	800-400			1000-600						
		heat treatable	80-120	400-220	300-200			400-220						
	Al-cast-alloy	not heat treatable	80	1000-600	800-400			1000-600						
		heat treatable	100	600-300	400-250			600-300						
	Copper-alloy	not heat treatable	90	200-120			200-150	210-130		200-150				
		heat treatable	100	150-90			150-60	160-90		150-110				
S	Heat resistant alloy (FE)	annealed	200		50-30			50-30						
		hardened	275		40-20			40-20						
	Heat resistant alloy (Ni, Co)	annealed	250		30-20			30-20						
		hardened	350		20-10			20-10						

Cutting data Grooving and parting off

Material			Hardness Brinell (HB)	Cutting speed v_c (ft/min)										
				K10	MG12	P20	TI22 TN32	TI25 TN35	TF45 TA45 TH35	TF46 TA46	AS62	AL96 AS66	H20	H54
P	Carbon steel	0.2% C	140			590-395	650-525	590-430	650-525	920-590	820-590	985-590	755-560	650-460
		0.4% C	180			525-360	590-495	560-395	590-495	820-460	755-560	885-495	720-525	590-395
		0.6% C	200			460-295	590-460	495-330		755-395	720-525	820-395	690-495	525-330
	Alloyed steel (<5%)	annealed	180			460-330	590-460	525-360	590-460	755-330	650-495	820-330	690-495	590-395
		quenched	280			360-295	525-360	430-295		625-295	525-360	720-295	560-395	525-330
		quenched	350			265	460-295	330-230		560-265	430-330	650-265	460-265	395-265
	high alloyed steel (>5%)	annealed	200			395-265	395-295			650-460	590-395	720-460	395-330	330-295
		hardened	-											
	Cast steel	unalloyed	180				430-330				650-495	650-495	590-395	
		alloyed	220				360-265				525-330	495-295	460-295	
M	Stainless steel	martensitic, ferritic	200		295-230		430-330	395-200		590-395	560-395	625-460	625-395	
		austenitic	180		295-200			330-230		460-360		460-360	560-395	
K	Cast iron	low tensile strength	180	295-200	265-200				430-295	590-395	590-395	650-395		
		high tensile strength	250	295-200	265-200				295-230	460-330	460-330	525-395		
	Spheroidal graphite cast iron	ferritic	160				295-230	295-230	395-265	560-295	560-295	590-430		
		perlitic	250				230-200	230-200	360-265	590-265	495-265	525-395		
	Malleable cast iron	ferritic	125		330-265		460-395	330-230		395-330	625-460	720-395		
		perlitic	225		230-165		330-265	265-200		295-265	460-330	625-330		
N	Al-alloy	not heat treatable	30-80	3280-1970	2625-1315			3280-1970						
		heat treatable	80-120	1315-720	985-650			1315-720						
	Al-cast-alloy	not heat treatable	80	3280-1970	2625-1315			3280-1970						
		heat treatable	100	1970-985	1315-820			1970-985						
	Copper-alloy	not heat treatable	90	650-395			650-495	690-430		650-495				
		heat treatable	100	495-295			650-495	690-430		650-495				
S	Heat resistant alloy (FE)	annealed	200		165-100			165-100						
		hardened	275		130-65			130-65						
	Heat resistant alloy (Ni. Co)	annealed	250		100-65			100-65						
		hardened	350		65-35			65-35						

Cutting data Face grooving

Material			Hardness Brinell (HB)	Cutting speed v_c (m/min)											
				K10	MG12	P20	TI22 TN32	TI25 TN35	TF45 TA45 TH35	TF46 TA45	AS62	AS66	H20	H54
P	Carbon steel	0.2% C	140			140-100	160-130	140-110	160-130	220-140	200-140	240-140	190-140	200-140
		0.4% C	180			130-90	140-120	130-100	140-120	200-120	190-130	220-120	180-130	180-120
		0.6% C	200			120-80	140-120	120-180		190-100	180-130	200-100	170-120	160-100
	Alloyed steel (<5%)	annealed	180			120-80	140-120	140-100	140-120	190-80	160-120	200-80	170-120	180-120
		quenched	280			90-70	140-90	110-80		170-80	140-90	180-80	140-100	160-100
		quenched	350			60	120-70	80-60		140-60	110-80	160-70	120-60	120-80
	high alloyed steel (>5%)	annealed	200			100-60	100-70			160-120	150-100	180-120	110-80	100-90
		hardened	-											
	Cast steel	unalloyed	180				110-80				160-120	160-120	140-100	
		alloyed	220				90-60				140-80	120-80	120-80	
M	Stainless steel	martensitic. ferritic	200		80-60		110-80	110-50		160-100	130-110	150-120	150-100	
		austenitic	180		60-40			80-60		120-100		110-80	140-100	
K	Cast iron	low tensile strength	180	70-50	70-50				110-70	140-100	140-100	160-100		
		high tensile strength	250	70-50	70-50				80-60	120-80	120-80	140-100		
	Spheroidal graphite cast iron	ferritic	160				90-60	80-60	100-60	140-80	150-70	150-110		
		perlitic	250				80-60	60-50	90-60	130-70	120-60	140-100		
	Malleable cast iron	ferritic	125		80-60		120-100	80-60		100-80	160-110	180-100		
		perlitic	225		60-40		80-60	60-50		80-60	120-80	150-120		
N	Al-alloy	not heat treatable	30-80	1000-600	800-400			1000-600						
		heat treatable	80-120	400-220	300-200			400-220						
	Al-cast-alloy	not heat treatable	80	1000-600	800-400			1000-600						
		heat treatable	100	600-300	400-250			600-300						
	Copper-alloy	not heat treatable	90	160-100			160-130	190-110						
		heat treatable	100	130-80			130-60	140-80						
S	Heat resistant alloy (FE)	annealed	200		40-30			40-30						
		hardened	275		35-20			35-20						
	Heat resistant alloy (Ni. Co)	annealed	250		25-20			20-10						
		hardened	350		20-10			20-10						

