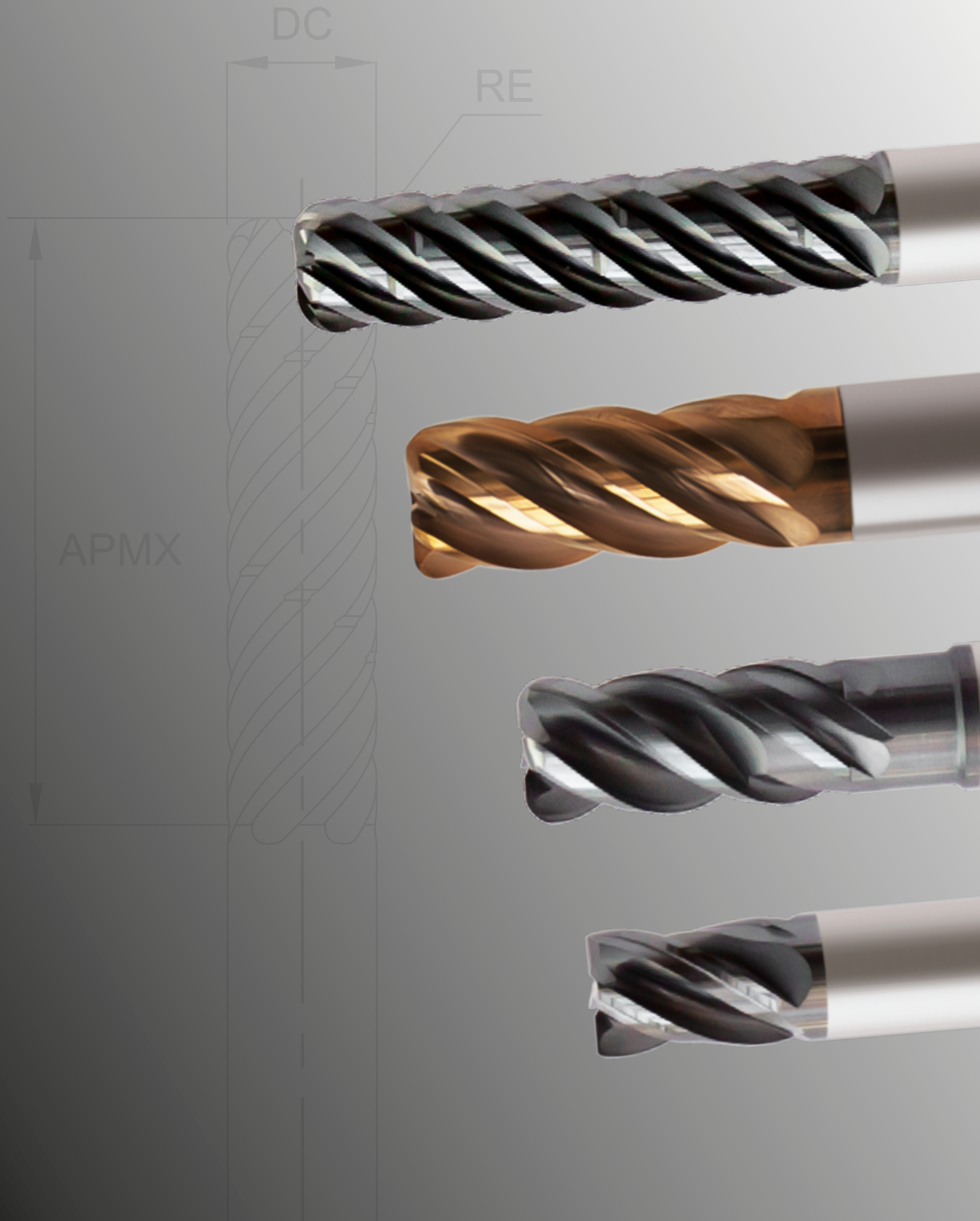


MASTERMILL **VX**

High performance machining of
Steel, Stainless Steel, Titanium
and Nickel Alloys



MASTERMILL VX

Code	Item	Description	Page No.
176323		4-flute Short Length 3.0mm - 20.0mm	P.3
178323		4-flute Standard Length 3.0mm - 20.0mm	P.4
179323		4-flute Standard Length Corner Radius, 3.0mm - 20.0mm	P.5-6
177323		4-flute Long Length Necked, 3.0 - 20.0mm	P.7
171329		4-flute Long Length Necked, Corner Radius, 3.0 - 20.0mm	P.9-10
170329		4-flute Standard Length Ball Nose, 3.0mm - 25.0mm	P.8

MASTERMILL VXD

170323		4-flute Double Core Corner Radius, 6.0mm - 25.0mm	P.11-12
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MASTERMILL VX5, VX5H

171323		5-flute Short Length 6.0mm - 25.0mm	P.13
173323		5-flute Short Length Corner Radius, 6.0mm - 25.0mm	P.14
172323		5-flute Standard Length 6.0mm - 25.0mm	P.15
172530		5-flute Double Taper Core Heavy Cut, 6.0mm - 25.0mm	P.16
174323		5-flute Standard Length Corner Radius, 6.0mm - 25.0mm	P.17-18
174530		5-flute Double Taper Core Heavy Cut, Corner Radius, 6.0mm - 25.0mm	P.19-20
175323		5-flute Standard Length Roughing, Fine Pitch, 6.0mm - 25.0mm	P.21

MASTERMILL VX6, VX6C

174329		6-flute Standard Length 6.0mm - 25.0mm	P.22
176329		6-flute Standard Length Corner Radius, 6.0mm - 25.0mm	P.23
175329		6-flute Long Length 6.0mm - 25.0mm	P.24
675329		6-flute Long Length Chipsplitter 6.0mm - 25.0mm	P.25
173329		6-flute Long Length Corner Radius, 6.0mm - 20.0mm	P.26
673329		6-flute Long Length Chipsplitter Corner Radius, 6.0mm - 25.0mm	P.27
		Cutting Data	P.28-41



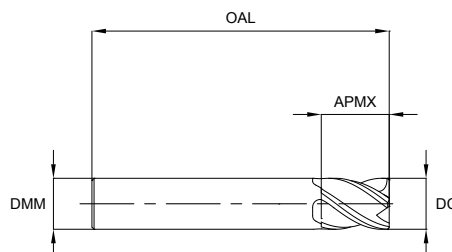
SHORT LENGTH



Series No. 176323

►cutting conditions: p.29-30

Chamfered for corner protection.
Minimized tool deflection.
Reduced tool vibration.



EUROPA CODE ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL	CHAMFER WIDTH CHW
1763230300	3.0	6	6	50	0.10
1763239001	3.0	4	6	50	0.10
1763230400	4.0	6	8	50	0.15
1763239002	4.0	4	8	50	0.15
1763230500	5.0	6	10	50	0.15
1763230600	6.0	6	10	50	0.20
1763230800	8.0	8	12	55	0.20
1763231000	10.0	10	14	60	0.30
1763231200	12.0	12	16	70	0.35
1763231600	16.0	16	22	80	0.40
1763232000	20.0	20	28	80	0.50

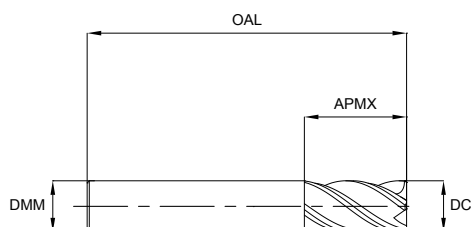
Mill Dia. Tolerance TCDC(mm)	Shank Dia. Tolerance TCDMM
0.00 / -0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary ○ Secondary	●	●	●	●	●	●	○						●	○		



STANDARD LENGTH


MG
HM

VX
COATED


Series No. 178323

▶cutting conditions: p.29-30

Chamfered for corner protection.
Minimized tool deflection.
Reduced tool vibration.

EUROPA CODE ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL	CHAMFER WIDTH CHW
1783230300	3.0	6	8	55	0.10
1783239001	3.0	4	8	55	0.10
1783230400	4.0	6	10	55	0.15
1783239002	4.0	4	10	55	0.15
1783230500	5.0	6	12	55	0.15
1783230600	6.0	6	12	55	0.20
1783230800	8.0	8	16	60	0.20
1783231000	10.0	10	20	75	0.30
1783231200	12.0	12	24	75	0.35
1783231600	16.0	16	32	100	0.40
1783232000	20.0	20	40	100	0.50

Mill Dia. Tolerance TCDC(mm)	Shank Dia. Tolerance TCDMM
0.00 / -0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary ○ Secondary	●	●	●	●	●	●	○						●	○		



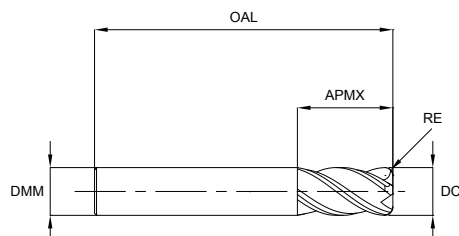
STANDARD LENGTH CORNER RADIUS



Series No. 179323

►cutting conditions: p.29-30

Corner radius.
Minimized tool deflection.
Reduced tool vibration.



EUROPA CODE ORDCODE	DIAMETER DC	CORNER RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1793230300	3.0	0.3	6	8	55
1793239001		0.5	6	8	55
1793230400	4.0	0.3	6	10	55
1793239002		0.5	6	10	55
1793230500	5.0	0.3	6	12	55
1793239003		0.5	6	12	55
1793239014		1.0	6	12	55
1793230600	6.0	0.3	6	12	55
1793239004		0.5	6	12	55
1793239005		1.0	6	12	55
1793239015		1.5	6	12	55
1793239016		2.0	6	12	55
1793239026	8.0	0.5	8	16	60
1793230800		1.0	8	16	60
1793239017		1.5	8	16	60
1793239018		2.0	8	16	60
1793231000	10.0	0.5	10	20	75
1793239006		1.0	10	20	75
1793239019		1.5	10	20	75
1793239020		2.0	10	20	75

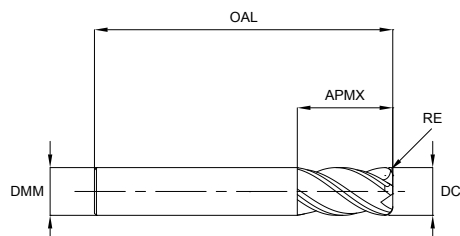
Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●	●	○						●	○		
○ Secondary																



STANDARD LENGTH CORNER RADIUS


MG
HM

VX
COATED


Series No. 179323

►cutting conditions: p.29-30

Corner radius.
Minimized tool deflection.
Reduced tool vibration.

