General Purpose+ Solid Carbide End Mills • Roughing/Finishing

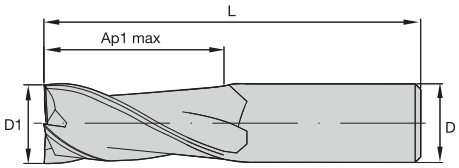
Application Data

NINA™ Solid Carbide Roughers and Finishers

NINA is the economic choice for high quality and high performance when regrinding isn't justified.

- Designed to minimize tool costs.
  - Shorter blanks and cut lengths.
- State-of-the-art substrate and coating enables vibration-free cutting.
- Different geometeries available for many applications.
- TICN/DCF/DCHP coating applicable in many materials.
- Short, compact design, great for shallow axial cuts.
- Excellent tool rigidity.
- Save expensive carbide material.

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiCN	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B248.

D1	D	length of cut Ap1 max	length L	UNCOATED - WW	TiCN - CW	TiAlN - RW
2,0	6	3,00	50	D00202002WW	–	D00202002RW
2,0	6	6,00	53	D01202002WW	–	D01202002RW
2,5	6	3,00	50	D00202502WW	–	D00202502RW
2,5	6	6,00	53	D01202502WW	D01202502CW	D01202502RW
2,8	6	7,00	57	D01202802WW	–	D01202802RW
3,0	6	4,00	50	D00203002WW	–	D00203002RW
3,0	6	7,00	57	D01203002WW	–	D01203002RW
3,5	6	4,00	50	D00203502WW	–	D00203502RW
3,5	6	7,00	57	D01203502WW	D01203502CW	D01203502RW
3,8	6	8,00	57	D01203802WW	D01203802CW	D01203802RW
4,0	6	5,00	54	D00204002WW	–	D00204002RW
4,0	6	8,00	57	D01204002WW	–	D01204002RW

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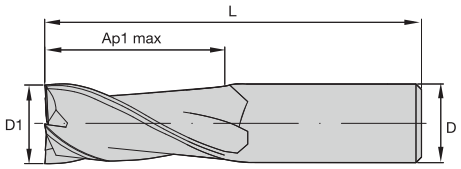


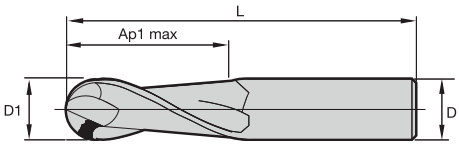
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiCN	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B248.

D1	D	length of cut Ap1 max	length L	UNCOATED - WW	TiCN - CW	TiAlN - RW
4,5	6	5,00	54	D00204502WW	–	D00204502RW
4,5	6	8,00	57	D01204502WW	–	D01204502RW
4,8	6	10,00	57	D01204802WW	–	D01204802RW
5,0	6	6,00	54	D00205002WW	–	D00205002RW
5,0	6	10,00	57	D01205002WW	D01205002CW	D01205002RW
5,5	6	7,00	54	D00205502WW	D00205502CW	–
5,5	6	10,00	57	D01205502WW	D01205502CW	D01205502RW
5,8	6	10,00	57	D01205752WW	–	D01205752RW
6,0	6	7,00	54	D00206002WW	–	D00206002RW
6,0	6	10,00	57	D01206002WW	–	D01206002RW
6,5	8	13,00	63	D01206503WW	D01206503CW	D01206503RW
6,8	8	13,00	63	D01206753WW	–	D01206753RW
7,0	8	8,00	58	D00207003WW	D00207003CW	D00207003RW
7,0	8	13,00	63	D01207003WW	–	D01207003RW
7,8	8	16,00	63	–	–	D01207753RW
8,0	8	9,00	58	D00208003WW	–	D00208003RW
8,0	8	16,00	63	D01208003WW	–	D01208003RW
8,7	10	16,00	72	–	–	D01208704RW
9,0	10	10,00	66	D00209004WW	–	D00209004RW
9,0	10	16,00	72	D01209004WW	–	D01209004RW
9,7	10	19,00	72	–	–	D01209704RW
10,0	10	11,00	66	D00210004WW	–	D00210004RW
10,0	10	19,00	72	D01210004WW	–	D01210004RW
11,7	12	22,00	83	–	–	D01211705RW
12,0	12	12,00	73	D00212005WW	D00212005CW	D00212005RW
12,0	12	22,00	83	–	–	D01212005RW
14,0	14	14,00	75	D00214014WW	D00214014CW	D00214014RW
14,0	14	22,00	83	–	–	D01214014RW
16,0	16	16,00	82	D00216006WW	–	D00216006RW
16,0	16	26,00	92	–	–	D01216006RW
18,0	18	18,00	84	–	D00218018CW	D00218018RW
20,0	20	20,00	92	D00220007WW	D00220007CW	D00220007RW
20,0	20	32,00	104	D01220007WW	–	D01220007RW

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

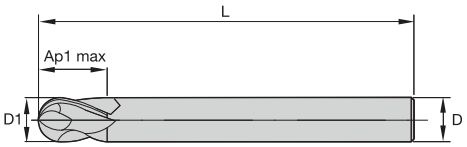
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B251.

D1	D	length of cut Ap1 max	length L	UNCOATED - WW	TiAlN - RW
3,0	6	4,00	50	D00103002WW	D00103002RW
3,0	6	7,00	57	D01103002WW	D01103002RW
4,0	6	5,00	54	D00104002WW	D00104002RW
4,0	6	8,00	57	D01104002WW	D01104002RW
5,0	6	6,00	54	D00105002WW	D00105002RW
5,0	6	10,00	57	D01105002WW	D01105002RW
6,0	6	7,00	54	D00106002WW	D00106002RW
6,0	6	10,00	57	D01106002WW	D01106002RW
8,0	8	9,00	58	D00108003WW	D00108003RW
8,0	8	16,00	63	D01108003WW	D01108003RW
10,0	10	11,00	66	D00110004WW	D00110004RW
10,0	10	19,00	72	D01110004WW	D01110004RW
12,0	12	12,00	73	D00112005WW	D00112005RW
12,0	12	22,00	83	D01112005WW	D01112005RW
14,0	14	14,00	75	D00114014WW	D00114014RW
14,0	14	22,00	83	D01114014WW	D01114014RW
16,0	16	16,00	82	D00116006WW	D00116006RW
16,0	16	26,00	92	–	D01116006RW
18,0	18	18,00	84	D00118018WW	D00118018RW
18,0	18	26,00	92	D01118018WW	D01118018RW
20,0	20	20,00	92	D00120007WW	D00120007RW
20,0	20	32,00	104	D01120007WW	D01120007RW

- Center cutting.
- For high-speed machining.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

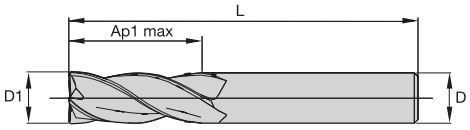
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
TiAlN	●	●	●	●	●	●	●	●	●	●	●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B252.

D1	D	length of cut Ap1 max	length L	TiAlN - RT
1,0	4	2,00	50	**D50101001RT**
2,0	6	4,00	50	**D50102002RT**
3,0	6	4,00	50	**D50103002RT**
4,0	6	5,00	54	**D50104002RT**
5,0	6	6,00	54	**D50105002RT**
6,0	6	7,00	54	**D50106002RT**
8,0	8	9,00	58	**D50108003RT**
10,0	10	11,00	66	**D50110004RT**
12,0	12	12,00	73	**D50112005RT**
16,0	16	16,00	82	**D50116006RT**
18,0	18	18,00	84	**D50118018RT**

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiCN	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B251.

D1	D	length of cut Ap1 max	length L	UNCOATED - WW	TiCN - CW	TiAlN - RW
2,0	6	3,00	50	D00302002WW	–	D00302002RW
2,0	6	6,00	53	D01302002WW	D01302002CW	D01302002RW
2,5	6	3,00	50	D00302502WW	–	D00302502RW
2,5	6	6,00	53	D01302502WW	D01302502CW	D01302502RW
3,0	6	4,00	50	D00303002WW	–	D00303002RW
3,0	6	7,00	57	D01303002WW	D01303002CW	D01303002RW
3,5	6	4,00	50	D00303502WW	–	D00303502RW
3,5	6	7,00	57	D01303502WW	–	D01303502RW
4,0	6	5,00	54	D00304002WW	–	D00304002RW
4,0	6	8,00	57	D01304002WW	D01304002CW	D01304002RW

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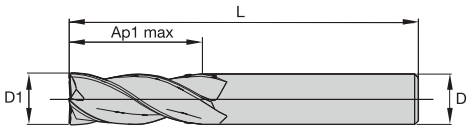


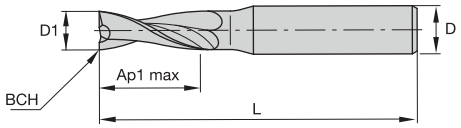
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiCN	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B251.

D1	D	length of cut Ap1 max	length L	UNCOATED - WW	TiCN - CW	TiAlN - RW
4,5	6	5,00	54	D00304502WW	–	D00304502RW
4,5	6	8,00	57	D01304502WW	D01304502CW	D01304502RW
5,0	6	6,00	54	D00305002WW	–	D00305002RW
5,0	6	10,00	57	D01305002WW	D01305002CW	D01305002RW
5,5	6	7,00	54	D00305502WW	–	D00305502RW
5,5	6	10,00	57	D01305502WW	–	D01305502RW
6,0	6	7,00	54	D00306002WW	–	D00306002RW
6,0	6	10,00	57	D01306002WW	D01306002CW	D01306002RW
6,5	8	13,00	63	D01306503WW	D01306503CW	D01306503RW
7,0	8	8,00	58	D00307003WW	–	D00307003RW
7,0	8	13,00	63	D01307003WW	D01307003CW	D01307003RW
8,0	8	9,00	58	D00308003WW	–	D00308003RW
8,0	8	16,00	63	D01308003WW	D01308003CW	D01308003RW
9,0	10	10,00	66	D00309004WW	–	D00309004RW
9,0	10	16,00	72	D01309004WW	–	–
10,0	10	11,00	66	D00310004WW	–	D00310004RW
10,0	10	19,00	72	D01310004WW	D01310004CW	D01310004RW
12,0	12	12,00	73	D00312005WW	–	D00312005RW
12,0	12	22,00	83	D01312005WW	D01312005CW	D01312005RW
14,0	14	14,00	75	D00314014WW	–	D00314014RW
14,0	14	22,00	83	–	–	D01314014RW
16,0	16	16,00	82	D00316006WW	–	D00316006RW
16,0	16	26,00	92	D01316006WW	D01316006CW	D01316006RW
18,0	18	18,00	84	D00318018WW	–	D00318018RW
20,0	20	20,00	92	D00320007WW	D00320007CW	D00320007RW
20,0	20	32,00	104	D01320007WW	D01320007CW	D01320007RW

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance h10 + / -	D	Tolerance h6 + / -
≤ 3	0 / 0,04	≤ 3	0 / 0,006
> 3 to 6	0 / 0,048	> 3 to 6	0 / 0,008
> 6 to 10	0 / 0,058	> 6 to 10	0 / 0,009
> 10 to 18	0 / 0,070	> 10 to 18	0 / 0,011
> 18 to 30	0 / 0,084	> 18 to 30	0 / 0,013

	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B254.

D1	D	length of cut Ap1 max	length L	BCH	K30F UNCOATED - ..	K30F-DCF TiAlN - LT	K30F UNCOATED - WW	K30F-DCF TiAlN - LW
2,0	6	3,00	50	0,10	022861-000020	422861-000020	022809-000020	422809-000020
2,0	6	6,00	57	0,10	022862-000020	422862-000020	022810-000020	422810-000020
2,5	6	3,00	50	0,10	022861-000025	422861-000025	022809-000025	422809-000025
2,5	6	7,00	57	0,10	022862-000025	422862-000025	022810-000025	422810-000025
3,0	6	4,00	50	0,10	022861-000030	422861-000030	022809-000030	422809-000030
3,0	6	7,00	57	0,10	022862-000030	422862-000030	022810-000030	422810-000030
3,5	6	4,00	50	0,10	022861-000035	422861-000035	022809-000035	422809-000035
3,5	6	7,00	57	0,10	022862-000035	422862-000035	022810-000035	422810-000035
4,0	6	5,00	54	0,10	022861-000040	422861-000040	022809-000040	422809-000040
4,0	6	8,00	57	0,10	022862-000040	422862-000040	022810-000040	422810-000040
4,5	6	5,00	54	0,10	022861-000045	422861-000045	022809-000045	422809-000045
4,5	6	8,00	57	0,10	022862-000045	422862-000045	022810-000045	422810-000045
5,0	6	6,00	54	0,10	022861-000050	422861-000050	022809-000050	422809-000050
5,0	6	10,00	57	0,10	022862-000050	422862-000050	022810-000050	422810-000050
5,5	6	7,00	54	0,10	022861-000055	422861-000055	022809-000055	422809-000055
5,5	6	10,00	57	0,10	022862-000055	422862-000055	022810-000055	422810-000055

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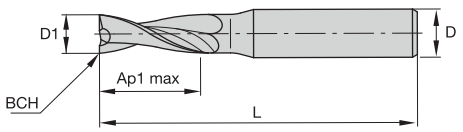


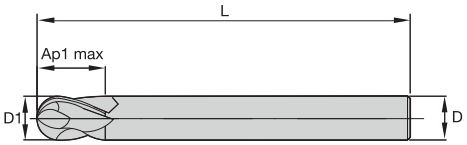
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B254.

D1	D	length of cut Ap1 max	length L	BCH	K30F UNCOATED - ..	K30F-DCF TiAlN - LT	K30F UNCOATED - WW	K30F-DCF TiAlN - LW
6,0	6	7,00	54	0,10	022861-000060	422861-000060	022809-000060	422809-000060
6,0	6	10,00	57	0,10	022862-000060	422862-000060	022810-000060	422810-000060
6,5	8	8,00	58	0,10	022861-000065	422861-000065	022809-000065	422809-000065
6,5	8	13,00	63	0,10	022862-000065	422862-000065	022810-000065	422810-000065
7,0	8	8,00	58	0,20	022861-000070	422861-000070	022809-000070	422809-000070
7,0	8	13,00	63	0,20	022862-000070	422862-000070	022810-000070	422810-000070
7,5	8	9,00	58	0,20	022861-000075	422861-000075	022809-000075	422809-000075
7,5	8	16,00	63	0,20	022862-000075	422862-000075	022810-000075	422810-000075
8,0	8	9,00	58	0,20	022861-000080	422861-000080	022809-000080	422809-000080
8,0	8	16,00	63	0,20	022862-000080	422862-000080	022810-000080	422810-000080
8,5	10	10,00	66	0,20	022861-000085	422861-000085	022809-000085	422809-000085
8,5	10	16,00	72	0,20	022862-000085	422862-000085	022810-000085	422810-000085
9,0	10	10,00	66	0,20	022861-000090	422861-000090	022809-000090	422809-000090
9,0	10	16,00	72	0,20	022862-000090	422862-000090	022810-000090	422810-000090
9,5	10	11,00	66	0,20	022861-000095	422861-000095	022809-000095	422809-000095
9,5	10	19,00	72	0,20	022862-000095	422862-000095	022810-000095	422810-000095
10,0	10	11,00	66	0,30	022861-000100	422861-000100	022809-000100	422809-000100
10,0	10	19,00	72	0,30	022862-000100	422862-000100	022810-000100	422810-000100
11,0	12	12,00	73	0,30	022861-000110	422861-000110	022809-000110	422809-000110
11,0	12	22,00	83	0,30	022862-000110	422862-000110	022810-000110	422810-000110
12,0	12	12,00	73	0,30	022861-000120	422861-000120	022809-000120	422809-000120
12,0	12	22,00	83	0,30	022862-000120	422862-000120	022810-000120	422810-000120
13,0	14	14,00	75	0,30	022861-000130	422861-000130	022809-000130	422809-000130
13,0	14	22,00	83	0,30	022862-000130	422862-000130	022810-000130	422810-000130
14,0	14	14,00	75	0,30	022861-000140	422861-000140	022809-000140	422809-000140
14,0	14	22,00	83	0,30	022862-000140	422862-000140	022810-000140	422810-000140
15,0	16	16,00	82	0,30	022861-000150	422861-000150	022809-000150	422809-000150
15,0	16	26,00	92	0,30	022862-000150	422862-000150	022810-000150	422810-000150
16,0	16	16,00	82	0,40	022861-000160	422861-000160	022809-000160	422809-000160
16,0	16	26,00	92	0,40	022862-000160	422862-000160	022810-000160	422810-000160
18,0	18	18,00	84	0,40	022861-000180	422861-000180	022809-000180	422809-000180
18,0	18	26,00	92	0,40	022862-000180	422862-000180	022810-000180	422810-000180
20,0	20	20,00	92	0,40	022861-000200	422861-000200	022809-000200	422809-000200
20,0	20	32,00	104	0,40	022862-000200	422862-000200	022810-000200	422810-000200

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

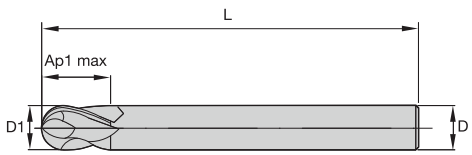
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
TiAlN	●	●	●	●	●	●	●	●	●	●	●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B256.

