



Size $\phi 0.1 \sim \phi 12$

CSS

Super
MG

UT
COAT

30°

40°

Flatland

Shank Dia
0/-0.005

*1 Helix angle 30°: $\phi D < 0.6, 1 \leq \phi D$ (length of cut 2.5D~3D)
 *2 Helix angle 40°: $0.6 \leq \phi D < 1, 1 \leq \phi D$ (length of cut 1D~2D)

Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

Work Material																	
Carbon Steels S45C S55C	Alloy Steels SK / SCM SUS	Prehardened Steels NAK HPM	Hardened Steels					Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
			~50HRC	~55HRC	~60HRC	~65HRC	~70HRC										
●	●	●	●	●				○	○		●			○	○		

φ3mm Shank
V Series

UDC-PCD
Series

CBN
Series

Square

Long Neck
Square

Radius

Long Neck
Radius

Taper Neck
Radius

Ball / Long
Shank Ball

Long Neck
Ball

Taper Neck
Ball

Taper

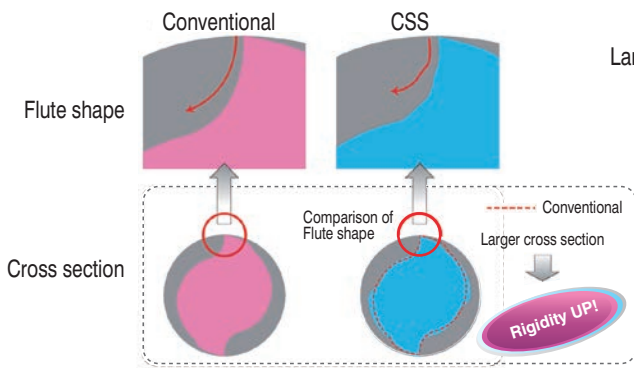
Barrel

Spiral
V Cutter

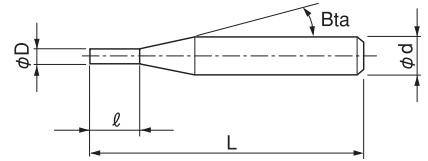
Drill

Technical Data

Unique Cross Section design



New flute shape → Higher rigidity and better chip evacuation
 Larger cross section → More resistance to breakage and wearing



The shank taper angle shown is not an exact value and to avoid contact with the work piece, we recommend the user controls the precise value of this angle. Shank taper angle should not make contact with the work piece.

Total 112 models

Unit (mm)

Model Number	Outside Diameter ϕD	Length of Cut l	Shank Taper Angle Bta	Overall Length L	Shank Diameter ϕd	Suggested Retail Price ¥
CSS 2001-0010	0.1	0.1	16°	45	4	7,800
CSS 2001-0015		0.15		45	4	7,800
CSS 2001-0020		0.2		45	4	7,800
CSS 2001-0025		0.25		45	4	7,800
CSS 2001-0030		0.3		45	4	7,800
CSS 2002-0020	0.2	0.2	16°	45	4	4,680
CSS 2002-0030		0.3		45	4	4,680
CSS 2002-0040-3		0.4		38	3	4,680
CSS 2002-0040-4		0.4		45	4	4,680
CSS 2002-0050		0.5		45	4	4,680
CSS 2002-0060	0.6	45	4	4,680		
CSS 2003-0030	0.3	0.3	16°	45	4	4,080
CSS 2003-0045		0.45		45	4	4,080
CSS 2003-0060-3		0.6		38	3	4,080
CSS 2003-0060-4		0.6		45	4	4,080
CSS 2003-0075		0.75		45	4	4,080
CSS 2003-0090	0.9	45	4	4,080		

Unit (mm)

Model Number	Outside Diameter ϕD	Length of Cut ℓ	Shank Taper Angle Beta	Overall Length L	Shank Diameter ϕd	Suggested Retail Price ¥
CSS 2004-0040	0.4	0.4	16°	45	4	4,560
CSS 2004-0060		0.6		45	4	4,560
CSS 2004-0080-3		0.8		38	3	4,560
CSS 2004-0080-4				45	4	4,560
CSS 2004-0100		1		45	4	4,560
CSS 2004-0120		1.2		45	4	4,560
CSS 2005-0050	0.5	0.5	16°	45	4	2,280
CSS 2005-0075		0.75		45	4	2,280
CSS 2005-0080		0.8		38	3	2,280
CSS 2005-0100		1		45	4	2,280
CSS 2005-0125		1.25		45	4	2,280
CSS 2005-0150		1.5		45	4	2,280
CSS 2006-0060	0.6	0.6	16°	45	4	3,480
CSS 2006-0090		0.9		45	4	3,480
CSS 2006-0100		1		38	3	3,480
CSS 2006-0120		1.2		45	4	3,480
CSS 2006-0150		1.5		45	4	3,480
CSS 2006-0180		1.8		45	4	3,480
CSS 2007-0070	0.7	0.7	16°	45	4	3,840
CSS 2007-0100		1		38	3	3,840
CSS 2007-0140		1.4		45	4	3,840
CSS 2007-0175		1.75		45	4	3,840
CSS 2007-0210		2.1		45	4	3,840
CSS 2008-0080		0.8		0.8	16°	45
CSS 2008-0120-3	1.2		38	3		2,280
CSS 2008-0120-4			45	4		2,280
CSS 2008-0160	1.6		45	4		2,280
CSS 2008-0200	2		45	4		2,280
CSS 2008-0240	2.4		45	4		2,280
CSS 2009-0090	0.9	0.9	16°	45	4	3,840
CSS 2009-0120		1.2		38	3	3,840
CSS 2009-0180		1.8		45	4	3,840
CSS 2009-0225		2.25		45	4	3,840
CSS 2009-0270		2.7		45	4	3,840
CSS 2010-0100		1		1	16°	45
CSS 2010-0150	1.5		45	4		2,040
CSS 2010-0200	2		45	4		2,040
CSS 2010-0250	2.5		45	4		2,040
CSS 2010-0300	3		45	4		2,040
CSS 2015-0150	1.5		1.5	16°		45
CSS 2015-0225		2.25	45		4	2,040
CSS 2015-0300		3	45		4	2,040
CSS 2015-0375		3.75	45		4	2,040
CSS 2015-0450		4.5	45		4	2,040
CSS 2020-0200		2	2		16°	45
CSS 2020-0300	3		45	4		2,040
CSS 2020-0400	4		45	4		2,040
CSS 2020-0500	5		45	4		2,040
CSS 2020-0600	6		45	4		2,040