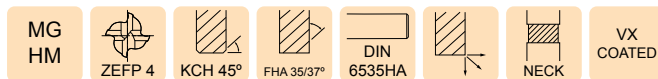
EUROPA CODE ORDCODE	DIAMETER DC	CORNER RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1793231200	12.0	0.5	12	24	75
1793239008		1.0	12	24	75
1793239021		1.5	12	24	75
1793239009		2.0	12	24	75
1793231600	16.0	1.0	16	32	100
1793239022		1.5	16	32	100
1793239010		2.0	16	32	100
1793239023		2.5	16	32	100
1793239011		3.0	16	32	100
1793232000	20.0	1.0	20	40	100
1793239024		1.5	20	40	100
1793239012		2.0	20	40	100
1793239025		2.5	20	40	100
1793239013		3.0	20	40	100

Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●	●	○						●	○		
○ Secondary																



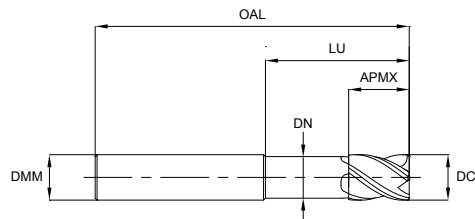
LONG LENGTH NECKED



Series No. 177323

►cutting conditions: p.29-30

Chamfered for corner protection.
Minimized tool deflection.
Reduced tool vibration.



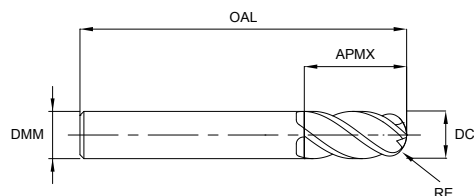
EUROPA CODE ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	EFFECTIVE LENGTH LU	OVERALL LENGTH OAL	NECK DIAMETER DN	CHAMFER WIDTH CHW
1773230300	3.0	6	6	17	57	2.7	0.10
1773230400	4.0	6	8	22	62	3.7	0.15
1773230500	5.0	6	10	27	65	4.7	0.15
1773230600	6.0	6	10	32	68	5.5	0.20
1773230800	8.0	8	12	46	82	7.5	0.20
1773231000	10.0	10	14	32	72	9.2	0.30
1773239001		10	14	55	100	9.2	0.30
1773231200	12.0	12	16	38	83	11.0	0.35
1773239002		12	16	64	108	11.0	0.35
1773231600	16.0	16	22	44	92	15.0	0.40
1773239003		16	22	60	108	15.0	0.40
1773239004		16	22	87	135	15.0	0.40
1773232000	20.0	20	28	54	104	19.0	0.50
1773239005		20	28	75	125	19.0	0.50
1773239006		20	28	110	160	19.0	0.50

Mill Dia. Tolerance TCDC(mm)	Shank Dia. Tolerance TCDMM
0.00 / -0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary ○ Secondary	●	●	●	●	●	●	○						●	○		



BALL NOSE

MG
HMVX
COATED

Series No. 170329

► cutting conditions: p.38

Minimized tool deflection.
Reduced tool vibration.

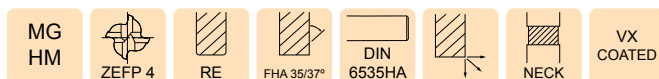
EUROPA CODE ORDCODE	DIAMETER DC	RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1703290300	3.0	1.5	6	8	57
1703290400	4.0	2.0	6	11	57
1703290500	5.0	2.5	6	13	57
1703290600	6.0	3.0	6	13	57
1703290800	8.0	4.0	8	19	63
1703291000	10.0	5.0	10	22	72
1703291200	12.0	6.0	12	26	83
1703291600	16.0	8.0	16	32	92
1703292000	20.0	10.0	20	38	104
1703292500	25.0	12.5	25	38	104

Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.01	+0.01	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary ○ Secondary	●	●	●	●	●	●	○						●	○		



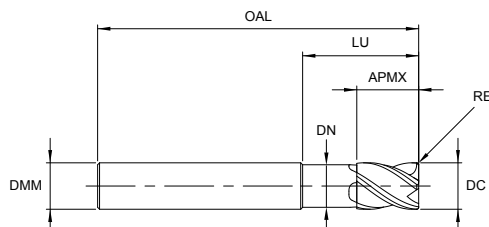
LONG LENGTH NECKED, CORNER RADIUS



Series No. 171329

►cutting conditions: p.29-30

Corner radius.
Minimized tool deflection.
Reduced tool vibration.



EUROPA CODE ORDCODE	DIAMETER DC	CORNER RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	EFFECTIVE LENGTH LU	OVERALL LENGTH OAL	NECK DIAMETER DN
1713290300	3.0	0.3	6	7	12	54	2.7
1713299001		0.3	6	7	17	57	2.7
1713299002		0.5	6	7	12	54	2.7
1713299003		0.5	6	7	17	57	2.7
1713290400	4.0	0.3	6	8	15	57	3.7
1713299004		0.3	6	8	22	63	3.7
1713299005		0.5	6	8	15	57	3.7
1713299006		0.5	6	8	22	63	3.7
1713290500	5.0	0.3	6	10	17	57	4.7
1713299007		0.3	6	10	27	67	4.7
1713299008		0.5	6	10	17	57	4.7
1713299009		0.5	6	10	27	67	4.7
1713290600	6.0	0.3	6	10	15	57	5.5
1713299010		0.3	6	10	20	62	5.5
1713299011		0.3	6	10	32	74	5.5
1713299012		0.5	6	10	15	57	5.5
1713299013		0.5	6	10	20	62	5.5
1713299014		0.5	6	10	32	74	5.5
1713299015		1.0	6	10	15	57	5.5
1713299016		1.0	6	10	20	62	5.5
1713299017		1.0	6	10	32	74	5.5
1713290800	8.0	0.5	8	12	20	63	7.5
1713299018		0.5	8	12	30	73	7.5
1713299019		0.5	8	12	46	90	7.5
1713299020		1.0	8	12	20	63	7.5
1713299021		1.0	8	12	30	73	7.5
1713299022		1.0	8	12	46	90	7.5

Mill Dia. Tolerance TDCD(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●	●	○						●	○		
○ Secondary																



LONG LENGTH NECKED, CORNER RADIUS

EUROPA CODE ORDCODE	DIAMETER DC	CORNER RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	EFFECTIVE LENGTH LU	OVERALL LENGTH OAL	NECK DIAMETER DN
1713291000	10.0	0.5	10	14	25	72	9.2
1713299023		0.5	10	14	35	82	9.2
1713299024		0.5	10	14	55	102	9.2
1713299025		1.0	10	14	25	82	9.2
1713299026		1.0	10	14	35	82	9.2
1713299027		1.0	10	14	55	102	9.2
1713291200	12.0	0.5	12	16	30	83	11.0
1713299028		0.5	12	16	40	93	11.0
1713299029		0.5	12	16	64	117	11.0
1713299030		1.0	12	16	30	83	11.0
1713299031		1.0	12	16	40	93	11.0
1713299032		1.0	12	16	64	117	11.0
1713299033		2.0	12	16	30	83	11.0
1713299034		2.0	12	16	40	93	11.0
1713299035		2.0	12	16	64	117	11.0
1713291600	16.0	1.0	16	22	38	92	15.0
1713299036		1.0	16	22	55	109	15.0
1713299037		1.0	16	22	87	141	15.0
1713299038		2.0	16	22	38	92	15.0
1713299039		2.0	16	22	55	109	15.0
1713299040		2.0	16	22	87	141	15.0
1713299041		3.0	16	22	38	92	15.0
1713299042		3.0	16	22	55	109	15.0
1713299043		3.0	16	22	87	141	15.0
1713292000	20.0	1.0	20	26	50	104	19.0
1713299044		1.0	20	26	70	124	19.0
1713299045		1.0	20	26	110	164	19.0
1713299046		2.0	20	26	50	104	19.0
1713299047		2.0	20	26	70	124	19.0
1713299048		2.0	20	26	110	164	19.0
1713299049		3.0	20	26	50	104	19.0
1713299050		3.0	20	26	70	124	19.0
1713299051		3.0	20	26	110	164	19.0

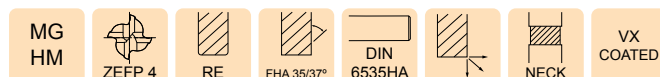
►cutting conditions: p.29-30

Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary ○ Secondary	●	●	●	●	●	●	○						●	○		



DOUBLE CORE, CORNER RADIUS



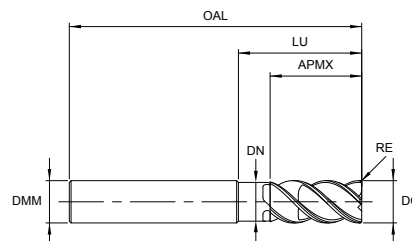
Series No. 170323

►cutting conditions: p.31-32

►cutting conditions, dynamic: p.39-41

Double core geometry reduces tool deflection and improves dimensional stability.

Optimized edge preparation protects against chipping problems in high speed machining.



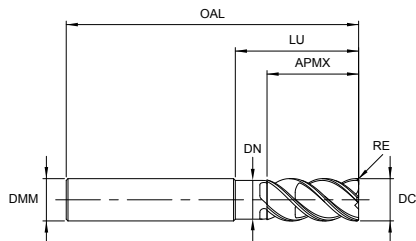
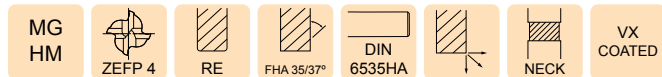
EUROPA CODE ORDCODE	DIAMETER DC	CORNER RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	EFFECTIVE LENGTH LU	OVERALL LENGTH OAL	NECK DIAMETER DN
1703230600	6.0	0.5	6	13	20	57	5.5
1703239001		1.0	6	13	20	57	5.5
1703230800	8.0	0.5	8	19	25	63	7.5
1703239002		1.0	8	19	25	63	7.5
1703239003		1.5	8	19	25	63	7.5
1703239004		2.0	8	19	25	63	7.5
1703231000	10.0	0.5	10	22	30	72	9.2
1703239005		1.0	10	22	30	72	9.2
1703239006		1.5	10	22	30	72	9.2
1703239007		2.0	10	22	30	72	9.2
1703231200	12.0	0.5	12	26	35	83	11.0
1703239008		1.0	12	26	35	83	11.0
1703239009		1.5	12	26	35	83	11.0
1703239010		2.0	12	26	35	83	11.0
1703239011		3.0	12	26	35	83	11.0
1703231400	14.0	1.0	14	26	35	83	13.0
1703239012		2.0	14	26	35	83	13.0
1703231600	16.0	1.0	16	35	43	92	15.0
1703239013		1.5	16	35	43	92	15.0
1703239014		2.0	16	35	43	92	15.0
1703239015		3.0	16	35	43	92	15.0
1703239016		4.0	16	35	43	92	15.0

Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●	○	○						○	●		
○ Secondary																



DOUBLE CORE, CORNER RADIUS



Series No. 170323

►cutting conditions: p.31-32

►cutting conditions, dynamic: p.39-41

Double core geometry reduces tool deflection and improves dimensional stability.

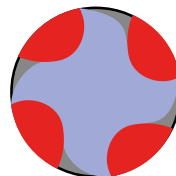
Optimized edge preparation protects against chipping problems in high speed machining.

