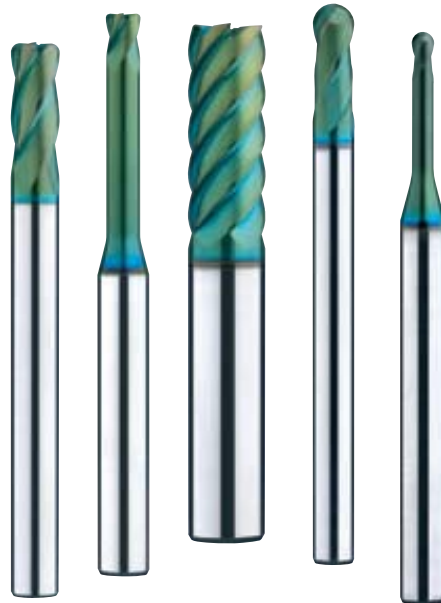


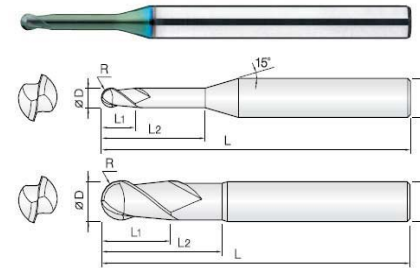
# 200 Series FOR HARDENED STEELS



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### 2 Flutes Rid Ball End Mills for Hardened Steels



Endmills for pre-hardened and hardened steel (HRc52~68)  
 Good wear resistance by Si-based PVD coating.  
 High precise edge tolerance.  
 Very nice work surface finish.  
 Outstanding performance at high speed machining by ultra fine (0.2um) WC grade.

**Cutting Data**  
P98

Size	D Tolerance
D ≤ Φ6	+0~ -0.01mm
D > Φ6	+0~ -0.015mm

Type	Part Number	Dimensions in mm					d
		R X D	L1	L2	L		
	210002005H04Z2-TIS	0.1R X 0.2	0.2	0.5	40	4	
	210002010H04Z2-TIS	0.1R X 0.2	0.2	1	40	4	
	210002015H04Z2-TIS	0.1R X 0.2	0.2	1.5	40	4	
	210002020H04Z2-TIS	0.1R X 0.2	0.2	2	40	4	
	210003010H04Z2-TIS	0.15R X 0.3	0.3	1	40	4	
	210003015H04Z2-TIS	0.15R X 0.3	0.3	1.5	40	4	
<b>UWC</b>	210003020H04Z2-TIS	0.15R X 0.3	0.3	2	40	4	
	210003030H04Z2-TIS	0.15R X 0.3	0.3	3	40	4	
	210004010H04Z2-TIS	0.2R X 0.4	0.4	1	40	4	
	210004020H04Z2-TIS	0.2R X 0.4	0.4	2	40	4	
	210004030H04Z2-TIS	0.2R X 0.4	0.4	3	40	4	
	210004040H04Z2-TIS	0.2R X 0.4	0.4	4	40	4	
<b>TISIN-S Coating</b>	210004050H04Z2-TIS	0.2R X 0.4	0.4	5	40	4	
	210004060H04Z2-TIS	0.2R X 0.4	0.4	6	40	4	
	210004080H04Z2-TIS	0.2R X 0.4	0.4	8	40	4	
	210005010H04Z2-TIS	0.25R X 0.5	0.5	1	45	4	
	210005020H04Z2-TIS	0.25R X 0.5	0.5	2	45	4	
	210005030H04Z2-TIS	0.25R X 0.5	0.5	3	45	4	
	210005040H04Z2-TIS	0.25R X 0.5	0.5	4	45	4	
	210005050H04Z2-TIS	0.25R X 0.5	0.5	5	45	4	
	210005060H04Z2-TIS	0.25R X 0.5	0.5	6	45	4	
	210005080H04Z2-TIS	0.25R X 0.5	0.5	8	45	4	
	210005100H04Z2-TIS	0.25R X 0.5	0.5	10	45	4	
	210006010H04Z2-TIS	0.3R X 0.6	0.6	1	45	4	
	210006020H04Z2-TIS	0.3R X 0.6	0.6	2	45	4	
	210006030H04Z2-TIS	0.3R X 0.6	0.6	3	45	4	
	210006040H04Z2-TIS	0.3R X 0.6	0.6	4	45	4	
	210006050H04Z2-TIS	0.3R X 0.6	0.6	5	45	4	
	210006060H04Z2-TIS	0.3R X 0.6	0.6	6	45	4	
	210006080H04Z2-TIS	0.3R X 0.6	0.6	8	45	4	
	210006100H04Z2-TIS	0.3R X 0.6	0.6	10	45	4	
	210006120H04Z2-TIS	0.3R X 0.6	0.6	12	45	4	
	210007020H04Z2-TIS	0.35R X 0.7	0.7	2	45	4	
	210007040H04Z2-TIS	0.35R X 0.7	0.7	4	45	4	
	210007080H04Z2-TIS	0.35R X 0.7	0.7	8	45	4	
	210007100H04Z2-TIS	0.35R X 0.7	0.7	10	45	4	
	210007120H04Z2-TIS	0.35R X 0.7	0.7	12	45	4	
	210008020H04Z2-TIS	0.4R X 0.8	0.8	2	45	4	
	210008040H04Z2-TIS	0.4R X 0.8	0.8	4	45	4	
	210008060H04Z2-TIS	0.4R X 0.8	0.8	6	45	4	
	210008080H04Z2-TIS	0.4R X 0.8	0.8	8	45	4	
	210008100H04Z2-TIS	0.4R X 0.8	0.8	10	45	4	
210008120H04Z2-TIS	0.4R X 0.8	0.8	12	45	4		
210009040H04Z2-TIS	0.45R X 0.9	0.9	4	45	4		
210010020H04Z2-TIS	0.5R X 1	1	2	50	4		
210010030H04Z2-TIS	0.5R X 1	1	3	50	4		
210010040H04Z2-TIS	0.5R X 1	1	4	50	4		
210010050H04Z2-TIS	0.5R X 1	1	5	50	4		