D1	D	length of cut Ap1 max	length L	TiAlN - RW
3,0	6	7,00	57	**D00903002RW**
4,0	6	8,00	57	**D00904002RW**
5,0	6	10,00	57	**D00905002RW**
6,0	6	10,00	57	**D00906002RW**
8,0	8	16,00	63	**D00908003RW**
10,0	10	19,00	72	**D00910004RW**
12,0	12	22,00	83	**D00912005RW**
14,0	14	22,00	83	**D00914014RW**
18,0	18	26,00	92	**D00918018RW**

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

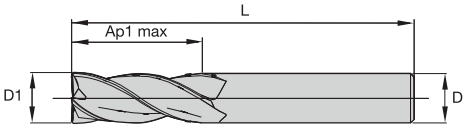
	P						M			K			S				H
	1	2	3	4	5	6	1	2	3	1	2	3	1	2	3	4	1
TiAlN	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B256.

D1	D	length of cut Ap1 max	length L	TiAlN - LW
3,0	6	7,00	57	**DC1903002LW**
4,0	6	8,00	57	**DC1904002LW**
5,0	6	10,00	57	**DC1905002LW**
6,0	6	10,00	57	**DC1906002LW**
8,0	8	16,00	63	**DC1908003LW**
10,0	10	19,00	72	**DC1910004LW**
12,0	12	22,00	83	**DC1912005LW**
14,0	14	22,00	83	**DC1914014LW**
16,0	16	26,00	92	**DC1916006LW**
18,0	18	26,00	92	**DC1918018LW**
20,0	20	32,00	104	**DC1920007LW**

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

	P				M		K	
	1	2	3	4	1	2	1	2
Uncoated	●	●						
TiCN	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B257.

D1	D	length of cut Ap1 max	length L	UNCOATED - WW	TiCN - CW	TiAlN - RW
2,0	6	4,00	50	D00402002WW	D00402002CW	D00402002RW
2,0	6	7,00	53	D01402002WW	D01402002CW	D01402002RW
2,5	6	4,00	50	D00402502WW	D00402502CW	D00402502RW
2,5	6	7,00	53	D01402502WW	D01402502CW	D01402502RW
3,0	6	5,00	50	D00403002WW	D00403002CW	D00403002RW
3,0	6	8,00	57	D01403002WW	D01403002CW	D01403002RW
3,5	6	6,00	50	D00403502WW	D00403502CW	D00403502RW
3,5	6	10,00	57	D01403502WW	D01403502CW	D01403502RW
4,0	6	8,00	54	D00404002WW	D00404002CW	D00404002RW
4,0	6	11,00	57	D01404002WW	D01404002CW	D01404002RW
4,5	6	8,00	54	D00404502WW	–	D00404502RW
4,5	6	11,00	57	D01404502WW	–	D01404502RW

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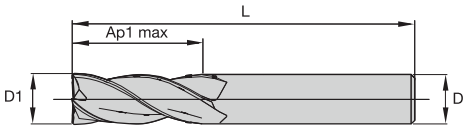


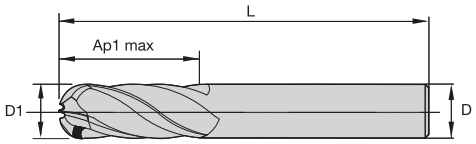
	P				M		K	
	1	2	3	4	1	2	1	2
Uncoated	●	●						
TiCN	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B257.

D1	D	length of cut Ap1 max	length L	UNCOATED - WW	TiCN - CW	TiAlN - RW
5,0	6	9,00	54	D00405002WW	D00405002CW	D00405002RW
5,0	6	13,00	57	D01405002WW	D01405002CW	D01405002RW
5,5	6	10,00	54	D00405502WW	D00405502CW	D00405502RW
5,5	6	13,00	57	D01405502WW	–	D01405502RW
6,0	6	10,00	54	D00406002WW	D00406002CW	D00406002RW
6,0	6	13,00	57	D01406002WW	D01406002CW	D01406002RW
6,5	8	16,00	63	D01406503WW	D01406503CW	D01406503RW
7,0	8	11,00	58	D00407003WW	D00407003CW	D00407003RW
7,0	8	16,00	63	D01407003WW	D01407003CW	D01407003RW
8,0	8	12,00	58	D00408003WW	D00408003CW	D00408003RW
8,0	8	19,00	63	D01408003WW	D01408003CW	D01408003RW
9,0	10	13,00	66	D00409004WW	D00409004CW	D00409004RW
9,0	10	19,00	72	D01409004WW	D01409004CW	D01409004RW
10,0	10	14,00	66	D00410004WW	D00410004CW	D00410004RW
10,0	10	22,00	72	D01410004WW	D01410004CW	D01410004RW
12,0	12	16,00	73	D00412005WW	D00412005CW	D00412005RW
12,0	12	26,00	83	D01412005WW	D01412005CW	D01412005RW
14,0	14	18,00	75	–	D00414014CW	D00414014RW
14,0	14	26,00	83	D01414014WW	D01414014CW	D01414014RW
16,0	16	22,00	82	D00416006WW	D00416006CW	D00416006RW
16,0	16	32,00	92	D01416006WW	D01416006CW	D01416006RW
18,0	18	24,00	84	D00418018WW	–	D00418018RW
18,0	18	32,00	92	D01418018WW	D01418018CW	D01418018RW
20,0	20	26,00	92	D00420007WW	D00420007CW	D00420007RW
20,0	20	38,00	104	D01420007WW	D01420007CW	D01420007RW
25,0	25	45,00	121	D01425008WW	D01425008CW	D01425008RW

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B260.

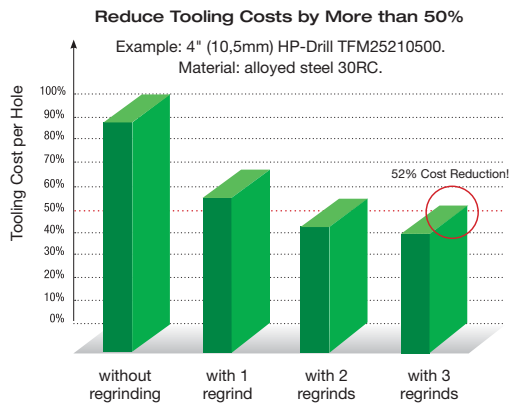
D1	D	length of cut Ap1 max	length L	UNCOATED - WW	TiAlN - RW
3,0	6	5,00	50	D00003002WW	D00003002RW
3,0	6	8,00	57	D01003002WW	D01003002RW
4,0	6	8,00	54	D00004002WW	D00004002RW
4,0	6	11,00	57	D01004002WW	D01004002RW
5,0	6	9,00	54	D00005002WW	D00005002RW
5,0	6	13,00	57	D01005002WW	D01005002RW
6,0	6	10,00	54	D00006002WW	D00006002RW
6,0	6	13,00	57	D01006002WW	D01006002RW
8,0	8	12,00	58	D00008003WW	D00008003RW
8,0	8	19,00	63	D01008003WW	D01008003RW
10,0	10	14,00	66	–	D00010004RW
10,0	10	22,00	72	D01010004WW	D01010004RW
12,0	12	16,00	73	–	D00012005RW
12,0	12	26,00	83	D01012005WW	D01012005RW
14,0	14	26,00	83	D01014014WW	D01014014RW
16,0	16	22,00	82	–	D00016006RW
16,0	16	32,00	92	D01016006WW	D01016006RW
18,0	18	32,00	92	D01018018WW	–
20,0	20	26,00	92	D00020007WW	D00020007RW
20,0	20	38,00	104	D01020007WW	D01020007RW

Anyone Can Regrind Your Tools — Only We Can Truly Recondition Them.

Why recondition?

Our Reconditioning Services help optimize the total value of your metalcutting tools throughout their entire life cycle by giving them “like-new” performance characteristics — with rapid turnaround time — so the tools you need are always on-hand and perform just like new.

By sending your worn drills and end mills for reconditioning, you will get:



- Proprietary geometry.
- Certified coatings.
- Superior quality.
- Like-new performance.
- Fast turnaround time.
- Application support throughout the entire tool life cycle.

Tools can often be reconditioned up to five times.

Reconditioning Services make perfect sense

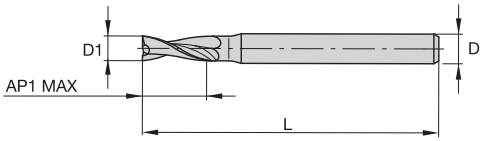
Our Reconditioning Services deliver considerable savings throughout the life of your cutting tools and can reduce your overall tooling costs by more than 50%.

How does it work?

Contact your Authorized Distributor to get started.

For facilities, or to find the nearest Distributor, visit www.widia.com.

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

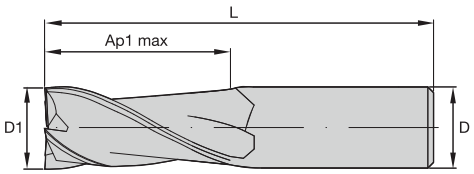
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B261.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiAlN - RT
0,4	3	1,50	38	**463200400..**	**463200400RT**
0,5	3	1,50	38	**463200500..**	**463200500RT**
0,6	3	1,50	38	**463200600..**	**463200600RT**
0,8	3	1,50	38	**463200800..**	**463200800RT**
1,0	3	2,00	38	**463201000..**	**463201000RT**
1,5	3	2,00	38	**463201500..**	**463201500RT**

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiCN	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B264.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiCN - CT	TiAlN - RT
1,0	3	4,00	38	400201000..	400201000CT	400201000RT
1,5	3	4,00	38	400201500..	400201500CT	400201500RT
2,0	3	6,30	38	400202000..	400202000CT	400202000RT
2,5	3	6,30	38	400202500..	400202500CT	400202500RT
3,0	3	9,50	38	400203000..	400203000CT	400203000RT
3,0	3	19,00	63	401203000..	401203000CT	401203000RT
3,0	3	25,00	75	402203000..	–	402203000RT
3,5	4	12,00	50	400203501..	400203501CT	400203501RT
4,0	4	12,00	50	400204001..	400204001CT	400204001RT
4,0	4	19,00	63	401204001..	–	401204001RT
4,0	4	31,00	75	402204001..	402204001CT	402204001RT
4,5	6	14,00	50	400204502..	400204502CT	400204502RT
5,0	6	14,00	50	400205002..	400205002CT	400205002RT
5,0	5	20,00	63	401205001..	–	401205001RT
5,0	5	31,00	100	402205001..	–	402205001RT
5,5	6	14,00	50	400205502..	400205502CT	400205502RT
6,0	6	16,00	50	400206002..	400206002CT	400206002RT
6,0	6	28,00	76	401206002..	401206002CT	401206002RT
6,0	6	38,00	100	402206002..	–	402206002RT
7,0	7	20,00	63	400207003..	–	400207003RT
8,0	8	20,00	63	400208003..	400208003CT	400208003RT
8,0	8	28,00	76	401208003..	–	401208003RT

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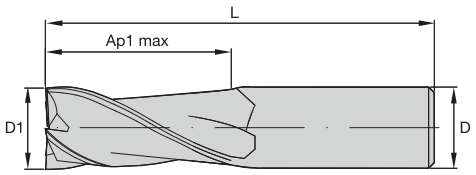


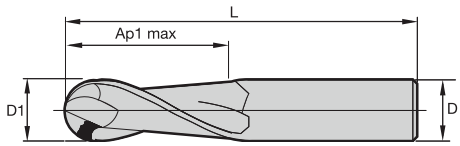
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiCN	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B264.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiCN - CT	TiAlN - RT
8,0	8	41,00	100	**402208003..**	**–**	**402208003RT**
9,0	9	20,00	63	**400209004..**	**–**	**400209004RT**
10,0	10	22,00	76	**400210004..**	**400210004CT**	**400210004RT**
10,0	10	32,00	89	**401210004..**	**–**	**401210004RT**
10,0	10	45,00	100	**402210004..**	**–**	**402210004RT**
11,0	11	25,00	76	**400211005..**	**400211005CT**	**400211005RT**
12,0	12	25,00	76	**400212005..**	**400212005CT**	**400212005RT**
12,0	12	45,00	100	**401212005..**	**–**	**401212005RT**
12,0	12	75,00	150	**402212005..**	**–**	**402212005RT**
14,0	14	32,00	83	**400214014..**	**400214014CT**	**400214014RT**
14,0	14	50,00	100	**401214014..**	**401214014CT**	**401214014RT**
14,0	14	75,00	150	**402214014..**	**–**	**402214014RT**
16,0	16	32,00	89	**400216006..**	**–**	**400216006RT**
16,0	16	56,00	110	**401216006..**	**401216006CT**	**401216006RT**
16,0	16	75,00	150	**402216006..**	**402216006CT**	**–**
18,0	18	38,00	100	**400218007..**	**400218007CT**	**400218007RT**
18,0	18	60,00	125	**401218018..**	**–**	**–**
18,0	18	75,00	150	**402218018..**	**–**	**402218018RT**
20,0	20	38,00	104	**400220007..**	**400220007CT**	**400220007RT**
20,0	20	56,00	125	**401220007..**	**401220007CT**	**–**
20,0	20	75,00	150	**402220007..**	**–**	**402220007RT**
25,0	25	62,00	140	**–**	**–**	**401225008RT**

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

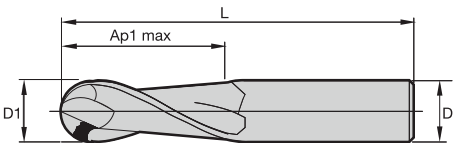
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiCN	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

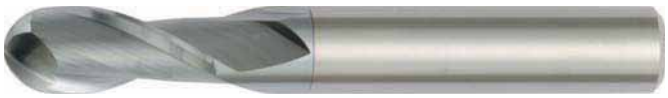
P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B264.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiCN - CT	TiAlN - RT
1,0	3	2,00	38	**465101000..**	**465101000CT**	**465101000RT**
1,2	3	2,00	38	**465101200..**	**465101200CT**	**465101200RT**
1,5	3	2,00	38	**465101500..**	**465101500CT**	**465101500RT**
1,8	3	2,00	38	**–**	**465101800CT**	**465101800RT**
2,0	3	2,00	38	**465102000..**	**465102000CT**	**465102000RT**

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.