EUROPA CODE ORDCODE	DIAMETER DC	CORNER RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	EFFECTIVE LENGTH LU	OVERALL LENGTH OAL	NECK DIAMETER DN
1703232000	20.0	1.0	20	44	56	110	19.0
1703239017		1.5	20	44	56	110	19.0
1703239018		2.0	20	44	56	110	19.0
1703239019		3.0	20	44	56	110	19.0
1703239020		3.5	20	44	56	110	19.0
1703239021		4.0	20	44	56	110	19.0
1703232500	25.0	1.0	25	55	70	130	24.0
1703239022		1.5	25	55	70	130	24.0
1703239023		2.0	25	55	70	130	24.0
1703239024		3.0	25	55	70	130	24.0
1703239025		4.0	25	55	70	130	24.0

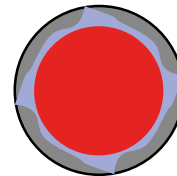
Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

DOUBLE CORE

1. 4 Flute Double Core with unique flute design for excellent chip evacuation and high rigidity.
2. Increased stability and chip flow reduces tool deflection, improving dimensional stability and workpiece accuracy.
3. Chip clogging minimized when used for slotting.



SECTION X-X
Excellent chip evacuation



SECTION Y-Y
Higher rigidity

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●	○	○						○	●		
○ Secondary																



SHORT LENGTH



Series No. 171323

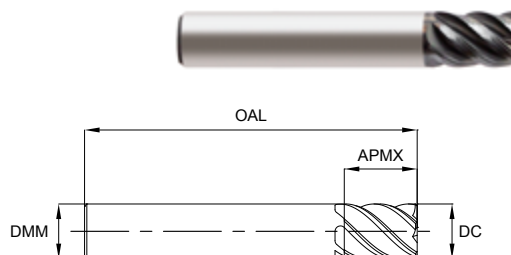
►cutting conditions: p.35

►cutting conditions, dynamic: p.39-41

Chamfered for corner protection.

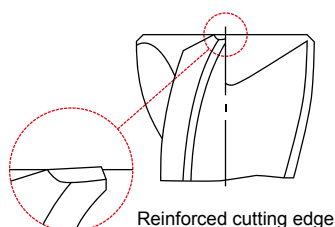
High rigidity of flute for heavy profiling and high speed machining.

Reinforced cutting edge.



EUROPA CODE ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL	CHAMFER WIDTH CHW
1713230600	6.0	6	10	54	0.20
1713230800	8.0	8	12	58	0.20
1713231000	10.0	10	14	66	0.30
1713231200	12.0	12	16	73	0.35
1713231600	16.0	16	22	82	0.40
1713232000	20.0	20	26	92	0.50
1713232500	25.0	25	29	100	0.50

Mill Dia. Tolerance TDCD(mm)	Shank Dia. Tolerance TCDMM
0.00 / -0.03	h6



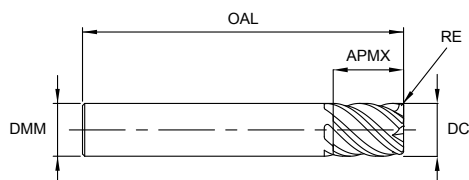
Reinforced cutting edge

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary ○ Secondary	●	●	●	●	●	○	○						○	●		



SHORT LENGTH CORNER RADIUS


MG
HM

VX
COATED


Series No. 173323

►cutting conditions: p.35

►cutting conditions, dynamic: p.39-41

Corner radius.

High rigidity of flute for heavy profiling and high speed machining.

EUROPA CODE ORDCODE	DIAMETER DC	RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1733230600	6.0	0.5	6	10	54
1733230800	8.0	0.5	8	12	58
1733231000	10.0	0.5	10	14	66
1733231200	12.0	0.5	12	16	73
1733231600	16.0	1.0	16	22	82
1733232000	20.0	1.0	20	26	92
1733232500	25.0	1.0	25	29	100

Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO		P			M		K		N					S		H	
VDI GROUP		1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	○ Secondary	●	●	●	●	●	○	○						○	●		



STANDARD LENGTH



Series No. 172323

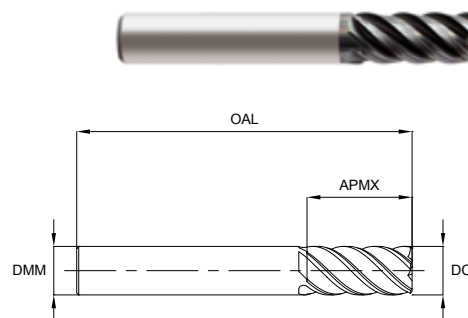
►cutting conditions: p.35

►cutting conditions, dynamic: p.39-41

Chamfered for corner protection.

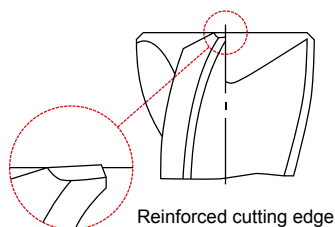
High rigidity of flute for heavy profiling and high speed machining.

Reinforced cutting edge.



EUROPA CODE ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL	CHAMFER WIDTH CHW
1723230600	6.0	6	13	57	0.20
1723230800	8.0	8	19	63	0.20
1723231000	10.0	10	22	72	0.30
1723231200	12.0	12	26	83	0.35
1723231600	16.0	16	36	92	0.40
1723232000	20.0	20	44	104	0.50
1723232500	25.0	25	54	121	0.50

Mill Dia. Tolerance TCDC(mm)	Shank Dia. Tolerance TCDMM
0.00 / -0.03	h6



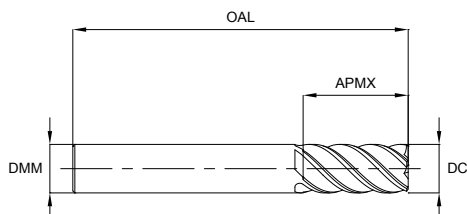
Reinforced cutting edge

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●	○	○						○	●		
○ Secondary																



STANDARD LENGTH HEAVY CUT


MG
HM

VX+
COATED


Series No. 172530

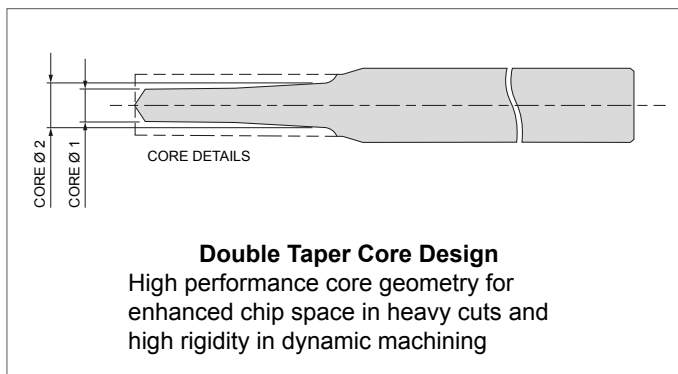
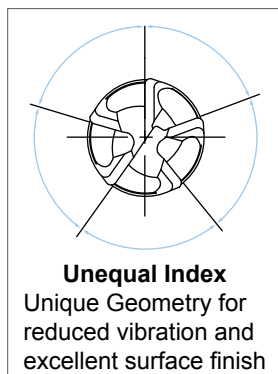
►cutting conditions: p.33-34

►cutting conditions, dynamic: p.39-41

Chamfered for corner protection.
Double tapered core for heavy profiling
and high speed machining.
VX+ coated for extended tool life in
HRSA materials

EUROPA CODE ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL	CHAMFER WIDTH CHW
1725300600	6.0	6	13	57	0.20
1725300800	8.0	8	19	63	0.20
1725301000	10.0	10	22	72	0.30
1725301200	12.0	12	26	83	0.35
1725301600	16.0	16	36	92	0.40
1725302000	20.0	20	44	104	0.50
1725302500	25.0	25	54	121	0.50

Mill Dia. Tolerance TCDC(mm)	Shank Dia. Tolerance TCDMM
0.00 / -0.03	≤ ø10.0 : h5 ≥ ø12.0 : h6



ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary ○ Secondary	●	●	●	●	●	○	○						●	○		



STANDARD LENGTH CORNER RADIUS



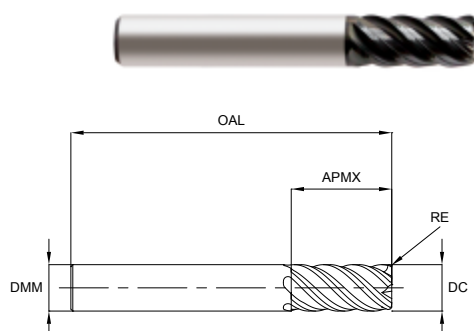
Series No. 174323

►cutting conditions: p.35

►cutting conditions, dynamic: p.39-41

Corner radius.

High rigidity of flute for heavy profiling and high speed machining.



EUROPA CODE ORDCODE	DIAMETER DC	RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1743230600	6.0	0.3	6	13	57
1743239001		0.5	6	13	57
1743239002		1.0	6	13	57
1743230800	8.0	0.5	8	19	63
1743239003		1.0	8	19	63
1743239004		1.5	8	19	63
1743239005		2.0	8	19	63
1743231000	10.0	0.5	10	22	72
1743239006		1.0	10	22	72
1743239007		1.5	10	22	72
1743239008		2.0	10	22	72
1743231200	12.0	0.5	12	26	83
1743239009		1.0	12	26	83
1743239010		1.5	12	26	83
1743239011		2.0	12	26	83
1743239012		2.5	12	26	83
1743239013		3.0	12	26	83
1743231600	16.0	1.0	16	36	92
1743239014		1.5	16	36	92
1743239015		2.0	16	36	92
1743239016		2.5	16	36	92
1743239017		3.0	16	36	92
1743239018		4.0	16	36	92

Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●	○	○						○	●		
○ Secondary																



STANDARD LENGTH CORNER RADIUS


MG
HM

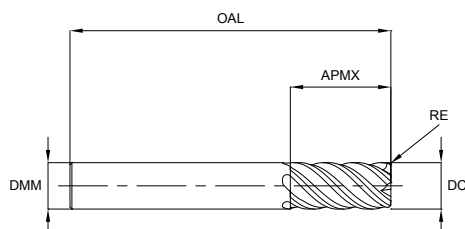
ZEFP 5

RE

FHA 35/37°

DIN
6535HA

VX
COATED

VX
COATED


Series No. 174323

►cutting conditions: p.35

►cutting conditions, dynamic: p.39-41

Corner radius.

High rigidity of flute for heavy profiling and high speed machining.

EUROPA CODE ORDCODE	DIAMETER DC	RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1743232000	20.0	1.0	20	44	104
1743239019		1.5	20	44	104
1743239020		2.0	20	44	104
1743239021		2.5	20	44	104
1743239022		3.0	20	44	104
1743239023		4.0	20	44	104
1743239024		5.0	20	44	104
1743232500	25.0	1.0	25	54	121
1743239025		1.5	25	54	121
1743239026		2.0	25	54	121
1743239027		2.5	25	54	121
1743239028		3.0	25	54	121
1743239029		4.0	25	54	121
1743239030		5.0	25	54	121

Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary ○ Secondary	●	●	●	●	●	○	○						○	●		



STANDARD LENGTH HEAVY CUT CORNER RADIUS



Series No. 174530

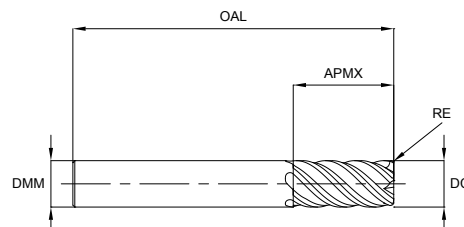
►cutting conditions: p.33-34

►cutting conditions, dynamic: p.39-41

Corner radius.