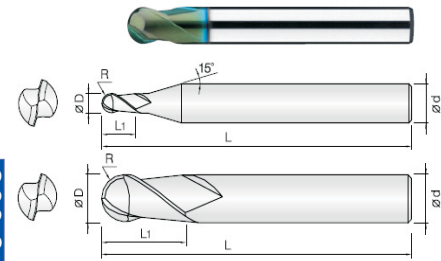
Type	Part Number	Dimensions in mm				
		R X D	L1	L2	L	d
	210010060H04Z2-TIS	0.5R X 1	1	6	50	4
	210010080H04Z2-TIS	0.5R X 1	1	8	50	4
	210010100H04Z2-TIS	0.5R X 1	1	10	50	4
	210010120H04Z2-TIS	0.5R X 1	1	12	50	4
	210010140H04Z2-TIS	0.5R X 1	1	14	50	4
	210010160H04Z2-TIS	0.5R X 1	1	16	50	4
	210010180H04Z2-TIS	0.5R X 1	1	18	50	4
	210010200H04Z2-TIS	0.5R X 1	1	20	50	4
	210010220H04Z2-TIS	0.5R X 1	1	22	60	4
	210012040H04Z2-TIS	0.6R X 1.2	1.2	4	50	4
	210012060H04Z2-TIS	0.6R X 1.2	1.2	6	50	4
	210012080H04Z2-TIS	0.6R X 1.2	1.2	8	50	4
	210012100H04Z2-TIS	0.6R X 1.2	1.2	10	50	4
	210012120H04Z2-TIS	0.6R X 1.2	1.2	12	50	4
	210012160H04Z2-TIS	0.6R X 1.2	1.2	16	50	4
	210012200H04Z2-TIS	0.6R X 1.2	1.2	20	50	4
	210012240H04Z2-TIS	0.6R X 1.2	1.2	24	60	4
	210014060H04Z2-TIS	0.7R X 1.4	1.4	6	50	4
	210014080H04Z2-TIS	0.7R X 1.4	1.4	8	50	4
	210014120H04Z2-TIS	0.7R X 1.4	1.4	12	50	4
	210014160H04Z2-TIS	0.7R X 1.4	1.4	16	50	4
	210015030H04Z2-TIS	0.75R X 1.5	1.5	3	50	4
	210015040H04Z2-TIS	0.75R X 1.5	1.5	4	50	4
	210015060H04Z2-TIS	0.75R X 1.5	1.5	6	50	4
	210015080H04Z2-TIS	0.75R X 1.5	1.5	8	50	4
	210015100H04Z2-TIS	0.75R X 1.5	1.5	10	50	4
	210015120H04Z2-TIS	0.75R X 1.5	1.5	12	50	4
	210015140H04Z2-TIS	0.75R X 1.5	1.5	14	50	4
	210015160H04Z2-TIS	0.75R X 1.5	1.5	16	50	4
	210015180H04Z2-TIS	0.75R X 1.5	1.5	18	50	4
	210015200H04Z2-TIS	0.75R X 1.5	1.5	20	50	4
	210015220H04Z2-TIS	0.75R X 1.5	1.5	22	60	4
	210015250H04Z2-TIS	0.75R X 1.5	1.5	25	60	4
	210015300H04Z2-TIS	0.75R X 1.5	1.5	30	70	4
	210016060H04Z2-TIS	0.8R X 1.6	1.6	6	50	4
	210016080H04Z2-TIS	0.8R X 1.6	1.6	8	50	4
	210016120H04Z2-TIS	0.8R X 1.6	1.6	12	50	4
	210016160H04Z2-TIS	0.8R X 1.6	1.6	16	50	4
	210016200H04Z2-TIS	0.8R X 1.6	1.6	20	50	4
	210018060H04Z2-TIS	0.9R X 1.8	1.8	6	50	4
	210018080H04Z2-TIS	0.9R X 1.8	1.8	8	50	4
	210018120H04Z2-TIS	0.9R X 1.8	1.8	12	50	4
	210018160H04Z2-TIS	0.9R X 1.8	1.8	16	50	4
	210018200H04Z2-TIS	0.9R X 1.8	1.8	20	50	4
	210020040H04Z2-TIS	1R X 2	2	4	50	4
	210020060H04Z2-TIS	1R X 2	2	6	50	4
	210020080H04Z2-TIS	1R X 2	2	8	50	4
	210020100H04Z2-TIS	1R X 2	2	10	50	4
	210020120H04Z2-TIS	1R X 2	2	12	50	4
	210020140H04Z2-TIS	1R X 2	2	14	50	4
	210020160H04Z2-TIS	1R X 2	2	16	50	4
	210020180H04Z2-TIS	1R X 2	2	18	50	4
	210020200H04Z2-TIS	1R X 2	2	20	50	4
	210020220H04Z2-TIS	1R X 2	2	22	60	4
	210020250H04Z2-TIS	1R X 2	2	25	60	4
	210025080H04Z2-TIS	1.25R X 2.5	2.5	8	50	4
	210025100H04Z2-TIS	1.25R X 2.5	2.5	10	50	4
	210025160H04Z2-TIS	1.25R X 2.5	2.5	16	50	4

Type	Part Number	Dimensions in mm				
		R X D	L1	L2	L	d
	210025200H04Z2-TIS	1.25R X 2.5	2.5	20	60	4
	210025250H04Z2-TIS	1.25R X 2.5	2.5	25	60	4
	210025300H04Z2-TIS	1.25R X 2.5	2.5	30	70	4
	210030060H06Z2-TIS	1.5R X 3	3	6	50	6
	210030080H06Z2-TIS	1.5R X 3	3	8	50	6
	210030100H06Z2-TIS	1.5R X 3	3	10	50	6
	210030120H06Z2-TIS	1.5R X 3	3	12	50	6
	210030160H06Z2-TIS	1.5R X 3	3	16	60	6
	210030200H06Z2-TIS	1.5R X 3	3	20	60	6
	210030250H06Z2-TIS	1.5R X 3	3	25	65	6
	210030300H06Z2-TIS	1.5R X 3	3	30	70	6
	210030350H06Z2-TIS	1.5R X 3	3	35	75	6
	210030400H06Z2-TIS	1.5R X 3	3	40	80	6
	210040080H06Z2-TIS	2R X 4	4	8	50	6
	210040100H06Z2-TIS	2R X 4	4	10	50	6
	210040120H06Z2-TIS	2R X 4	4	12	50	6
	210040160H06Z2-TIS	2R X 4	4	16	60	6
	210040200H06Z2-TIS	2R X 4	4	20	60	6
	210040250H06Z2-TIS	2R X 4	4	25	65	6
	210040300H06Z2-TIS	2R X 4	4	30	70	6
	210040350H06Z2-TIS	2R X 4	4	35	75	6
	210040400H06Z2-TIS	2R X 4	4	40	80	6
	210050150H06Z2-TIS	2.5R X 5	5	15	60	6
	210050200H06Z2-TIS	2.5R X 5	5	20	60	6
	210050250H06Z2-TIS	2.5R X 5	5	25	70	6
	210050300H06Z2-TIS	2.5R X 5	5	30	75	6
	210050400H06Z2-TIS	2.5R X 5	5	40	80	6
	210060150H06Z2-TIS	3R X 6	10	15	55	6
	210080250060Z2-TIS	4R X 8	12	25	60	8
	210100300070Z2-TIS	5R X 10	16	30	70	10
	210120300075Z2-TIS	6R X 12	18	30	75	12

200 Series

200 Series

**2 Flutes Short Length Ball End Mills for Hardened Steels**

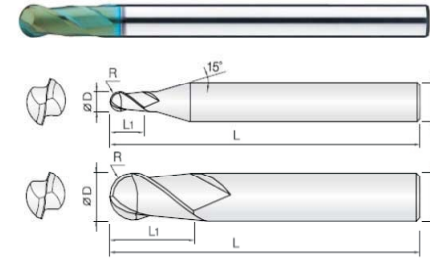


Endmills for pre-hardened and hardened steel (HRc52-68)  
 Good wear resistance by Si-based PVD coating.  
 High precise edge tolerance.  
 Very nice work surface finish.  
 Outstanding performance at high speed machining by ultra fine (0.2um) WC grade.

**Cutting Data**  
P99

Size	D Tolerance
D ≤ Φ6	+0~ -0.01mm
D > Φ6	+0~ -0.015mm

**2 Flutes Ball End Mills for Hardened Steels**



Endmills for pre-hardened and hardened steel (HRc52-68)  
 Good wear resistance by Si-based PVD coating.  
 High precise edge tolerance.  
 Very nice work surface finish.  
 Outstanding performance at high speed machining by ultra fine (0.2um) WC grade.

**Cutting Data**  
P99

Size	D Tolerance
D ≤ Φ6	+0~ -0.01mm
D > Φ6	+0~ -0.015mm

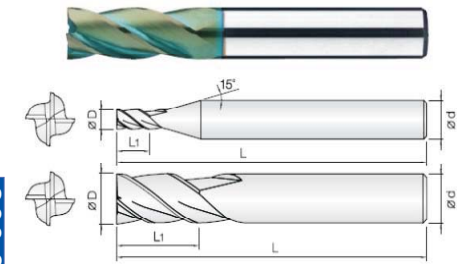
200 Series

200 Series

Type	Part Number	Dimensions in mm				
		R X D	L1	L2	L	d
2	230002002H04Z2-TIS	0.1R X 0.2	0.2	40	4	
	230003003H04Z2-TIS	0.15R X 0.3	0.3	40	4	
	230004004H04Z2-TIS	0.2R X 0.4	0.4	40	4	
	230005005H04Z2-TIS	0.25R X 0.5	0.5	40	4	
	230006006H04Z2-TIS	0.3R X 0.6	0.6	40	4	
	230007007H04Z2-TIS	0.35R X 0.7	0.7	40	4	
	230008008H04Z2-TIS	0.4R X 0.8	0.8	40	4	
	230009009H04Z2-TIS	0.45R X 0.9	0.9	40	4	
	230010010H04Z2-TIS	0.5R X 1	1	40	4	
	230015015H04Z2-TIS	0.75R X 1.5	1.5	40	4	
UWC	230020020H04Z2-TIS	1R X 2	2	45	4	
	230030030H04Z2-TIS	1.5R X 3	3	45	4	
	230030030H06Z2-TIS	1.5R X 3	3	45	6	
	230040040H04Z2-TIS	2R X 4	4	45	4	
	230040040H06Z2-TIS	2R X 4	4	45	6	
	230050050H06Z2-TIS	2.5R X 5	5	50	6	
	230060060050Z2-TIS	3R X 6	6	50	6	
	230080080050Z2-TIS	4R X 8	8	50	8	
	230100100060Z2-TIS	5R X 10	10	60	10	
	230120120060Z2-TIS	6R X 12	12	60	12	
TISIN-S Coating						
R ±0.005 0.1R - 3R						
R ±0.01 4R - 6R						
30° Helix Angle						

