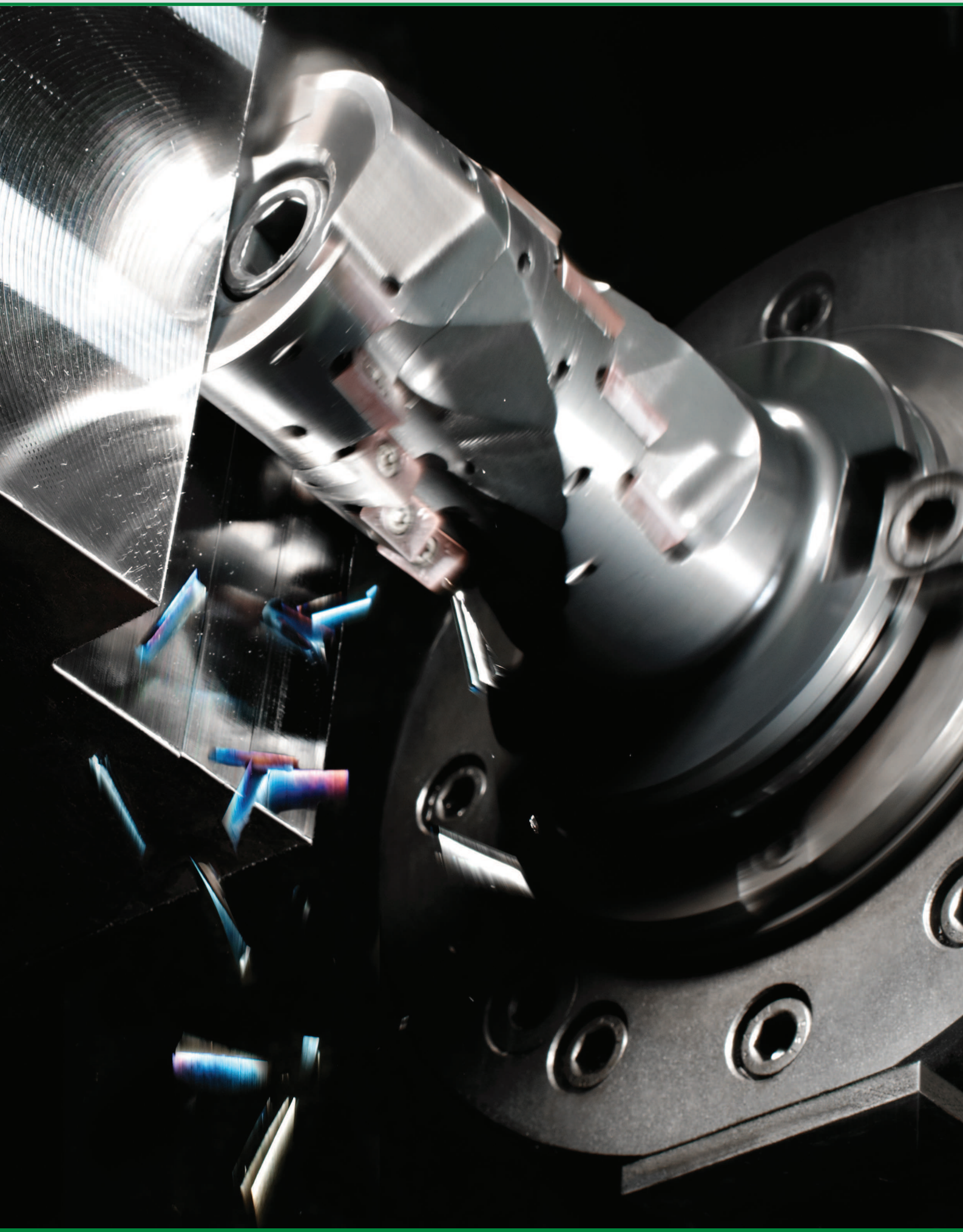
WIDIA



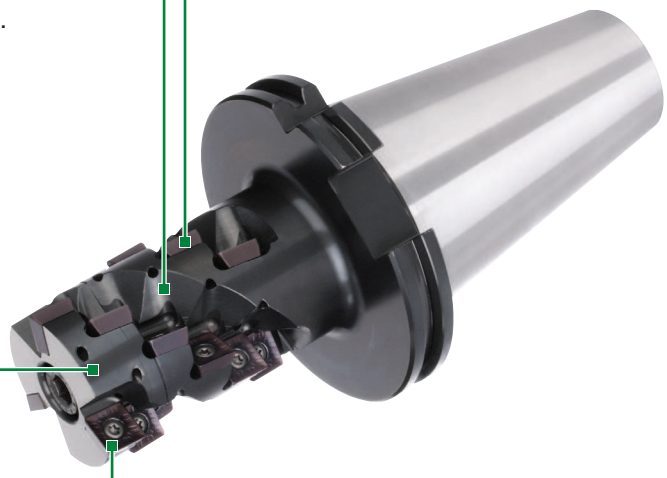
Indexable Milling • Helical Mills

First Choice for High Productivity Helical Milling •
M390 Series

With a replaceable nose collar and positive helix for increased productivity, the M390 Series Helical Mills provide optimal chip evacuation and performance with lower maintenance costs.

- Strong insert and tool design for maximum productivity.
- New SDMX inserts — helical cutting edge for smooth cutting.
- Long edge shoulder ensures stable insert support.

M390



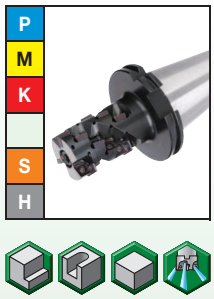
Helical Mills

M390 SD1204...

Max depth of cut: 17mm

Lead angle: 90°
Indexes per insert: 4
Diameter: 50–80mm

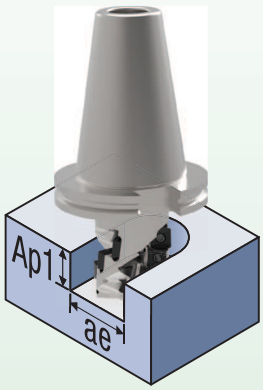
Pages: K4–K9



Maximum cutting depth (Ap1) and contact width (ae) ratios based on application type

Slot Milling