3mm Shank
V Series

UDC-PCD
Series

CBN
Series

Square

Long Neck
Square

Radius

Long Neck
Radius

Taper Neck
Radius

Ball / Long
Shank Ball

Long Neck
Ball

Taper Neck
Ball

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data

Unit (mm)

Model Number	Outside Diameter φD	Length of Cut ℓ	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Suggested Retail Price ¥
CSS 2025-0250	2.5	2.5	16°	50	4	2,040
CSS 2025-0375		3.75		50	4	2,040
CSS 2025-0500		5		50	4	2,040
CSS 2025-0625		6.25		50	4	2,040
CSS 2025-0750		7.5		50	4	2,040
CSS 2030-0300	3	3	16°	50	6	2,640
CSS 2030-0450		4.5		50	6	2,640
CSS 2030-0600		6		50	6	2,640
CSS 2030-0750		7.5		50	6	2,640
CSS 2030-0900	4	9	16°	50	6	2,640
CSS 2040-0400		4		50	6	2,880
CSS 2040-0600		6		50	6	2,880
CSS 2040-0800		8		50	6	2,880
CSS 2040-1000		10		50	6	2,880
CSS 2040-1200	12	50	6	2,880		
CSS 2050-0500	5	5	16°	50	6	3,120
CSS 2050-0750		7.5		50	6	3,120
CSS 2050-1000		10		50	6	3,120
CSS 2050-1250		12.5		60	6	3,120
CSS 2050-1500		15		60	6	3,120
CSS 2060-0600	6	6	—	50	6	3,360
CSS 2060-0900		9		50	6	3,360
CSS 2060-1200		12		50	6	3,360
CSS 2060-1500		15		60	6	3,360
CSS 2060-1800		18		60	6	3,360
CSS 2070-1750	7	17.5	16°	70	8	8,700
CSS 2070-2100		21		80	8	8,700
CSS 2080-0800	8	8	—	70	8	6,320
CSS 2080-1200		12		70	8	6,320
CSS 2080-1600		16		70	8	6,320
CSS 2080-2000		20		70	8	6,320
CSS 2080-2400		24		80	8	6,320
CSS 2090-2250	9	22.5	16°	80	10	12,420
CSS 2090-2700		27		80	10	12,420
CSS 2100-1000	10	10	—	70	10	7,580
CSS 2100-1500		15		70	10	7,580
CSS 2100-2000		20		70	10	7,580
CSS 2100-2500		25		80	10	7,580
CSS 2100-3000		30		80	10	7,580
CSS 2110-2750	11	27.5	16°	80	12	17,160
CSS 2110-3300		33		80	12	17,160
CSS 2120-1200	12	12	—	80	12	11,170
CSS 2120-1800		18		80	12	11,170
CSS 2120-2400		24		80	12	11,170
CSS 2120-3000		30		80	12	11,170
CSS 2120-3600		36		90	12	11,170