End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see pages B265–B266.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiAlN - RT
1,0	3	4,00	38	400101000..	400101000RT
1,5	3	5,00	38	400101500..	400101500RT
2,0	3	6,30	38	400102000..	400102000RT
3,0	3	9,50	38	400103002..	400103002RT
3,0	3	25,00	75	402103000..	402103000RT
4,0	4	12,00	50	400104002..	400104002RT
4,0	4	19,00	63	401104001..	401104001RT
4,0	4	31,00	75	402104001..	402104001RT
5,0	5	20,00	63	401105001..	401105001RT
5,0	5	31,00	100	402105001..	402105001RT
5,0	6	14,00	50	400105002..	400105002RT
6,0	6	16,00	50	400106002..	400106002RT
6,0	6	28,00	76	401106002..	401106002RT
6,0	6	38,00	100	402106002..	402106002RT
8,0	8	20,00	63	400108003..	400108003RT
8,0	8	28,00	76	401108003..	401108003RT
8,0	8	41,00	100	402108003..	402108003RT
10,0	10	22,00	76	400110004..	400110004RT
10,0	10	32,00	89	401110004..	401110004RT
10,0	10	45,00	100	402110004..	402110004RT
12,0	12	25,00	76	400112005..	400112005RT
12,0	12	45,00	100	401112005..	401112005RT

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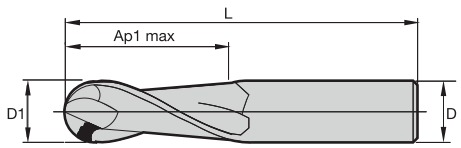
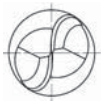


	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see pages B265–B266.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiAlN - RT
12,0	12	75,00	150	–	**402112005RT**
14,0	14	32,00	83	**400114014..**	**400114014RT**
14,0	14	50,00	100	**401114014..**	–
14,0	14	75,00	150	**402114014..**	**402114014RT**
16,0	16	32,00	89	**400116006..**	**400116006RT**
16,0	16	56,00	110	**401116006..**	–
16,0	16	75,00	150	–	**402116006RT**
18,0	18	75,00	150	–	**402118018RT**
20,0	20	38,00	104	**400120007..**	**400120007RT**
20,0	20	56,00	125	**401120007..**	**401120007RT**
20,0	20	75,00	150	–	**402120007RT**

End Mills	fine finishing	finishing	roughing	slot milling	plunging	contour milling
end mill Z= 1 	○	○	●	●	●	○
end mill Z= 2 	○	○	◑	●	●	○
end mill Z= 3 	○	◑	◑	●	◑	○
end mill Z= 4/5 	◑	●	●	● VariMill™ only	○	○
multi-flute cutter Z= 6–8 	●	●	○	○	○	○
Ball Nose and Torus End Mills						
ball nose end mill Z= 2 				●		●
ball nose end mill Z= 4 				◑		●

● first choice

◑ suitable with limitations

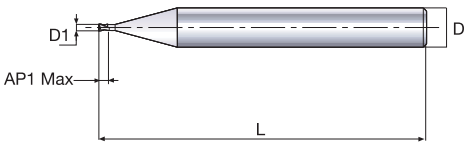
○ not recommended

Always select a tool with the shortest possible flute length whenever possible. This will increase the stability of the tool and give the best results.

When selecting an end mill, the following machining factors will affect your selection of the correct end mill for your application:

1. Tool overhang.
2. Coolant flow.
3. Machine and setup stability.
4. Machine power and torque.
5. Material to be machined.
6. Machine adapter size (CV40, CV50, HSK63, etc.).
7. See “Selecting the Best Tool” on pages B4–B15.

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

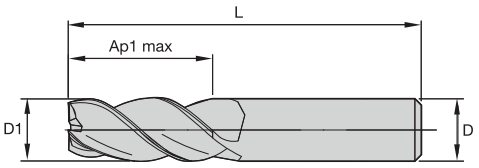
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B267.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiAlN - RT
0,4	3	1,50	38	463300400..	463300400RT
0,5	3	1,50	38	463300500..	463300500RT
0,6	3	1,50	38	463300600..	463300600RT
0,8	3	1,50	38	463300800..	463300800RT
1,0	3	2,00	38	463301000..	463301000RT
1,2	3	2,00	38	463301200..	463301200RT
1,5	3	2,00	38	463301500..	463301500RT
1,8	3	2,00	38	463301800..	463301800RT

- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiCN	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see pages B267–B268.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiCN - CT	TiAlN - RT
1,0	3	4,00	38	400301000..	400301000CT	400301000RT
1,5	3	4,00	38	400301500..	400301500CT	400301500RT
2,0	3	6,30	38	400302000..	400302000CT	400302000RT
2,5	3	6,30	38	400302500..	400302500CT	400302500RT
3,0	3	9,50	38	400303000..	400303000CT	400303000RT
3,0	3	19,00	63	401303000..	–	401303000RT
3,5	4	12,00	50	400303501..	400303501CT	400303501RT
4,0	4	12,00	50	400304001..	400304001CT	400304001RT
4,0	4	19,00	63	401304001..	–	401304001RT
4,5	6	14,00	50	400304502..	400304502CT	400304502RT
5,0	6	14,00	50	400305002..	–400305002CT	400305002RT
5,0	5	20,00	63	401305001..		401305001RT
6,0	6	16,00	50	400306002..	400306002CT	400306002RT
6,0	6	28,00	76	401306002..	–	401306002RT
7,0	7	20,00	63	400307003..	400307003CT	400307003RT
8,0	8	20,00	63	400308003..	400308003CT	400308003RT
8,0	8	28,00	76	401308003..	–	401308003RT
9,0	9	20,00	63	400309004..	400309004CT	400309004RT

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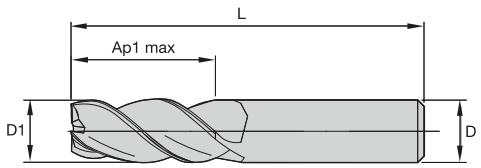

	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiCN	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see pages B267–B268.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiCN - CT	TiAlN - RT
10,0	10	22,00	76	400310004..	400310004CT	400310004RT
10,0	10	32,00	89	401310004..	–	401310004RT
11,0	11	25,00	76	400311005..	400311005CT	400311005RT
12,0	12	25,00	76	400312005..	400312005CT	400312005RT
12,0	12	45,00	100	401312005..	–	401312005RT
14,0	14	32,00	83	400314014..	400314014CT	400314014RT
16,0	16	32,00	89	400316006..	–	400316006RT
16,0	16	56,00	110	401316006..	–	401316006RT
18,0	18	38,00	100	400318007..	400318007CT	400318007RT
20,0	20	38,00	104	400320007..	–	400320007RT
20,0	20	56,00	125	401320007..	401320007CT	401320007RT
25,0	25	62,00	140	–	401325008CT	401325008RT

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	Fax:	80889297
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	Fax:	0805540029
Germany	**Phone:**	**0800 1015774**
	Fax:	0800 0007531
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	Fax:	020790477
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	Fax:	0800 028 5721

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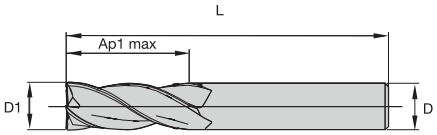
- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

	P				M		K	
	1	2	3	4	1	2	1	2
Uncoated	●	●						
TiCN	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●

P - Steels
M - Stainless Steels
K - Cast Iron
N - Non-Ferrous
S - High-Temp Alloys
H - Hard Materials

For material descriptions, see Inside Back Cover.
For application data, sees pages B269–B270.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiCN - CT	TiAlN - RT
1,0	3	4,00	38	400401000..	400401000CT	400401000RT
1,5	3	4,00	38	400401500..	400401500CT	400401500RT
2,0	3	6,30	38	400402000..	400402000CT	400402000RT
2,5	3	6,30	38	400402500..	400402500CT	400402500RT
3,0	3	9,50	38	400403000..	400403000CT	400403000RT
3,0	3	19,00	63	401403000..	401403000CT	401403000RT
3,0	3	25,00	75	402403000..	–	402403000RT
3,5	4	12,00	50	400403501..	400403501CT	400403501RT
4,0	4	12,00	50	400404001..	400404001CT	400404001RT
4,0	4	19,00	63	401404001..	401404001CT	401404001RT
4,0	4	31,00	75	402404001..	–	402404001RT
4,5	6	14,00	50	400404502..	400404502CT	400404502RT
5,0	5	14,00	50	400405001..	400405001CT	400405001RT
5,0	6	14,00	50	400405002..	400405002CT	400405002RT
5,0	5	20,00	63	401405001..	401405001CT	401405001RT
5,0	5	31,00	100	402405001..	402405001CT	402405001RT
5,5	6	14,00	50	400405502..	400405502CT	400405502RT
6,0	6	16,00	50	400406002..	400406002CT	400406002RT
6,0	6	28,00	76	401406002..	401406002CT	401406002RT
6,0	6	38,00	100	402406002..	–	402406002RT

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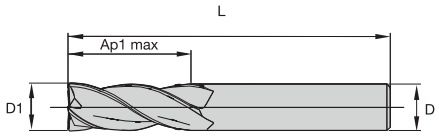
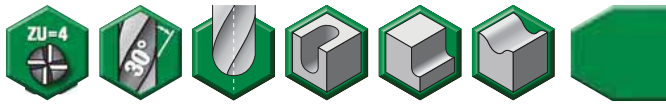


	P				M		K	
	1	2	3	4	1	2	1	2
Uncoated	●	●						
TiCN	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●

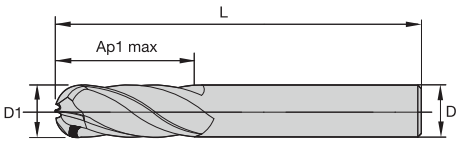
P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, sees pages B269–B270.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiCN - CT	TiAlN - RT
7,0	7	20,00	63	400407003..	400407003CT	400407003RT
8,0	8	20,00	63	400408003..	400408003CT	400408003RT
8,0	8	28,00	76	401408003..	401408003CT	401408003RT
8,0	8	41,00	100	402408003..	–	402408003RT
9,0	9	20,00	63	400409004..	–	400409004RT
10,0	10	22,00	76	400410004..	400410004CT	400410004RT
10,0	10	32,00	89	401410004..	401410004CT	401410004RT
10,0	10	45,00	100	402410004..	–	402410004RT
11,0	11	25,00	76	400411005..	400411005CT	400411005RT
12,0	12	25,00	76	400412005..	400412005CT	400412005RT
12,0	12	45,00	100	401412005..	401412005CT	401412005RT
12,0	12	75,00	150	402412005..	–	402412005RT
14,0	14	32,00	83	400414014..	–	400414014RT
14,0	14	50,00	100	401414014..	–	401414014RT
14,0	14	75,00	150	402414014..	–	402414014RT
16,0	16	32,00	89	400416006..	400416006CT	400416006RT
16,0	16	56,00	110	401416006..	401416006CT	401416006RT
16,0	16	75,00	150	402416006..	402416006CT	402416006RT
18,0	18	38,00	100	400418007..	400418007CT	400418007RT
18,0	18	60,00	125	401418018..	401418018CT	401418018RT
18,0	18	75,00	150	402418018..	402418018CT	402418018RT
20,0	20	38,00	104	400420007..	400420007CT	400420007RT
20,0	20	56,00	125	401420007..	401420007CT	401420007RT
20,0	20	75,00	150	402420007..	402420007CT	402420007RT
25,0	25	62,00	140	401425008..	401425008CT	401425008RT



- Center cutting.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance e8	D	Tolerance h6 + / -
≤ 3	-0,014 / -0,028	≤ 3	0 / 0,006
> 3 to 6	-0,020 / -0,038	> 3 to 6	0 / 0,008
> 6 to 10	-0,025 / -0,047	> 6 to 10	0 / 0,009
> 10 to 18	-0,032 / -0,059	> 10 to 18	0 / 0,011
> 18 to 30	-0,040 / -0,073	> 18 to 30	0 / 0,013

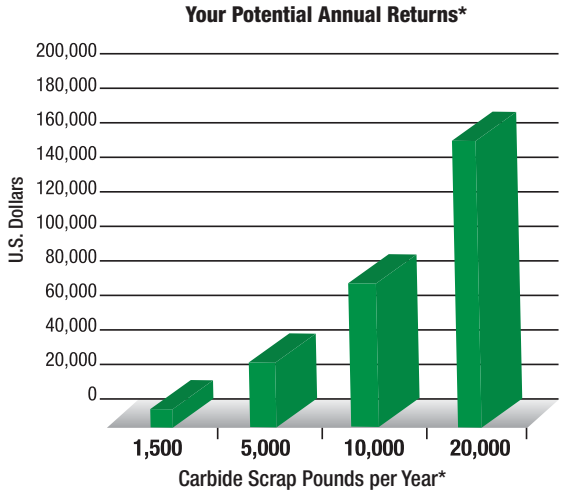
	P				M		K		N		
	1	2	3	4	1	2	1	2	1	2	5
Uncoated	●	●							●	●	●
TiCN	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●			●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B271.

D1	D	length of cut Ap1 max	length L	UNCOATED - ..	TiCN - CT	TiAlN - RT
3,0	3	9,50	38	400003002..	400003000CT	400003002RT
4,0	4	12,00	50	400004002..	400004002CT	400004002RT
4,0	4	19,00	63	401004001..	–	401004001RT
5,0	6	14,00	50	400005002..	400005002CT	400005002RT
5,0	5	20,00	63	401005001..	–	401005001RT
6,0	6	16,00	50	400006002..	400006002CT	400006002RT
6,0	6	28,00	76	401006002..	–	401006002RT
8,0	8	20,00	63	400008003..	400008003CT	400008003RT
8,0	8	28,00	76	401008003..	–	401008003RT
10,0	10	22,00	76	400010004..	400010004CT	400010004RT
10,0	10	32,00	89	401010004..	–	401010004RT
12,0	12	25,00	76	400012005..	400012005CT	400012005RT
12,0	12	45,00	100	401012005..	–	401012005RT
14,0	14	32,00	83	400014014..	400014014CT	400014014RT
14,0	14	50,00	100	401014014..	–	–
16,0	16	32,00	89	400016006..	400016006CT	400016006RT
18,0	18	38,00	100	400018007..	–	400018007RT
20,0	20	38,00	104	400020007..	–	400020007RT
20,0	20	56,00	125	401020007..	401020007CT	401020007RT

Get Cash or Credit for Your Used Carbide.



Actual returns may vary based on current market value for carbide recycled materials.

Why recycle?

It's the right thing to do!

It's easy for your company to be environmentally conscious with our Carbide Recycling Program.

By sending us your used carbide tools, you help preserve and protect the environment and ensure that these products are responsibly recycled.

It's profitable!

Not only does WIDIA-Hanita make it easy for your company to be environmentally conscious, we offer an added incentive — it is profitable.

Through our Carbide Recycling Program, get the full value of your investment in metalcutting tools, improve profitability, and reduce your overall tooling spend. When you send us your used carbide, we will reward you with cash or credit. (Credit offer valid in U.S.A. only.)

It's EASY!

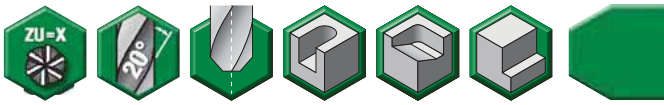
Our Carbide Recycling Program is available on the Web and is easy to use. You can request a quote, arrange to send us your used carbide, and check the status of your shipment. To find out more, please contact your Authorized Distributor.

Contact your local Distributor for more information.

