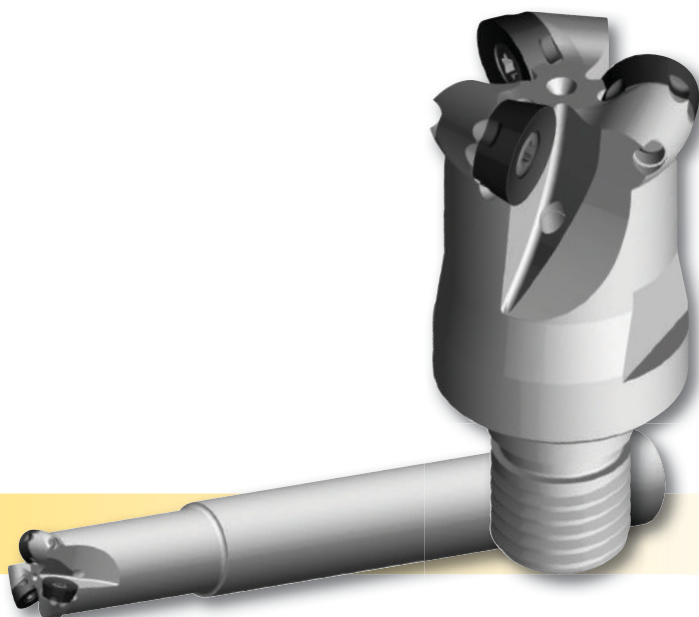


➤ 7713VR Series

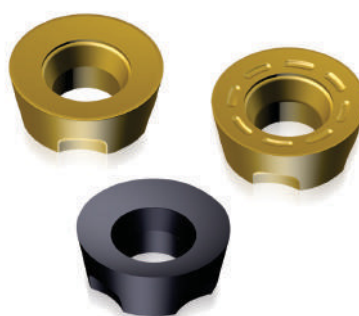
Round Insert Milling Cutter with Indexation

The 7713VR is our newest round insert cutter series. Designed with a new silver-satin surface treatment that reduces body degradation during high-performance applications and enhances body tool life. This cutter series has an anti-rotation design that ensures a precise number of indexes per insert. This enables maximum usage of the available edges for roughing applications.



Features and Benefits

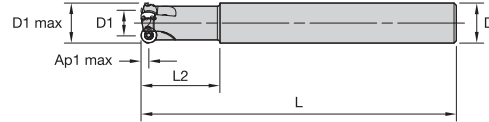
This unique patented pocket system prevents the inserts from rotating in the pocket during heavy-feed machining and unstable conditions. The 7713VR cutter is excellent for roughing and semi-finishing of all materials, especially stainless steel and high-temperature alloys, as well as for steel, and tool steel.



7713VR10:
Maximum a_p = 5mm
Diameter Range = 20–50mm

7713VR12:
Maximum a_p = 6mm
Diameter Range = 32–80mm

- Copy/contour milling applications.
- Patented locking system prevents insert rotation during heavy machining.
- Positive flute design for excellent chip evacuation.

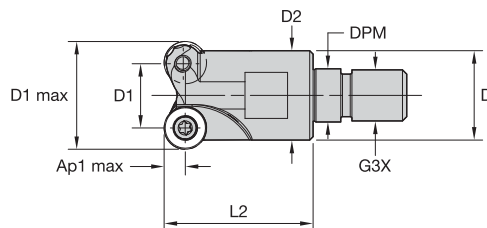


■ Cylindrical End Mills

order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z
5672811	7713VR10CA020Z2R40	20	10	20	180	40	5,0	2
5673047	7713VR10CA025Z3R50	25	15	25	200	50	5,0	3
5673048	7713VR10CA032Z4R70	32	22	32	250	70	5,0	4

■ Spare Parts

D1 max	insert screw	Nm	Torx driver
20	D4007T	3,1	TB15
25	D4007T	3,1	TB15
32	D4008T	3,1	TB15