φ3mm Shank
V Series

UDC-PCD
Series

CBN
Series

Square
Long Neck
Square

Radius

Long Neck
Radius

Taper Neck
Radius

Ball / Long
Shank Ball

Long Neck
Ball

Taper Neck
Ball

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data

Milling Conditions for CSS

Slotting

◆ 1D flute length type L/D=1

WORK MATERIAL			CARBON STEELS S45C / S50C Annealed Materials (~225HB)			ALLOY STEELS SK / SCM Annealed Materials (225~325HB)			STAINLESS STEELS SUS304 * Use water soluble or oil coolant.		
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)
				Slotting	a_p		Slotting	a_p		Slotting	a_p
2001-0010	0.1	0.1	30,000	30	0.01	30,000	30	0.01	30,000	30	0.01
2002-0020	0.2	0.2	30,000	85	0.02	30,000	85	0.02	30,000	60	0.02
2003-0030	0.3	0.3	30,000	110	0.03	30,000	110	0.03	30,000	110	0.03
2004-0040	0.4	0.4	30,000	120	0.04	30,000	120	0.04	30,000	120	0.04
2005-0050	0.5	0.5	27,000	120	0.05	24,000	105	0.05	24,000	120	0.05
2006-0060	0.6	0.6	24,000	120	0.09	20,000	90	0.09	20,000	120	0.09
2007-0070	0.7	0.7	22,500	115	0.105	17,800	90	0.105	17,800	120	0.105
2008-0080	0.8	0.8	21,000	110	0.12	16,700	90	0.12	16,700	120	0.12
2009-0090	0.9	0.9	19,500	105	0.135	15,600	85	0.135	15,600	120	0.135
2010-0100	1	1	18,000	100	1	14,500	75	1	14,500	125	1
2015-0150	1.5	1.5	16,000	275	1.5	13,000	200	1.5	13,000	135	1.5
2020-0200	2	2	12,000	275	2	10,000	200	2	10,000	135	2
2025-0250	2.5	2.5	10,200	375	2.5	8,400	260	2.5	8,400	140	2.5
2030-0300	3	3	8,500	475	3	6,800	325	3	6,800	150	3
2040-0400	4	4	7,200	475	4	5,700	325	4	5,700	175	4
2050-0500	5	5	6,000	500	5	4,800	350	5	4,800	200	5
2060-0600	6	6	5,000	500	6	4,000	350	6	4,000	200	6
2080-0800	8	8	3,500	475	8	2,700	350	8	2,400	150	8
2100-1000	10	10	2,300	450	10	1,900	325	10	1,400	100	10
2120-1200	12	12	1,850	425	12	1,550	300	12	1,250	90	12

WORK MATERIAL			PREHARDENED STEELS HPM / NAK (30~45HRC)			HARDENED STEELS SKD / SKT / STAVAX (45~55HRC)		
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)
				Slotting	a_p		Slotting	a_p
2001-0010	0.1	0.1	30,000	15	0.01	24,000	10	0.004
2002-0020	0.2	0.2	30,000	30	0.02	23,000	25	0.008
2003-0030	0.3	0.3	30,000	55	0.03	20,000	25	0.012
2004-0040	0.4	0.4	30,000	60	0.04	16,800	25	0.016
2005-0050	0.5	0.5	24,000	60	0.05	14,400	30	0.025
2006-0060	0.6	0.6	20,000	60	0.09	12,000	35	0.03
2007-0070	0.7	0.7	17,800	60	0.105	10,000	35	0.035
2008-0080	0.8	0.8	16,700	60	0.12	8,500	35	0.04
2009-0090	0.9	0.9	15,600	60	0.135	7,300	35	0.045
2010-0100	1	1	14,500	60	1	6,550	35	0.2
2015-0150	1.5	1.5	12,000	160	1.5	4,400	35	0.3
2020-0200	2	2	9,000	160	2	3,300	35	0.4
2025-0250	2.5	2.5	7,900	210	2.5	2,750	35	0.5
2030-0300	3	3	6,800	260	3	2,200	35	0.6
2040-0400	4	4	5,100	260	4	1,650	40	0.8
2050-0500	5	5	4,050	260	5	1,300	40	1
2060-0600	6	6	3,300	260	6	1,100	40	1.2
2080-0800	8	8	2,300	235	8	800	40	1.6
2100-1000	10	10	1,500	225	10	690	40	2
2120-1200	12	12	1,200	210	12	550	40	2.4

Ø3mm Shank
V SeriesUDC-PCD
SeriesCBN
Series

Square

Long Neck
Square

Radius

Long Neck
RadiusTaper Neck
RadiusBall / Long
Shank BallLong Neck
BallTaper Neck
Ball

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data

Milling Conditions for CSS

◆ 1.5D flute length type $1 < L/D \leq 1.5$

WORK MATERIAL			CARBON STEELS S45C / S50C Annealed Materials (~225HB)			ALLOY STEELS SK / SCM Annealed Materials (225~325HB)			STAINLESS STEELS SUS304 *Use water soluble or oil coolant.		
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)
				Slotting	a_p		Slotting	a_p		Slotting	a_p
2001-0015	0.1	0.15	30,000	30	0.01	30,000	30	0.01	30,000	30	0.01
2002-0030	0.2	0.3	30,000	85	0.02	30,000	85	0.02	30,000	60	0.02
2003-0045	0.3	0.45	30,000	110	0.03	30,000	110	0.03	30,000	110	0.03
2004-0060	0.4	0.6	30,000	120	0.04	30,000	120	0.04	30,000	120	0.04
2005-0075	0.5	0.75	27,000	120	0.05	24,000	105	0.05	24,000	120	0.05
2006-0090	0.6	0.9	24,000	120	0.09	20,000	90	0.09	20,000	120	0.09
2007-0100	0.7	1	22,500	115	0.105	17,800	90	0.105	17,800	120	0.105
2008-0120	0.8	1.2	21,000	110	0.12	16,700	90	0.12	16,700	120	0.12
2009-0120	0.9	1.2	19,500	105	0.135	15,600	85	0.135	15,600	120	0.135
2010-0150	1	1.5	18,000	100	1	14,500	75	1	14,500	125	1
2015-0225	1.5	2.25	16,000	275	1.5	13,000	200	1.5	13,000	135	1.5
2020-0300	2	3	12,000	275	2	10,000	200	2	10,000	135	2
2025-0375	2.5	3.75	10,200	375	2.5	8,400	260	2.5	8,400	140	2.5
2030-0450	3	4.5	8,500	475	3	6,800	325	3	6,800	150	3
2040-0600	4	6	7,200	475	4	5,700	325	4	5,700	175	4
2050-0750	5	7.5	6,000	500	5	4,800	350	5	4,800	200	5
2060-0900	6	9	5,000	500	6	4,000	350	6	4,000	200	6
2080-1200	8	12	3,500	475	8	2,700	350	8	2,400	150	8
2100-1500	10	15	2,300	450	10	1,900	325	10	1,400	100	10
2120-1800	12	18	1,850	425	12	1,550	300	12	1,250	90	12