Double tapered core for heavy profiling and high speed machining.

VX⁺ coated for extended tool life in HRSA materials



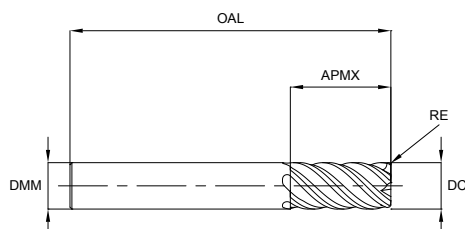
EUROPA CODE ORDCODE	DIAMETER DC	RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1745300600	6.0	0.3	6	13	57
1745309001		0.5	6	13	57
1745309002		1.0	6	13	57
1745300800	8.0	0.5	8	19	63
1745309003		1.0	8	19	63
1745309004		1.5	8	19	63
1745309005		2.0	8	19	63
1745301000	10.0	0.5	10	22	72
1745309006		1.0	10	22	72
1745309007		1.5	10	22	72
1745309008		2.0	10	22	72
1745309009		2.5	10	22	72
1745301200	12.0	0.5	12	26	83
1745309010		1.0	12	26	83
1745309011		1.5	12	26	83
1745309012		2.0	12	26	83
1745309013		2.5	12	26	83
1745309014		3.0	12	26	83
1745301600	16.0	0.5	16	36	92
1745309015		1.0	16	36	92
1745309016		1.5	16	36	92
1745309017		2.0	16	36	92
1745309018		2.5	16	36	92
1745309019		3.0	16	36	92
1745309020		4.0	16	36	92

Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	≤ ø10.0 : h5 ≥ ø12.0 : h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●	○	○						●	○		
○ Secondary																



STANDARD LENGTH HEAVY CUT CORNER RADIUS

MG
HMVX+
COATED

Series No. 174530

►cutting conditions: p.33-34

►cutting conditions, dynamic: p.39-41

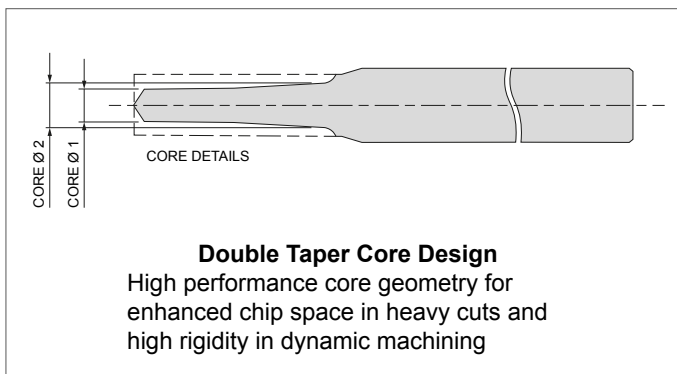
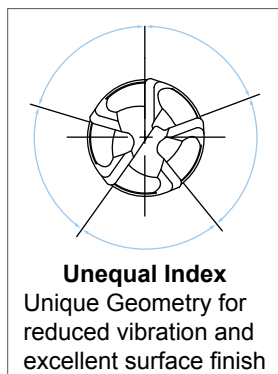
Corner radius.

Double tapered core for heavy profiling and high speed machining.

VX+ coated for extended tool life in HRSA materials

EUROPA CODE ORDCODE	DIAMETER DC	RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1745302000	20.0	1.0	20	44	104
1745309021		1.5	20	44	104
1745309022		2.0	20	44	104
1745309023		2.5	20	44	104
1745309024		3.0	20	44	104
1745309025		4.0	20	44	104
1745309026		5.0	20	44	104
1745302500	25.0	1.0	25	54	121
1745309027		1.5	25	54	121
1745309028		2.0	25	54	121
1745309029		2.5	25	54	121
1745309030		3.0	25	54	121
1745309031		4.0	25	54	121
1745309032		5.0	25	54	121

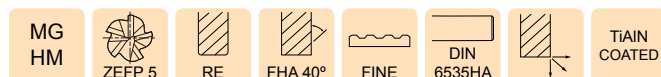
Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	≤ ø10.0 : h5 ≥ ø12.0 : h6



ISO		P			M		K		N					S		H	
VDI GROUP		1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	○ Secondary	●	●	●	●	●	○	○						●	○		



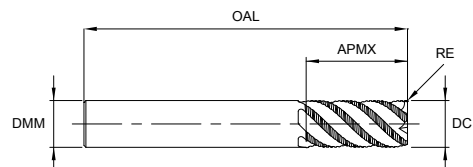
STANDARD LENGTH ROUGHING



Series No. 175323

►cutting conditions: p.36

Corner radius.
High rigidity of flute and excellent chip evacuation in difficult to machine materials.



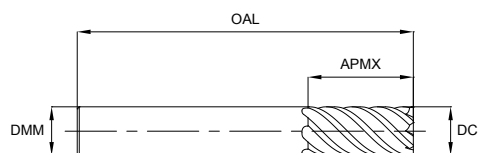
EUROPA CODE ORDCODE	DIAMETER DC	RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1753230600	6.0	0.2	6	16	57
1753230800	8.0	0.2	8	16	63
1753231000	10.0	0.3	10	22	72
1753231200	12.0	0.3	12	26	83
1753231400	14.0	0.3	14	26	83
1753231600	16.0	0.3	16	32	92
1753232000	20.0	0.3	20	38	104
1753232500	25.0	0.3	25	45	121

Mill Dia. DC	Mill Dia. Tolerance TDCD(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
		RETOLL	RETOLU	
6.0, 8.0, 10.0	0.00 / -0.058	-0.03	+0.03	h6
12.0, 14.0, 16.0	0.00 / -0.070			
20.0, 25.0	0.00 / -0.084			

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary ○ Secondary				●	○								○	●		



STANDARD LENGTH


MG
HM

VX
COATED

Series No. 174329

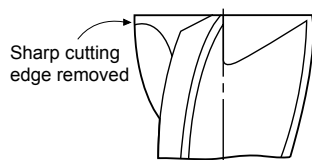
►cutting conditions: p.37

►cutting conditions, dynamic: p.39-41

Unequal index and unique geometry optimised for high speed and trochoidal milling.
90° corner with edge preparation for corner protection.

EUROPA CODE ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1743290600	6.0	6	13	57
1743290800	8.0	8	19	63
1743291000	10.0	10	22	72
1743291200	12.0	12	26	83
1743291600	16.0	16	32	92
1743292000	20.0	20	38	104
1743292500	25.0	25	44	104

Mill Dia. Tolerance TCDC(mm)	Shank Dia. Tolerance TCDMM
0.00 / -0.03	h6



ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●								●	●		
○ Secondary																



STANDARD LENGTH CORNER RADIUS

MG
HMVX
COATED

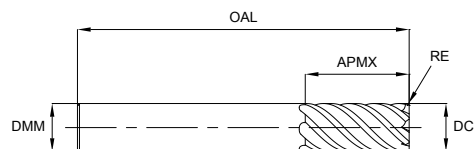
Series No. 176329

►cutting conditions: p.37

►cutting conditions, dynamic: p.39-41

Corner radius.

Unequal index and unique geometry optimised for high speed and trochoidal milling.



EUROPA CODE ORDCODE	DIAMETER DC	RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1763290600	6.0	0.5	6	13	57
1763299001		1.0	6	13	57
1763290800	8.0	0.5	8	19	63
1763299002		1.0	8	19	63
1763291000	10.0	0.5	10	22	72
1763299003		1.0	10	22	72
1763299004		1.5	10	22	72
1763299005		2.0	10	22	72
1763291200	12.0	0.5	12	26	83
1763299006		1.0	12	26	83
1763299007		1.5	12	26	83
1763299008		2.0	12	26	83
1763299009		3.0	12	26	83
1763291600	16.0	1.0	16	32	92
1763299010		1.5	16	32	92
1763299011		2.0	16	32	92
1763299012		3.0	16	32	92
1763292000	20.0	1.0	20	38	104
1763299013		1.5	20	38	104
1763299014		2.0	20	38	104
1763299015		3.0	20	38	104
1763292500	25.0	1.0	25	44	104
1763299016		1.5	25	44	104
1763299017		2.0	25	44	104
1763299018		3.0	25	44	104

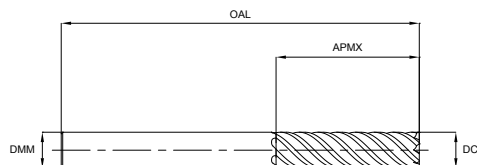
Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●								●	●		
○ Secondary																



LONG LENGTH


MG
HM

VX
COATED


Series No. 175329

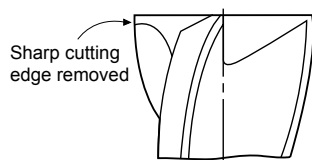
►cutting conditions: p.37

►cutting conditions, dynamic: p.39-41

Unequal index and unique geometry optimised for high speed and trochoidal milling.
90° corner with edge preparation for corner protection.

EUROPA CODE ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1753290600	6.0	6	24	75
1753290800	8.0	8	32	75
1753291000	10.0	10	40	100
1753291200	12.0	12	48	120
1753291600	16.0	16	64	140
1753292000	20.0	20	80	150
1753292500	25.0	25	100	170

Mill Dia. Tolerance TCDC(mm)	Shank Dia. Tolerance TCDMM
0.00 / -0.03	h6



ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●								●	●		
○ Secondary																



LONG LENGTH CHIPSPLITTER

MG
HM



ZEFP 6



FHA 45°



DIN
6535HA



VX
COATED



Series No. 675329

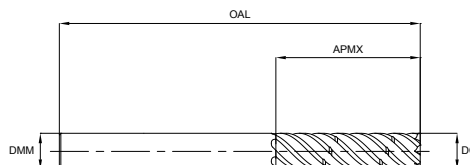
►cutting conditions: p.37

►cutting conditions, dynamic: p.39-41

Sharp corner

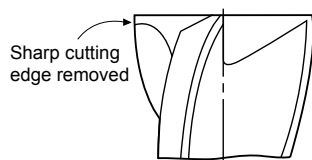
Unequal index and unique geometry optimised for high speed and trochoidal milling.

Chip splitter geometry for better swarf control.