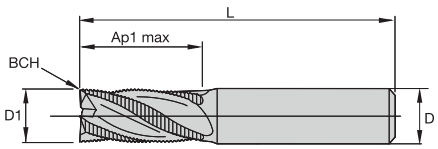
Green Boxes for Green Companies

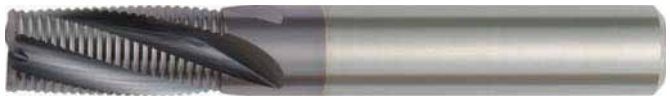
The Green Box™ program is a safe and efficient way for you to package and ship your spent carbide tools to an authorized recycling location.

Qualified used carbide includes: mixed coated and uncoated metalcutting tools free of chips, oil, and steel contamination. Material must be free of braze.



- Center cutting.
- Fine pitch.
- LW = Multi-layer.
- RW = Mono-layer.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.





End Mill Tolerances

D1	Tolerance d11	D	Tolerance h6 + / -
≤ 3	-0,020 / -0,080	≤ 3	0 / 0,006
> 3 to 6	-0,030 / -0,105	> 3 to 6	0 / 0,008
> 6 to 10	-0,040 / -0,130	> 6 to 10	0 / 0,009
> 10 to 18	-0,050 / -0,160	> 10 to 18	0 / 0,011
> 18 to 30	-0,065 / -0,195	> 18 to 30	0 / 0,013

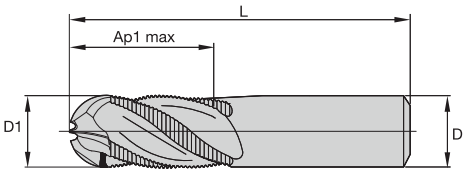
	P					M			K			N			S		H
	1	2	3	4	5	1	2	3	1	2	3	1	2	5	1	3	1
TiCN	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B274.

D1	D	length of cut Ap1 max	length L	BCH	Z U	TiAlN - RT	TiCN - CW	TiAlN - LW	TiAlN - RW
4,0	6	11,00	55	0,25	3	490604002RT	490604002CW	490604002LW	490604002RW
5,0	6	13,00	57	0,25	3	490605002RT	490605002CW	490605002LW	490605002RW
6,0	6	13,00	57	0,25	3	490606002RT	490606002CW	490606002LW	490606002RW
7,0	8	16,00	63	0,25	3	490607003RT	490607003CW	490607003LW	490607003RW
8,0	8	16,00	63	0,25	3	490608003RT	490608003CW	490608003LW	490608003RW
9,0	10	19,00	72	0,25	4	490609004RT	490609004CW	490609004LW	490609004RW
10,0	10	22,00	72	0,25	4	490610004RT	490610004CW	490610004LW	490610004RW
11,0	12	26,00	83	0,25	4	490611005RT	490611005CW	490611005LW	490611005RW
12,0	12	26,00	83	0,35	4	490612005RT	490612005CW	490612005LW	490612005RW
13,0	14	26,00	83	0,35	4	490613014RT	490613014CW	490613014LW	490613014RW
14,0	14	26,00	83	0,35	4	490614014RT	490614014CW	490614014LW	490614014RW
16,0	16	32,00	92	0,35	4	490616006RT	490616006CW	490616006LW	490616006RW
18,0	18	32,00	92	0,35	4	490618018RT	490618018CW	490618018LW	490618018RW
20,0	20	38,00	104	0,35	4	490620007RT	490620007CW	490620007LW	490620007RW
25,0	25	45,00	121	0,50	5	490625008RT	490625008CW	490625008LW	490625008RW

- Center cutting.
- Fine pitch.
- LW = Multi-layer.
- RW = Mono-layer.
- Standard items listed. Additional styles and coatings made to order.
- For information about Custom Solutions, see page B136.
- For information about Reconditioning Services, see page B220.



End Mill Tolerances

D1	Tolerance d11	D	Tolerance h6 + / -
≤ 3	-0,020 / -0,080	≤ 3	0 / 0,006
> 3 to 6	-0,030 / -0,105	> 3 to 6	0 / 0,008
> 6 to 10	-0,040 / -0,130	> 6 to 10	0 / 0,009
> 10 to 18	-0,050 / -0,160	> 10 to 18	0 / 0,011
> 18 to 30	-0,065 / -0,195	> 18 to 30	0 / 0,013

	P					M			K			N			S		H
	1	2	3	4	5	1	2	3	1	2	3	1	2	5	1	3	1
TiCN	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TiAlN	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●

P - Steels *K - Cast Iron* *S - High-Temp Alloys*
M - Stainless Steels *N - Non-Ferrous* *H - Hard Materials*

For material descriptions, see Inside Back Cover.
For application data, see page B274.

D1	D	length of cut Ap1 max	length L	Z U	TiCN - CW	TiAlN - LW	TiAlN - RW
5,0	6	13,00	57	3	**496605002CW**	**496605002LW**	**496605002RW**
6,0	6	13,00	57	3	**496606002CW**	**496606002LW**	**496606002RW**
8,0	8	16,00	63	3	**496608003CW**	**496608003LW**	**496608003RW**
10,0	10	22,00	72	4	**496610004CW**	**496610004LW**	**496610004RW**
12,0	12	26,00	83	4	**496612005CW**	**496612005LW**	**496612005RW**
14,0	14	26,00	83	4		**496614014LW**	**496614014RW**
16,0	16	32,00	92	4	**496616006CW**	**496616006LW**	**496616006RW**
18,0	18	32,00	92	4	**496618018CW**	–	–
20,0	20	38,00	104	4	**496620007CW**	–	**496620007RW**
25,0	25	45,00	121	4	**496625008CW**	–	**496625008RW**

Lists 423002 323002 423001 323001 • NINA

A

B

				K30F-TiCN TiCN			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.								
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	ap	Min		Max	Min		Max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0
P1	0,5 x D	0,1 x D	0,25 x D	120	-	160	150	-	200	Fz	0,0138	0,021	0,0284	0,036	0,0438	0,06	0,072	0,0828
P2	0,5 x D	0,1 x D	0,25 x D	112	-	152	140	-	190	Fz	0,0138	0,021	0,028	0,036	0,044	0,060	0,072	0,083
P3	0,5 x D	0,1 x D	0,25 x D	96	-	128	120	-	160	Fz	0,0113	0,017	0,023	0,030	0,036	0,050	0,061	0,070
P4	0,5 x D	0,1 x D	0,25 x D	72	-	120	90	-	150	Fz	0,01048	0,016	0,021	0,027	0,033	0,045	0,054	0,062
M1	0,5 x D	0,1 x D	0,25 x D	72	-	92	90	-	115	Fz	0,0113	0,017	0,023	0,030	0,036	0,050	0,061	0,070
M2	0,5 x D	0,1 x D	0,25 x D	48	-	64	60	-	80	Fz	0,0094	0,014	0,019	0,024	0,029	0,040	0,048	0,056
K1	0,5 x D	0,1 x D	0,25 x D	96	-	120	120	-	150	Fz	0,0138	0,021	0,028	0,036	0,044	0,060	0,072	0,083
K2	0,5 x D	0,1 x D	0,25 x D	88	-	104	110	-	130	Fz	0,0113	0,017	0,023	0,030	0,036	0,050	0,061	0,070
N1	0,5 x D	0,1 x D	0,25 x D	400	-	1600				Fz	0,02	0,030	0,040	0,050	0,060	0,080	0,100	0,120
N2	0,5 x D	0,1 x D	0,25 x D	400	-	1200				Fz	0,016	0,024	0,032	0,040	0,048	0,064	0,080	0,096
N5	0,5 x D	0,1 x D	0,25 x D	200	-	600	250	-	750	Fz	0,018	0,027	0,036	0,045	0,054	0,072	0,090	0,108

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 423004 423003 • NINA

A

B

				K30F-DCHP AlTiN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.					
				Cutting Speed Vc m/min				D1 - Diameter				
Group	ap	ae	ap	Min		Max	mm	4,0	6,0	8,0	10,0	12,0
P1	1,5 x D	0,5 x D	1 x D	180	-	220	Fz	0,030	0,050	0,060	0,070	0,072
P2	1,5 x D	0,5 x D	1 x D	160	-	200	Fz	0,030	0,050	0,060	0,070	0,072
P3	1,5 x D	0,5 x D	1 x D	160	-	180	Fz	0,025	0,040	0,050	0,060	0,070
P4	1,5 x D	0,5 x D	1 x D	140	-	160	Fz	0,023	0,036	0,045	0,054	0,063
M1	1,5 x D	0,5 x D	1 x D	90	-	115	Fz	0,025	0,040	0,050	0,060	0,065
M2	1,5 x D	0,5 x D	1 x D	60	-	80	Fz	0,020	0,030	0,040	0,050	0,060
K1	1,5 x D	0,5 x D	1 x D	120	-	150	Fz	0,030	0,050	0,060	0,070	0,080
K2	1,5 x D	0,5 x D	1 x D	110	-	130	Fz	0,025	0,040	0,050	0,060	0,070
K3	1,5 x D	0,5 x D	1 x D	100	-	130	Fz	0,020	0,030	0,040	0,050	0,060

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Lists 423048 423047 • NINA

A

B

K30F-DCHP
AlTiN

Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A).
For Slotting (B), reduce Fz by 20%.

				Cutting Speed Vc m/min				D1 - Diameter				
Group	ap	ae	ap	Min		Max	mm	4,0	6,0	8,0	10,0	12,0
P1	1 x D	0,1 x D	0,5 x D	150	-	200	Fz	0,028	0,044	0,060	0,072	0,083
P2	1 x D	0,1 x D	0,5 x D	140	-	190	Fz	0,028	0,044	0,060	0,072	0,083
P3	1 x D	0,1 x D	0,5 x D	120	-	160	Fz	0,023	0,036	0,050	0,061	0,070
P4	1 x D	0,1 x D	0,5 x D	90	-	150	Fz	0,021	0,033	0,045	0,054	0,062
M1	1 x D	0,1 x D	0,5 x D	90	-	115	Fz	0,023	0,036	0,050	0,061	0,070
M2	1 x D	0,1 x D	0,5 x D	60	-	80	Fz	0,019	0,029	0,040	0,048	0,056
K1	1 x D	0,1 x D	0,5 x D	120	-	150	Fz	0,028	0,044	0,060	0,072	0,083
K2	1 x D	0,1 x D	0,5 x D	110	-	130	Fz	0,023	0,036	0,050	0,061	0,070
N5	1 x D	0,1 x D	0,5 x D	250	-	750	Fz	0,036	0,054	0,072	0,090	0,108

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Lists 423039 423038 • NINA

A

K30F-DCHP
AlTiN

Recommended Feed Per Tooth (Fz=mm/th) for 3D Milling / Profiling.

			Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	Min		Max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0
P1	0,7 x D	0,25 x D	150	-	200	Fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083
P2	0,7 x D	0,25 x D	140	-	190	Fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083
P3	0,7 x D	0,25 x D	120	-	160	Fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070
P4	0,7 x D	0,25 x D	90	-	150	Fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062
M1	0,7 x D	0,25 x D	90	-	115	Fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070
M2	0,7 x D	0,25 x D	60	-	80	Fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056
K1	0,7 x D	0,25 x D	120	-	150	Fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083
K2	0,7 x D	0,25 x D	110	-	130	Fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070
N5	0,7 x D	0,25 x D	250	-	750	Fz	0,018	0,027	0,036	0,045	0,054	0,072	0,090	0,108

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Lists 423036 423037 • NINA

A

			K30F-DCF TiAlN			K30F-DCHP AlTiN			Recommended Feed Per Tooth (Fz=mm/th) for Chamfering (A).			
			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter		
Group	ap	ae	Min		Max	Min		Max	mm	6,0	8,0	10,0
P1	0,35 x D	0,35 x D	145	-	155	145	-	155	Fz	0,037	0,045	0,062
P2	0,35 x D	0,35 x D	135	-	145	135	-	145	Fz	0,037	0,045	0,062
P3	0,35 x D	0,35 x D	115	-	135	115	-	135	Fz	0,037	0,045	0,062
P4	0,35 x D	0,35 x D	105	-	115	105	-	115	Fz	0,037	0,045	0,062
P5	0,35 x D	0,35 x D	90	-	105	90	-	105	Fz	0,037	0,045	0,062
P6	0,35 x D	0,35 x D	25	-	35	25	-	35	Fz	0,028	0,035	0,048
M1	0,35 x D	0,35 x D	80	-	90	80	-	90	Fz	0,028	0,035	0,048
M2	0,35 x D	0,35 x D	70	-	80	70	-	80	Fz	0,028	0,035	0,048
M3	0,35 x D	0,35 x D	60	-	70	60	-	70	Fz	0,028	0,035	0,048
K1	0,35 x D	0,35 x D	180	-	205	180	-	205	Fz	0,037	0,045	0,062
K2	0,35 x D	0,35 x D	150	-	180	150	-	180	Fz	0,037	0,045	0,062
K3	0,35 x D	0,35 x D	130	-	150	130	-	150	Fz	0,037	0,045	0,062
N1	0,35 x D	0,35 x D	690	-	720	690	-	720	Fz	0,055	0,075	0,095
N2	0,35 x D	0,35 x D	750	-	780	750	-	780	Fz	0,055	0,075	0,095
N3	0,35 x D	0,35 x D	700	-	720	700	-	720	Fz	0,055	0,075	0,095
N4	0,35 x D	0,35 x D	150	-	165	150	-	165	Fz	0,055	0,075	0,095
N5	0,35 x D	0,35 x D	225	-	270	225	-	270	Fz	0,055	0,075	0,095
N6	0,35 x D	0,35 x D	230	-	255	230	-	255	Fz	0,055	0,075	0,095
S1	0,35 x D	0,35 x D	70	-	80	70	-	80	Fz	0,028	0,035	0,048
S2	0,35 x D	0,35 x D	60	-	70	60	-	70	Fz	0,028	0,035	0,048
S3	0,35 x D	0,35 x D	80	-	90	80	-	90	Fz	0,028	0,035	0,048
S4	0,35 x D	0,35 x D	60	-	75	60	-	75	Fz	0,028	0,035	0,048
H1	0,35 x D	0,35 x D	25	-	35	25	-	35	Fz	0,028	0,035	0,048

List D002

A

B

				Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P1	0,75 x D	0,1 x D	0,5 x D	75	-	100	120	-	160	150	-	200	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
P2	0,75 x D	0,1 x D	0,5 x D	70	-	95	112	-	152	140	-	190	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
P3	0,75 x D	0,1 x D	0,5 x D				96	-	128	120	-	160	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131
P4	0,75 x D	0,1 x D	0,5 x D				72	-	120	90	-	150	Fz	0,012	0,025	0,038	0,052	0,062	0,072	0,081	0,088	0,101	0,112
M1	0,75 x D	0,1 x D	0,5 x D				72	-	92	90	-	115	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131
M2	0,75 x D	0,1 x D	0,5 x D				48	-	64	60	-	80	Fz	0,011	0,022	0,034	0,046	0,056	0,065	0,073	0,080	0,093	0,105
K1	0,75 x D	0,1 x D	0,5 x D				96	-	120	120	-	150	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
K2	0,75 x D	0,1 x D	0,5 x D				88	-	104	110	-	130	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131
N1	0,75 x D	0,1 x D	0,5 x D	250	-	1000	400	-	1600				Fz	0,023	0,046	0,069	0,092	0,115	0,138	0,161	0,184	0,230	0,288
N2	0,75 x D	0,1 x D	0,5 x D	250	-	750	400	-	1200				Fz	0,018	0,037	0,055	0,074	0,092	0,110	0,129	0,147	0,184	0,230
N5	0,75 x D	0,1 x D	0,5 x D	125	-	375	200	-	600	250	-	750	Fz	0,021	0,041	0,062	0,083	0,104	0,124	0,145	0,166	0,207	0,259