WORK MATERIAL			PREHARDENED STEELS HPM / NAK (30~45HRC)			HARDENED STEELS SKD / SKT / STAVAX (45~55HRC)		
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)
				Slotting	a_p		Slotting	a_p
2001-0015	0.1	0.15	30,000	15	0.01	24,000	10	0.004
2002-0030	0.2	0.3	30,000	30	0.02	23,000	25	0.008
2003-0045	0.3	0.45	30,000	55	0.03	20,000	25	0.012
2004-0060	0.4	0.6	30,000	60	0.04	16,800	25	0.016
2005-0075	0.5	0.75	24,000	60	0.05	14,400	30	0.025
2006-0090	0.6	0.9	20,000	60	0.09	12,000	35	0.03
2007-0100	0.7	1	17,800	60	0.105	10,000	35	0.035
2008-0120	0.8	1.2	16,700	60	0.12	8,500	35	0.04
2009-0120	0.9	1.2	15,600	60	0.135	7,300	35	0.045
2010-0150	1	1.5	14,500	60	1	6,550	35	0.2
2015-0225	1.5	2.25	12,000	160	1.5	4,400	35	0.3
2020-0300	2	3	9,000	160	2	3,300	35	0.4
2025-0375	2.5	3.75	7,900	210	2.5	2,750	35	0.5
2030-0450	3	4.5	6,800	260	3	2,200	35	0.6
2040-0600	4	6	5,100	260	4	1,650	40	0.8
2050-0750	5	7.5	4,050	260	5	1,300	40	1
2060-0900	6	9	3,300	260	6	1,100	40	1.2
2080-1200	8	12	2,300	235	8	800	40	1.6
2100-1500	10	15	1,500	225	10	690	40	2
2120-1800	12	18	1,200	210	12	550	40	2.4

Milling Conditions for CSS

◆ 2D flute length type $1.5 < L/D \leq 2$

WORK MATERIAL			CARBON STEELS S45C / S50C Annealed Materials (~225HB)			ALLOY STEELS SK / SCM Annealed Materials (225~325HB)			STAINLESS STEELS SUS304 * Use water soluble or oil coolant.		
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)
				Slotting	a_p		Slotting	a_p		Slotting	a_p
2001-0020	0.1	0.2	30,000	30	0.01	30,000	30	0.01	30,000	30	0.01
2002-0040	0.2	0.4	30,000	85	0.02	30,000	85	0.02	30,000	60	0.02
2003-0060	0.3	0.6	30,000	110	0.03	30,000	110	0.03	30,000	110	0.03
2004-0080	0.4	0.8	30,000	120	0.04	30,000	120	0.04	30,000	120	0.04
2005-0080	0.5	0.8	27,000	120	0.05	24,000	105	0.05	24,000	120	0.05
2005-0100	0.5	1	27,000	120	0.05	24,000	105	0.05	24,000	120	0.05
2006-0100	0.6	1	24,000	120	0.09	20,000	90	0.09	20,000	120	0.09
2006-0120	0.6	1.2	24,000	120	0.09	20,000	90	0.09	20,000	120	0.09
2007-0140	0.7	1.4	22,500	115	0.105	17,800	90	0.105	17,800	120	0.105
2008-0160	0.8	1.6	21,000	110	0.12	16,700	90	0.12	16,700	120	0.12
2009-0180	0.9	1.8	19,500	105	0.135	15,600	85	0.135	15,600	120	0.135
2010-0200	1	2	18,000	100	0.8	14,500	75	0.8	14,500	125	0.8
2015-0300	1.5	3	16,000	275	1.2	13,000	200	1.2	13,000	135	1.2
2020-0400	2	4	12,000	275	1.6	10,000	200	1.6	10,000	135	1.6
2025-0500	2.5	5	10,200	375	2	8,400	260	2	8,400	140	2
2030-0600	3	6	8,500	475	2.4	6,800	325	2.4	6,800	150	2.4
2040-0800	4	8	7,200	475	3.2	5,700	325	3.2	5,700	175	3.2
2050-1000	5	10	6,000	500	4	4,800	350	4	4,800	200	4
2060-1200	6	12	5,000	500	4.8	4,000	350	4.8	4,000	200	4.8
2080-1600	8	16	3,500	475	6.4	2,700	350	6.4	2,400	150	6.4
2100-2000	10	20	2,300	450	8	1,900	325	8	1,400	100	8
2120-2400	12	24	1,850	425	9.6	1,550	300	9.6	1,250	90	9.6