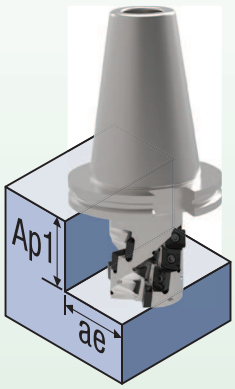
ae = 1 x D1
Ap1 max = 0,6 x D1



**Not recommended in ISO "H" materials.*

Contouring

ae = 0,25–0,4 x D1
Ap1 max = 1 x D1
ae = >0,4 x D1
Ap1 max = 0,6 x D1

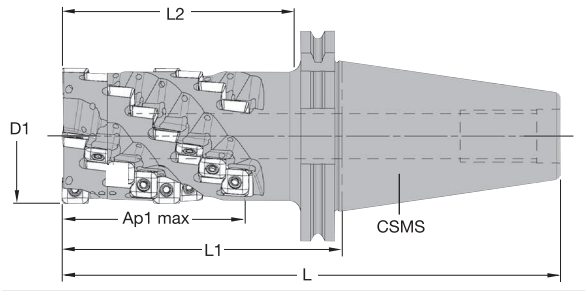


**Not recommended in ISO "H" materials.*

Profiling

ae = <0,25 x D1
Ap1 max = Ap1 max

- Four cutting edges per insert.
- Replaceable end cap.
- Positive helix for high productivity.



Integral

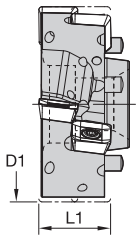
order number	catalogue number	D1	L	L1	L2	Ap1 max	Z	Z U	CSMS system size	max RPM	coolant supply	kg
2021422	**12393041200**	50	207	105	82	64,0	18	3	DV50	14000	Yes	3,4
2021423	**12393041400**	63	232	130	107	85,0	32	4	DV50	12000	Yes	4,3
2021424	**12393041800**	80	262	160	137	117,0	55	5	DV50	10500	Yes	6,3

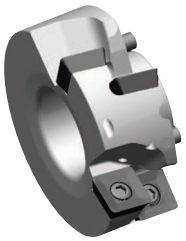
NOTE: Z = number of pocket seats.
ZU = number of effective teeth.