EUROPA CODE ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
6753290600	6.0	6	24	75
6753290800	8.0	8	32	75
6753291000	10.0	10	40	100
6753291200	12.0	12	48	120
6753291600	16.0	16	64	140
6753292000	20.0	20	80	150
6753292500	25.0	25	100	170

Mill Dia. Tolerance TCDC(mm)	Shank Dia. Tolerance TCDMM
0.00 / -0.03	h6

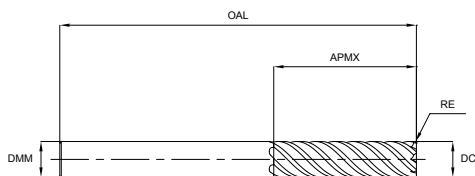


ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●								●	●		
○ Secondary																



LONG LENGTH CORNER RADIUS


MG
HM

VX
COATED


Series No. 173329

►cutting conditions: p.37

►cutting conditions, dynamic: p.39-41

Corner radius.

Unequal index and unique geometry optimised for high speed and trochoidal milling.

EUROPA CODE ORDCODE	DIAMETER DC	RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
1733290600	6.0	0.5	6	24	75
1733299001		1.0	6	24	75
1733290800	8.0	0.5	8	32	75
1733299002		1.0	8	32	75
1733299003		2.0	8	32	75
1733291000	10.0	0.5	10	40	100
1733299004		1.0	10	40	100
1733299005		1.5	10	40	100
1733299006		2.0	10	40	100
1733291200	12.0	0.5	12	48	120
1733299007		1.0	12	48	120
1733299008		1.5	12	48	120
1733299009		2.0	12	48	120
1733299010		3.0	12	48	120
1733291600	16.0	1.0	16	64	140
1733299011		1.5	16	64	140
1733299012		2.0	16	64	140
1733299013		3.0	16	64	140
1733292000	20.0	1.0	20	80	150
1733299014		1.5	20	80	150
1733299015		2.0	20	80	150
1733299016		3.0	20	80	150
1733299017		4.0	20	80	150
1733299018		5.0	25	80	150
1733292500	25.0	1.0	25	100	170
1733299019		1.5	25	100	170
1733299020		2.0	25	100	170
1733299021		3.0	25	100	170
1733299022		4.0	25	100	170
1733299023		5.0	25	100	170

Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●								●	●		
○ Secondary																



LONG LENGTH CHIPSPLITTER CORNER RADIUS

MG
HMVX
COATED

Series No. 673329

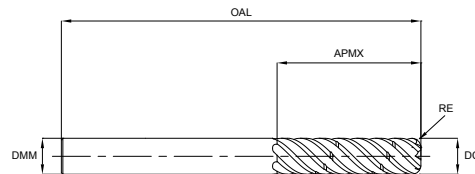
►cutting conditions: p.37

►cutting conditions, dynamic: p.39-41

Corner radius.

Unequal index and unique geometry optimised for high speed and trochoidal milling.

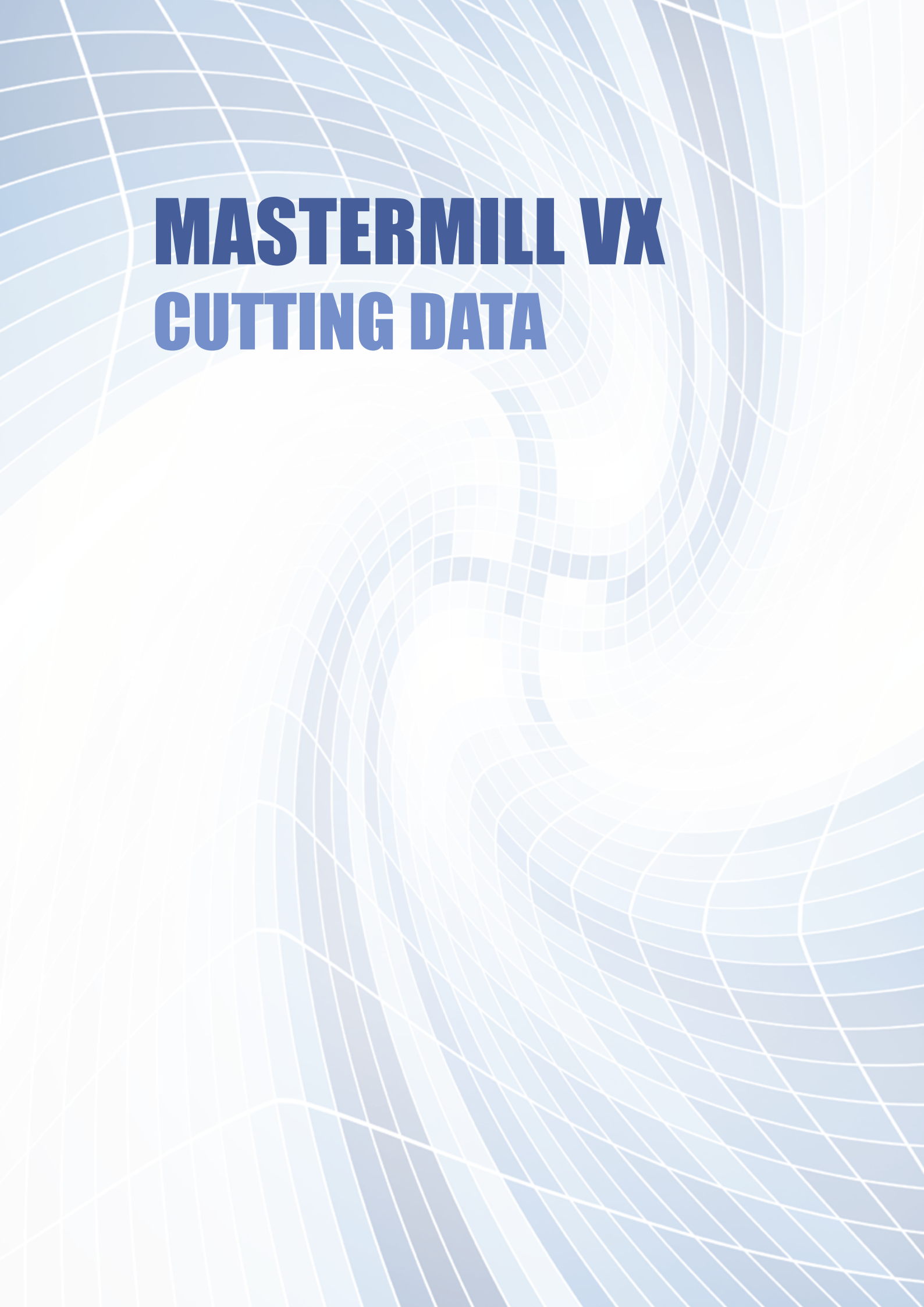
Chip splitter geometry for better swarf control.



EUROPA CODE ORDCODE	DIAMETER DC	RADIUS RE	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL
6733290600	6.0	0.5	6	24	75
6733299001		1.0	6	24	75
6733290800	8.0	0.5	8	32	75
6733299002		1.0	8	32	75
6733299003		2.0	8	32	75
6733291000	10.0	0.5	10	40	100
6733299004		1.0	10	40	100
6733299005		1.5	10	40	100
6733299006		2.0	10	40	100
6733291200	12.0	0.5	12	48	120
6733299007		1.0	12	48	120
6733299008		1.5	12	48	120
6733299009		2.0	12	48	120
6733299010		3.0	12	48	120
6733291600	16.0	1.0	16	64	140
6733299011		1.5	16	64	140
6733299012		2.0	16	64	140
6733299013		3.0	16	64	140
6733292000	20.0	1.0	20	80	150
6733299014		1.5	20	80	150
6733299015		2.0	20	80	150

Mill Dia. Tolerance TCDC(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance TCDMM
	RETOLL	RETOLU	
0.00 / -0.03	-0.03	+0.03	h6

ISO	P			M		K		N					S		H	
VDI GROUP	1-5	6-9	10-11	12, 13	14	15-16	17-20	21-25	26-28	29.1	29.2	30	31-35	36-37	38-39	40-41
● Primary	●	●	●	●	●								●	●		
○ Secondary																



MASTERMILL VX

CUTTING DATA



CUTTING DATA

171329, 176323, 177323, 178323, 179323 (4 Flute VX)

VDI MATERIAL GROUP		HRc	SIDE CUTTING	Size (mm)								
				3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-5	Non-alloy Steel	<25	v_c (m/min)	152	152	152	152	152	168	168	168
				n	16128	12096	9677	8064	6048	5348	4456	2674
				f_z	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.065
				f (mm/min)	323	387	513	516	653	813	838	695
	6-9	Low alloy Steel	25-35	v_c (m/min)	107	107	107	107	107	117	117	117
				n	11353	8515	6812	5677	4257	3724	3104	1862
				f_z	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.065
				f (mm/min)	227	272	300	363	460	566	583	484
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	64	64	64	64	64	70	70	70
				n	6791	5093	4074	3395	2546	2228	1857	1114
				f_z	0.003	0.006	0.008	0.011	0.019	0.027	0.032	0.037
				f (mm/min)	81	122	130	149	194	241	238	201
M	12	Ferritic/ Martensitic Stainless Steel		v_c (m/min)	161	161	161	161	161	161	161	161
				n	17083	12812	10250	8541	6406	5125	4270	2562
				f_z	0.004	0.006	0.009	0.013	0.022	0.034	0.040	0.055
				f (mm/min)	273	307	369	444	564	697	683	564
	13	Martensitic Stainless Steel		v_c (m/min)	115	115	115	115	115	115	115	115
				n	12202	9151	7321	6104	4576	3661	3050	1830
				f_z	0.005	0.008	0.013	0.018	0.028	0.048	0.056	0.063
				f (mm/min)	244	293	381	439	512	703	683	564
	14	Austenitic Stainless Steel		v_c (m/min)	104	104	104	104	104	104	104	104
				n	11035	8276	6621	5517	4138	3310	2759	1655
				f_z	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.062
				f (mm/min)	221	265	344	397	463	636	607	510
K	15-20	Cast Iron		v_c (m/min)	112	112	112	112	112	123	123	123
				n	11884	8913	7130	5942	4456	3915	3263	2447
				f_z	0.006	0.010	0.014	0.020	0.034	0.048	0.058	0.065
				f (mm/min)	285	357	399	475	606	752	757	634
S	31-35	HRSA Fe & Ni/Co Based		v_c (m/min)	31	31	31	31	31	31	31	31
				n	3289	2467	1974	1645	1233	987	822	617
				f_z	0.005	0.007	0.012	0.018	0.031	0.047	0.055	0.064
				f (mm/min)	66	69	95	118	153	186	181	152
	36-37	Titanium/ Titanium Alloys		v_c (m/min)	81	81	81	81	81	81	81	81
				n	8594	6446	5157	4297	3223	2578	2149	1289
				f_z	0.004	0.007	0.011	0.016	0.025	0.043	0.050	0.056
				f (mm/min)	138	180	227	275	322	445	430	356

MATERIAL GROUPS P,K

1.5 x DC - GROUP M
1.0 x DC - S31-35
1.0 x DC - S36-37

0.5 x DC - GROUP M
0.25 x DC - S31-35
0.35 x DC - S36-37

Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.