WORK MATERIAL			PREHARDENED STEELS HPM / NAK (30~45HRC)			HARDENED STEELS SKD / SKT / STAVAX (45~55HRC)		
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)
				Slotting	a_p		Slotting	a_p
2001-0020	0.1	0.2	30,000	15	0.01	24,000	10	0.003
2002-0040	0.2	0.4	30,000	30	0.02	23,000	25	0.008
2003-0060	0.3	0.6	30,000	55	0.03	20,000	25	0.012
2004-0080	0.4	0.8	30,000	60	0.04	16,800	25	0.016
2005-0080	0.5	0.8	24,000	60	0.05	14,400	30	0.025
2005-0100	0.5	1	24,000	60	0.05	14,400	30	0.025
2006-0100	0.6	1	20,000	60	0.09	12,000	35	0.03
2006-0120	0.6	1.2	20,000	60	0.09	12,000	35	0.03
2007-0140	0.7	1.4	17,800	60	0.105	10,000	35	0.035
2008-0160	0.8	1.6	16,700	60	0.12	8,500	35	0.04
2009-0180	0.9	1.8	15,600	60	0.135	7,300	35	0.045
2010-0200	1	2	14,500	60	0.8	6,550	35	0.15
2015-0300	1.5	3	12,000	160	1.2	4,400	35	0.225
2020-0400	2	4	9,000	160	1.6	3,300	35	0.3
2025-0500	2.5	5	7,900	210	2	2,750	35	0.37
2030-0600	3	6	6,800	260	2.4	2,200	35	0.45
2040-0800	4	8	5,100	260	3.2	1,650	40	0.6
2050-1000	5	10	4,050	260	4	1,300	40	0.75
2060-1200	6	12	3,300	260	4.8	1,100	40	0.9
2080-1600	8	16	2,300	235	3.2	800	40	1.2
2100-2000	10	20	1,500	225	4	690	40	1.5
2120-2400	12	24	1,200	210	4.8	550	40	1.8

Ø3mm Shank
V SeriesUDC-PCD
SeriesCBN
Series

Square

Long Neck
Square

Radius

Long Neck
RadiusTaper Neck
RadiusBall / Long
Shank BallLong Neck
BallTaper Neck
Ball

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data

Milling Conditions for CSS

◆ 2.5D flute length type $2 < L/D \leq 2.5$

WORK MATERIAL			CARBON STEELS S45C / S50C Annealed Materials (~225HB)			ALLOY STEELS SK / SCM Annealed Materials (225~325HB)			STAINLESS STEELS SUS304 * Use water soluble or oil coolant.		
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)
				Slotting	a_p		Slotting	a_p		Slotting	a_p
2001-0025	0.1	0.25	30,000	30	0.007	30,000	30	0.007	30,000	30	0.007
2002-0050	0.2	0.5	30,000	85	0.014	30,000	85	0.014	30,000	60	0.014
2003-0075	0.3	0.75	30,000	110	0.021	30,000	110	0.021	30,000	110	0.021
2004-0100	0.4	1	30,000	120	0.028	30,000	120	0.028	30,000	120	0.028
2005-0125	0.5	1.25	27,000	120	0.035	24,000	105	0.035	24,000	120	0.035
2006-0150	0.6	1.5	24,000	120	0.06	20,000	90	0.06	20,000	120	0.06
2007-0175	0.7	1.75	22,500	115	0.07	17,800	90	0.07	17,800	120	0.07
2008-0200	0.8	2	21,000	110	0.08	16,700	90	0.08	16,700	120	0.08
2009-0225	0.9	2.25	19,500	105	0.09	15,600	85	0.09	15,600	120	0.09
2010-0250	1	2.5	20,000	130	0.5	15,000	60	0.5	11,000	120	0.25
2015-0375	1.5	3.75	12,800	170	0.75	10,000	100	0.75	7,000	120	0.375
2020-0500	2	5	9,300	210	1	7,500	140	1	5,000	120	0.5
2025-0625	2.5	6.25	7,600	235	1.25	6,250	160	1.25	4,100	120	0.62
2030-0750	3	7.5	5,900	260	1.5	5,000	180	1.5	3,200	120	0.75
2040-1000	4	10	4,200	300	2	3,750	220	2	2,250	120	1
2050-1250	5	12.5	3,200	340	2.5	3,000	260	2.5	1,700	120	1.25
2060-1500	6	15	2,500	380	3	2,500	300	3	1,350	120	1.5
2070-1750	7	17.5	2,270	345	3.5	2,270	270	3.5	1,150	105	1.75
2080-2000	8	20	2,100	320	4	2,100	250	4	1,000	90	2
2090-2250	9	22.5	1,935	300	4.5	1,935	220	4.5	895	80	2.25
2100-2500	10	25	1,800	280	5	1,800	200	5	810	75	2.5
2110-2750	11	27.5	1,635	265	5.5	1,635	180	5.5	735	70	2.75
2120-3000	12	30	1,500	250	6	1,500	160	6	670	65	3