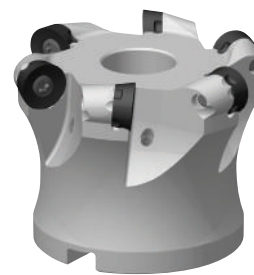
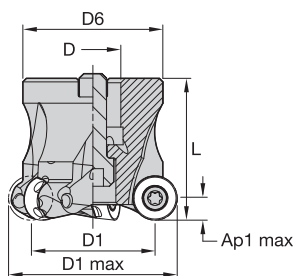
■ Screw-On End Mills

order number	catalogue number	D1 max	D1	D	D2	L2	G3X	DPM	Ap1 max	Z
5673768	7713VR10SA025Z3R35	25	15	21	24	35	M12	12,50	5,0	3
5673050	7713VR10SA032Z4R35	32	22	29	31	35	M16	17,00	5,0	4
5673341	7713VR10SA035Z5R35	35	25	29	34	35	M16	17,00	5,0	5

■ Spare Parts

D1 max	insert screw	Nm	Torx driver
20	D4007T	3,1	TB15
25	D4007T	3,1	TB15
32	D4008T	3,1	TB15
35	D4007T	3,1	TB15

- Copy/contour milling applications.
- Patented locking system prevents insert rotation during heavy machining.
- Positive flute design for excellent chip evacuation.



■ Shell Mills

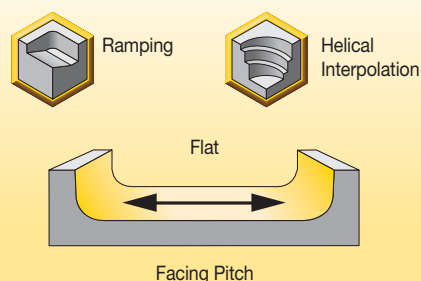
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z
5672813	7713VR10-A040Z05R	40	30	16	36	40	5,0	5
5672625	7713VR10-A042Z06R	42	32	16	38	40	5,0	6
5673340	7713VR10-A050Z06R	50	40	22	41	40	5,0	6

■ Spare Parts

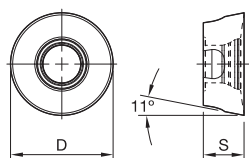
D1 max	insert screw	Nm	Torx driver	socket-head cap screw
40	D4008T	3,1	TB15	M8 1.25 X 25 SHCS
42	D4007T	3,1	TB15	M8 1.25 X 25 SHCS
50	D4008T	3,1	TB15	M10 1.5 X 25 SHCS
63	D4008T	3,1	TB15	M10 1.5 X 25 SHCS

■ Technical Information (mm)

order number	catalogue number	facing pitch	ramping angle	dimension		ap max helical/linear	max RPM
				helical hole min-max			
5672811	7713VR10CA020Z2R40	10	1,89	22	38	3,33	79500
5673047	7713VR10CA025Z3R50	15	5,22	32	48	3,33	64500
5673048	7713VR10CA032Z4R70	22	8,64	46	62	3,33	53500
5672813	7713VR10-A040Z05R	30	7,28	62	78	3,33	45500
5672625	7713VR10-A042Z06R	32	6,71	66	82	3,33	39500
5673340	7713VR10-A050Z06R	40	5,22	82	98	3,33	39500
5673768	7713VR10SA025Z3R35	15	5,22	32	48	3,33	64500
5673050	7713VR10SA032Z4R35	22	8,64	46	62	3,33	53500
5673341	7713VR10SA035Z5R35	25	7,20	52	68	3,33	50000



- ◆◆ first choice with coolant
- ◇◇ first choice without coolant
- ◆ alternate choice with coolant
- ◇ alternate choice without coolant



P1-P2	◇/◆	◇◇	◇/◆	
P3-P4		◆◆	◇/◆	
P5-P6			◆◆	◇/◆
M1-M2	◆◆	◇◇	◆	
M3	◆	◆	◆◆	
K1-K2		◇	◇/◆	
K3		◆	◇/◆	
N1				
N2				
S1	◆		◆◆	◆
S2	◆		◆◆	◆
S3	◆◆		◆	
S4	◆◆		◆	◆