Type	Part Number	Dimensions in mm				
		R X D	L1	L2	L	d
2	231002004H04Z2-TIS	0.1R X 0.2	0.4	40	4	
	231003006H04Z2-TIS	0.15R X 0.3	0.6	40	4	
	231004008H04Z2-TIS	0.2R X 0.4	0.8	40	4	
	231005010H04Z2-TIS	0.25R X 0.5	1	45	4	
	231006012H04Z2-TIS	0.3R X 0.6	1.2	45	4	
	231008020H04Z2-TIS	0.4R X 0.8	2	45	4	
	231010025H04Z2-TIS	0.5R X 1	2.5	50	4	
	231010025H06Z2-TIS	0.5R X 1	2.5	50	6	
	231015040H04Z2-TIS	0.75R X 1.5	4	50	4	
	231015040H06Z2-TIS	0.75R X 1.5	4	50	6	
UWC	231020050H04Z2-TIS	1R X 2	5	50	4	
	231020050H06Z2-TIS	1R X 2	5	50	6	
	231025060H04Z2-TIS	1.25R X 2.5	6	50	4	
	231030080H04Z2-TIS	1.5R X 3	8	50	4	
	231030080H06Z2-TIS	1.5R X 3	8	60	6	
	231040080H04Z2-TIS	2R X 4	8	60	4	
	231040080H06Z2-TIS	2R X 4	8	70	6	
	231050100H06Z2-TIS	2.5R X 5	10	75	6	
	231060100060Z2-TIS	3R X 6	10	60	6	
	231060120090Z2-TIS	3R X 6	12	90	6	
R ±0.005 0.1R - 3R	231080120060Z2-TIS	4R X 8	12	60	8	
	231080140100Z2-TIS	4R X 8	14	100	8	
	231100150070Z2-TIS	5R X 10	15	70	10	
	231100180100Z2-TIS	5R X 10	18	100	10	
	231120180075Z2-TIS	6R X 12	18	75	12	
	231120220110Z2-TIS	6R X 12	22	110	12	
R ±0.01 4R - 6R						
30° Helix Angle						

**4 Flutes End Mills for Hardened Steels**



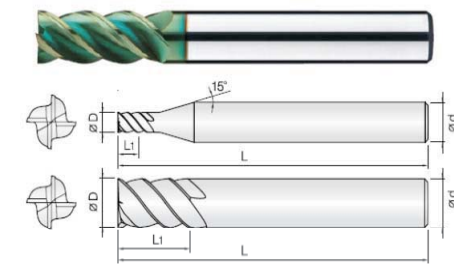
**Endmills for pre-hardened and hardened steel (HRc52~65)**  
 Good wear resistance by Si-based PVD coating.  
 High precise edge tolerance.  
 Reinforced edge design for preventing edge chipping.  
 Outstanding performance at high speed machining by ultra fine (0.2um) WC grade.

**Cutting Data**  
P99

Size	D Tolerance
D ≤ Φ5	+0~ -0.01mm
D > Φ5	+0~ -0.02mm

Type	Part Number	Dimensions in mm					d
		D	L1	L2	L		
4	250010025H04Z4-TIS	1	2.5		40	4	
	250010025H06Z4-TIS	1	2.5		40	6	
	250015040H04Z4-TIS	1.5	4		40	4	
	250015040H06Z4-TIS	1.5	4		40	6	
	250020060H04Z4-TIS	2	6		40	4	
	250020060H06Z4-TIS	2	6		40	6	
	250025080H04Z4-TIS	2.5	8		45	4	
	250025080H06Z4-TIS	2.5	8		45	6	
	250030080H04Z4-TIS	3	8		45	4	
	250030080H06Z4-TIS	3	8		45	6	
UWC	250040110H04Z4-TIS	4	11		45	4	
	250040110H06Z4-TIS	4	11		45	6	
	250050130H06Z4-TIS	5	13		50	6	
	250060130H06Z4-TIS	6	13		50	6	
	250080190H08Z4-TIS	8	19		60	8	
	250100220H10Z4-TIS	10	22		70	10	
	250120260H12Z4-TIS	12	26		75	12	
TISIN-S Coating							
D +0~-0.01 Φ0.1 - Φ5							
D +0~-0.02 Φ6 - Φ12							
30° Helix Angle							

**4 Flutes 45° Helix End Mills for Hardened Steels**



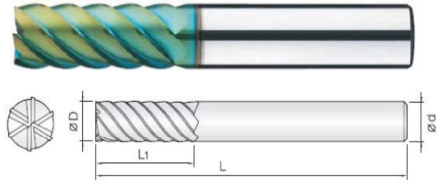
**Endmills for pre-hardened and hardened steel (HRc52~65)**  
 Good wear resistance by Si-based PVD coating.  
 High precise edge tolerance.  
 Reinforced edge design for preventing edge chipping.  
 45° degree helix design for high speed, feed condition.  
 Outstanding performance at high speed machining by ultra fine (0.2um) WC grade.

**Cutting Data**  
P100

Size	D Tolerance
D ≤ Φ5	+0~ -0.01mm
D > Φ5	+0~ -0.02mm

Type	Part Number	Dimensions in mm					d
		D	L1	L2	L		
4	260010050H06Z4-TIS	1	2.5		40	6	
	260020050H06Z4-TIS	2	5		40	6	
	260030080H06Z4-TIS	3	8		45	6	
	260040110H06Z4-TIS	4	11		45	6	
	260050130H06Z4-TIS	5	13		50	6	
	260060130H06Z4-TIS	6	13		50	6	
	260080200H08Z4-TIS	8	20		60	8	
	260100220H10Z4-TIS	10	22		70	10	
	260120260H12Z4-TIS	12	26		75	12	
UWC							
TISIN-S Coating							
D +0~-0.01 Φ0.1 - Φ5							
D +0~-0.02 Φ6 - Φ12							
45° Helix Angle							

**6 Flutes 45° Helix End Mills for Hardened Steels**



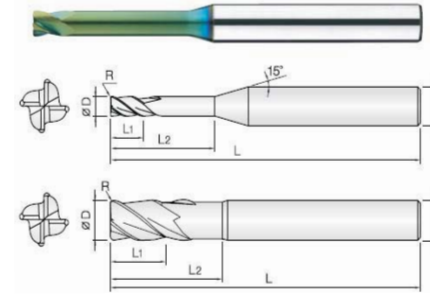
Endmills for pre-hardened and hardened steel (HRc52~65)  
 Good wear resistance by Si-based PVD coating.  
 High precise edge tolerance.  
 Reinforced edge design for preventing edge chipping.  
 45° degree helix design for high speed, feed condition.  
 Outstanding performance at high speed machining by ultra fine (0.2um) WC grade.