For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)

n - RPM (rev/min)

f_z - feed per tooth (mm)

f - feed rate (mm/min)

a_p - axial depth of cut

a_e - radial depth of cut



CUTTING DATA

171329, 176323, 177323, 178323, 179323 (4 Flute VX)

VDI MATERIAL GROUP		HRc	SLOTTING	Size (mm)								
				3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-5	Non-alloy Steel	<25	v_c (m/min)	152	152	152	152	152	168	168	168
				n	16128	12096	9677	8064	6048	5348	4456	2674
				f_z	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.065
				f (mm/min)	323	387	513	516	653	813	838	695
	6-9	Low alloy Steel	25-35	v_c (m/min)	107	107	107	107	107	117	117	117
				n	11353	8515	6812	5677	4257	3724	3104	1862
				f_z	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.065
				f (mm/min)	227	272	300	363	460	566	583	484
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	64	64	64	64	64	70	70	70
				n	6791	5093	4074	3395	2546	2228	1857	1114
				f_z	0.003	0.006	0.008	0.011	0.019	0.027	0.032	0.037
				f (mm/min)	81	122	130	149	194	241	238	201
M	12	Ferritic/ Martensitic Stainless Steel		v_c (m/min)	161	161	161	161	161	161	161	161
				n	17083	12812	10250	8541	6406	5125	4270	2562
				f_z	0.004	0.006	0.009	0.013	0.022	0.034	0.040	0.055
				f (mm/min)	273	307	369	444	564	697	683	564
	13	Martensitic Stainless Steel		v_c (m/min)	115	115	115	115	115	115	115	115
				n	12202	9151	7321	6104	4576	3661	3050	1830
				f_z	0.005	0.008	0.013	0.018	0.028	0.048	0.056	0.063
				f (mm/min)	244	293	381	439	512	703	683	564
	14	Austenitic Stainless Steel		v_c (m/min)	104	104	104	104	104	104	104	104
				n	11035	8276	6621	5517	4138	3310	2759	1655
				f_z	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.062
				f (mm/min)	221	265	344	397	463	636	607	510
K	15-20	Cast Iron		v_c (m/min)	112	112	112	112	112	123	123	123
				n	11884	8913	7130	5942	4456	3915	3263	2447
				f_z	0.006	0.010	0.014	0.020	0.034	0.048	0.058	0.065
				f (mm/min)	285	357	399	475	606	752	757	634
S	31-35	HRSA Fe & Ni/Co Based		v_c (m/min)	31	31	31	31	31	31	31	31
				n	3289	2467	1974	1645	1233	987	822	617
				f_z	0.005	0.007	0.012	0.018	0.031	0.047	0.055	0.064
				f (mm/min)	66	69	95	118	153	186	181	152
	36-37	Titanium/ Titanium Alloys		v_c (m/min)	81	81	81	81	81	81	81	81
				n	8594	6446	5157	4297	3223	2578	2149	1611
				f_z	0.004	0.007	0.011	0.016	0.025	0.043	0.050	0.056
				f (mm/min)	138	180	227	275	322	445	430	356

MATERIAL
GROUP P, K

1.0 x DC

1.0 x DC - GROUP M
0.5 x DC - S31-35
0.5 x DC - S36-37

Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.

For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)

n - RPM (rev/min)

f_z - feed per tooth (mm)

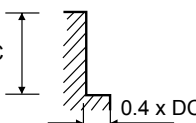
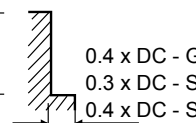
f - feed rate (mm/min)

a_p - axial depth of cut

a_e - radial depth of cut



CUTTING DATA

170323 (4 Flute VXD) - For dynamic & trochoidal milling see p.39-41																				
VDI MATERIAL GROUP			HRc	SIDE CUTTING	Size (mm)															
					6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0								
P	1-5	Non-alloy Steel	<25	v _c (m/min)	160	160	160	160	160	160	160	160								
				n	8488	6366	5093	4244	3638	3183	2546	2037								
				f _z	0.027	0.035	0.042	0.053	0.058	0.063	0.077	0.084								
				f (mm/min)	917	891	856	900	844	802	784	684								
	6-9	Low alloy Steel	25-35	v _c (m/min)	150	150	150	150	150	150	150	150								
				n	7958	5968	4775	3979	3410	2984	2387	1910								
				f _z	0.025	0.035	0.042	0.049	0.056	0.063	0.070	0.084								
				f (mm/min)	796	836	802	780	764	752	668	642								
	10-11	High alloy Steel, Tool Steel	35-45	v _c (m/min)	150	150	150	150	150	150	150	150								
				n	7958	5968	4775	3979	3410	2984	2387	1910								
				f _z	0.027	0.035	0.046	0.053	0.060	0.067	0.077	0.084								
				f (mm/min)	859	836	879	844	819	800	736	642								
M	12	Ferritic/ Martensitic Stainless Steel	v _c (m/min)	155	155	155	155	155	155	155	155									
			n	8223	6167	4934	4112	3524	3084	2467	1974									
			f _z	0.034	0.046	0.057	0.067	0.076	0.086	0.095	0.114									
			f (mm/min)	1125	1125	1125	1094	1071	1055	937	900									
	13	Martensitic Stainless Steel	v _c (m/min)	105	105	105	105	105	105	105	105									
			n	5570	4187	3342	2785	2387	2089	1671	1337									
			f _z	0.025	0.034	0.042	0.048	0.055	0.062	0.071	0.081									
			f (mm/min)	557	568	562	535	525	518	475	433									
	14	Austenitic Stainless Steel	v _c (m/min)	44	44	44	44	44	44	44	44									
			n	2334	1751	1401	1168	1000	875	700	560									
			f _z	0.016	0.021	0.027	0.032	0.036	0.040	0.046	0.052									
			f (mm/min)	151	146	149	151	144	140	128	117									
K	15-20	Cast Iron	v _c (m/min)	175	175	175	175	175	175	175	175									
			n	9284	6963	5570	4642	3979	3482	2785	2228									
			f _z	0.021	0.028	0.035	0.042	0.048	0.053	0.060	0.070									
			f (mm/min)	780	780	780	780	764	738	668	624									
S	31-35	HRSA Fe & Ni/Co Based	v _c (m/min)	32	32	32	32	32	32	32	32									
			n	1698	1273	1019	849	728	637	509	407									
			f _z	0.020	0.026	0.032	0.038	0.044	0.048	0.055	0.065									
			f (mm/min)	136	132	130	129	128	122	112	106									
	36-37	Titanium/ Titanium Alloys	v _c (m/min)	70	70	70	70	70	70	70	70									
			n	3714	2785	2228	1857	1592	1393	1114	891									
			f _z	0.034	0.048	0.057	0.067	0.076	0.086	0.095	0.114									
			f (mm/min)	508	529	508	494	484	476	423	406									
MATERIAL GROUP P, K					1.0 x DC								1.0 x DC - M12-13 0.6 x DC - M14 0.6 x DC - S31-35 1.0 x DC - S36-37							
									0.4 x DC - GROUP M 0.3 x DC - S31-35 0.4 x DC - S36-37											

Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
 All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut



CUTTING DATA

170323 (4 Flute VXD) - For dynamic & trochoidal milling see p.39-41											
VDI MATERIAL GROUP		HRc	SLOTTING	Size (mm)							
				6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1-5	Non-alloy Steel	<25	v_c (m/min)	125	125	125	125	125	125	125
				n	6631	4974	3979	3316	2842	2487	1989
				f_z	0.025	0.034	0.042	0.049	0.056	0.063	0.070
				f (mm/min)	663	676	668	650	637	627	557
	6-9	Low alloy Steel	25-35	v_c (m/min)	120	120	120	120	120	120	120
				n	6366	4775	3820	3183	2728	2387	1910
				f_z	0.025	0.034	0.042	0.049	0.056	0.063	0.070
				f (mm/min)	637	649	642	624	611	602	535
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	120	120	120	120	120	120	120
				n	6366	4775	3820	3183	2728	238	1910
				f_z	0.027	0.035	0.042	0.053	0.058	0.063	0.077
				f (mm/min)	688	668	642	675	633	602	588
M	12	Ferritic/ Martensitic Stainless Steel		v_c (m/min)	125	125	125	125	125	125	125
				n	6631	4974	3979	3316	2842	2487	1989
				f_z	0.034	0.046	0.057	0.067	0.074	0.081	0.095
				f (mm/min)	907	907	907	882	841	803	756
	13	Martensitic Stainless Steel		v_c (m/min)	85	85	85	85	85	85	85
				n	4509	3382	2706	2255	1933	1691	1353
				f_z	0.025	0.034	0.042	0.048	0.055	0.062	0.071
				f (mm/min)	446	463	452	428	425	418	386
	14	Austenitic Stainless Steel		v_c (m/min)	36	36	36	36	36	36	36
				n	1910	1432	1146	955	819	716	573
				f_z	0.016	0.021	0.027	0.032	0.036	0.040	0.046
				f (mm/min)	123	120	122	123	118	114	105
K	15-20	Cast Iron		v_c (m/min)	140	140	140	140	140	140	140
				n	7427	5570	4456	3714	3183	2785	2228
				f_z	0.021	0.028	0.035	0.042	0.048	0.053	0.060
				f (mm/min)	624	624	624	624	611	590	535
S	31-35	HRSA Fe & Ni/Co Based		v_c (m/min)	25	25	25	25	25	25	25
				n	1326	995	796	663	568	497	397
				f_z	0.018	0.024	0.030	0.036	0.040	0.044	0.050
				f (mm/min)	95	95	95	95	91	88	80
	36-37	Titanium/ Titanium Alloys		v_c (m/min)	55	55	55	55	55	55	55
				n	2918	2188	1751	1459	1251	1094	875
				f_z	0.034	0.046	0.057	0.067	0.076	0.086	0.095
				f (mm/min)	399	399	399	388	380	374	333

MATERIAL GROUP P, K

1.0 x DC - M12-13
0.5 x DC - M14
0.4 x DC - S31-35
1.0 x DC - S36-37

Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
 All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

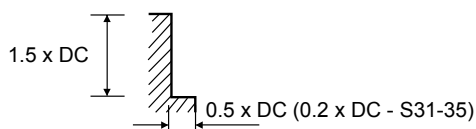
v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut



CUTTING DATA

172530, 174530 (5 Flute VX5H) - For dynamic & trochoidal milling see p.39-41

VDI MATERIAL GROUP		HRc	SIDE CUTTING	Size (mm)						
				6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-5	Non-alloy Steel	<25	v_c (m/min)	152	152	152	152	152	152
				n	8060	6050	4840	4030	3020	1935
				f_z	0.038	0.046	0.059	0.074	0.095	0.123
				f (mm/min)	1530	1390	1430	1490	1435	1190
	6-9	Low alloy Steel	25-35	v_c (m/min)	122	122	122	122	122	122
				n	6470	4850	3880	3240	2430	1550
				f_z	0.029	0.036	0.045	0.058	0.072	0.088
				f (mm/min)	1380	1255	1285	1345	1295	1070
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	122	122	122	122	122	122
				n	6470	4850	3880	3240	2430	1550
				f_z	0.029	0.036	0.045	0.058	0.072	0.088
				f (mm/min)	1380	1255	1285	1345	1295	1070
M	12	Ferritic/ Martensitic Stainless Steel		v_c (m/min)	76	76	76	76	76	76
				n	4030	3025	2420	2015	1510	970
				f_z	0.024	0.031	0.04	0.05	0.061	0.08
				f (mm/min)	485	470	485	505	460	385
	13	Martensitic Stainless Steel		v_c (m/min)	91	91	91	91	91	91
				n	4830	3620	2895	2415	1810	1160
				f_z	0.031	0.036	0.048	0.062	0.072	0.083
				f (mm/min)	750	650	695	750	650	420
	14	Austenitic Stainless Steel		v_c (m/min)	61	61	61	61	61	61
				n	3230	2425	1940	1620	1215	970
				f_z	0.024	0.028	0.037	0.05	0.056	0.067
				f (mm/min)	385	340	360	405	340	285
K	15-20	Cast Iron		v_c (m/min)	113	113	113	113	113	113
				n	5995	4495	3595	2995	2250	1795
				f_z	0.034	0.041	0.051	0.062	0.082	0.099
				f (mm/min)	1020	920	915	930	920	890
S	31-35	HRSA Fe & Ni/Co Based		v_c (m/min)	27	27	27	27	27	27
				n	1430	1075	860	715	535	430
				f_z	0.024	0.031	0.037	0.046	0.054	0.061
				f (mm/min)	170	165	160	165	145	130
	36-37	Titanium/ Titanium Alloys		v_c (m/min)	49	49	49	49	49	49
				n	2600	1950	1560	1300	975	780
				f_z	0.024	0.031	0.037	0.046	0.054	0.061
				f (mm/min)	310	300	290	300	260	215



Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
 All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut



CUTTING DATA

172530, 174530 (5 Flute VX5H) - For dynamic & trochoidal milling see p.39-41

VDI MATERIAL GROUP		HRc	SLOTTING	Size (mm)						
				6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-5	Non-alloy Steel	<25	v_c (m/min)	84	84	84	84	84	84
				n	4455	3340	2675	2225	1670	1070
				f_z	0.031	0.038	0.048	0.058	0.074	0.097
				f (mm/min)	690	635	640	645	620	525
	6-9	Low alloy Steel	25-35	v_c (m/min)	84	84	84	84	84	84
				n	4455	3340	2675	2225	1670	1070
				f_z	0.024	0.028	0.037	0.046	0.059	0.075
				f (mm/min)	535	470	495	510	490	400
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	76	76	76	76	76	76
				n	4030	3025	2420	2015	1510	970
				f_z	0.024	0.028	0.037	0.046	0.059	0.075
				f (mm/min)	485	420	450	465	445	360
M	12	Ferritic/ Martensitic Stainless Steel		v_c (m/min)	69	69	69	69	69	69
				n	3660	2745	2195	1830	1375	880
				f_z	0.019	0.023	0.032	0.041	0.049	0.065
				f (mm/min)	350	315	350	375	335	285
	13	Martensitic Stainless Steel		v_c (m/min)	76	76	76	76	76	76
				n	4030	3025	2420	2015	1510	965
				f_z	0.024	0.028	0.037	0.05	0.059	0.067
				f (mm/min)	485	420	450	505	445	405
	14	Austenitic Stainless Steel		v_c (m/min)	61	61	61	61	61	61
				n	3235	2425	1940	1615	1215	970
				f_z	0.019	0.023	0.029	0.041	0.046	0.053
				f (mm/min)	305	280	280	330	280	225
K	15-20	Cast Iron		v_c (m/min)	79	79	79	79	79	79
				n	4190	3140	2515	2095	1570	1005
				f_z	0.026	0.033	0.04	0.05	0.068	0.08
				f (mm/min)	545	520	500	525	525	500
S	31-35	HRSA Fe & Ni/Co Based		v_c (m/min)	20	20	20	20	20	20
				n	1060	795	635	530	400	320
				f_z	0.019	0.026	0.029	0.036	0.044	0.051
				f (mm/min)	100	100	90	95	85	80
	36-37	Titanium/ Titanium Alloys		v_c (m/min)	49	49	49	49	49	49
				n	2600	1950	1560	1300	975	780
				f_z	0.019	0.026	0.029	0.036	0.044	0.051
				f (mm/min)	245	255	225	235	215	200

MATERIAL GROUP P, K

1.0 x DC

MATERIAL GROUP M, S

0.5 x DC

Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
 All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

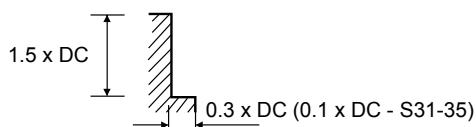
v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut



CUTTING DATA

171323, 172323, 173323, 174323 (5 Flute VX5) - For dynamic & trochoidal milling see p.39-41

VDI MATERIAL GROUP		HRc	SIDE CUTTING	Size (mm)						
				6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-5	Non-alloy Steel	<25	v_c (m/min)	144	144	144	144	144	144
				n	7639	5730	4584	3820	2865	1833
				f_z	0.034	0.038	0.050	0.063	0.076	0.101
				f (mm/min)	1299	1089	1146	1203	1089	926
	6-9	Low alloy Steel	25-35	v_c (m/min)	101	101	101	101	101	101
				n	5358	4019	3215	2679	2009	1286
				f_z	0.034	0.038	0.050	0.063	0.076	0.101
				f (mm/min)	911	764	804	844	764	649
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	60	60	60	60	60	60
				n	3183	2387	1910	1592	1194	764
				f_z	0.024	0.027	0.035	0.044	0.054	0.071
				f (mm/min)	382	322	334	350	322	271
M	12	Ferritic/ Martensitic Stainless Steel		v_c (m/min)	117	117	117	117	117	117
				n	6207	4655	3724	3104	2328	1490
				f_z	0.024	0.025	0.030	0.046	0.054	0.071
				f (mm/min)	745	582	559	714	628	529
	13	Martensitic Stainless Steel		v_c (m/min)	82	82	82	82	82	82
				n	4350	3263	2610	2175	1631	1044
				f_z	0.030	0.032	0.038	0.063	0.069	0.088
				f (mm/min)	653	522	496	685	563	459
	14	Austenitic Stainless Steel		v_c (m/min)	59	59	59	59	59	59
				n	3130	2348	1878	1565	1174	751
				f_z	0.030	0.032	0.038	0.063	0.069	0.088
				f (mm/min)	470	376	354	493	405	331
K	15-20	Cast Iron		v_c (m/min)	106	106	106	106	106	106
				n	5623	4218	3374	2812	2109	1350
				f_z	0.043	0.048	0.063	0.079	0.096	0.111
				f (mm/min)	1209	1012	1063	1111	1012	850
S	31-35	HRSA Fe & Ni/Co Based		v_c (m/min)	31	31	31	31	31	31
				n	1645	1233	987	822	617	395
				f_z	0.021	0.022	0.027	0.044	0.048	0.053
				f (mm/min)	173	136	133	181	148	122
	36-37	Titanium/ Titanium Alloys		v_c (m/min)	69	69	69	69	69	69
				n	3661	2745	2196	1830	1373	879
				f_z	0.027	0.029	0.034	0.057	0.062	0.079
				f (mm/min)	494	398	373	522	426	347



Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
 All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut



CUTTING DATA

175323 (5 Flute VX5 Roughing)												
VDI MATERIAL GROUP			HRc	SIDE CUTTING	Size (mm)							
					6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
M	12-14	Stainless Steel		v_c (m/min)	80	80	80	80	80	80	80	80
				n	4244	3183	2546	2122	1819	1592	1273	1019
				f_z	0.025	0.034	0.041	0.051	0.057	0.063	0.081	0.091
				f (mm/min)	531	541	522	541	518	501	516	463
S	31-35	HRSA Fe & Ni/Co Based		v_c (m/min)	40	40	40	40	40	40	40	40
				n	2122	1592	1273	1061	909	796	637	509
				f_z	0.020	0.025	0.037	0.040	0.046	0.052	0.061	0.068
				f (mm/min)	212	199	236	212	209	207	197	173
	36-37	Titanium/ Titanium Alloys		v_c (m/min)	65	65	65	65	65	65	65	65
				n	3448	2586	2069	1724	1478	1293	1035	828
				f_z	0.022	0.031	0.038	0.046	0.052	0.058	0.074	0.084
				f (mm/min)	379	401	393	397	384	375	383	348

MATERIAL GROUP M, S36-37

1.5 x DC

a_e

a_e : $\phi 6.0 - \phi 10.0 : 0.15 \times DC$
 $\phi 12.0 - \phi 16.0 : 0.1 \times DC$
 $\phi 20.0 - \phi 25.0 : 0.05 \times DC$

MATERIAL GROUP S31-35

1.0 x DC

$0.05 \times DC$

Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
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For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

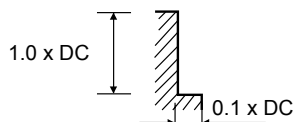
v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut



CUTTING DATA

173329, 673329, 174329, 175329, 675329, 176329 (6 Flute VX6 & VX6C) - For dynamic & trochoidal milling see p.39-41

VDI MATERIAL GROUP		HRc		Size (mm)						
				6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-5	Non-alloy Steel	<25	v_c (m/min)	151	151	151	151	151	151
				n	7998	5998	4799	3999	2999	1919
				f_z	0.022	0.035	0.043	0.053	0.061	0.075
				f (mm/min)	1056	1224	1238	1272	1098	864
	6-9	Low alloy Steel	25-35	v_c (m/min)	126	126	126	126	126	126
				n	6705	5029	4023	3353	2514	1609
				f_z	0.017	0.028	0.035	0.041	0.049	0.058
				f (mm/min)	684	845	845	825	739	560
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	70	70	70	70	70	70
				n	3716	2787	2230	1858	1394	892
				f_z	0.012	0.019	0.024	0.029	0.033	0.037
				f (mm/min)	268	318	321	323	276	214
M	12	Ferritic/ Martensitic Stainless Steel		v_c (m/min)	131	131	131	131	131	131
				n	6947	5211	4168	3474	2605	1667
				f_z	0.017	0.028	0.035	0.041	0.049	0.058
				f (mm/min)	709	875	875	855	766	580
	13	Martensitic Stainless Steel		v_c (m/min)	93	93	93	93	93	93
				n	4928	3696	2957	2464	1848	1183
				f_z	0.012	0.021	0.027	0.031	0.038	0.043
				f (mm/min)	326	466	479	458	421	341
	14	Austenitic Stainless Steel		v_c (m/min)	85	85	85	85	85	85
				n	4524	3393	2714	2262	1696	1086
				f_z	0.012	0.021	0.027	0.031	0.038	0.043
				f (mm/min)	326	428	440	421	387	313
S	31-35	HRSA Fe & Ni/Co Based		v_c (m/min)	26	26	26	26	26	26
				n	1380	1035	830	690	515	330
				f_z	0.014	0.023	0.029	0.036	0.044	0.053
				f (mm/min)	115	140	145	150	135	105
	36-37	Titanium/ Titanium Alloys		v_c (m/min)	93	93	93	93	93	93
				n	4935	3700	2960	2465	1850	1185
				f_z	0.012	0.021	0.027	0.031	0.038	0.043
				f (mm/min)	355	465	480	460	420	340



Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
 All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut



CUTTING DATA

170329 (4 Flute VX Ball Nose)													
VDI MATERIAL GROUP		HRC		Size (mm)									
				3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-5	Non-alloy Steel	<25	v_c (m/min)	162	162	162	162	162	162	162	162	162
				n	17189	12892	10313	8594	6446	5157	4297	3223	2063
				f_z	0.025	0.027	0.030	0.040	0.060	0.065	0.070	0.075	0.090
				f (mm/min)	1719	1392	1238	1375	1547	1341	1203	967	817
	6-9	Low alloy Steel	25-35	v_c (m/min)	113	113	113	113	113	113	113	113	113
				n	11990	8992	7194	5995	4496	3597	2997	2248	1439
				f_z	0.025	0.027	0.030	0.040	0.060	0.065	0.070	0.074	0.090
				f (mm/min)	1199	921	863	959	1079	935	839	665	570
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	68	68	68	68	68	68	68	68	68
				n	7215	5411	4329	3608	2706	2165	1804	1353	866
				f_z	0.017	0.019	0.021	0.028	0.042	0.045	0.049	0.052	0.063
				f (mm/min)	491	411	364	404	455	390	354	281	242
M	12	Ferritic/ Martensitic Stainless Steel		v_c (m/min)	85	85	85	85	85	85	85	85	85
				n	9019	6764	5411	4509	3382	2706	2255	1691	1353
				f_z	0.020	0.020	0.025	0.041	0.045	0.050	0.055	0.060	0.065
				f (mm/min)	722	541	541	740	609	541	496	406	352
	13	Martensitic Stainless Steel		v_c (m/min)	77	77	77	77	77	77	77	77	77
				n	8170	6127	4902	4085	3064	2451	2042	1532	1225
				f_z	0.015	0.015	0.025	0.030	0.040	0.045	0.050	0.054	0.058
				f (mm/min)	490	368	490	490	490	441	408	332	284
	14	Austenitic Stainless Steel		v_c (m/min)	77	77	77	77	77	77	77	77	77
				n	8170	6127	4902	4085	3064	2451	2042	1532	1225
				f_z	0.020	0.020	0.025	0.041	0.045	0.050	0.055	0.060	0.065
				f (mm/min)	654	490	490	670	551	490	449	368	319
K	15-20	Cast Iron		v_c (m/min)	119	119	119	119	119	119	119	119	119
				n	12626	9470	7576	6313	4735	3788	3157	2367	1894
				f_z	0.031	0.033	0.037	0.050	0.074	0.081	0.087	0.093	0.112
				f (mm/min)	1566	1250	1121	1263	1402	1227	1098	881	848
S	31-35	HRSA Fe & Ni/Co Based		v_c (m/min)	21	21	21	21	21	21	21	21	21
				n	2228	1671	1337	1114	836	668	557	418	334
				f_z	0.014	0.014	0.017	0.028	0.031	0.035	0.038	0.042	0.045
				f (mm/min)	125	94	91	125	104	94	85	70	60
	36-37	Titanium/ Titanium Alloys		v_c (m/min)	47	47	47	47	47	47	47	47	47
				n	4987	3740	2992	2493	1870	1496	1247	935	748
				f_z	0.018	0.018	0.022	0.037	0.040	0.045	0.049	0.054	0.058
				f (mm/min)	359	269	263	369	299	269	244	202	174

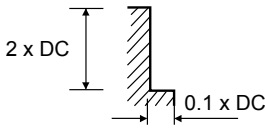
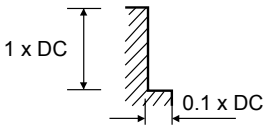
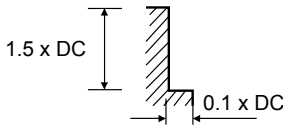
1.0 x DC
0.3 x DC - S31-35
0.3 x DC - S36-37
(0.2 x DC - S31-35)

Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut



CUTTING DATA - DYNAMIC 10% RADIAL DoC

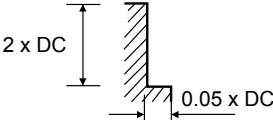
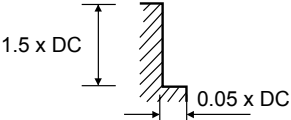
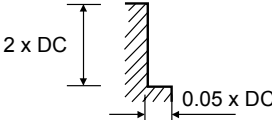
4 Flute VXD, 5 Flute VX5 & VX5H, 6 FLUTE VX6 & VX6C											
VDI MATERIAL GROUP			HRc		Size (mm)						
					6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-5	Non-alloy Steel	<25	v _c (m/min)	240	240	240	240	240	240	240
				f _z	0.05	0.086	0.107	0.128	0.15	0.167	0.172
	6-9	Low alloy Steel	25-35	v _c (m/min)	160	160	160	160	160	160	160
				f _z	0.037	0.063	0.079	0.095	0.111	0.124	0.129
	10-11	High alloy Steel, Tool Steel	35-45	v _c (m/min)	80	80	80	80	80	80	80
				f _z	0.03	0.053	0.065	0.078	0.091	0.102	0.107
M	12	Ferritic/ Martensitic Stainless Steel		v _c (m/min)	170	170	170	170	170	170	170
				f _z	0.036	0.062	0.077	0.093	0.108	0.12	0.125
	13	Martensitic Stainless Steel		v _c (m/min)	120	120	120	120	120	120	120
				f _z	0.03	0.053	0.065	0.078	0.091	0.102	0.106
	14	Austenitic Stainless Steel		v _c (m/min)	110	110	110	110	110	110	110
				f _z	0.03	0.053	0.065	0.078	0.091	0.102	0.106
K	15-20	Cast Iron		v _c (m/min)	110	110	110	110	110	110	110
				f _z	0.025	0.028	0.037	0.047	0.051	0.056	0.066
S	31-35	HRSA Fe & Ni/Co Based		v _c (m/min)	30	30	30	30	30	30	30
				f _z	0.024	0.041	0.052	0.061	0.072	0.083	0.085
	36-37	Titanium/ Titanium Alloys		v _c (m/min)	90	90	90	90	90	90	90
				f _z	0.024	0.041	0.052	0.062	0.072	0.084	0.087
MATERIAL GROUP P, M, K				MATERIAL GROUP S31-35				MATERIAL GROUP S36-37			
											

Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
 All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut



CUTTING DATA - DYNAMIC 5% RADIAL DoC

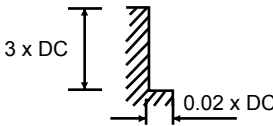
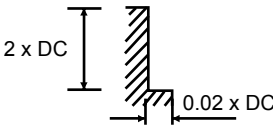
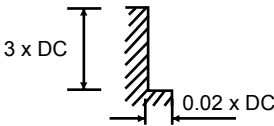
4 Flute VXD, 5 Flute VX5 & VX5H, 6 FLUTE VX6 & VX6C											
VDI MATERIAL GROUP			HRc		Size (mm)						
					6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-5	Non-alloy Steel	<25	v _c (m/min)	300	300	300	300	300	300	300
				f _z	0.068	0.116	0.144	0.172	0.202	0.225	0.232
	6-9	Low alloy Steel	25-35	v _c (m/min)	200	200	200	200	200	200	200
				f _z	0.05	0.085	0.106	0.128	0.149	0.167	0.174
	10-11	High alloy Steel, Tool Steel	35-45	v _c (m/min)	100	100	100	100	100	100	100
				f _z	0.041	0.071	0.088	0.105	0.123	0.137	0.144
M	12	Ferritic/ Martensitic Stainless Steel		v _c (m/min)	210	210	210	210	210	210	210
				f _z	0.049	0.084	0.104	0.125	0.146	0.162	0.168
	13	Martensitic Stainless Steel		v _c (m/min)	150	150	150	150	150	150	150
				f _z	0.041	0.071	0.088	0.105	0.123	0.137	0.143
	14	Austenitic Stainless Steel		v _c (m/min)	130	130	130	130	130	130	130
				f _z	0.041	0.071	0.088	0.105	0.123	0.137	0.142
K	15-20	Cast Iron		v _c (m/min)	135	135	135	135	135	135	135
				f _z	0.034	0.038	0.050	0.063	0.069	0.076	0.089
S	31-35	HRSA Fe & Ni/Co Based		v _c (m/min)	35	35	35	35	35	35	35
				f _z	0.033	0.055	0.07	0.082	0.097	0.112	0.115
	36-37	Titanium/ Titanium Alloys		v _c (m/min)	116	116	116	116	116	116	116
				f _z	0.033	0.055	0.07	0.083	0.097	0.113	0.117
MATERIAL GROUP P, M, K				MATERIAL GROUP S31-35				MATERIAL GROUP S36-37			
											

Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
 All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut



CUTTING DATA - DYNAMIC 2% RADIAL DoC

4 Flute VXD, 5 Flute VX5 & VX5H, 6 FLUTE VX6 & VX6C											
VDI MATERIAL GROUP			HRc		Size (mm)						
					6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-5	Non-alloy Steel	<25	v _c (m/min)	370	370	370	370	370	370	370
				f _z	0.098	0.167	0.208	0.25	0.292	0.325	0.335
	6-9	Low alloy Steel	25-35	v _c (m/min)	240	240	240	240	240	240	240
				f _z	0.072	0.123	0.153	0.185	0.215	0.241	0.251
	10-11	High alloy Steel, Tool Steel	35-45	v _c (m/min)	120	120	120	120	120	120	120
				f _z	0.059	0.102	0.127	0.152	0.178	0.198	0.208
M	12	Ferritic/ Martensitic Stainless Steel		v _c (m/min)	260	260	260	260	260	260	260
				f _z	0.071	0.121	0.15	0.18	0.211	0.234	0.242
	13	Martensitic Stainless Steel		v _c (m/min)	180	180	180	180	180	180	180
				f _z	0.059	0.102	0.127	0.152	0.178	0.198	0.205
	14	Austenitic Stainless Steel		v _c (m/min)	160	160	160	160	160	160	160
				f _z	0.059	0.102	0.127	0.152	0.178	0.198	0.205
K	15-20	Cast Iron		v _c (m/min)	170	170	170	170	170	170	170
				f _z	0.049	0.055	0.072	0.091	0.1	0.11	0.128
S	31-35	HRSA Fe & Ni/Co Based		v _c (m/min)	40	40	40	40	40	40	40
				f _z	0.048	0.079	0.101	0.118	0.14	0.162	0.166
	36-37	Titanium/ Titanium Alloys		v _c (m/min)	140	140	140	140	140	140	140
				f _z	0.048	0.079	0.101	0.120	0.140	0.163	0.169
MATERIAL GROUP P, M, K				MATERIAL GROUP S31-35				MATERIAL GROUP S36-37			
											

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For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)
 n - RPM (rev/min)
 f_z - feed per tooth (mm)
 f - feed rate (mm/min)
 a_p - axial depth of cut
 a_e - radial depth of cut