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D012

A

B

				Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P1	1,25 x D	0,1 x D	0,5 x D	90	-	110	144	-	176	180	-	220	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P2	1,25 x D	0,1 x D	0,5 x D	80	-	100	128	-	160	160	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P3	1,25 x D	0,1 x D	0,5 x D				128	-	144	160	-	180	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
P4	1,25 x D	0,1 x D	0,5 x D				112	-	128	140	-	160	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088	0,098
M1	1,25 x D	0,1 x D	0,5 x D				72	-	92	90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
M2	1,25 x D	0,1 x D	0,5 x D				48	-	64	60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081	0,091
K1	1,25 x D	0,1 x D	0,5 x D				96	-	120	120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
K2	1,25 x D	0,1 x D	0,5 x D				88	-	104	110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
N1	1,25 x D	0,1 x D	0,5 x D	250	-	1000	400	-	1600				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250
N2	1,25 x D	0,1 x D	0,5 x D	250	-	750	400	-	1200				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160	0,200
N5	1,25 x D	0,1 x D	0,5 x D	250	-	500	400	-	800	500	-	1000	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422867 022867 422807 022807

A

B

				K30F Uncoated			K30F-DCF TiAlN				Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.								
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	0,75 x D	0,1 x D	0,5 x D	60	-	80	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	0,75 x D	0,1 x D	0,5 x D	56	-	76	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	0,75 x D	0,1 x D	0,5 x D				120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	0,75 x D	0,1 x D	0,5 x D				90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	0,75 x D	0,1 x D	0,5 x D				90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	0,75 x D	0,1 x D	0,5 x D				60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	0,75 x D	0,1 x D	0,5 x D				120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	0,75 x D	0,1 x D	0,5 x D				110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
N1	0,75 x D	0,1 x D	0,5 x D	250	-	1000				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,140	0,160	0,200
N2	0,75 x D	0,1 x D	0,5 x D	250	-	750				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160
N5	0,75 x D	0,1 x D	0,5 x D	100	-	300	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422860 422808

A

B

				K30F Uncoated			K30F-DCF TiAlN				Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.								
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	1,25 x D	0,1 x D	0,5 x D	150	-	200	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	1,25 x D	0,1 x D	0,5 x D	140	-	190	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	1,25 x D	0,1 x D	0,5 x D	120	-	160	120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	1,25 x D	0,1 x D	0,5 x D	90	-	150	90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	1,25 x D	0,1 x D	0,5 x D	90	-	115	90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	1,25 x D	0,1 x D	0,5 x D	60	-	80	60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	1,25 x D	0,1 x D	0,5 x D	120	-	150	120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	1,25 x D	0,1 x D	0,5 x D	110	-	130	110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
N1	1,25 x D	0,1 x D	0,5 x D	250	-	750				Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180
N2	0,75 x D	0,1 x D	0,5 x D	250	-	750				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160
N5	0,75 x D	0,1 x D	0,5 x D	100	-	300	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422819 022819

	A		B	K30F Uncoated			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	1,25 x D	0,1 x D	0,5 x D	60	-	80	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	1,25 x D	0,1 x D	0,5 x D	56	-	76	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	1,25 x D	0,1 x D	0,5 x D				120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	1,25 x D	0,1 x D	0,5 x D				90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	1,25 x D	0,1 x D	0,5 x D				90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	1,25 x D	0,1 x D	0,5 x D				60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	1,25 x D	0,1 x D	0,5 x D				120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	1,25 x D	0,1 x D	0,5 x D				110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
N1	1,25 x D	0,1 x D	0,5 x D	100	-	300				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,140	0,160	0,200
N2	1,25 x D	0,1 x D	0,5 x D	250	-	750				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160
N5	1,25 x D	0,1 x D	0,5 x D	250	-	500	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422838 022838

	A		B	K30F Uncoated			K30F-DCHP AlTiN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.											
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter											
Group	ap	ae	ap	Min		Max	Min		Max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P1	1 x D	0,25 x D	0,5 x D	90	-	110	180	-	220	Fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,107	0,114
P2	1 x D	0,25 x D	0,5 x D	80	-	100	160	-	200	Fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,107	0,114
P3	1 x D	0,25 x D	0,5 x D				160	-	180	Fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,094	0,101
P4	1 x D	0,25 x D	0,4 x D				140	-	160	Fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,082	0,088
M1	1 x D	0,25 x D	0,5 x D				90	-	115	Fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,094	0,101
M2	1 x D	0,25 x D	0,5 x D				60	-	80	Fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,075	0,081
K1	1 x D	0,25 x D	0,5 x D				120	-	150	Fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,107	0,114
K2	1 x D	0,25 x D	0,5 x D				110	-	130	Fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,094	0,101
N1	1 x D	0,25 x D	0,5 x D	250	-	1000				Fz	0,020	0,030	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,180	0,200
N2	1 x D	0,25 x D	0,5 x D	250	-	750				Fz	0,016	0,024	0,032	0,040	0,048	0,064	0,080	0,096	0,112	0,128	0,144	0,160
N5	1 x D	0,25 x D	0,5 x D	100	-	300	250	-	750	Fz	0,018	0,027	0,036	0,045	0,054	0,072	0,090	0,108	0,126	0,144	0,162	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D001

A

B

Group	ap	ae	ap	Uncoated Cutting Speed Vc m/min Min		Max	TiAlN Cutting Speed Vc m/min Min		Max	mm	Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%. D1 - Diameter 3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	1 x D	0,25 x D	0,5 x D	75	-	100	150	-	200	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	1 x D	0,25 x D	0,5 x D	70	-	95	140	-	190	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	1 x D	0,25 x D	0,5 x D				120	-	160	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	1 x D	0,25 x D	0,4 x D				90	-	150	Fz	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	1 x D	0,25 x D	0,5 x D				90	-	115	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	1 x D	0,25 x D	0,5 x D				60	-	80	Fz	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	1 x D	0,25 x D	0,5 x D				120	-	150	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	1 x D	0,25 x D	0,5 x D				110	-	130	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	1 x D	0,25 x D	0,5 x D	250	-	1000				Fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	1 x D	0,25 x D	0,5 x D	250	-	750				Fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	1 x D	0,25 x D	0,5 x D	125	-	375	250	-	750	Fz	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D011

A

B

Group	ap	ae	ap	Uncoated Cutting Speed Vc m/min Min		Max	TiAlN Cutting Speed Vc m/min Min		Max	mm	Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%. D1 - Diameter 3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	1,25 x D	0,25 x D	0,5 x D	75	-	100	150	-	200	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	1,25 x D	0,25 x D	0,5 x D	70	-	95	140	-	190	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	1,25 x D	0,25 x D	0,5 x D				120	-	160	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	1,25 x D	0,25 x D	0,5 x D				90	-	150	Fz	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	1,25 x D	0,25 x D	0,5 x D				90	-	115	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	1,25 x D	0,25 x D	0,5 x D				60	-	80	Fz	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	1,25 x D	0,25 x D	0,5 x D				120	-	150	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	1,25 x D	0,25 x D	0,5 x D				110	-	130	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	1,25 x D	0,25 x D	0,5 x D	250	-	1000				Fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	1,25 x D	0,25 x D	0,5 x D	250	-	750				Fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	1,25 x D	0,25 x D	0,5 x D	125	-	375	250	-	750	Fz	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D501

A

B

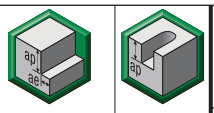
Group	A ap	A ae	B ap	TiAlN Cutting Speed Vc m/min Min		Max	mm	Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%. D1 - Diameter 1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	0,7 x D	0,25 x D	0,5 x D	150	-	200	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	0,7 x D	0,25 x D	0,5 x D	140	-	190	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	0,7 x D	0,25 x D	0,5 x D	120	-	160	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	0,7 x D	0,25 x D	0,5 x D	90	-	150	Fz	0,005	0,010	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	0,7 x D	0,25 x D	0,5 x D	90	-	115	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	0,7 x D	0,25 x D	0,5 x D	60	-	80	Fz	0,005	0,009	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	0,7 x D	0,25 x D	0,5 x D	120	-	150	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	0,7 x D	0,25 x D	0,5 x D	110	-	130	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	0,7 x D	0,25 x D	0,5 x D	400	-	1600	Fz	0,010	0,020	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	0,7 x D	0,25 x D	0,5 x D	400	-	1200	Fz	0,008	0,016	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	0,7 x D	0,25 x D	0,5 x D	250	-	750	Fz	0,009	0,018	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

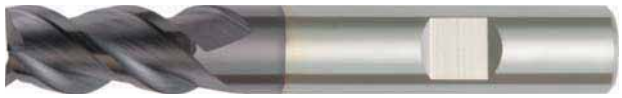
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D003



A

B



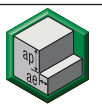
Group	A ap	A ae	B ap	Uncoated Cutting Speed Vc m/min Min	Uncoated Max	TiCN Min	TiCN Max	TiAlN Min	TiAlN Max	mm	D1 - Diameter 2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
				Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.															
P1	0,75 x D	0,1 x D	0,25 x D	75	100	120	160	150	200	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131
P2	0,75 x D	0,1 x D	0,25 x D	70	95	112	152	140	190	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131
P3	0,75 x D	0,1 x D	0,25 x D			96	128	120	160	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116
P4	0,75 x D	0,1 x D	0,25 x D			72	120	90	150	Fz	0,012	0,025	0,038	0,052	0,062	0,072	0,081	0,088	0,101
M1	0,75 x D	0,1 x D	0,25 x D			72	92	90	115	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116
M2	0,75 x D	0,1 x D	0,25 x D			48	64	60	80	Fz	0,011	0,022	0,034	0,046	0,056	0,065	0,073	0,080	0,093
K1	0,75 x D	0,1 x D	0,25 x D			96	120	120	150	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131
K2	0,75 x D	0,1 x D	0,25 x D			88	104	110	130	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116
N1	0,75 x D	0,1 x D	0,25 x D	250	1000	400	1600			Fz	0,023	0,046	0,069	0,092	0,115	0,138	0,161	0,184	0,230
N2	0,75 x D	0,1 x D	0,25 x D	250	750	400	1200			Fz	0,018	0,037	0,055	0,074	0,092	0,110	0,129	0,147	0,184
N5	0,75 x D	0,1 x D	0,25 x D	125	375	200	600	250	750	Fz	0,021	0,041	0,062	0,083	0,104	0,124	0,145	0,166	0,207

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

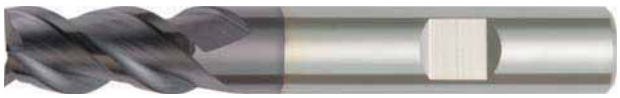
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D013



A

B



Group	A ap	A ae	B ap	Uncoated Cutting Speed Vc m/min Min	Uncoated Max	TiCN Min	TiCN Max	TiAlN Min	TiAlN Max	mm	D1 - Diameter 2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
				Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.															
P1	1,5 x D	0,1 x D	0,25 x D	75	100	120	160	150	200	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131
P2	1,5 x D	0,1 x D	0,25 x D	70	95	112	152	140	190	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131
P3	1,5 x D	0,1 x D	0,25 x D			96	128	120	160	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116
P4	1,5 x D	0,1 x D	0,25 x D			72	120	90	150	Fz	0,012	0,025	0,038	0,052	0,062	0,072	0,081	0,088	0,101
M1	1,5 x D	0,1 x D	0,25 x D			72	92	90	115	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116
M2	1,5 x D	0,1 x D	0,25 x D			48	64	60	80	Fz	0,011	0,022	0,034	0,046	0,056	0,065	0,073	0,080	0,093
K1	1,5 x D	0,1 x D	0,25 x D			96	120	120	150	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131
K2	1,5 x D	0,1 x D	0,25 x D			88	104	110	130	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116
N1	1,5 x D	0,1 x D	0,25 x D	250	1000	400	1600			Fz	0,023	0,046	0,069	0,092	0,115	0,138	0,161	0,184	0,230
N2	1,5 x D	0,1 x D	0,25 x D	250	750	400	1200			Fz	0,018	0,037	0,055	0,074	0,092	0,110	0,129	0,147	0,184
N5	1,5 x D	0,1 x D	0,25 x D	125	375	200	600	250	750	Fz	0,021	0,041	0,062	0,083	0,104	0,124	0,145	0,166	0,207

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422861 022861 422809 022809

A

B

				K30F Uncoated			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	0,5 x D	0,1 x D	0,25 x D	90	-	110	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	0,5 x D	0,1 x D	0,25 x D	80	-	100	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	0,5 x D	0,1 x D	0,25 x D				120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	0,5 x D	0,1 x D	0,25 x D				90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	0,5 x D	0,1 x D	0,25 x D				90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	0,5 x D	0,1 x D	0,25 x D				60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	0,5 x D	0,1 x D	0,25 x D				120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	0,5 x D	0,1 x D	0,25 x D				110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
N1	0,5 x D	0,1 x D	0,25 x D	250	-	1000				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,140	0,160	0,200
N2	0,5 x D	0,1 x D	0,25 x D	250	-	750				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160
N5	0,5 x D	0,1 x D	0,25 x D	100	-	300	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180

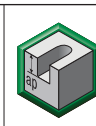
Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422862 022862 422810 022810

A



B

				K30F Uncoated			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	1,25 x D	0,1 x D	0,25 x D	90	-	110	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	1,25 x D	0,1 x D	0,25 x D	80	-	100	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	1,25 x D	0,1 x D	0,25 x D				120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	1,25 x D	0,1 x D	0,25 x D				90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	1,25 x D	0,1 x D	0,25 x D				90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	1,25 x D	0,1 x D	0,25 x D				60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	1,25 x D	0,1 x D	0,25 x D				120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	1,25 x D	0,1 x D	0,25 x D				110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
N1	1,25 x D	0,1 x D	0,25 x D	250	-	1000				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,140	0,160	0,200
N2	1,25 x D	0,1 x D	0,25 x D	250	-	750				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160
N5	1,25 x D	0,1 x D	0,25 x D	100	-	300	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422821 022821

A

B

				K30F Uncoated			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	1,25 x D	0,1 x D	0,25 x D	60	-	80	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	1,25 x D	0,1 x D	0,25 x D	56	-	76	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	1,25 x D	0,1 x D	0,25 x D				120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	1,25 x D	0,1 x D	0,25 x D				90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	1,25 x D	0,1 x D	0,25 x D				90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	1,25 x D	0,1 x D	0,25 x D				60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	1,25 x D	0,1 x D	0,25 x D				120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	1,25 x D	0,1 x D	0,25 x D				110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
N1	1,25 x D	0,1 x D	0,25 x D	250	-	1000				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,140	0,160	0,200
N2	1,25 x D	0,1 x D	0,25 x D	250	-	750				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160
N5	1,25 x D	0,1 x D	0,25 x D	100	-	300	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D009

A

B

				TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.							
				Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	ap	Min		Max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	1,25 x D	0,25 x D	0,5 x D	150	-	200	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	1,25 x D	0,25 x D	0,5 x D	140	-	190	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	1,25 x D	0,25 x D	0,5 x D	120	-	160	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	1,25 x D	0,25 x D	0,5 x D	90	-	150	Fz	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	1,25 x D	0,25 x D	0,5 x D	90	-	115	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	1,25 x D	0,25 x D	0,5 x D	60	-	80	Fz	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	1,25 x D	0,25 x D	0,5 x D	120	-	150	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	1,25 x D	0,25 x D	0,5 x D	110	-	130	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	1,25 x D	0,25 x D	0,5 x D	400	-	1600	Fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	1,25 x D	0,25 x D	0,5 x D	400	-	1200	Fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	1,25 x D	0,25 x D	0,5 x D	250	-	750	Fz	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

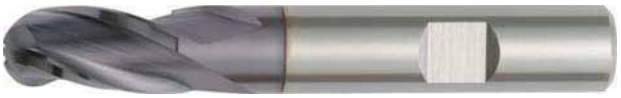
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List DC19