WORK MATERIAL			PREHARDENED STEELS HPM / NAK (30~45HRC)			HARDENED STEELS SKD / SKT / STAVAX (45~55HRC)		
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)
				Slotting	a_p		Slotting	a_p
2001-0025	0.1	0.25	30,000	15	0.007	24,000	10	0.002
2002-0050	0.2	0.5	30,000	30	0.014	23,000	25	0.004
2003-0075	0.3	0.75	30,000	55	0.021	20,000	25	0.006
2004-0100	0.4	1	30,000	60	0.028	16,800	25	0.008
2005-0125	0.5	1.25	24,000	60	0.035	14,400	30	0.015
2006-0150	0.6	1.5	20,000	60	0.06	12,000	35	0.018
2007-0175	0.7	1.75	17,800	60	0.07	10,000	35	0.021
2008-0200	0.8	2	16,700	60	0.08	8,500	35	0.024
2009-0225	0.9	2.25	15,600	60	0.09	7,300	35	0.027
2010-0250	1	2.5	11,000	60	0.25	5,500	20	0.05
2015-0375	1.5	3.75	7,500	90	0.375	3,750	25	0.075
2020-0500	2	5	5,700	120	0.5	2,850	30	0.1
2025-0625	2.5	6.25	4,800	135	0.62	2,400	30	0.12
2030-0750	3	7.5	3,900	150	0.75	1,950	35	0.15
2040-1000	4	10	2,900	180	1	1,450	40	0.2
2050-1250	5	12.5	2,400	210	1.25	1,200	45	0.25
2060-1500	6	15	2,000	240	1.5	1,000	55	0.3
2070-1750	7	17.5	1,630	230	1.5	815	55	0.3
2080-2000	8	20	1,350	220	1.5	675	55	0.3
2090-2250	9	22.5	1,135	210	1.5	565	55	0.3
2100-2500	10	25	960	200	1.5	480	55	0.3
2110-2750	11	27.5	845	180	1.5	425	55	0.3
2120-3000	12	30	750	160	1.5	375	55	0.3

Milling Conditions for CSS

◆ 3D flute length type L/D=3

WORK MATERIAL			CARBON STEELS S45C / S50C Annealed Materials (~225HB)			ALLOY STEELS SK / SCM Annealed Materials (225~325HB)			STAINLESS STEELS SUS304 * Use water soluble or oil coolant.		
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)
				Slotting	a_p		Slotting	a_p		Slotting	a_p
2001-0030	0.1	0.3	30,000	30	0.005	30,000	30	0.005	30,000	30	0.005
2002-0060	0.2	0.6	30,000	85	0.01	30,000	85	0.01	30,000	60	0.01
2003-0090	0.3	0.9	30,000	110	0.015	30,000	110	0.015	30,000	110	0.015
2004-0120	0.4	1.2	30,000	120	0.02	30,000	120	0.02	30,000	120	0.02
2005-0150	0.5	1.5	27,000	120	0.025	24,000	105	0.025	24,000	120	0.025
2006-0180	0.6	1.8	24,000	120	0.05	20,000	90	0.05	20,000	120	0.05
2007-0210	0.7	2.1	22,500	115	0.056	17,800	90	0.056	17,800	120	0.056
2008-0240	0.8	2.4	21,000	110	0.064	16,700	90	0.064	16,700	120	0.064
2009-0270	0.9	2.7	19,500	105	0.072	15,600	85	0.072	15,600	120	0.072
2010-0300	1	3	20,000	130	0.5	15,000	60	0.5	11,000	120	0.25
2015-0450	1.5	4.5	12,800	170	0.75	10,000	100	0.75	7,000	120	0.375
2020-0600	2	6	9,300	210	1	7,500	140	1	5,000	120	0.5
2025-0750	2.5	7.5	7,600	235	1.25	6,250	160	1.25	4,100	120	0.62
2030-0900	3	9	5,900	260	1.5	5,000	180	1.5	3,200	120	0.75
2040-1200	4	12	4,200	300	2	3,750	220	2	2,250	120	1
2050-1500	5	15	3,200	340	2.5	3,000	260	2.5	1,700	120	1.25
2060-1800	6	18	2,500	380	3	2,500	300	3	1,350	120	1.5
2070-2100	7	21	2,270	345	3.5	2,270	270	3.5	1,150	105	1.75
2080-2400	8	24	2,100	320	4	2,100	250	4	1,000	90	2
2090-2700	9	27	1,935	300	4.5	1,935	220	4.5	895	80	2.25
2100-3000	10	30	1,800	280	5	1,800	200	5	810	75	2.5
2110-3300	11	33	1,635	265	5.5	1,635	180	5.5	735	70	2.75
2120-3600	12	36	1,500	250	6	1,500	160	6	670	65	3