ISO catalogue number	D	S	hm	CE	KCSM40	SP6519	X500	X700
Light Machining								
RPHT10T3M0E422X8	10,00	3,96	0,03	8	-	5660778	-	-



General Machining								
RPHT10T3M0E422X4	10,00	3,97	0,03	4	-	5659867	5660462	5665491
RPPT10T3M0E432X4	10,00	3,97	0,04	4	6201907	-	-	-
RPPT10T3M0E432X5	10,00	3,97	0,03	5	-	-	5894139	-

NOTE: CE: number of indexes
 ap max recommendation to use all indexes of the insert:
 ..E422x8: ap recommended ≤ 1,5mm, ap max ≤ 2,5mm
 ..E422X4: ap recommended ≤ 2,5mm, ap max ≤ 5mm
 ..E432X4: ap recommended ≤ 2,5mm, ap max ≤ 5mm
 ..E432X5: ap recommended ≤ 2mm, ap max ≤ 3,5mm



■ Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 5,00 Axial Depth of Cut (ap)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	10%				20%			30%			40%			50–100%		
422-X8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	422-X8
432-X5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	432-X5
422-X4	0,12	0,29	0,57	0,08	0,21	0,40	0,06	0,16	0,30	0,05	0,14	0,26	0,05	0,13	0,24	422-X4
432-X4	0,12	0,29	0,57	0,08	0,21	0,40	0,06	0,16	0,30	0,05	0,14	0,26	0,05	0,13	0,24	432-X4

At 2,50 Axial Depth of Cut (ap)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)														Insert Geometry	
	10%			20%			30%			40%			50–100%			
422-X8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	422-X8	
432-X5	0,13	0,34	0,66	0,10	0,24	0,47	0,07	0,18	0,35	0,06	0,16	0,30	0,06	0,15	0,28	432-X5
422-X4	0,13	0,34	0,66	0,10	0,24	0,47	0,07	0,18	0,35	0,06	0,16	0,30	0,06	0,15	0,28	422-X4
432-X4	0,13	0,34	0,66	0,10	0,24	0,47	0,07	0,18	0,35	0,06	0,16	0,30	0,06	0,15	0,28	432-X4

At 2,00 Axial Depth of Cut (ap)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	10%			20%			30%			40%			50–100%			
422-X8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	422-X8
432-X5	0,14	0,37	0,71	0,10	0,26	0,51	0,08	0,20	0,38	0,07	0,17	0,33	0,06	0,16	0,30	432-X5
422-X4	0,14	0,37	0,71	0,10	0,26	0,51	0,08	0,20	0,38	0,07	0,17	0,33	0,06	0,16	0,30	422-X4
432-X4	0,14	0,37	0,71	0,10	0,26	0,51	0,08	0,20	0,38	0,07	0,17	0,33	0,06	0,16	0,30	432-X4

At 1,50 Axial Depth of Cut (ap)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	10%			20%			30%			40%			50–100%			
422-X8	0,16	0,41	0,80	0,12	0,30	0,57	0,09	0,22	0,42	0,08	0,19	0,37	0,07	0,18	0,34	422-X8
432-X5	0,16	0,41	0,80	0,12	0,30	0,57	0,09	0,22	0,42	0,08	0,19	0,37	0,07	0,18	0,34	432-X5
422-X4	0,16	0,41	0,80	0,12	0,30	0,57	0,09	0,22	0,42	0,08	0,19	0,37	0,07	0,18	0,34	422-X4
432-X4	0,16	0,41	0,80	0,12	0,30	0,57	0,09	0,22	0,42	0,08	0,19	0,37	0,07	0,18	0,34	432-X4