Spare Parts

D1	 insert screw	 Nm	 Torx wrench	 end cap	 socket-head cap screw
50	**12148037700**	4,0	**12148000600**	**12393051200**	**12147625400**
63	**12148037700**	4,0	**12148000600**	**12393051400**	**12148783700**
80	**12148037700**	4,0	**12148000600**	**12393051800**	**12148783700**

- Four cutting edges per insert.
- Replaceable end cap.
- Positive helix for high productivity.





End Cap

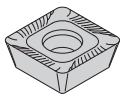
order number	catalogue number	D1	L1	Z U	Z	kg
2021428	**12393051200**	50	21	3	6	0,2
2021429	**12393051400**	63	21	4	8	0,3
2021430	**12393051800**	80	21	5	10	0,5

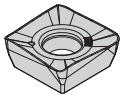
NOTE: Z = number of pocket seats.
ZU = number of effective teeth.

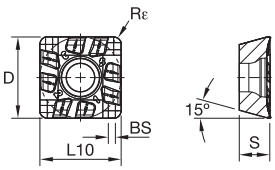
Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1–P2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
P3–P4	.E..ML	TN7535	**.S..MM**	**TN6540**	.S..MH	TN6540
P5–P6	.E..ML	TN7535	**.S..MM**	**TN6540**	.S..MH	TN6540
M1–M2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MH	TN6540
M3	.E..ML	TN7535	**.S..MM**	**TN7535**	.S..MH	TN7535
K1–K2	.E..ML	WK15CM	**.E..ML**	**WK15CM**	.S..MH	WK15CM
K3	.E..ML	WK15CM	**.S..MM**	**TN6525**	.S..MH	TN6525
N1–N2	–	–	**–**	**–**	–	–
N3	–	–	**–**	**–**	–	–
S1–S2	.E..ML	TN6540	**.S..MM**	**TN6540**	.S..MM	TN6540
S3	.E..ML	TN6540	**.S..MM**	**WS30PM**	.S..MM	TN6540
S4	.E..ML	TN6540	**.S..MM**	**WS30PM**	.S..MM	TN6540
H1	.S..MM	WS30PM	**.S..MM**	**WS30PM**	.S..MM	WS30PM

Inserts • SD1204..


SDMT-ML


SDMX-MM



● first choice
○ alternate choice

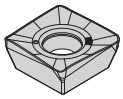
P			●	●	●	●		
M			○	●	○	○		○
K		●	○	○		○	●	
N								
S				●				●
H								

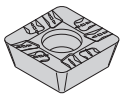
SDMT-ML

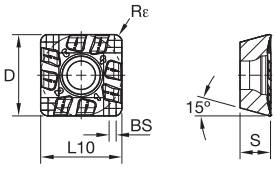
catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMT1204PDRML	4	12,70	12,70	4,77	1,10	1,20	0,08	3094667	-	3020185	2030439	2030437	5427423	-

SDMX-MM

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMX120408RMM	4	12,70	12,70	4,76	1,93	0,80	0,10	-	3950588	3950589	3950590	3950591	-	5522490
SDMX120412RMM	4	12,70	12,70	4,76	1,50	1,20	0,10	-	3950596	3950597	3950599	3950600	-	5519572
SDMX120416RMM	4	12,70	12,70	4,76	1,50	1,60	0,10	4145063	4145064	4145065	-	-	-	-
SDMX120424RMM	4	12,70	12,70	4,76	0,60	2,40	0,10	-	-	4145072	-	4145093	-	-
SDMX120432RMM	4	12,70	12,70	4,76	–	3,20	0,10	-	-	4145094	-	4145095	-	-


SDMX-MH


SDMT-MH



● first choice
○ alternate choice

P			●	●	●	●		
M			○	●	○	○		○
K	●	○	○		○	●		
N								
S				●				●
H								

■ SDMX-MH

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMX120408RMH	4	12,70	12,70	4,76	1,93	0,80	0,14	-	-	3950592	3950594	3950595	5427427	-
SDMX120412RMH	4	12,70	12,70	4,76	1,54	1,20	0,14	3950614	3950601	3950603	3950605	3950606	5427428	-
SDMX120416RMH	4	12,70	12,70	4,76	1,50	1,60	0,14	-	-	3950607	-	3950609	-	-