WORK MATERIAL			PREHARDENED STEELS HPM / NAK (30~45HRC)			HARDENED STEELS SKD / SKT / STAVAX (45~55HRC)		
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)
				Slotting	a_p		Slotting	a_p
2001-0030	0.1	0.3	30,000	15	0.005	24,000	10	0.001
2002-0060	0.2	0.6	30,000	30	0.01	23,000	25	0.002
2003-0090	0.3	0.9	30,000	55	0.015	20,000	25	0.003
2004-0120	0.4	1.2	30,000	60	0.02	16,800	25	0.004
2005-0150	0.5	1.5	24,000	60	0.025	14,400	30	0.013
2006-0180	0.6	1.8	20,000	60	0.05	12,000	35	0.015
2007-0210	0.7	2.1	17,800	60	0.056	10,000	35	0.018
2008-0240	0.8	2.4	16,700	60	0.064	8,500	35	0.02
2009-0270	0.9	2.7	15,600	60	0.072	7,300	35	0.023
2010-0300	1	3	11,000	60	0.25	5,500	15	0.05
2015-0450	1.5	4.5	7,500	90	0.375	3,750	20	0.075
2020-0600	2	6	5,700	120	0.5	2,850	25	0.1
2025-0750	2.5	7.5	4,800	135	0.62	2,400	30	0.12
2030-0900	3	9	3,900	150	0.75	1,950	35	0.15
2040-1200	4	12	2,900	180	1	1,450	40	0.2
2050-1500	5	15	2,400	210	1.25	1,200	45	0.25
2060-1800	6	18	2,000	240	1.5	1,000	55	0.3
2070-2100	7	21	1,630	230	1.5	815	55	0.3
2080-2400	8	24	1,350	220	1.5	675	55	0.3
2090-2700	9	27	1,135	210	1.5	565	55	0.3
2100-3000	10	30	960	200	1.5	480	55	0.3
2110-3300	11	33	845	180	1.5	425	55	0.3
2120-3600	12	36	750	160	1.5	375	55	0.3

Ø3mm Shank
V SeriesUDC-PCD
SeriesCBN
Series

Square

Long Neck
Square

Radius

Long Neck
RadiusTaper Neck
RadiusBall / Long
Shank BallLong Neck
BallTaper Neck
Ball

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data

Milling Conditions for CSS

Side Milling

◆ 1D flute length type L/D=1

WORK MATERIAL			CARBON STEELS S45C / S50C Annealed Materials (~225HB)				ALLOY STEELS SK / SCM Annealed Materials (225~325HB)				STAINLESS STEELS SUS304 * Use water soluble or oil coolant.			
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	
				Side Milling	a _p	a _e		Side Milling	a _p	a _e		Side Milling	a _p	a _e
2001-0010	0.1	0.1	30,000	70	0.1	0.007	30,000	55	0.1	0.006	30,000	60	0.1	0.005
2002-0020	0.2	0.2	30,000	180	0.2	0.014	30,000	140	0.2	0.012	30,000	120	0.2	0.01
2003-0030	0.3	0.3	30,000	280	0.3	0.021	30,000	210	0.3	0.018	30,000	180	0.3	0.015
2004-0040	0.4	0.4	30,000	380	0.4	0.028	30,000	260	0.4	0.024	30,000	225	0.4	0.02
2005-0050	0.5	0.5	27,000	490	0.5	0.035	24,000	360	0.5	0.03	24,000	315	0.5	0.025
2006-0060	0.6	0.6	24,000	600	0.6	0.042	20,000	450	0.6	0.036	20,000	400	0.6	0.03
2007-0070	0.7	0.7	22,500	600	0.7	0.049	17,800	450	0.7	0.042	17,800	400	0.7	0.035
2008-0080	0.8	0.8	21,000	600	0.8	0.056	16,700	450	0.8	0.048	16,700	400	0.8	0.04
2009-0090	0.9	0.9	19,500	600	0.9	0.063	15,600	450	0.9	0.054	15,600	400	0.9	0.045
2010-0100	1	1	18,000	600	1	0.075	14,500	450	1	0.075	14,500	500	1	0.05
2015-0150	1.5	1.5	16,000	900	1.5	0.113	13,000	600	1.5	0.113	13,000	750	1.5	0.075
2020-0200	2	2	12,000	900	2	0.15	10,000	600	2	0.15	10,000	750	2	0.1
2025-0250	2.5	2.5	10,200	900	2.5	0.19	8,400	600	2.5	0.19	8,400	750	2.5	0.13
2030-0300	3	3	8,500	900	3	0.225	6,800	600	3	0.225	6,800	750	3	0.15
2040-0400	4	4	7,200	675	4	0.6	5,700	500	4	0.6	5,700	575	4	0.4
2050-0500	5	5	6,000	750	5	0.75	4,800	550	5	0.75	4,800	650	5	0.5
2060-0600	6	6	5,000	800	6	0.9	4,000	600	6	0.9	4,000	650	6	0.6
2080-0800	8	8	3,500	700	8	1.2	2,700	525	8	1.2	2,400	600	8	0.8
2100-1000	10	10	2,300	600	10	1.5	1,900	450	10	1.5	1,400	500	10	1
2120-1200	12	12	1,850	550	12	1.8	1,550	400	12	1.8	1,250	450	12	1.2