A

B



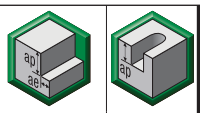
				TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.							
				Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	ap	Min		Max	mm	3,0	5,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	1,0 x D	0,5 x D	1 x D	150	-	200	Fz	0,022	0,036	0,044	0,060	0,072	0,083	0,101	0,114
P2	1,0 x D	0,5 x D	1 x D	140	-	190	Fz	0,022	0,036	0,044	0,060	0,072	0,083	0,101	0,114
P3	1,0 x D	0,5 x D	1 x D	120	-	160	Fz	0,018	0,030	0,036	0,050	0,061	0,070	0,087	0,101
P4	1,0 x D	0,5 x D	1 x D	90	-	150	Fz	0,016	0,027	0,033	0,045	0,054	0,062	0,077	0,088
P5	1,0 x D	0,5 x D	1 x D	60	-	100	Fz	0,015	0,024	0,029	0,040	0,048	0,056	0,070	0,081
P6	1,0 x D	0,5 x D	1 x D	50	-	75	Fz	0,012	0,020	0,025	0,034	0,040	0,047	0,057	0,065
M1	1,0 x D	0,5 x D	1 x D	80	-	100	Fz	0,018	0,030	0,036	0,050	0,061	0,070	0,087	0,101
M2	1,0 x D	0,5 x D	1 x D	60	-	80	Fz	0,015	0,024	0,029	0,040	0,048	0,056	0,070	0,081
M3	1,0 x D	0,5 x D	1 x D	60	-	80	Fz	0,012	0,020	0,025	0,034	0,040	0,047	0,057	0,065
K1	1,0 x D	0,5 x D	1 x D	120	-	160	Fz	0,022	0,036	0,044	0,060	0,072	0,083	0,101	0,114
K2	1,0 x D	0,5 x D	1 x D	110	-	140	Fz	0,018	0,030	0,036	0,050	0,061	0,070	0,087	0,101
K3	1,0 x D	0,5 x D	1 x D	100	-	130	Fz	0,015	0,024	0,029	0,040	0,048	0,056	0,070	0,081
S1	1,0 x D	0,5 x D	1 x D	90	-	115	Fz	0,018	0,030	0,036	0,050	0,061	0,070	0,087	0,101
S2	1,0 x D	0,5 x D	1 x D	20	-	40	Fz	0,010	0,016	0,019	0,026	0,032	0,037	0,046	0,054
S3	1,0 x D	0,5 x D	1 x D	50	-	80	Fz	0,015	0,024	0,029	0,040	0,048	0,056	0,070	0,081
S4	1,0 x D	0,5 x D	1 x D	45	-	65	Fz	0,013	0,021	0,026	0,037	0,045	0,052	0,064	0,074
H1	1,0 x D	0,5 x D	1 x D	100	-	140	Fz	0,016	0,027	0,033	0,045	0,054	0,062	0,077	0,088

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D004



A

B

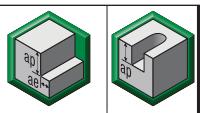
Group	A ap	A ae	B ap	Uncoated Cutting Speed Vc m/min Min	Uncoated Max	TiCN Min	TiCN Max	TiAlN Min	TiAlN Max	mm	Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%. D1 - Diameter 2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P1	1,0 x D	0,1 x D	0,5 x D	75	100	120	160	150	200	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
P2	1,0 x D	0,1 x D	0,5 x D	70	95	112	152	140	190	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
P3	1,0 x D	0,1 x D	0,5 x D			96	128	120	160	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131
P4	1,0 x D	0,1 x D	0,5 x D			72	120	90	150	Fz	0,012	0,025	0,038	0,052	0,062	0,072	0,081	0,088	0,101	0,112
M1	1,0 x D	0,1 x D	0,5 x D			72	92	90	115	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131
M2	1,0 x D	0,1 x D	0,5 x D			48	64	60	80	Fz	0,011	0,022	0,034	0,046	0,056	0,065	0,073	0,080	0,093	0,105
K1	1,0 x D	0,1 x D	0,5 x D			96	120	120	150	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
K2	1,0 x D	0,1 x D	0,5 x D			88	104	110	130	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D014



A

B

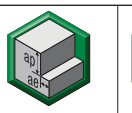
Group	A ap	A ae	B ap	Uncoated Cutting Speed Vc m/min Min	Uncoated Max	TiCN Min	TiCN Max	TiAlN Min	TiAlN Max	mm	Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%. D1 - Diameter 2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P1	1,5 x D	0,1 x D	75	- 100	120	- 160	150	- 200	200	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
P2	1,5 x D	0,1 x D	70	- 95	112	- 152	140	- 190	190	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
P3	1,5 x D	0,1 x D			96	- 128	120	- 160	160	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131
P4	1,5 x D	0,1 x D			72	- 120	90	- 150	150	Fz	0,012	0,025	0,038	0,052	0,062	0,072	0,081	0,088	0,101	0,112
M1	1,5 x D	0,1 x D			72	- 92	90	- 115	115	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131
M2	1,5 x D	0,1 x D			48	- 64	60	- 80	80	Fz	0,011	0,022	0,034	0,046	0,056	0,065	0,073	0,080	0,093	0,105
K1	1,5 x D	0,1 x D			96	- 120	120	- 150	150	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
K2	1,5 x D	0,1 x D			88	- 104	110	- 130	130	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422863 022863 422811 022811



A

B

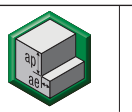
				KCF Uncoated			KCF-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	1,0 x D	0,1 x D	0,5 x D	90	-	110	180	-	220	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	1,0 x D	0,1 x D	0,5 x D	80	-	100	160	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	1,0 x D	0,1 x D	0,5 x D				160	-	180	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	1,0 x D	0,1 x D	0,5 x D				140	-	160	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	1,0 x D	0,1 x D	0,5 x D				90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	1,0 x D	0,1 x D	0,5 x D				60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	1,0 x D	0,1 x D	0,5 x D				120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	1,0 x D	0,1 x D	0,5 x D				110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422864 022864 422812 022812



A

B

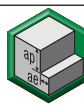
				KCF Uncoated			KCF-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	1,5 x D	0,1 x D	0,5 x D	60	-	80	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	1,5 x D	0,1 x D	0,5 x D	56	-	76	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	1,5 x D	0,1 x D	0,5 x D				120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	1,5 x D	0,1 x D	0,5 x D				90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	1,5 x D	0,1 x D	0,5 x D				90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	1,5 x D	0,1 x D	0,5 x D				60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	1,5 x D	0,1 x D	0,5 x D				120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	1,5 x D	0,1 x D	0,5 x D				110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422825 022825



A

B

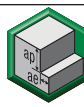
				K30F Uncoated			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min	-	Max	Min	-	Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	1,5 x D	0,1 x D	0,5 x D	60	-	80	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	1,5 x D	0,1 x D	0,5 x D	56	-	76	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	1,5 x D	0,1 x D	0,5 x D	48	-	64	120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	1,5 x D	0,1 x D	0,5 x D	36	-	60	90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	1,5 x D	0,1 x D	0,5 x D	45	-	58	90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	1,5 x D	0,1 x D	0,5 x D	30	-	40	60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	1,5 x D	0,1 x D	0,5 x D	60	-	75	120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	1,5 x D	0,1 x D	0,5 x D	55	-	65	110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422848 022848



A

B

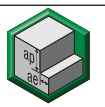
				K30F Uncoated			K30F-DCHP AlTiN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%								
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min	-	Max	Min	-	Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	1,25 x D	0,25 x D	0,5 x D	60	-	80	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	1,25 x D	0,25 x D	0,5 x D	56	-	76	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	1,25 x D	0,25 x D	0,5 x D				120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	1,25 x D	0,25 x D	0,4 x D				90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	1,25 x D	0,25 x D	0,5 x D				90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	1,25 x D	0,25 x D	0,5 x D				60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	1,25 x D	0,25 x D	0,5 x D				120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	1,25 x D	0,25 x D	0,5 x D				110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	1,25 x D	0,25 x D	0,5 x D	250	-	1000				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	1,25 x D	0,25 x D	0,5 x D	250	-	750				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	1,25 x D	0,25 x D	0,5 x D	100	-	300	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D000



A

B

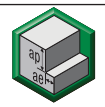
				Uncoated			TiAlN				Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.							
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	ap	Min		Max	Min		Max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	0,7 x D	0,25 x D	0,5 x D	75	-	100	150	-	200	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	0,7 x D	0,25 x D	0,5 x D	70	-	95	140	-	190	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	0,7 x D	0,25 x D	0,5 x D				120	-	160	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	0,7 x D	0,25 x D	0,5 x D				90	-	150	Fz	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	0,7 x D	0,25 x D	0,5 x D				90	-	115	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	0,7 x D	0,25 x D	0,5 x D				60	-	80	Fz	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	0,7 x D	0,25 x D	0,5 x D				120	-	150	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	0,7 x D	0,25 x D	0,5 x D				110	-	130	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	0,7 x D	0,25 x D	0,5 x D	250	-	1000				Fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	0,7 x D	0,25 x D	0,5 x D	250	-	750				Fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	0,7 x D	0,25 x D	0,5 x D	125	-	375	250	-	750	Fz	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List D010



A

B

				Uncoated			TiAlN				Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.							
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	ap	Min		Max	Min		Max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	1,25 x D	0,25 x D	0,5 x D	75	-	100	150	-	200	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	1,25 x D	0,25 x D	0,5 x D	70	-	95	140	-	190	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	1,25 x D	0,25 x D	0,5 x D				120	-	160	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	1,25 x D	0,25 x D	0,5 x D				90	-	150	Fz	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	1,25 x D	0,25 x D	0,5 x D				90	-	115	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	1,25 x D	0,25 x D	0,5 x D				60	-	80	Fz	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	1,25 x D	0,25 x D	0,5 x D				120	-	150	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	1,25 x D	0,25 x D	0,5 x D				110	-	130	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	1,25 x D	0,25 x D	0,5 x D	250	-	1000				Fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	1,25 x D	0,25 x D	0,5 x D	250	-	750				Fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	1,25 x D	0,25 x D	0,5 x D	125	-	375	250	-	750	Fz	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422826 422822

	A		B	K30F-DCHP AlTiN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.								
				Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	ap	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	1,5 x D	0,1 x D	0,2 x D	150	-	200	Fz	0,011	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	1,5 x D	0,1 x D	0,2 x D	140	-	190	Fz	0,011	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	1,5 x D	0,1 x D	0,2 x D	120	-	160	Fz	0,009	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	1,5 x D	0,1 x D	0,1 x D	90	-	150	Fz	0,009	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	1,5 x D	0,1 x D	0,15 x D	80	-	100	Fz	0,009	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	1,5 x D	0,1 x D	0,1 x D	60	-	80	Fz	0,008	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	1,5 x D	0,1 x D	0,2 x D	120	-	160	Fz	0,011	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	1,5 x D	0,1 x D	0,2 x D	110	-	140	Fz	0,009	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4632

	A		B	Uncoated			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.						
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			D1 - Diameter						
Group	ap	ae	ap	Min		Max	Min		Max	mm	0,4	0,5	0,6	0,8	1,0	1,2	1,5
P1	1 x D	0,1 x D	0,25 x D	75	-	100	150	-	200	Fz	0,003	0,004	0,005	0,006	0,008	0,009	0,012
P2	1 x D	0,1 x D	0,25 x D	70	-	95	140	-	190	Fz	0,003	0,004	0,005	0,006	0,008	0,009	0,012
P3	1 x D	0,1 x D	0,25 x D				120	-	160	Fz	0,003	0,003	0,004	0,005	0,006	0,008	0,010
P4	1 x D	0,1 x D	0,25 x D				90	-	150	Fz	0,002	0,003	0,004	0,005	0,006	0,007	0,009
M1	1 x D	0,1 x D	0,25 x D				90	-	115	Fz	0,003	0,003	0,004	0,005	0,006	0,008	0,010
M2	1 x D	0,1 x D	0,25 x D				60	-	80	Fz	0,002	0,003	0,003	0,004	0,005	0,006	0,008
K1	1 x D	0,1 x D	0,25 x D				120	-	150	Fz	0,003	0,004	0,005	0,006	0,008	0,009	0,012
K2	1 x D	0,1 x D	0,25 x D				110	-	130	Fz	0,003	0,003	0,004	0,005	0,006	0,008	0,010
N1	1 x D	0,1 x D	0,25 x D	250	-	1000				Fz	0,005	0,006	0,007	0,009	0,012	0,014	0,017
N2	1 x D	0,1 x D	0,25 x D	250	-	750				Fz	0,004	0,005	0,006	0,007	0,009	0,011	0,014
N5	1 x D	0,1 x D	0,25 x D	125	-	375	250	-	750	Fz	0,004	0,005	0,006	0,008	0,010	0,012	0,016

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4002

A

B

				Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.										
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter									
Group	ap	ae	ap	Min		Max	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P1	1,25 x D	0,1 x D	0,5 x D	75	-	100	120	-	160	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P2	1,25 x D	0,1 x D	0,5 x D	70	-	95	112	-	152	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P3	1,25 x D	0,1 x D	0,5 x D				96	-	128	120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
P4	1,25 x D	0,1 x D	0,5 x D				72	-	120	90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088	0,098
M1	1,25 x D	0,1 x D	0,5 x D				72	-	92	90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
M2	1,25 x D	0,1 x D	0,5 x D				48	-	64	60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081	0,091
K1	1,25 x D	0,1 x D	0,5 x D				96	-	120	120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
K2	1,25 x D	0,1 x D	0,5 x D				88	-	104	110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
N1	1,25 x D	0,1 x D	0,5 x D	250	-	1000	400	-	1600				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250
N2	1,25 x D	0,1 x D	0,5 x D	250	-	750	400	-	1200				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160	0,200
N5	1,25 x D	0,1 x D	0,5 x D	125	-	375	200	-	600	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

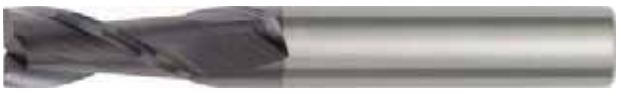
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4012

A

B



				Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.										
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter									
Group	ap	ae	ap	Min		Max	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P1	2 x D	0,1 x D	0,25 x D	90	-	110	144	-	176	180	-	220	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P2	2 x D	0,1 x D	0,25 x D	80	-	100	128	-	160	160	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P3	2 x D	0,1 x D	0,25 x D				128	-	144	160	-	180	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
P4	2 x D	0,1 x D	0,25 x D				112	-	128	140	-	160	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088	0,098
M1	2 x D	0,1 x D	0,25 x D				72	-	92	90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
M2	2 x D	0,1 x D	0,25 x D				48	-	64	60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081	0,091
K1	2 x D	0,1 x D	0,25 x D				96	-	120	120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
K2	2 x D	0,1 x D	0,25 x D				88	-	104	110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
N1	2 x D	0,1 x D	0,25 x D	250	-	1000	400	-	1600				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250
N2	2 x D	0,1 x D	0,25 x D	250	-	750	400	-	1200				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160	0,200
N5	2 x D	0,1 x D	0,25 x D	250	-	500	400	-	800	500	-	1000	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4022

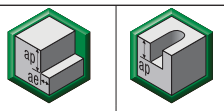
			Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.										
	A		Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter									
Group	ap	ae	Min		Max	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P1	3 x D	0,05 x D	75	-	100	120	-	160	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P2	3 x D	0,05 x D	70	-	95	112	-	152	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P3	3 x D	0,05 x D				96	-	128	120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
P4	3 x D	0,05 x D				72	-	120	90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088	0,098
M1	3 x D	0,05 x D				72	-	92	90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
M2	3 x D	0,05 x D				48	-	64	60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081	0,091
K1	3 x D	0,05 x D				96	-	120	120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
K2	3 x D	0,05 x D				88	-	104	110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
N1	3 x D	0,05 x D	250	-	1000	400	-	1600				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,140	0,160	0,200	0,250
N2	3 x D	0,05 x D	250	-	750	400	-	1200				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160	0,200
N5	3 x D	0,05 x D	125	-	375	200	-	600	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180	0,225