**Cutting Data**  
P100

Size	D Tolerance
D ≤ Φ8	+0~ -0.02mm
D > Φ8	-0.01~ -0.03mm

Type	Part Number	Dimensions in mm					d
		D	L1	L2	L		
6	261060150H06Z6-TIS	6	15		50	6	
	261060200H06Z6-TIS	6	20		60	6	
	261080200H08Z6-TIS	8	20		60	8	
	261080250H08Z6-TIS	8	25		65	8	
	261080350H08Z6-TIS	8	35		90	8	
	261100250H10Z6-TIS	10	25		70	10	
	261100350H10Z6-TIS	10	35		90	10	
	261120300H12Z6-TIS	12	30		80	12	
	261120400H12Z6-TIS	12	40		90	12	
	261160500H16Z6-TIS	16	50		110	16	
UWC	261160650H16Z6-TIS	16	65		120	16	
	261200600H20Z6-TIS	20	60		120	20	
	261200800H20Z6-TIS	20	80		150	20	
TISIN-S Coating							
D +0~0.02 Φ0.1 - Φ5							
D -0.01~0.03 Φ10 - Φ20							
45° Helix Angle							

**4 Flutes Rib Corner Radius End Mills for Hardened Steels**



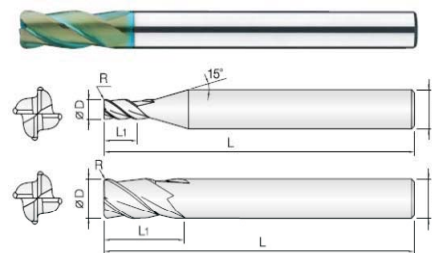
Endmills for pre-hardened and hardened steel (HRc52~68)  
 Good wear resistance by Si-based PVD coating.  
 High precise edge tolerance.  
 Designed for minimizing edge chipping by corner R shape.  
 Various corner R and flute length for wide range application.  
 Outstanding performance at high speed machining by ultra fine (0.2um) WC grade.

**Cutting Data**  
P101

Size	D Tolerance
D ≤ Φ6	+0~ -0.01mm
D > Φ6	+0~ -0.015mm

Type	Part Number	Dimensions in mm					d
		R X D	L1	L2	L		
4	270010D05040Z4-TIS	1 X R0.05	1	4	45	4	
	270010D05060Z4-TIS	1 X R0.05	1	6	45	4	
	270010D05080Z4-TIS	1 X R0.05	1	8	45	4	
	270010D05100Z4-TIS	1 X R0.05	1	10	50	4	
	270010D05120Z4-TIS	1 X R0.05	1	12	50	4	
	270010001040Z4-TIS	1 X R0.1	1	4	45	4	
	270010001060Z4-TIS	1 X R0.1	1	6	45	4	
	270010001080Z4-TIS	1 X R0.1	1	8	45	4	
	270010001100Z4-TIS	1 X R0.1	1	10	50	4	
	270010001120Z4-TIS	1 X R0.1	1	12	50	4	
UWC	270010002040Z4-TIS	1 X R0.2	1	4	45	4	
	270010002060Z4-TIS	1 X R0.2	1	6	45	4	
	270010002080Z4-TIS	1 X R0.2	1	8	45	4	
	270010002100Z4-TIS	1 X R0.2	1	10	50	4	
	270010002120Z4-TIS	1 X R0.2	1	12	50	4	
	270010003040Z4-TIS	1 X R0.3	1	4	45	4	
	270010003060Z4-TIS	1 X R0.3	1	6	45	4	
	270010003080Z4-TIS	1 X R0.3	1	8	45	4	
	270010003100Z4-TIS	1 X R0.3	1	10	50	4	
	270010003120Z4-TIS	1 X R0.3	1	12	50	4	
R ±0.005 Φ1 - Φ6	270012001040Z4-TIS	1.2 X R0.1	1.2	4	45	4	
	270012001060Z4-TIS	1.2 X R0.1	1.2	6	45	4	
	270012001080Z4-TIS	1.2 X R0.1	1.2	8	45	4	
	270012001100Z4-TIS	1.2 X R0.1	1.2	10	50	4	
	270012001120Z4-TIS	1.2 X R0.1	1.2	12	50	4	
	270012002040Z4-TIS	1.2 X R0.2	1.2	4	45	4	
	270012002060Z4-TIS	1.2 X R0.2	1.2	6	45	4	
	270012002080Z4-TIS	1.2 X R0.2	1.2	8	45	4	
	270012002100Z4-TIS	1.2 X R0.2	1.2	10	50	4	
	270012002120Z4-TIS	1.2 X R0.2	1.2	12	50	4	
R ±0.01 Φ8 - Φ12	270012003040Z4-TIS	1.2 X R0.3	1.2	4	45	4	
	270012003060Z4-TIS	1.2 X R0.3	1.2	6	45	4	
	270012003080Z4-TIS	1.2 X R0.3	1.2	8	45	4	
	270012003100Z4-TIS	1.2 X R0.3	1.2	10	50	4	
	270012003120Z4-TIS	1.2 X R0.3	1.2	12	50	4	
	270015001060Z4-TIS	1.5 X R0.1	1.5	6	45	4	
	270015001080Z4-TIS	1.5 X R0.1	1.5	8	45	4	
	270015001100Z4-TIS	1.5 X R0.1	1.5	10	50	4	
	270015001120Z4-TIS	1.5 X R0.1	1.5	12	50	4	
	270015001160Z4-TIS	1.5 X R0.1	1.5	16	50	4	
30° Helix Angle	270015002060Z4-TIS	1.5 X R0.2	1.5	6	45	4	
	270015002080Z4-TIS	1.5 X R0.2	1.5	8	45	4	
	270015002100Z4-TIS	1.5 X R0.2	1.5	10	50	4	
	270015002120Z4-TIS	1.5 X R0.2	1.5	12	50	4	
	270015002160Z4-TIS	1.5 X R0.2	1.5	16	50	4	
	270015003060Z4-TIS	1.5 X R0.3	1.5	6	45	4	
	270015003080Z4-TIS	1.5 X R0.3	1.5	8	45	4	
	270015003100Z4-TIS	1.5 X R0.3	1.5	10	50	4	

**4 Flutes Corner Radius End Mills for Hardened Steels**



Endmills for pre-hardened and hardened steel (HRc52~68)  
 Good wear resistance by Si-based PVD coating.  
 High precise edge tolerance.  
 Designed for minimizing edge chipping by corner R shape.  
 Various corner R and overall length for wide range application.  
 Outstanding performance at high speed machining by ultra fine (0.2um) WC grade.

**Cutting Data**  
P101

Size	D Tolerance
D ≤ Φ6	+0~ -0.01mm
D > Φ6	+0~ -0.015mm

Type	Part Number	Dimensions in mm				
		R X D	L1	L2	L	d
	270050001160Z4-TIS	5 X R0.1	5	16	60	6
	270050001300Z4-TIS	5 X R0.1	5	30	70	6
	270050002160Z4-TIS	5 X R0.2	5	16	60	6
	270050002300Z4-TIS	5 X R0.2	5	30	70	6
	270050003160Z4-TIS	5 X R0.3	5	16	60	6
	270050003300Z4-TIS	5 X R0.3	5	30	70	6
	270050005160Z4-TIS	5 X R0.5	5	16	60	6
	270050005300Z4-TIS	5 X R0.5	5	30	70	6
	270050010160Z4-TIS	5 X R1	5	16	60	6
	270050010300Z4-TIS	5 X R1	5	30	70	6
	270060001200Z4-TIS	6 X R0.1	7	20	60	6
	270060001400Z4-TIS	6 X R0.1	7	40	80	6
	270060002200Z4-TIS	6 X R0.2	7	20	60	6
	270060002400Z4-TIS	6 X R0.2	7	40	80	6
	270060003200Z4-TIS	6 X R0.3	7	20	60	6
	270060003400Z4-TIS	6 X R0.3	7	40	80	6
	270060005200Z4-TIS	6 X R0.5	7	20	60	6
	270060005400Z4-TIS	6 X R0.5	7	40	80	6
	270060010200Z4-TIS	6 X R1	7	20	60	6
	270060010400Z4-TIS	6 X R1	7	40	80	6
	270060015200Z4-TIS	6 X R1.5	7	20	60	6
	270060015400Z4-TIS	6 X R1.5	7	40	80	6
	270080005220Z4-TIS	8 X R0.5	9	22	65	8
	270080010220Z4-TIS	8 X R1	9	22	65	8
	270080015220Z4-TIS	8 X R1.5	9	22	65	8
	270080020220Z4-TIS	8 X R2	9	22	65	8
	270100005240Z4-TIS	10 X R0.5	11	24	70	10
	270100010240Z4-TIS	10 X R1	11	24	70	10
	270100015240Z4-TIS	10 X R1.5	11	24	70	10
	270100025240Z4-TIS	10 X R2.5	11	24	70	10
	270120005260Z4-TIS	12 X R0.5	13	26	80	12
	270120010260Z4-TIS	12 X R1	13	26	80	12
	270120015260Z4-TIS	12 X R1.5	13	26	80	12
	270120020260Z4-TIS	12 X R2	13	26	80	12
	270120030260Z4-TIS	12 X R3	13	26	80	12