Material Group		KCSM40			SP6519			X500			X700		
P	1	275	240	205	355	260	155	325	240	155	-	-	-
	2	240	205	160	310	230	140	290	215	140	-	-	-
	3	205	180	160	275	200	120	250	185	120	-	-	-
	4	180	160	145	210	150	90	190	145	90	-	-	-
	5	160	145	125	170	125	85	155	120	85	160	125	85
	6	125	110	90	145	100	60	130	95	60	140	100	60
M	1	275	220	180	325	235	140	300	220	140	310	230	140
	2	180	145	125	280	205	125	265	190	120	275	205	125
	3	145	125	110	235	170	100	215	155	95	230	170	100
K	1	-	-	-	355	265	170	310	265	205	-	-	-
	2	-	-	-	290	210	130	265	215	155	-	-	-
	3	-	-	-	265	190	120	205	170	120	-	-	-
N	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-
H	1	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-

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

Dry
Wet



Material Group		KCSM40			SP6519			X500			X700		
P	1	–	–	–	285	210	125	260	190	125	–	–	–
	2	–	–	–	250	185	110	230	170	110	–	–	–
	3	–	–	–	220	160	95	200	150	95	–	–	–
	4	–	–	–	170	120	70	150	115	70	–	–	–
	5	165	140	115	135	100	70	125	95	70	130	100	70
	6	145	105	75	115	80	50	105	75	50	110	80	50
M	1	200	165	135	260	190	110	240	175	110	250	185	110
	2	170	140	115	225	165	100	210	150	95	220	165	100
	3	140	105	80	190	135	80	170	125	75	185	135	80
K	1	–	–	–	285	210	135	250	210	165	–	–	–
	2	–	–	–	230	170	105	210	170	125	–	–	–
	3	–	–	–	210	150	95	165	135	95	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	40	30	25	50	40	25	50	30	25	50	40	25
	2	40	30	25	50	30	20	45	30	20	45	30	20
	3	50	40	25	50	40	25	50	40	25	50	40	25
	4	55	50	30	75	55	35	70	50	30	70	50	35
H	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

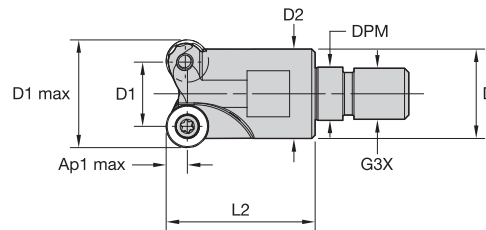
NOTE: FIRST choice starting speeds are in **bold** type.

As the average chip thickness increases, the speed should be decreased.

 Dry

 Wet

- Copy/contour milling applications.
- Patented locking system prevents insert rotation during heavy machining.
- Positive flute design for excellent chip evacuation.

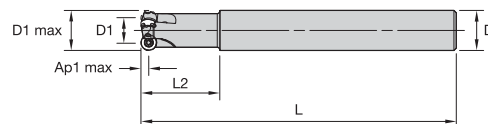


■ Screw-On End Mills

order number	catalogue number	D1 max	D1	D	D2	L2	G3X	DPM	Ap1 max	Z
5673052	7713VR12SA032Z3R35	32	20	29	31	35	M16	17,00	6,0	3
5673439	7713VR12SA040Z4R43	40	28	29	38	43	M16	17,00	6,0	4

■ Spare Parts

catalogue number	insert screw	Nm	Torx driver
7713VR12SA032Z3R35	D4008T	3,1	T15
7713VR12SA040Z4R43	D4008T	3,1	T15



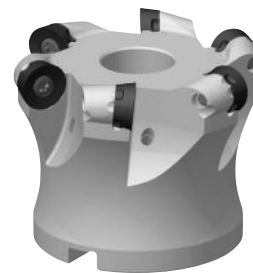
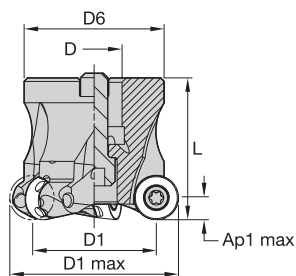
■ Cylindrical End Mills

order number	catalogue number	D1 max	D1	D	L	L2	Ap1 max	Z
5673830	7713VR12CA032Z3R70	32	20	32	250	70	6,0	3

■ Spare Parts

catalogue number	insert screw	Nm	Torx driver
7713VR12CA032Z3R70	D4008T	3,1	T15

- Copy/contour milling applications.
- Patented locking system prevents insert rotation during heavy machining.
- Positive flute design for excellent chip evacuation.