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422815 022815



A

B

				K30F Uncoated			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	18,0	20,0
P1	3 x D	0,05 x D	0,15 x D	60	-	80	150	-	200	Fz	0,013	0,028	0,044	0,060	0,072	0,083	0,101	0,107	0,114
P2	3 x D	0,05 x D	0,15 x D	56	-	76	140	-	190	Fz	0,013	0,028	0,044	0,060	0,072	0,083	0,101	0,107	0,114
P3	3 x D	0,05 x D	0,15 x D				120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,094	0,101
P4	3 x D	0,05 x D	0,15 x D				90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,077	0,082	0,088
M1	3 x D	0,05 x D	0,15 x D				90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,094	0,101
M2	3 x D	0,05 x D	0,15 x D				60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,070	0,075	0,081
K1	3 x D	0,05 x D	0,15 x D				120	-	150	Fz	0,013	0,028	0,044	0,060	0,072	0,083	0,101	0,107	0,114
K2	3 x D	0,05 x D	0,15 x D				110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,094	0,101
N1	3 x D	0,05 x D	0,15 x D	250	-	1000				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,160	0,180	0,200
N2	3 x D	0,05 x D	0,15 x D	250	-	750				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,128	0,144	0,160
N5	3 x D	0,05 x D	0,15 x D	250	-	500	500	-	1000	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,144	0,162	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4651

A

B

				Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.								
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	ap	Min		Max	Min		Max	Min		Max	mm	0,4	0,5	0,6	0,8	1,0	1,2	1,5	1,8
P1	0,5 x D	0,5 x D	0,5 x D	75	-	100	120	-	160	150	-	200	Fz	0,003	0,003	0,004	0,005	0,007	0,008	0,010	0,011
P2	0,5 x D	0,5 x D	0,5 x D	70	-	95	112	-	152	140	-	190	Fz	0,003	0,003	0,004	0,005	0,007	0,008	0,010	0,011
P3	0,3 x D	0,3 x D	0,3 x D				96	-	128	120	-	160	Fz	0,002	0,003	0,003	0,004	0,006	0,007	0,008	0,009
P4	0,3 x D	0,3 x D	0,3 x D				72	-	120	90	-	150	Fz	0,002	0,003	0,003	0,004	0,005	0,006	0,007	0,008
M1	0,3 x D	0,3 x D	0,3 x D				72	-	92	90	-	115	Fz	0,002	0,003	0,003	0,004	0,006	0,007	0,008	0,009
M2	0,3 x D	0,3 x D	0,3 x D				48	-	64	60	-	80	Fz	0,002	0,002	0,003	0,004	0,005	0,006	0,007	0,007
K1	0,5 x D	0,5 x D	0,5 x D				96	-	120	120	-	150	Fz	0,003	0,003	0,004	0,005	0,007	0,008	0,010	0,011
K2	0,5 x D	0,5 x D	0,5 x D				88	-	104	110	-	130	Fz	0,002	0,003	0,003	0,004	0,006	0,007	0,008	0,009
N1	0,5 x D	0,5 x D	0,5 x D	250	-	1000	400	-	1600				Fz	0,004	0,005	0,006	0,008	0,010	0,012	0,014	0,016
N2	0,5 x D	0,5 x D	0,5 x D	250	-	750	400	-	1200				Fz	0,003	0,004	0,005	0,006	0,008	0,010	0,011	0,013
N5	0,5 x D	0,5 x D	0,5 x D	125	-	375	200	-	600	250	-	750	Fz	0,004	0,005	0,005	0,007	0,009	0,011	0,013	0,014

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

List 4001

A

B

				Uncoated			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.										
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter									
Group	ap	ae	ap	Min		Max	Min		Max	mm	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	1,25 x D	0,25 x D	0,5 x D	75	-	100	150	-	200	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	1,25 x D	0,25 x D	0,5 x D	70	-	95	140	-	190	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	1,25 x D	0,25 x D	0,5 x D				120	-	160	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	1,25 x D	0,25 x D	0,5 x D				90	-	150	Fz	0,005	0,010	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	1,25 x D	0,25 x D	0,5 x D				90	-	115	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	1,25 x D	0,25 x D	0,5 x D				60	-	80	Fz	0,005	0,009	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	1,25 x D	0,25 x D	0,5 x D				120	-	150	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	1,25 x D	0,25 x D	0,5 x D				110	-	130	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	1,25 x D	0,25 x D	0,5 x D	250	-	1000				Fz	0,010	0,020	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	1,25 x D	0,25 x D	0,5 x D	250	-	750				Fz	0,008	0,016	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	1,25 x D	0,25 x D	0,5 x D	125	-	375	250	-	750	Fz	0,009	0,018	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4011

A

B

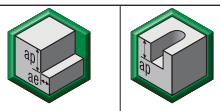
				Uncoated			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.										
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter									
Group	ap	ae	ap	Min		Max	Min		Max	mm	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	2,0 x D	0,15 x D	0,25 x D	75	-	100	150	-	200	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	2,0 x D	0,15 x D	0,25 x D	70	-	95	140	-	190	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	2,0 x D	0,15 x D	0,25 x D				120	-	160	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	2,0 x D	0,15 x D	0,25 x D				90	-	150	Fz	0,005	0,010	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	2,0 x D	0,15 x D	0,25 x D				90	-	115	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	2,0 x D	0,15 x D	0,25 x D				60	-	80	Fz	0,005	0,009	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	2,0 x D	0,15 x D	0,25 x D				120	-	150	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	2,0 x D	0,15 x D	0,25 x D				110	-	130	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	2,0 x D	0,15 x D	0,25 x D	250	-	1000				Fz	0,010	0,020	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	2,0 x D	0,15 x D	0,25 x D	250	-	750				Fz	0,008	0,016	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	2,0 x D	0,15 x D	0,25 x D	125	-	375	250	-	750	Fz	0,009	0,018	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4021



A

B

				Uncoated			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.										
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter									
Group	ap	ae	ap	Min		Max	Min		Max	mm	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	3,0 x D	0,05 x D	0,2 x D	75	-	100	150	-	200	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	3,0 x D	0,05 x D	0,2 x D	70	-	95	140	-	190	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	3,0 x D	0,05 x D	0,2 x D				120	-	160	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	3,0 x D	0,05 x D	0,2 x D				90	-	150	Fz	0,005	0,010	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	3,0 x D	0,05 x D	0,2 x D				90	-	115	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	3,0 x D	0,05 x D	0,2 x D				60	-	80	Fz	0,005	0,009	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	3,0 x D	0,05 x D	0,2 x D				120	-	150	Fz	0,007	0,014	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	3,0 x D	0,05 x D	0,2 x D				110	-	130	Fz	0,006	0,011	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	3,0 x D	0,05 x D	0,2 x D	250	-	1000				Fz	0,010	0,020	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	3,0 x D	0,05 x D	0,2 x D	250	-	750				Fz	0,008	0,016	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	3,0 x D	0,05 x D	0,2 x D	125	-	375	250	-	750	Fz	0,009	0,018	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4633

A

B

				Uncoated			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.							
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter						
Group	ap	ae	ap	Min		Max	Min		Max	mm	0,4	0,5	0,6	0,8	1,0	1,2	1,5
P1	1 x D	0,1 x D	0,25 x D	75	-	100	150	-	200	Fz	0,003	0,004	0,005	0,006	0,008	0,009	0,012
P2	1 x D	0,1 x D	0,25 x D	70	-	95	140	-	190	Fz	0,003	0,004	0,005	0,006	0,008	0,009	0,012
P3	1 x D	0,1 x D	0,25 x D				120	-	160	Fz	0,003	0,003	0,004	0,005	0,006	0,008	0,010
P4	1 x D	0,1 x D	0,25 x D				90	-	150	Fz	0,002	0,003	0,004	0,005	0,006	0,007	0,009
M1	1 x D	0,1 x D	0,25 x D				90	-	115	Fz	0,003	0,003	0,004	0,005	0,006	0,008	0,010
M2	1 x D	0,1 x D	0,25 x D				60	-	80	Fz	0,002	0,003	0,003	0,004	0,005	0,006	0,008
K1	1 x D	0,1 x D	0,25 x D				120	-	150	Fz	0,003	0,004	0,005	0,006	0,008	0,009	0,012
K2	1 x D	0,1 x D	0,25 x D				110	-	130	Fz	0,003	0,003	0,004	0,005	0,006	0,008	0,010
N1	1 x D	0,1 x D	0,25 x D	250	-	1000				Fz	0,005	0,006	0,007	0,009	0,012	0,014	0,017
N2	1 x D	0,1 x D	0,25 x D	250	-	750				Fz	0,004	0,005	0,006	0,007	0,009	0,011	0,014
N5	1 x D	0,1 x D	0,25 x D	125	-	375	250	-	750	Fz	0,004	0,005	0,006	0,008	0,010	0,012	0,016

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

List 4003

A

B

				Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.								
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	ap	Min		Max	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	0,75 x D	0,1 x D	0,25 x D	75	-	100	120	-	160	150	-	200	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131
P2	0,75 x D	0,1 x D	0,25 x D	70	-	95	112	-	152	140	-	190	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131
P3	0,75 x D	0,1 x D	0,25 x D				96	-	128	120	-	160	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116
P4	0,75 x D	0,1 x D	0,25 x D				72	-	120	90	-	150	Fz	0,012	0,025	0,038	0,052	0,062	0,072	0,081	0,088	0,101
M1	0,75 x D	0,1 x D	0,25 x D				72	-	92	90	-	115	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116
M2	0,75 x D	0,1 x D	0,25 x D				48	-	64	60	-	80	Fz	0,011	0,022	0,034	0,046	0,056	0,065	0,073	0,080	0,093
K1	0,75 x D	0,1 x D	0,25 x D				96	-	120	120	-	150	Fz	0,016	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131
K2	0,75 x D	0,1 x D	0,25 x D				88	-	104	110	-	130	Fz	0,013	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116
N1	0,75 x D	0,1 x D	0,25 x D	250	-	1000	400	-	1600				Fz	0,023	0,046	0,069	0,092	0,115	0,138	0,161	0,184	0,230
N2	0,75 x D	0,1 x D	0,25 x D	250	-	750	400	-	1200				Fz	0,018	0,037	0,055	0,074	0,092	0,110	0,129	0,147	0,184
N5	0,75 x D	0,1 x D	0,25 x D	125	-	375	200	-	600	250	-	750	Fz	0,021	0,041	0,062	0,083	0,104	0,124	0,145	0,166	0,207

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4013

A

B

				Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	Min		Max	mm	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0
P1	1,5 x D	0,1 x D	0,25 x D	75	-	100	120	-	160	150	-	200	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P2	1,5 x D	0,1 x D	0,25 x D	70	-	95	112	-	152	140	-	190	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
P3	1,5 x D	0,1 x D	0,25 x D				96	-	128	120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
P4	1,5 x D	0,1 x D	0,25 x D				72	-	120	90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088
M1	1,5 x D	0,1 x D	0,25 x D				72	-	92	90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
M2	1,5 x D	0,1 x D	0,25 x D				48	-	64	60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081
K1	1,5 x D	0,1 x D	0,25 x D				96	-	120	120	-	150	Fz	0,014	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114
K2	1,5 x D	0,1 x D	0,25 x D				88	-	104	110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101
N1	1,5 x D	0,1 x D	0,25 x D	250	-	1000	400	-	1600				Fz	0,020	0,040	0,060	0,080	0,100	0,120	0,140	0,160	0,200
N2	1,5 x D	0,1 x D	0,25 x D	250	-	750	400	-	1200				Fz	0,016	0,032	0,048	0,064	0,080	0,096	0,112	0,128	0,160
N5	1,5 x D	0,1 x D	0,25 x D	125	-	375	200	-	600	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,126	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 422858

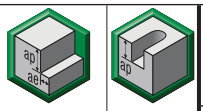
A

			K30F-DCHP AlTiN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A).									
			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	Min		Max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	18,0	20,0	25,0
P1	2,5 x D	0,1 x D	150	-	200	Fz	0,013	0,028	0,044	0,060	0,072	0,083	0,101	0,107	0,114	0,121
P2	2,5 x D	0,1 x D	140	-	190	Fz	0,013	0,028	0,044	0,060	0,072	0,083	0,101	0,107	0,114	0,121
P3	2,5 x D	0,1 x D	120	-	160	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,094	0,101	0,108
P4	2,5 x D	0,1 x D	90	-	150	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,077	0,082	0,088	0,094
M1	2,5 x D	0,1 x D	90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,094	0,101	0,108
M2	2,5 x D	0,1 x D	60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,070	0,075	0,081	0,086
K1	2,5 x D	0,1 x D	120	-	150	Fz	0,013	0,028	0,044	0,060	0,072	0,083	0,101	0,107	0,114	0,121
K2	2,5 x D	0,1 x D	110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,094	0,101	0,108
N5	2,5 x D	0,1 x D	250	-	750	Fz	0,018	0,036	0,054	0,072	0,090	0,108	0,144	0,162	0,180	0,198

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

List 4004



A

B

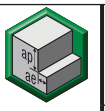
				Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.										
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter									
Group	ap	ae	ap	Min		Max	Min		Max	Min		Max	mm	1,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P1	1,5 x D	0,1 x D	0,5 x D	75	-	100	120	-	160	150	-	200	Fz	0,008	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
P2	1,5 x D	0,1 x D	0,5 x D	70	-	95	112	-	152	140	-	190	Fz	0,008	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
P3	1,5 x D	0,1 x D	0,5 x D				96	-	128	120	-	160	Fz	0,006	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131
P4	1,5 x D	0,1 x D	0,5 x D				72	-	120	90	-	150	Fz	0,006	0,025	0,038	0,052	0,062	0,072	0,081	0,088	0,101	0,112
M1	1,5 x D	0,1 x D	0,5 x D				72	-	92	90	-	115	Fz	0,006	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131
M2	1,5 x D	0,1 x D	0,5 x D				48	-	64	60	-	80	Fz	0,005	0,022	0,034	0,046	0,056	0,065	0,073	0,080	0,093	0,105
K1	1,5 x D	0,1 x D	0,5 x D				96	-	120	120	-	150	Fz	0,008	0,033	0,050	0,069	0,083	0,095	0,106	0,116	0,131	0,142
K2	1,5 x D	0,1 x D	0,5 x D				88	-	104	110	-	130	Fz	0,006	0,027	0,042	0,058	0,070	0,081	0,091	0,100	0,116	0,131

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4014



A

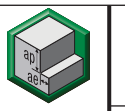
			Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.										
			Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter									
Group	ap	ae	Min		Max	Min		Max	Min		Max	mm	1,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P1	2 x D	0,1 x D	75	-	100	120	-	160	150	-	200	Fz	0,007	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P2	2 x D	0,1 x D	70	-	95	112	-	152	140	-	190	Fz	0,007	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P3	2 x D	0,1 x D				96	-	128	120	-	160	Fz	0,006	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
P4	2 x D	0,1 x D				72	-	120	90	-	150	Fz	0,005	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088	0,098
M1	2 x D	0,1 x D				72	-	92	90	-	115	Fz	0,006	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
M2	2 x D	0,1 x D				48	-	64	60	-	80	Fz	0,005	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081	0,091
K1	2 x D	0,1 x D				96	-	120	120	-	150	Fz	0,007	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
K2	2 x D	0,1 x D				88	-	104	110	-	130	Fz	0,006	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4024