Type	Part Number	Dimensions in mm				
		R X D	L1	L2	L	d
	280010D05H04Z4-TIS	1 X R0.05	2.5	45	4	
	280010001H04Z4-TIS	1 X R0.1	2.5	45	4	
	280010002H04Z4-TIS	1 X R0.2	2.5	45	4	
	280010003H04Z4-TIS	1 X R0.3	2.5	45	4	
	280015D05H04Z4-TIS	1.5 X R0.05	4	45	4	
	280015001H04Z4-TIS	1.5 X R0.1	4	45	4	
	280015002H04Z4-TIS	1.5 X R0.2	4	45	4	
	280015003H04Z4-TIS	1.5 X R0.3	4	45	4	
	280015005H04Z4-TIS	1.5 X R0.5	4	45	4	
	280020D05H04Z4-TIS	2 X R0.05	6	45	4	
	280020001H04Z4-TIS	2 X R0.1	6	45	4	
	280020002H04Z4-TIS	2 X R0.2	6	45	4	
	280020003H04Z4-TIS	2 X R0.3	6	45	4	
	280020005H04Z4-TIS	2 X R0.5	6	45	4	
	280025001H04Z4-TIS	2.5 X R0.1	6	50	4	
	280025002H04Z4-TIS	2.5 X R0.2	6	50	4	
	280025003H04Z4-TIS	2.5 X R0.3	6	50	4	
	280025005H04Z4-TIS	2.5 X R0.5	6	50	4	
	280030001H06Z4-TIS	3 X R0.1	8	60	6	
	280030002H06Z4-TIS	3 X R0.2	8	60	6	
	280030003H06Z4-TIS	3 X R0.3	8	60	6	
	280030005H06Z4-TIS	3 X R0.5	8	60	6	
	280030010H06Z4-TIS	3 X R1	8	60	6	
	280040001H06Z4-TIS	4 X R0.1	11	70	6	
	280040002H06Z4-TIS	4 X R0.2	11	70	6	
	280040003H06Z4-TIS	4 X R0.3	11	70	6	
	280040005H06Z4-TIS	4 X R0.5	11	70	6	
	280040010H06Z4-TIS	4 X R1	11	70	6	
	280050001H06Z4-TIS	5 X R0.1	13	75	6	
	280050002H06Z4-TIS	5 X R0.2	13	75	6	
	280050003H06Z4-TIS	5 X R0.3	13	75	6	
	280050005H06Z4-TIS	5 X R0.5	13	75	6	
	280050010H06Z4-TIS	5 X R1	13	75	6	
	280060001055Z4-TIS	6 X R0.1	11	55	6	
	280060001080Z4-TIS	6 X R0.1	13	80	6	
	280060002055Z4-TIS	6 X R0.2	11	55	6	
	280060002080Z4-TIS	6 X R0.2	13	80	6	
	280060003055Z4-TIS	6 X R0.3	11	55	6	
	280060003080Z4-TIS	6 X R0.3	13	80	6	
	280060005055Z4-TIS	6 X R0.5	11	55	6	
	280060005080Z4-TIS	6 X R0.5	13	80	6	
	280060010055Z4-TIS	6 X R1	11	55	6	
	280060010080Z4-TIS	6 X R1	13	80	6	
	280060015055Z4-TIS	6 X R1.5	11	55	6	
	280060015080Z4-TIS	6 X R1.5	13	80	6	
	280060020055Z4-TIS	6 X R2	11	55	6	
	280060020080Z4-TIS	6 X R2	13	80	6	
	280080005060Z4-TIS	8 X R0.5	16	60	8	

Type	Part Number	Dimensions in mm					d
		R X D	L1	L2	L		
	270015003120Z4-TIS	1.5 X R0.3	1.5	12	50	4	
	270015003160Z4-TIS	1.5 X R0.3	1.5	16	50	4	
	270015005060Z4-TIS	1.5 X R0.5	1.5	6	45	4	
	270015005080Z4-TIS	1.5 X R0.5	1.5	8	45	4	
	270015005100Z4-TIS	1.5 X R0.5	1.5	10	50	4	
	270015005120Z4-TIS	1.5 X R0.5	1.5	12	50	4	
	270015005160Z4-TIS	1.5 X R0.5	1.5	16	50	4	
	270020001060Z4-TIS	2 X R0.1	2	6	45	4	
	270020001080Z4-TIS	2 X R0.1	2	8	45	4	
	270020001100Z4-TIS	2 X R0.1	2	10	50	4	
	270020001120Z4-TIS	2 X R0.1	2	12	50	4	
	270020001160Z4-TIS	2 X R0.1	2	16	50	4	
	270020001200Z4-TIS	2 X R0.1	2	20	50	4	
	270020001250Z4-TIS	2 X R0.1	2	25	60	4	
	270020002060Z4-TIS	2 X R0.2	2	6	45	4	
	270020002080Z4-TIS	2 X R0.2	2	8	45	4	
	270020002100Z4-TIS	2 X R0.2	2	10	50	4	
	270020002120Z4-TIS	2 X R0.2	2	12	50	4	
	270020002160Z4-TIS	2 X R0.2	2	16	50	4	
	270020002200Z4-TIS	2 X R0.2	2	20	50	4	
	270020002250Z4-TIS	2 X R0.2	2	25	60	4	
	270020003060Z4-TIS	2 X R0.3	2	6	45	4	
	270020003080Z4-TIS	2 X R0.3	2	8	45	4	
	270020003100Z4-TIS	2 X R0.3	2	10	50	4	
	270020003120Z4-TIS	2 X R0.3	2	12	50	4	
	270020003160Z4-TIS	2 X R0.3	2	16	50	4	
	270020003200Z4-TIS	2 X R0.3	2	20	50	4	
	270020003250Z4-TIS	2 X R0.3	2	25	60	4	
	270020005060Z4-TIS	2 X R0.5	2	6	45	4	
	270020005080Z4-TIS	2 X R0.5	2	8	45	4	
	270020005100Z4-TIS	2 X R0.5	2	10	50	4	
	270020005120Z4-TIS	2 X R0.5	2	12	50	4	
	270020005160Z4-TIS	2 X R0.5	2	16	50	4	
	270020005200Z4-TIS	2 X R0.5	2	20	50	4	
	270020005250Z4-TIS	2 X R0.5	2	25	60	4	
	270025001100Z4-TIS	2.5 X R0.1	2.5	10	50	4	
	270025001160Z4-TIS	2.5 X R0.1	2.5	16	50	4	
	270025001200Z4-TIS	2.5 X R0.1	2.5	20	50	4	
	270025001250Z4-TIS	2.5 X R0.1	2.5	25	60	4	
	270025002100Z4-TIS	2.5 X R0.2	2.5	10	50	4	
	270025002160Z4-TIS	2.5 X R0.2	2.5	16	50	4	
	270025002200Z4-TIS	2.5 X R0.2	2.5	20	50	4	
	270025002250Z4-TIS	2.5 X R0.2	2.5	25	60	4	
	270025003100Z4-TIS	2.5 X R0.3	2.5	10	50	4	
	270025003160Z4-TIS	2.5 X R0.3	2.5	16	50	4	
	270025003200Z4-TIS	2.5 X R0.3	2.5	20	50	4	
	270025003250Z4-TIS	2.5 X R0.3	2.5	25	60	4	
	270025005100Z4-TIS	2.5 X R0.5	2.5	10	50	4	
	270025005160Z4-TIS	2.5 X R0.5	2.5	16	50	4	
	270025005200Z4-TIS	2.5 X R0.5	2.5	20	50	4	
	270025005250Z4-TIS	2.5 X R0.5	2.5	25	60	4	
	270030001100Z4-TIS	3 X R0.1	3	10	50	6	
	270030001160Z4-TIS	3 X R0.1	3	16	55	6	
	270030001200Z4-TIS	3 X R0.1	3	20	60	6	
	270030001250Z4-TIS	3 X R0.1	3	25	65	6	
	270030001300Z4-TIS	3 X R0.1	3	30	70	6	
	270030001350Z4-TIS	3 X R0.1	3	35	75	6	
	270030002100Z4-TIS	3 X R0.2	3	10	50	6	