■ Shell Mills

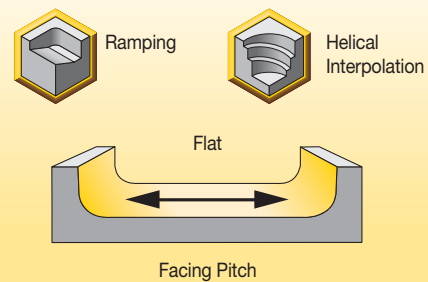
order number	catalogue number	D1 max	D1	D	D6	L	Ap1 max	Z
5672232	7713VR12-A040Z04R	40	28	16	34	40	6,0	4
5672233	7713VR12-A050Z05R	50	38	22	43	40	6,0	5
5673769	7713VR12-A052Z05R	52	40	22	45	40	6,0	5
5672234	7713VR12-A063Z06R	63	51	22	56	50	6,0	6
5672235	7713VR12-A066Z06R	66	54	27	56	50	6,0	6
5673829	7713VR12-A080Z08R	80	68	27	68	50	6,0	8

■ Spare Parts

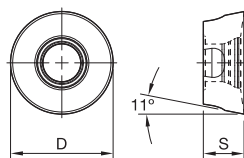
catalogue number	insert screw	Nm	Torx driver	mounting screw
7713VR12-A040Z04R	D4010T	3,1	T15	M8 1.25 X 25 SHCS
7713VR12-A050Z05R	D4010T	3,1	T15	M10 1.5 X 25 SHCS
7713VR12-A052Z05R	D4010T	3,1	T15	M10 1.5 X 25 SHCS
7713VR12-A063Z06R	D4010T	3,1	T15	M10 1.5 X 25 SHCS
7713VR12-A066Z06R	D4010T	3,1	T15	M12 X 1.75 X 30 SHCS
7713VR12-A080Z08R	D4010T	3,1	T15	M12 X 1.75 X 30 SHCS

■ Technical Information (mm)

order number	catalogue number	facing pitch	ramping angle	dimension		ap max helical/linear	max RPM
				helical hole min-max			
5673830	7713VR12CA032Z3R70	20	10,80	42	62	4,00	40000
5672232	7713VR12-A040Z04R	28	7,90	58	78	4,00	34000
5672233	7713VR12-A050Z05R	38	5,50	78	98	4,00	29000
5673769	7713VR12-A052Z05R	40	5,15	82	102	4,00	28500
5672234	7713VR12-A063Z06R	51	3,85	104	124	4,00	25000
5672235	7713VR12-A066Z06R	54	3,60	110	130	4,00	24500
5673829	7713VR12-A080Z08R	68	2,75	138	158	4,00	21500
5673052	7713VR12SA032Z3R35	20	10,80	42	62	4,00	40000
5673439	7713VR12SA040Z4R43	28	7,90	58	78	4,00	34000



- ◆◆ first choice with coolant
- ◇◇ first choice without coolant
- ◆ alternate choice with coolant
- ◇ alternate choice without coolant



P1-P2	◇◇	◇/◆	
P3-P4	◆◆	◇/◆	
P5-P6		◆◆	◇/◆
M1-M2	◇◇	◆	
M3	◆	◆◆	
K1-K2	◇	◇/◆	
K3	◆	◇/◆	
N1			
N2			
S1		◆◆	◆
S2		◆◆	◆
S3		◆◆	
S4		◆	◆◆