	A		Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.										
			Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter									
Group	ap	ae	Min		Max	Min		Max	Min		Max	mm	1,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	20,0	25,0
P1	3 x D	0,1 x D	75	-	100	120	-	160	150	-	200	Fz	0,007	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P2	3 x D	0,1 x D	70	-	95	112	-	152	140	-	190	Fz	0,007	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
P3	3 x D	0,1 x D				96	-	128	120	-	160	Fz	0,006	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
P4	3 x D	0,05 x D				72	-	120	90	-	150	Fz	0,005	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,088	0,098
M1	3 x D	0,05 x D				72	-	92	90	-	115	Fz	0,006	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114
M2	3 x D	0,05 x D				48	-	64	60	-	80	Fz	0,005	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,081	0,091
K1	3 x D	0,1 x D				96	-	120	120	-	150	Fz	0,007	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,114	0,124
K2	3 x D	0,1 x D				88	-	104	110	-	130	Fz	0,006	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,101	0,114

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422816 022816

	A		B	K30F Uncoated			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.									
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter								
Group	ap	ae	ap	Min		Max	Min		Max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	18,0	20,0
P1	3 x D	0,1 x D	0,15 x D	90	-	110	180	-	220	Fz	0,013	0,028	0,044	0,060	0,072	0,083	0,101	0,107	0,114
P2	3 x D	0,1 x D	0,15 x D	80	-	100	160	-	200	Fz	0,013	0,028	0,044	0,060	0,072	0,083	0,101	0,107	0,114
P3	3 x D	0,1 x D	0,15 x D				160	-	180	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,094	0,101
P4	3 x D	0,05 x D	0,15 x D				140	-	160	Fz	0,010	0,021	0,033	0,045	0,054	0,062	0,077	0,082	0,088
M1	3 x D	0,1 x D	0,15 x D				90	-	115	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,094	0,101
M2	3 x D	0,1 x D	0,15 x D				60	-	80	Fz	0,009	0,019	0,029	0,040	0,048	0,056	0,070	0,075	0,081
K1	3 x D	0,1 x D	0,15 x D				120	-	150	Fz	0,013	0,028	0,044	0,060	0,072	0,083	0,101	0,107	0,114
K2	3 x D	0,1 x D	0,15 x D				110	-	130	Fz	0,011	0,023	0,036	0,050	0,061	0,070	0,087	0,094	0,101

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4000

A

B

				Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.								
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	ap	Min		Max	Min		Max	Min		Max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	1,25 x D	0,25 x D	0,5 x D	75	-	100	120	-	160	150	-	200	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	1,25 x D	0,25 x D	0,5 x D	70	-	95	112	-	152	140	-	190	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	1,25 x D	0,25 x D	0,5 x D				96	-	128	120	-	160	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	1,25 x D	0,25 x D	0,5 x D				72	-	120	90	-	150	Fz	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	1,25 x D	0,25 x D	0,5 x D				72	-	92	90	-	115	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	1,25 x D	0,25 x D	0,5 x D				48	-	64	60	-	80	Fz	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	1,25 x D	0,25 x D	0,5 x D				96	-	120	120	-	150	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	1,25 x D	0,25 x D	0,5 x D				88	-	104	110	-	130	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	1,25 x D	0,25 x D	0,5 x D	250	-	1000	400	-	1600				Fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	1,25 x D	0,25 x D	0,5 x D	250	-	750	400	-	1200				Fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	1,25 x D	0,25 x D	0,5 x D	125	-	375	200	-	600	250	-	750	Fz	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4010

A

B

				Uncoated			TiCN			TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.								
				Cutting Speed Vc m/min			Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter							
Group	ap	ae	ap	Min		Max	Min		Max	Min		Max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P1	2,5 x D	0,15 x D	0,25 x D	75	-	100	120	-	160	150	-	200	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P2	2,5 x D	0,15 x D	0,25 x D	70	-	95	112	-	152	140	-	190	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
P3	2,5 x D	0,15 x D	0,25 x D				96	-	128	120	-	160	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
P4	2,5 x D	0,15 x D	0,25 x D				72	-	120	90	-	150	Fz	0,016	0,021	0,033	0,045	0,054	0,062	0,077	0,088
M1	2,5 x D	0,15 x D	0,25 x D				72	-	92	90	-	115	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
M2	2,5 x D	0,15 x D	0,25 x D				48	-	64	60	-	80	Fz	0,014	0,019	0,029	0,040	0,048	0,056	0,070	0,081
K1	2,5 x D	0,15 x D	0,25 x D				96	-	120	120	-	150	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101	0,114
K2	2,5 x D	0,15 x D	0,25 x D				88	-	104	110	-	130	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087	0,101
N1	2,5 x D	0,15 x D	0,25 x D	250	-	1000	400	-	1600				Fz	0,030	0,040	0,060	0,080	0,100	0,120	0,160	0,200
N2	2,5 x D	0,15 x D	0,25 x D	250	-	750	400	-	1200				Fz	0,024	0,032	0,048	0,064	0,080	0,096	0,128	0,160
N5	2,5 x D	0,15 x D	0,25 x D	125	-	375	200	-	600	250	-	750	Fz	0,027	0,036	0,054	0,072	0,090	0,108	0,144	0,180

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422845 022845

	A		B	K30F Uncoated			K30F-DCHP AlTiN			Recommended Feed Per Tooth (Fz=mm/th) for 3D Milling/Profiling (A).							
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter						
Group	ap	ae	ap	Min		Max	Min		Max	mm	3,0	4,0	6,0	8,0	10,0	12,0	16,0
P1	1,5 x D	0,15 x D	0,25 x D	60	-	80	150	-	200	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101
P2	1,5 x D	0,15 x D	0,25 x D	56	-	76	140	-	190	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101
P3	1,5 x D	0,15 x D	0,25 x D				120	-	160	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087
P4	1,5 x D	0,15 x D	0,25 x D				90	-	150	Fz	0,016	0,021	0,033	0,045	0,054	0,062	0,077
M1	1,5 x D	0,15 x D	0,25 x D				90	-	115	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087
M2	1,5 x D	0,15 x D	0,25 x D				60	-	80	Fz	0,014	0,019	0,029	0,040	0,048	0,056	0,070
K1	1,5 x D	0,15 x D	0,25 x D				120	-	150	Fz	0,021	0,028	0,044	0,060	0,072	0,083	0,101
K2	1,5 x D	0,15 x D	0,25 x D				110	-	130	Fz	0,017	0,023	0,036	0,050	0,061	0,070	0,087

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422813 022813

	A		B	K30F Uncoated			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.							
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter						
Group	ap	ae	ap	Min		Max	Min		Max	mm	6,0	8,0	10,0	12,0	16,0	20,0	25,0
P1	1 x D	0,5 x D	1 x D	60	-	80	150	-	200	Fz	0,032	0,043	0,052	0,063	0,077	0,087	0,097
P2	1 x D	0,5 x D	1 x D	56	-	76	140	-	190	Fz	0,032	0,043	0,052	0,063	0,077	0,087	0,097
P3	1 x D	0,5 x D	1 x D				120	-	160	Fz	0,026	0,036	0,044	0,054	0,067	0,077	0,088
P4	1 x D	0,4 x D	1 x D				90	-	150	Fz	0,024	0,032	0,039	0,048	0,059	0,067	0,076
M1	1 x D	0,4 x D	0,75 x D				80	-	100	Fz	0,026	0,036	0,044	0,054	0,067	0,077	0,088
M2	1 x D	0,4 x D	0,5 x D				60	-	80	Fz	0,018	0,024	0,029	0,036	0,044	0,050	0,056
K1	1 x D	0,5 x D	1 x D	48	-	64	120	-	160	Fz	0,032	0,043	0,052	0,063	0,077	0,087	0,097
K2	1 x D	0,4 x D	1 x D	44	-	56	110	-	140	Fz	0,026	0,036	0,044	0,054	0,067	0,077	0,088
K3	1 x D	0,4 x D	1 x D	40	-	52	100	-	130	Fz	0,021	0,029	0,035	0,043	0,053	0,062	0,070

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm. .

Lists 422818 022818

A

B

				K30F Uncoated			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.						
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter					
Group	ap	ae	ap	Min		Max	Min		Max	mm	6,0	8,0	10,0	12,0	16,0	20,0
P1	1,5 x D	0,5 x D	1 x D	60	-	80	150	-	200	Fz	0,033	0,041	0,049	0,060	0,073	0,082
P2	1,5 x D	0,5 x D	1 x D	56	-	76	140	-	190	Fz	0,033	0,041	0,049	0,060	0,073	0,082
P3	1,5 x D	0,4 x D	1 x D				120	-	160	Fz	0,027	0,034	0,041	0,051	0,063	0,073
P4	1,5 x D	0,4 x D	0,75 x D				90	-	150	Fz	0,024	0,030	0,037	0,045	0,055	0,063
K1	1,5 x D	0,5 x D	1 x D				120	-	160	Fz	0,033	0,041	0,049	0,060	0,073	0,082
K2	1,5 x D	0,4 x D	1 x D				110	-	140	Fz	0,027	0,034	0,041	0,051	0,063	0,073
K3	1,5 x D	0,4 x D	1 x D				100	-	130	Fz	0,021	0,027	0,033	0,040	0,050	0,058

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

Lists 422846 022846

A

B

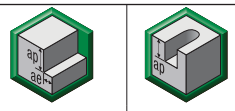
				K30F Uncoated			K30F-DCF TiAlN			Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.						
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter					
Group	ap	ae	ap	Min		Max	Min		Max	mm	6,0	8,0	10,0	12,0	16,0	20,0
P1	1,5 x D	0,5 x D	1 x D	60	-	80	150	-	200	Fz	0,033	0,041	0,049	0,060	0,073	0,082
P2	1,5 x D	0,5 x D	1 x D	56	-	76	140	-	190	Fz	0,033	0,041	0,049	0,060	0,073	0,082
P3	1,5 x D	0,4 x D	1 x D				120	-	160	Fz	0,027	0,034	0,041	0,051	0,063	0,073
P4	1,5 x D	0,4 x D	0,75 x D				90	-	150	Fz	0,024	0,030	0,037	0,045	0,055	0,063
P5	1,5 x D	0,4 x D	0,75 x D				60	-	100	Fz	0,021	0,027	0,033	0,040	0,050	0,058
K1	1,5 x D	0,5 x D	1 x D				120	-	160	Fz	0,033	0,041	0,049	0,060	0,073	0,082
K2	1,5 x D	0,4 x D	1 x D				110	-	140	Fz	0,027	0,034	0,041	0,051	0,063	0,073
K3	1,5 x D	0,4 x D	1 x D				100	-	130	Fz	0,021	0,027	0,033	0,040	0,050	0,058

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

List 4906



A

B

				TiCN			TiAlN				Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.						
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter						
Group	ap	ae	ap	Min		Max	Min		Max	mm	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P1	1,5 x D	0,5 x D	1 x D	120	-	160	150	-	200	Fz	0,049	0,059	0,072	0,080	0,087	0,093	0,098
P2	1,5 x D	0,5 x D	1 x D	112	-	152	140	-	190	Fz	0,049	0,059	0,072	0,080	0,087	0,093	0,098
P3	1,5 x D	0,4 x D	0,75 x D	96	-	128	120	-	160	Fz	0,041	0,049	0,061	0,068	0,075	0,082	0,087
P4	1 x D	0,3 x D	0,5 x D	72	-	120	90	-	150	Fz	0,037	0,044	0,054	0,060	0,066	0,072	0,076
P5	1,5 x D	0,4 x D	0,75 x D	48	-	80	60	-	100	Fz	0,033	0,039	0,049	0,055	0,060	0,065	0,070
M1	1 x D	0,4 x D	0,75 x D	64	-	80	80	-	100	Fz	0,041	0,049	0,061	0,068	0,075	0,082	0,087
M2	1 x D	0,4 x D	0,75 x D	48	-	64	60	-	80	Fz	0,033	0,039	0,049	0,055	0,060	0,065	0,070
M3	1 x D	0,4 x D	0,75 x D	48	-	64	60	-	80	Fz	0,026	0,032	0,039	0,044	0,048	0,052	0,056
K1	1,5 x D	0,5 x D	1 x D	96	-	128	120	-	160	Fz	0,049	0,059	0,072	0,080	0,087	0,093	0,098
K2	1,5 x D	0,4 x D	1 x D	88	-	112	110	-	140	Fz	0,041	0,049	0,061	0,068	0,075	0,082	0,087
K3	1,5 x D	0,4 x D	1 x D	80	-	104	100	-	130	Fz	0,033	0,039	0,049	0,055	0,060	0,065	0,070
S1	1,5 x D	0,4 x D	0,75 x D	40	-	72	50	-	90	Fz	0,041	0,049	0,061	0,068	0,075	0,082	0,087
S3	1,5 x D	0,4 x D	0,75 x D	40	-	64	50	-	80	Fz	0,033	0,039	0,049	0,055	0,060	0,065	0,070
H1	1,0 x D	0,3 x D	0,5 x D	64	-	112	80	-	140	Fz	0,037	0,044	0,054	0,060	0,066	0,072	0,076

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.

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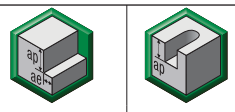

A

B

				TiCN			TiAlN				Recommended Feed Per Tooth (Fz=mm/th) for Side Milling (A). For Slotting (B), reduce Fz by 20%.						
				Cutting Speed Vc m/min			Cutting Speed Vc m/min				D1 - Diameter						
Group	ap	ae	ap	Min		Max	Min		Max	mm	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P1	1,5 x D	0,5 x D	1 x D	120	-	160	150	-	200	Fz	0,049	0,059	0,072	0,080	0,087	0,093	0,098
P2	1,5 x D	0,5 x D	1 x D	112	-	152	140	-	190	Fz	0,049	0,059	0,072	0,080	0,087	0,093	0,098
P3	1,5 x D	0,4 x D	0,75 x D	96	-	128	120	-	160	Fz	0,041	0,049	0,061	0,068	0,075	0,082	0,087
P4	1 x D	0,3 x D	0,5 x D	72	-	120	90	-	150	Fz	0,037	0,044	0,054	0,060	0,066	0,072	0,076
P5	1,5 x D	0,4 x D	0,75 x D	48	-	80	60	-	100	Fz	0,033	0,039	0,049	0,055	0,060	0,065	0,070
M1	1 x D	0,4 x D	0,75 x D	64	-	80	80	-	100	Fz	0,041	0,049	0,061	0,068	0,075	0,082	0,087
M2	1 x D	0,4 x D	0,75 x D	48	-	64	60	-	80	Fz	0,033	0,039	0,049	0,055	0,060	0,065	0,070
M3	1 x D	0,4 x D	0,75 x D	48	-	64	60	-	80	Fz	0,026	0,032	0,039	0,044	0,048	0,052	0,056
K1	1,5 x D	0,5 x D	1 x D	96	-	128	120	-	160	Fz	0,049	0,059	0,072	0,080	0,087	0,093	0,098
K2	1,5 x D	0,4 x D	1 x D	88	-	112	110	-	140	Fz	0,041	0,049	0,061	0,068	0,075	0,082	0,087
K3	1,5 x D	0,4 x D	1 x D	80	-	104	100	-	130	Fz	0,033	0,039	0,049	0,055	0,060	0,065	0,070
S1	1,5 x D	0,4 x D	0,75 x D	40	-	72	50	-	90	Fz	0,041	0,049	0,061	0,068	0,075	0,082	0,087
S3	1,5 x D	0,4 x D	0,75 x D	40	-	64	50	-	80	Fz	0,033	0,039	0,049	0,055	0,060	0,065	0,070
H1	1,0 x D	0,3 x D	0,5 x D	64	-	112	80	-	140	Fz	0,037	0,044	0,054	0,060	0,066	0,072	0,076

Lower value of cutting speed is used for high-stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters greater than 12mm.