Type	Part Number	Dimensions in mm					d
		R X D	L1	L2	L		
	270030002160Z4-TIS	3 X R0.2	3	16	55	6	
	270030002200Z4-TIS	3 X R0.2	3	20	60	6	
	270030002250Z4-TIS	3 X R0.2	3	25	65	6	
	270030002300Z4-TIS	3 X R0.2	3	30	70	6	
	270030002350Z4-TIS	3 X R0.2	3	35	75	6	
	270030003100Z4-TIS	3 X R0.3	3	10	50	6	
	270030003160Z4-TIS	3 X R0.3	3	16	55	6	
	270030003200Z4-TIS	3 X R0.3	3	20	60	6	
	270030003250Z4-TIS	3 X R0.3	3	25	65	6	
	270030003300Z4-TIS	3 X R0.3	3	30	70	6	
	270030003350Z4-TIS	3 X R0.3	3	35	75	6	
	270030005100Z4-TIS	3 X R0.5	3	10	50	6	
	270030005160Z4-TIS	3 X R0.5	3	16	55	6	
	270030005200Z4-TIS	3 X R0.5	3	20	60	6	
	270030005250Z4-TIS	3 X R0.5	3	25	65	6	
	270030005300Z4-TIS	3 X R0.5	3	30	70	6	
	270030005350Z4-TIS	3 X R0.5	3	35	75	6	
	270030010100Z4-TIS	3 X R1	3	10	50	6	
	270030010160Z4-TIS	3 X R1	3	16	55	6	
	270030010200Z4-TIS	3 X R1	3	20	60	6	
	270030010250Z4-TIS	3 X R1	3	25	65	6	
	270030010300Z4-TIS	3 X R1	3	30	70	6	
	270030010350Z4-TIS	3 X R1	3	35	75	6	
	270040001130Z4-TIS	4 X R0.1	4	13	55	6	
	270040001160Z4-TIS	4 X R0.1	4	16	55	6	
	270040001200Z4-TIS	4 X R0.1	4	20	60	6	
	270040001250Z4-TIS	4 X R0.1	4	25	65	6	
	270040001300Z4-TIS	4 X R0.1	4	30	70	6	
	270040001350Z4-TIS	4 X R0.1	4	35	75	6	
	270040001400Z4-TIS	4 X R0.1	4	40	80	6	
	270040002130Z4-TIS	4 X R0.2	4	13	55	6	
	270040002160Z4-TIS	4 X R0.2	4	16	55	6	
	270040002200Z4-TIS	4 X R0.2	4	20	60	6	
	270040002250Z4-TIS	4 X R0.2	4	25	65	6	
	270040002300Z4-TIS	4 X R0.2	4	30	70	6	
	270040002350Z4-TIS	4 X R0.2	4	35	75	6	
	270040002400Z4-TIS	4 X R0.2	4	40	80	6	
	270040003130Z4-TIS	4 X R0.3	4	13	55	6	
	270040003160Z4-TIS	4 X R0.3	4	16	55	6	
	270040003200Z4-TIS	4 X R0.3	4	20	60	6	
	270040003250Z4-TIS	4 X R0.3	4	25	65	6	
	270040003300Z4-TIS	4 X R0.3	4	30	70	6	
	270040003350Z4-TIS	4 X R0.3	4	35	75	6	
	270040003400Z4-TIS	4 X R0.3	4	40	80	6	
	270040005130Z4-TIS	4 X R0.5	4	13	55	6	
	270040005160Z4-TIS	4 X R0.5	4	16	55	6	
	270040005200Z4-TIS	4 X R0.5	4	20	60	6	
	270040005250Z4-TIS	4 X R0.5	4	25	65	6	
	270040005300Z4-TIS	4 X R0.5	4	30	70	6	
	270040005350Z4-TIS	4 X R0.5	4	35	75	6	
	270040005400Z4-TIS	4 X R0.5	4	40	80	6	
	270040010130Z4-TIS	4 X R1	4	13	55	6	
	270040010160Z4-TIS	4 X R1	4	16	55	6	
	270040010200Z4-TIS	4 X R1	4	20	60	6	
	270040010250Z4-TIS	4 X R1	4	25	65	6	
	270040010300Z4-TIS	4 X R1	4	30	70	6	
	270040010350Z4-TIS	4 X R1	4	35	75	6	
	270040010400Z4-TIS	4 X R1	4	40	80	6	

200 Series

200 Series

Type	Part Number	Dimensions in mm				
		R X D	L1	L2	L	d
	280080005090Z4-TIS	8 X R0.5	19	90	8	
	280080010060Z4-TIS	8 X R1	16	60	8	
	280080010090Z4-TIS	8 X R1	19	90	8	
	280080015060Z4-TIS	8 X R1.5	16	60	8	
	280080015090Z4-TIS	8 X R1.5	19	90	8	
	280080020060Z4-TIS	8 X R2	16	60	8	
	280080020090Z4-TIS	8 X R2	19	90	8	
	280100003070Z4-TIS	10 X R0.3	19	70	10	
	280100003100Z4-TIS	10 X R0.3	22	100	10	
	280100005070Z4-TIS	10 X R0.5	19	70	10	
	280100005100Z4-TIS	10 X R0.5	22	100	10	
	280100010070Z4-TIS	10 X R1	19	70	10	
	280100010100Z4-TIS	10 X R1	22	100	10	
	280100015070Z4-TIS	10 X R1.5	19	70	10	
	280100015100Z4-TIS	10 X R1.5	22	100	10	
	280100020070Z4-TIS	10 X R2	19	70	10	
	280100020100Z4-TIS	10 X R2	22	100	10	
	280100025070Z4-TIS	10 X R2.5	19	70	10	
	280100025100Z4-TIS	10 X R2.5	22	100	10	
	280120005075Z4-TIS	12 X R0.5	22	75	12	
	280120005110Z4-TIS	12 X R0.5	26	110	12	
	280120010075Z4-TIS	12 X R1	22	75	12	
	280120010110Z4-TIS	12 X R1	26	110	12	
	280120015075Z4-TIS	12 X R1.5	22	75	12	
	280120015110Z4-TIS	12 X R1.5	26	110	12	
	280120020075Z4-TIS	12 X R2	22	75	12	
	280120020110Z4-TIS	12 X R2	26	110	12	
	280120025075Z4-TIS	12 X R2.5	22	75	12	
	280120025110Z4-TIS	12 X R2.5	26	110	12	
	280120030075Z4-TIS	12 X R3	22	75	12	
	280120030110Z4-TIS	12 X R3	26	110	12	