■ SDMT-MH

catalogue number	cutting edges	D	L10	S	BS	Rε	hm	TN6520	TN6525	TN6540	TN7525	TN7535	WK15CM	WS30PM
SDMT1204PDRMH	4	12,70	12,70	4,81	1,10	1,20	0,14	3094669	3325040	3326330	2030419	2030417	5427422	-

Recommended Starting Speeds [m/min]

Material Group		TN6520			TN6525			TN6540			TN7525		
P	0	–	–	–	340	**265**	235	300	**235**	200	340	**260**	235
	1	–	–	–	340	**265**	235	300	**235**	200	340	**260**	235
	2	–	–	–	265	**210**	180	210	**160**	140	260	**210**	180
	3	–	–	–	235	**180**	155	180	**140**	115	235	**180**	155
	4	–	–	–	195	**140**	120	150	**110**	90	195	**140**	120
	5	–	–	–	260	**195**	165	200	**150**	125	260	**195**	165
	6	–	–	–	170	**135**	110	135	**100**	85	170	**135**	110
M	1	–	–	–	160	**100**	65	110	**65**	50	205	**185**	155
	2	–	–	–	100	**65**	40	65	**40**	35	185	**160**	140
	3	–	–	–	105	**65**	45	70	**40**	35	145	**130**	115
K	1	375	**265**	190	230	**205**	185	185	**170**	150	315	**235**	200
	2	325	**210**	160	180	**160**	150	145	**130**	115	270	**200**	165
	3	250	**190**	135	150	**135**	120	130	**120**	105	200	**165**	140
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	40	**30**	25	–	–	–
	2	–	–	–	–	–	–	20	**15**	10	–	–	–
	3	–	–	–	–	–	–	60	**35**	25	–	–	–
	4	–	–	–	–	–	–	50	**25**	20	–	–	–
H	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

(continued)

(Recommended Starting Speeds [m/min] — continued)

Material Group		TN7535			WK15CM			WS30PM		
P	0	455	**395**	370	–	–	–	–	–	–
	1	455	**395**	370	–	–	–	–	–	–
	2	280	**255**	230	–	–	–	–	–	–
	3	255	**230**	205	–	–	–	–	–	–
	4	190	**175**	160	–	–	–	–	–	–
	5	260	**230**	210	–	–	–	–	–	–
	6	160	**135**	110	–	–	–	–	–	–
M	1	205	**185**	155	–	–	–	225	**200**	185
	2	185	**160**	140	–	–	–	205	**180**	145
	3	145	**130**	115	–	–	–	155	**135**	105
K	1	295	**265**	240	420	**385**	340	–	–	–
	2	235	**210**	190	335	**295**	275	–	–	–
	3	195	**175**	160	280	**250**	230	–	–	–
N	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	45	**40**	30
	2	–	–	–	–	–	–	45	**40**	30
	3	–	–	–	–	–	–	55	**45**	30
	4	–	–	–	–	–	–	85	**60**	40
H	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–

*NOTE: FIRST choice starting speeds are in **bold** type.*
As the average chip thickness increases, the speed should be decreased.

Recommended Starting Feeds

Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
.F..ALP	0,12	**0,23**	0,46	0,08	**0,17**	0,33	0,06	**0,13**	0,25	0,06	**0,11**	0,22	0,05	**0,10**	0,20	.F..ALP
.E..ML	0,12	**0,35**	0,58	0,08	**0,25**	0,42	0,06	**0,19**	0,31	0,06	**0,17**	0,27	0,05	**0,15**	0,25	.E..ML
.S..MM	0,12	**0,42**	0,70	0,08	**0,30**	0,50	0,06	**0,23**	0,38	0,06	**0,20**	0,33	0,05	**0,18**	0,30	.S..MM
.S..MH	0,23	**0,54**	0,85	0,17	**0,39**	0,61	0,13	**0,29**	0,46	0,11	**0,25**	0,40	0,10	**0,23**	0,36	.S..MH

NOTE: Use "Light Machining" value as starting feed rate.