Cutting data Face grooving

Material			Hardness Brinell (HB)	Cutting speed v_c (ft/min)										
				K10	MG12	P20	TI22 TN32	TI25 TN35	TF45 TA45 TH35	TF46 TA45	AS62	AS66	H20	H54
P	Carbon steel	0.2% C	140			460-330	525-430	460-360	525-430	720-460	650-460	790-460	625-460	650-460
		0.4% C	180			430-300	460-395	430-330	460-395	650-395	625-430	720-395	590-430	590-395
		0.6% C	200			395-265	460-395	395-590		625-330	590-430	650-330	560-395	525-330
	Alloyed steel (<5%)	annealed	180			395-265	460-395	460-330	460-395	625-265	525-395	650-265	560-395	590-395
		quenched	280			300-230	460-300	360-265		560-265	460-300	590-265	460-330	525-330
		quenched	350			200	395-230	265-200		460-200	360-265	525-230	395-200	395-265
	high alloyed steel (>5%)	annealed	200			330-200	330-230			525-395	495-330	590-395	360-265	330-300
		hardened	-											
	Cast steel	unalloyed	180				360-265				525-395	525-395	460-330	
		alloyed	220				300-200				460-265	395-265	395-265	
M	Stainless steel	martensitic, ferritic	200		265-200		360-265	360-165		525-330	430-360	495-395	495-330	
		austenitic	180		200-130			265-200		395-330		360-265	460-330	
K	Cast iron	low tensile strength	180	230-165	230-165				360-230	460-330	460-330	525-330		
		high tensile strength	250	230-165	230-165				265-200	395-265	395-265	460-330		
	Spheroidal graphite cast iron	ferritic	160				300-200	265-200	330-200	460-265	495-230	495-360		
		perlitic	250				265-200	200-165	300-200	430-230	395-200	460-330		
	Malleable cast iron	ferritic	125		265-200		395-330	265-200		330-265	525-360	590-330		
		perlitic	225		200-130		265-200	200-165		265-200	395-265	495-395		
N	Al-alloy	not heat treatable	30-80	3280-1970	2625-1315			3280-1970						
		heat treatable	80-120	1315-720	985-650			1315-720						
	Al-cast-alloy	not heat treatable	80	3280-1970	2625-1315			3280-1970						
		heat treatable	100	1970-985	1315-820			1970-985						
	Copper-alloy	not heat treatable	90	525-330			525-430	625-360						
		heat treatable	100	430-265			430-200	460-265						
S	Heat resistant alloy (FE)	annealed	200		130-100			130-100						
		hardened	275		115-65			115-65						
	Heat resistant alloy (Ni. Co)	annealed	250		85-65			65-35						
		hardened	350		65-35			65-35						

Nominal cutting speeds with HORN grades

Material			Hardness Brinell (HB)	* Cutting speed v_c (m/min)			
				MG12	TN35	TI25	TF45 / TA45 / TH35
P	Carbon steel. unalloyed	C < 0.4%	125	14-110	14-180	14-180	14-180
		C > 0.4% < 0.6%	150	14-110	14-180	14-180	14-180
		C > 0.6% < 0.8%	200	14-110	14-180	14-180	14-180
	low alloyed steel	annealed	180	16-90	16-150	16-150	
		quenched	275	16-90	16-150	16-150	
		quenched	160	16-90	16-150	16-150	
	high alloyed steel	annealed	200		19-90	19-90	
		quenched	325		19-90	19-90	
	Cast steel	unalloyed	180	19-110	19-180	19-180	
		low alloyed	200	19-110	19-180	19-180	
		high alloyed	225	19-110	19-180	19-180	
M	Stainless steel	martensitic. ferritic. annealed	200		19-90	19-90	
		austenitic Ni>8%/Cr 18-20%	180		16-80		
N	Al-alloy			14-220	16-600	16-600	
	Copper and brass alloys			14-220	14-700	14-700	
S	Heat resistant alloy	NiFe				18-75	18-75
		NiCo				18-40	18-40

* v_c is depending on the bore diameter and therefore of the maximum numbers of revolutions of the machine.

Nominal cutting speeds with HORN grades

Material			Hardness Brinell (HB)	* Cutting speed v_c (ft/min)			
				MG12	TN35	TI25	TF45 / TA45 / TH35
P	Carbon steel. unalloyed	C < 0.4%	125	45-360	45-590	45-590	45-590
		C > 0.4% < 0.6%	150	45-360	45-590	45-590	45-590
		C > 0.6% < 0.8%	200	45-360	45-590	45-590	45-590
	low alloyed steel	annealed	180	50-295	50-490	50-490	
		quenched	275	50-295	50-490	50-490	
		quenched	160	50-295	50-490	50-490	
	high alloyed steel	annealed	200		60-295	60-295	
		quenched	325		60-295	60-295	
	Cast steel	unalloyed	180	60-360	60-590	60-590	
		low alloyed	200	60-360	60-590	60-590	
		high alloyed	225	60-360	60-590	60-590	
M	Stainless steel	martensitic, ferritic. annealed	200		60-295	60-295	
		austenitic Ni>8%/Cr 18-20%	180		50-260		
N	Al-alloy			45-720	50-1970	50-1970	
	Copper and brass alloys			45-720	45-2295	45-2295	
S	Heat resistant alloy	NiFe				60-245	60-245
		NiCo				60-130	60-130

* v_c is depending on the bore diameter and therefore of the maximum numbers of revolutions of the machine.