200 Series



**UWC**

**TISIN-S**  
Coating

**R**  
±0.005  
Φ1 - Φ6

**R**  
±0.01  
Φ8 - Φ12

**30°**  
Helix Angle

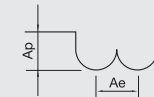
210

• RPM : rev./min • Feed : mm/min

Material	Prehardened Steels / Hardened Steels NAK / STAVAX						Hardened Steels SKD11				Hardened Steels HAP10				Hardened Steels HAP72			
	~ 55HRc						55HRc ~ 62HRc				62HRc ~ 66HRc				66HRc ~ 70HRc			
Radius	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	
																		R0.1
▷	1	60,000	180	0.003	0.005	60,000	180	0.002	0.003	60,000	120	0.002	0.003	45,000	60	0.002	0.003	
▷	1.5	60,000	120	0.002	0.003	48,000	60	0.001	0.002	48,000	60	0.001	0.002	36,000	30	0.001	0.002	
R0.15	1	60,000	330	0.006	0.008	45,000	300	0.004	0.007	43,500	160	0.003	0.003	32,500	80	0.003	0.005	
▷	3	42,500	120	0.002	0.004	32,000	70	0.002	0.004	32,000	60	0.001	0.002	24,000	30	0.001	0.002	
R0.2	1	50,000	480	0.010	0.020	37,500	400	0.007	0.012	35,000	220	0.005	0.008	26,250	110	0.005	0.008	
▷	3	40,000	240	0.005	0.008	31,900	200	0.004	0.008	30,500	150	0.003	0.005	22,800	70	0.002	0.005	
▷	5	28,000	120	0.002	0.004	21,500	120	0.002	0.003	20,000	100	0.002	0.003	15,000	40	0.001	0.002	
R0.25	1	44,000	630	0.015	0.040	33,000	520	0.010	0.020	30,000	280	0.007	0.010	22,500	140	0.007	0.010	
▷	5	27,000	130	0.003	0.008	24,200	100	0.002	0.005	23,500	70	0.002	0.004	17,600	30	0.002	0.004	
▷	10	14,000	40	0.001	0.002	14,000	30	0.001	0.002	14,000	20	0.001	0.002	10,350	10	0.001	0.002	
R0.3	1	40,000	1,300	0.045	0.150	30,000	14,000	0.030	0.130	26,500	950	0.015	0.090	20,000	480	0.015	0.090	
▷	5	32,000	370	0.010	0.075	25,000	380	0.007	0.050	23,000	250	0.005	0.040	18,000	120	0.005	0.040	
▷	10	14,900	170	0.003	0.020	14,900	160	0.002	0.015	14,900	110	0.002	0.015	11,100	50	0.002	0.015	
R0.4	2	35,000	1,500	0.060	0.210	27,000	1,500	0.040	0.170	23,500	950	0.020	0.120	17,500	480	0.020	0.120	
▷	6	28,000	550	0.020	0.120	23,000	500	0.012	0.095	20,500	350	0.006	0.065	15,500	180	0.006	0.065	
▷	10	15,000	250	0.010	0.085	14,700	320	0.005	0.060	14,650	220	0.004	0.050	11,000	100	0.004	0.050	
R0.5	2	30,000	1,600	0.200	0.400	24,000	1,800	0.100	0.300	21,000	1,600	0.050	0.200	16,000	800	0.050	0.200	
▷	5	30,000	1,600	0.010	0.300	24,000	1,800	0.050	0.200	21,000	1,600	0.030	0.170	16,000	800	0.030	0.170	
▷	10	14,800	320	0.018	0.130	14,800	400	0.010	0.090	14,700	320	0.010	0.090	11,100	160	0.010	0.090	
▷	16	12,750	220	0.008	0.080	10,500	230	0.005	0.045	10,500	150	0.005	0.045	7,850	70	0.005	0.045	
R0.75	3	30,000	2,450	0.250	0.550	17,000	1,800	0.120	0.400	15,000	1,600	0.060	0.290	11,250	850	0.060	0.290	
▷	10	23,500	1,200	0.100	0.350	15,000	1,100	0.045	0.250	14,000	1,000	0.030	0.210	10,500	500	0.030	0.210	
▷	20	9,000	260	0.018	0.160	8,000	320	0.010	0.120	8,000	200	0.010	0.120	6,000	100	0.010	0.120	
R1	4	28,000	2,700	0.300	0.700	14,000	2,000	0.150	0.500	12,250	1,800	0.080	0.350	9,200	800	0.080	0.350	
▷	10	28,000	2,700	0.200	0.600	14,000	2,000	0.100	0.400	12,250	1,800	0.060	0.300	9,200	800	0.060	0.300	
▷	20	8,650	360	0.035	0.250	8,650	450	0.020	0.190	8,560	340	0.020	0.190	6,400	170	0.020	0.190	
▷	30	7,850	260	0.024	0.200	7,000	330	0.014	0.160	7,000	200	0.014	0.160	5,250	100	0.014	0.160	
R1.5	6	21,000	2,800	0.400	1.000	10,500	2,000	0.200	0.700	9,200	1,700	0.120	0.550	6,900	900	0.120	0.550	
▷	10	21,000	2,800	0.300	0.900	10,500	2,000	0.150	0.650	9,200	1,700	0.100	0.500	6,900	900	0.100	0.500	
▷	20	14,500	1,300	0.180	0.700	9,250	1,300	0.100	0.500	8,400	1,050	0.075	0.450	6,450	500	0.075	0.450	
▷	30	5,750	330	0.050	0.380	5,750	400	0.030	0.290	5,700	340	0.030	0.290	4,100	170	0.030	0.290	
R2	8	18,000	3,000	0.500	1.300	9,000	2,100	0.250	0.950	7,900	1,800	0.150	0.750	5,900	900	0.150	0.750	
▷	20	18,000	3,000	0.400	1.200	9,000	2,100	0.200	0.850	7,900	1,800	0.130	0.700	5,900	900	0.130	0.700	
▷	30	7,000	500	0.100	0.600	7,000	600	0.060	0.450	7,000	500	0.060	0.450	5,250	240	0.060	0.450	
▷	40	4,300	330	0.065	0.500	4,300	400	0.040	0.390	4,300	340	0.040	0.390	3,200	180	0.040	0.390	
R2.5	20	14,400	3,000	0.500	1.500	7,200	2,100	0.250	1.050	6,350	1,800	0.160	0.880	4,750	900	0.160	0.880	
▷	30	10,000	1,400	0.310	1.200	6,400	1,300	0.160	0.880	6,200	1,100	0.110	0.730	4,650	600	0.110	0.730	
▷	40	6,000	550	0.125	0.780	6,000	670	0.080	0.625	6,000	530	0.080	0.625	4,500	270	0.080	0.625	
R3	15	13,000	3,500	0.600	1.800	6,500	2,500	0.300	1.300	5,700	2,200	0.200	1.000	4,300	1,100	0.200	1.000	
R4	25	9,500	2,800	0.700	2.100	5,200	2,100	0.400	1.700	4,500	1,800	0.250	1.350	3,400	900	0.250	1.350	
R5	30	7,500	2,300	0.800	2.500	4,300	2,800	0.500	2.100	3,750	1,600	0.300	1.700	2,800	850	0.300	1.700	
R6	30	6,200	1,800	0.900	3.000	3,600	1,600	0.600	2.600	3,150	1,400	0.350	2.000	2,350	680	0.350	2.000	

200 Series

Depth of Cut

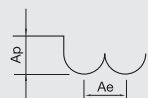




**230 / 231**

• RPM : rev./min • Feed : mm/min

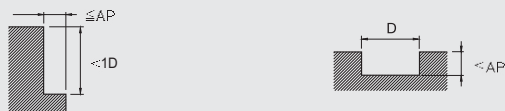
Material	Prehardened Steels / Hardened Steels NAK / STAVAX				Hardened Steels SKD11				Hardened Steels HAP10				Hardened Steels HAP72				
	~ 55HRc				55HRc ~ 62HRc				62HRc ~ 66HRc				66HRc ~ 70HRc				
	Radius	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth
R0.2		60,000	180	0.003	0.005	60,000	180	0.002	0.003	60,000	120	0.002	0.003	45,000	60	0.002	0.003
R0.15		60,000	330	0.006	0.008	45,000	300	0.004	0.007	43,500	160	0.003	0.003	32,500	80	0.003	0.005
R0.1		50,000	480	0.010	0.020	37,500	400	0.007	0.012	35,000	220	0.005	0.008	26,250	110	0.005	0.008
R0.25		44,000	630	0.015	0.040	33,000	520	0.010	0.020	30,000	280	0.007	0.010	22,500	140	0.007	0.010
R0.3		40,000	1,000	0.030	0.130	30,000	1,100	0.020	0.100	26,500	700	0.010	0.075	20,000	380	0.010	0.075
R6		35,000	1,500	0.060	0.210	27,000	1,500	0.040	0.170	23,500	950	0.020	0.120	17,500	480	0.020	0.120
R3		30,000	1,600	0.200	0.400	24,000	1,800	0.100	0.300	21,000	1,600	0.050	0.200	16,000	800	0.050	0.200
R0.4		30,000	2,400	0.250	0.550	17,000	1,800	0.120	0.400	15,000	1,600	0.060	0.290	11,250	850	0.060	0.290
R0.5		28,000	2,700	0.300	0.700	14,000	2,000	0.150	0.500	12,250	1,800	0.080	0.350	9,200	800	0.080	0.350
R0.75		21,000	2,800	0.400	1.000	10,500	2,000	0.200	0.700	9,200	1,700	0.120	0.550	6,900	900	0.120	0.550
R1		18,000	3,000	0.500	1.300	9,000	2,100	0.250	0.950	7,900	1,800	0.150	0.750	5,900	900	0.150	0.750
R1.5		15,600	3,000	0.500	1.500	78,000	2,100	0.250	1.050	6,800	1,900	0.160	0.880	5,100	900	0.160	0.880
R2		13,000	3,300	0.600	1.800	6,500	2,300	0.300	1.300	5,700	2,000	0.200	1.000	4,300	1,000	0.200	1.000
R2.5		9,500	2,800	0.700	2.100	5,200	2,100	0.400	1.700	4,500	1,800	0.250	1.350	3,400	900	0.250	1.350
R4		7,500	2,300	0.800	2.500	4,300	2,800	0.500	2.100	3,750	1,600	0.300	1.700	2,800	850	0.300	1.700
R5		6,200	1,800	0.900	3.000	3,600	1,600	0.600	2.600	3,150	1,400	0.350	2.000	2,350	680	0.350	2.000