ISO catalogue number	D	S	hm	CE	SP6519	X500	X700
Light Machining							
RPHT1204M0E422X4	12,00	4,76	0,04	4	-	5666015	-
RPHT1204M0E442X4	12,00	4,76	0,04	4	5659264	5660351	-
RPHT1204M0E442X5	12,00	4,76	0,04	5	5658324	5657681	-
General Machining							
RPPT1204M0E432X4	12,00	4,76	0,04	4	-	5970235	-
RPPT1204M0E432X5	12,00	4,76	0,04	5	-	5675038	5674803
RPHT1204M0TX4	12,00	4,76	0,10	4	-	5654371	-

NOTE: CE: number of indexes
ap max recommendation to use all indexes of the insert:
 ..E422X4: ap recommended ≤ 3,5mm, ap max ≤ 6mm
 ..E422X5: ap recommended ≤ 2,5mm, ap max ≤ 4mm
 ..E432X4: ap recommended ≤ 3,5mm, ap max ≤ 6mm
 ..E432X5: ap recommended ≤ 2,5mm, ap max ≤ 4mm
 ..MOTX4: ap recommended ≤ 3,5mm, ap max ≤ 6mm

■ Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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At 6,00 Axial Depth of Cut (ap)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
432–X5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	432–X5
442–X4	0,23	0,41	0,66	0,17	0,30	0,47	0,13	0,22	0,35	0,11	0,19	0,31	0,10	0,18	0,28	442–X4
432–X4	0,23	0,41	0,66	0,17	0,30	0,47	0,13	0,22	0,35	0,11	0,19	0,31	0,10	0,18	0,28	432–X4
T–X4	0,23	0,41	0,66	0,17	0,30	0,47	0,13	0,22	0,35	0,11	0,19	0,31	0,10	0,18	0,28	T–X4

At 3,00 Axial Depth of Cut (ap)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
432–X5	0,16	0,49	0,93	0,12	0,35	0,66	0,09	0,26	0,49	0,08	0,23	0,43	0,07	0,21	0,39	432–X5
442–X4	0,16	0,49	0,93	0,12	0,35	0,66	0,09	0,26	0,49	0,08	0,23	0,43	0,07	0,21	0,39	442–X4
432–X4	0,16	0,49	0,93	0,12	0,35	0,66	0,09	0,26	0,49	0,08	0,23	0,43	0,07	0,21	0,39	432–X4
T–X4	0,27	0,68	1,10	0,19	0,49	0,78	0,14	0,36	0,58	0,13	0,32	0,50	0,12	0,29	0,46	T–X4

At 2,50 Axial Depth of Cut (ap)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
432–X5	0,17	0,52	1,00	0,12	0,37	0,71	0,09	0,28	0,53	0,08	0,24	0,46	0,07	0,22	0,42	432–X5
442–X4	0,17	0,52	1,00	0,12	0,37	0,71	0,09	0,28	0,53	0,08	0,24	0,46	0,07	0,22	0,42	442–X4
432–X4	0,17	0,52	1,00	0,12	0,37	0,71	0,09	0,28	0,53	0,08	0,24	0,46	0,07	0,22	0,42	432–X4
T–X4	0,29	0,73	1,18	0,21	0,52	0,84	0,15	0,39	0,62	0,13	0,34	0,54	0,12	0,31	0,49	T–X4

At 1,50 Axial Depth of Cut (ap)

Insert Geometry	Recommended Starting Feed per Tooth (Fz) in Relation to % of Radial Engagement (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
432–X5	0,21	0,64	1,23	0,15	0,46	0,87	0,11	0,34	0,65	0,10	0,30	0,56	0,09	0,27	0,51	432–X5
442–X4	0,21	0,64	1,23	0,15	0,46	0,87	0,11	0,34	0,65	0,10	0,30	0,56	0,09	0,27	0,51	442–X4
432–X4	0,21	0,64	1,23	0,15	0,46	0,87	0,11	0,34	0,65	0,10	0,30	0,56	0,09	0,27	0,51	432–X4
T–X4	0,35	0,90	1,47	0,25	0,64	1,03	0,19	0,47	0,76	0,17	0,41	0,66	0,15	0,38	0,60	T–X4