**250**

• RPM : rev./min • Feed : mm/min

Material	Alloy Steels / Tool Steels / Hardened Steels SKD61 / SK / NAK			Hardened Steels SKD61					
	45HRc ~ 55HRc			55HRc ~ 62HRc					
	Outside Diameter	RPM	FEED	Ap	RPM	FEED	Ap		
1mm	40,000	2,800	0.060	32,000	2,200	0.060	16,000	680	0.050
1.5mm	40,000	4,300	0.120	32,000	3,300	0.080	10,600	600	0.080
2mm	30,000	4,300	0.180	24,000	3,300	0.100	8,100	480	0.100
2.5mm	24,000	3,700	0.250	19,000	2,800	0.130	6,400	430	0.130
3mm	20,000	3,300	0.300	16,000	2,500	0.150	5,400	360	0.150
4mm	15,000	2,800	0.400	12,000	2,200	0.200	4,000	430	0.200
5mm	12,000	2,200	0.500	9,000	1,600	0.250	3,200	360	0.200
6mm	10,000	1,900	0.600	7,000	1,200	0.300	2,700	300	0.200
8mm	8,000	1,300	0.800	5,600	1,000	0.400	2,000	220	0.200
10mm	6,400	1,200	1.000	4,500	900	0.500	1,600	190	0.300
12mm	6,400	1,000	1.000	3,800	800	0.500	1,300	150	0.300

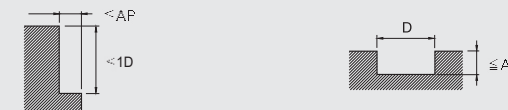


■ The table is based on side machining.

**260**

• RPM : rev./min • Feed : mm/min

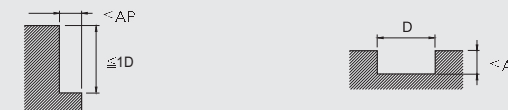
Material	Hardened Steels SKD61			Hardened Steels SKD11			Hardened Steels SKS / SKH		
	45HRc ~ 55HRc			55HRc ~ 62HRc			60HRc ~ 70HRc		
	Outside Diameter	RPM	FEED	Ap	RPM	FEED	Ap	RPM	FEED
2mm	40,000	1,800	0.100	24,000	900	0.050	16,000	500	0.050
3mm	32,000	3,600	0.200	1,500	1,700	0.100	11,000	1,100	0.050
4mm	24,000	4,000	0.200	12,000	2,000	0.100	8,000	1,100	0.050
5mm	20,000	4,600	0.250	10,000	2,200	0.150	6,500	1,300	0.075
6mm	16,000	5,300	0.300	8,000	2,600	0.200	5,300	1,600	0.100
8mm	12,000	5,400	0.400	6,000	2,600	0.200	4,000	1,600	0.100
10mm	9,600	5,500	0.500	4,400	2,600	0.300	3,200	1,600	0.200
12mm	8,000	4,600	0.600	4,000	2,200	0.300	2,500	1,300	0.200



**261**

• RPM : rev./min • Feed : mm/min

Material	Hardened Steels SKD61			Hardened Steels SKD11			Hardened Steels SKS / SKH		
	45HRc ~ 55HRc			55HRc ~ 62HRc			60HRc ~ 70HRc		
	Outside Diameter	RPM	FEED	Ap	RPM	FEED	Ap	RPM	FEED
6mm	16,000	5,300	0.300	8,000	2,600	0.200	5,300	1,600	0.100
8mm	12,000	5,400	0.400	6,000	2,600	0.200	4,000	1,600	0.100
10mm	9,600	5,500	0.500	4,400	2,600	0.300	3,200	1,600	0.200
12mm	8,000	4,600	0.600	4,000	2,200	0.300	2,500	1,300	0.200
16mm	6,000	3,200	0.800	3,000	1,600	0.500	2,000	1,000	0.300
20mm	4,800	2,700	1.000	2,400	1,200	0.500	1,600	800	0.300



270 / 280

• RPM : rev./min • Feed : mm/min

200 Series

Material		Prehardened Steels / Hardened Steels NAK / SKD				Hardened Steels SKD / SKT				Hardened Steels SKD / SKT			
Hardness		30HRc ~ 45HRc				45HRc ~ 55HRc				55HRc ~ 65HRc			
Outside Diameter	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
1mm	4	14,000	1,100	0.033	0.230	12,200	910	0.026	0.207	8,600	540	0.013	0.207
	10	9,000	430	0.009	0.107	7,800	430	0.008	0.085	5,500	300	0.005	0.043
1.2mm	4	13,400	1,200	0.027	0.383	12,200	930	0.020	0.255	9,400	700	0.017	0.170
	10	9,200	680	0.014	0.153	7,400	510	0.008	0.128	6,500	680	0.005	0.043
1.5mm	6	12,000	1,100	0.035	0.413	10,800	1,000	0.032	0.378	8,200	400	0.021	0.172
	12	8,600	710	0.025	0.275	7,900	660	0.022	0.252	6,000	250	0.009	0.138
2mm	6	13,200	1,100	0.054	0.551	12,200	1,020	0.051	0.620	9,800	590	0.024	0.275
	12	9,300	880	0.039	0.344	8,600	820	0.037	0.344	7,000	360	0.015	0.153
2.5mm	10	11,000	1,200	0.057	0.459	10,200	1,000	0.057	0.459	8,500	430	0.041	0.275
	20	8,000	1,000	0.041	0.230	7,600	570	0.026	0.191	6,500	250	0.019	0.077
3mm	10	11,500	1,800	0.082	0.595	10,700	1,800	0.051	0.595	9,100	620	0.038	0.476
	20	8,500	1,300	0.049	0.493	8,000	1,300	0.031	0.493	6,500	470	0.019	0.271
4mm	13	9,500	1,370	0.091	1.000	7,900	1,330	0.071	1.000	6,700	740	0.043	0.700
	20	7,500	1,200	0.060	0.800	6,200	1,120	0.047	0.800	5,400	630	0.022	0.560
	30	6,600	960	0.037	0.648	5,500	920	0.029	0.648	4,700	600	0.011	0.388
6mm	20	6,000	1,470	0.153	2.004	3,500	850	0.153	1.114	3,000	650	0.060	1.114
	40	3,000	680	0.085	1.148	1,700	400	0.085	0.638	1,400	300	0.034	0.468
8mm	22	4,800	1,600	0.184	2.540	2,900	680	0.184	1.320	2,400	650	0.087	1.320
10mm	24	3,840	1,750	0.210	2.730	2,300	540	0.220	1.430	1,900	460	0.094	1.450
12mm	26	3,000	1,800	0.230	2.700	1,800	430	0.240	1.490	1,600	450	0.110	1.500

• Ap : Axial Depth  
• Ae : Radial Depth