Material Group		SP6519			X500			X700		
P	1	355	260	155	325	240	155	–	–	–
	2	310	230	140	290	215	140	–	–	–
	3	275	200	120	250	185	120	–	–	–
	4	210	150	90	190	145	90	–	–	–
	5	170	125	85	155	120	85	160	125	85
	6	145	100	60	130	95	60	140	100	60
M	1	325	235	140	300	220	140	310	230	140
	2	280	205	125	265	190	120	275	205	125
	3	235	170	100	215	155	95	230	170	100
K	1	355	265	170	310	265	205	–	–	–
	2	290	210	130	265	215	155	–	–	–
	3	265	190	120	205	170	120	–	–	–
N	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
S	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
H	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–

Material Group		KCSM40			SP6519			X500			X700		
P	1	–	–	–	285	210	125	260	190	125	–	–	–
	2	–	–	–	250	185	110	230	170	110	–	–	–
	3	–	–	–	220	160	95	200	150	95	–	–	–
	4	–	–	–	170	120	70	150	115	70	–	–	–
	5	165	140	115	135	100	70	125	95	70	130	100	70
	6	145	105	75	115	80	50	105	75	50	110	80	50
M	1	200	165	135	260	190	110	240	175	110	250	185	110
	2	170	140	115	225	165	100	210	150	95	220	165	100
	3	140	105	80	190	135	80	170	125	75	185	135	80
K	1	–	–	–	285	210	135	250	210	165	–	–	–
	2	–	–	–	230	170	105	210	170	125	–	–	–
	3	–	–	–	210	150	95	165	135	95	–	–	–
N	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–
S	1	40	30	25	50	40	25	50	30	25	50	40	25
	2	40	30	25	50	30	20	45	30	20	45	30	20
	3	50	40	25	50	40	25	50	40	25	50	40	25
	4	55	50	30	75	55	35	70	50	30	70	50	35
H	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–

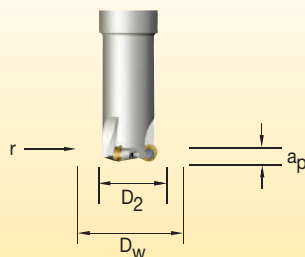
NOTE: FIRST choice starting speeds are in **bold** type.

As the average chip thickness increases, the speed should be decreased.

■ Dry

■ Wet

7713VR Technical Information



Working Diameter:

Formula to evaluate the correct working diameter based on axial depth of cut (a_p).

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

where:

D_w = Working diameter

D_2 = Diameter of cutter insert centre to centre

r = Insert radius

a_p = Axial depth of cut

where:

f_z = Feed per tooth

h_m = Average chip thickness

r = Insert radius

a_e = Radial depth of cut

a_p = Axial depth of cut

Formula to find programmed feed rate based on radial engagement and axial depth of cut.

$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}}$$

Formula to calculate the average chip thickness h_m in relation with radial engagement and depth of cut.

$$h_m = f_z \times \frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}$$

Simplified formulas to evaluate h_m and f_z based on radial engagement or depth of cut.

Calculation of the average chip thickness in relation with the D.O.C. (Axial)

Formula: Programme Feed Rate (f_z)

$$f_z = h_m \times \sqrt{\frac{d}{a_p}}$$

h_m = Average chip thickness

a_p = Depth of cut

f_z = Feed per tooth

d = Insert diameter

Formula: Average Chip Thickness (h_m)

$$h_m = f_z \times \sqrt{\frac{a_e}{d}}$$

Calculation of the average chip thickness in relation with the a_e (Radial Engagement) if a_e is less than 50% of diameter

Formula: Programme Feed Rate (f_z)

$$f_z = h_m \times \sqrt{\frac{d}{a_e}}$$

h_m = Average chip thickness

a_e = Radial engagement

f_z = Feed per tooth

d = Cutter diameter

Formula: Average Chip Thickness (h_m)

$$h_m = f_z \times \sqrt{\frac{d}{a_p}}$$