WORK MATERIAL			PREHARDENED STEELS HPM / NAK (30~45HRC)				HARDENED STEELS SKD / SKT / STAVAX (45~55HRC)			
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Milling Amount (mm)	
				Side Milling	a _p	a _e		Side Milling	a _p	a _e
2001-0010	0.1	0.1	30,000	40	0.1	0.005	24,000	25	0.1	0.004
2002-0020	0.2	0.2	30,000	80	0.2	0.01	23,000	35	0.2	0.008
2003-0030	0.3	0.3	30,000	120	0.3	0.015	20,000	45	0.3	0.012
2004-0040	0.4	0.4	30,000	150	0.4	0.02	16,800	55	0.4	0.016
2005-0050	0.5	0.5	24,000	210	0.5	0.025	14,400	65	0.5	0.02
2006-0060	0.6	0.6	20,000	265	0.6	0.03	12,000	80	0.6	0.024
2007-0070	0.7	0.7	17,800	265	0.7	0.035	10,000	80	0.7	0.028
2008-0080	0.8	0.8	16,700	265	0.8	0.04	8,500	80	0.8	0.032
2009-0090	0.9	0.9	15,600	265	0.9	0.045	7,300	80	0.9	0.036
2010-0100	1	1	14,500	300	1	0.05	6,550	80	1	0.045
2015-0150	1.5	1.5	12,000	450	1.5	0.075	4,400	100	1.5	0.068
2020-0200	2	2	9,000	450	2	0.1	3,300	115	2	0.09
2025-0250	2.5	2.5	7,900	450	2.5	0.13	2,750	120	2.5	0.11
2030-0300	3	3	6,800	450	3	0.15	2,200	130	3	0.135
2040-0400	4	4	5,100	350	4	0.4	1,650	150	4	0.18
2050-0500	5	5	4,050	425	5	0.5	1,300	160	5	0.225
2060-0600	6	6	3,300	500	6	0.6	1,100	180	6	0.27
2080-0800	8	8	2,300	450	8	0.8	800	130	8	0.36
2100-1000	10	10	1,500	450	10	1	690	110	10	0.45
2120-1200	12	12	1,200	400	12	1.2	550	110	12	0.54

- φ3mm Shank V Series
- UDC-PCD Series
- CBN Series
- Square
- Long Neck Square
- Radius
- Long Neck Radius
- Taper Neck Radius
- Ball / Long Shank Ball
- Long Neck Ball
- Taper Neck Ball
- Taper
- Barrel
- Spiral V Cutter
- Drill
- Technical Data

Milling Conditions for CSS

◆ 1.5D flute length type $1 < L/D \leq 1.5$

WORK MATERIAL			CARBON STEELS S45C / S50C Annealed Materials (~225HB)				ALLOY STEELS SK / SCM Annealed Materials (225~325HB)				STAINLESS STEELS SUS304 * Use water soluble or oil coolant.						
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)	
				Side Milling	a_p	a_e	Side Milling		a_p	a_e	Side Milling	a_p		a_e	Side Milling	a_p	a_e
2001-0015	0.1	0.15	30,000	70	0.15	0.007	30,000	55	0.15	0.006	30,000	60	0.15	0.005			
2002-0030	0.2	0.3	30,000	180	0.3	0.014	30,000	140	0.3	0.012	30,000	120	0.3	0.01			
2003-0045	0.3	0.45	30,000	280	0.45	0.021	30,000	210	0.45	0.018	30,000	180	0.45	0.015			
2004-0060	0.4	0.6	30,000	380	0.6	0.028	30,000	260	0.6	0.024	30,000	225	0.6	0.02			
2005-0075	0.5	0.75	27,000	490	0.75	0.035	24,000	360	0.75	0.03	24,000	315	0.75	0.025			
2006-0090	0.6	0.9	24,000	600	0.9	0.042	20,000	450	0.9	0.036	20,000	400	0.9	0.03			
2007-0100	0.7	1	22,500	600	1	0.049	17,800	450	1	0.042	17,800	400	1	0.035			
2008-0120	0.8	1.2	21,000	600	1.2	0.056	16,700	450	1.2	0.048	16,700	400	1.2	0.04			
2009-0120	0.9	1.2	19,500	600	1.2	0.063	15,600	450	1.2	0.054	15,600	400	1.2	0.045			
2010-0150	1	1.5	18,000	600	1.5	0.075	14,500	450	1.5	0.075	14,500	500	1.5	0.05			
2015-0225	1.5	2.25	16,000	900	2.25	0.113	13,000	600	2.25	0.113	13,000	750	2.25	0.075			
2020-0300	2	3	12,000	900	3	0.15	10,000	600	3	0.15	10,000	750	3	0.1			
2025-0375	2.5	3.75	10,200	900	3.75	0.19	8,400	600	3.75	0.19	8,400	750	3.75	0.13			
2030-0450	3	4.5	8,500	900	4.5	0.225	6,800	600	4.5	0.225	6,800	750	4.5	0.15			
2040-0600	4	6	7,200	675	6	0.6	5,700	500	6	0.6	5,700	575	6	0.4			
2050-0750	5	7.5	6,000	750	7.5	0.75	4,800	550	7.5	0.75	4,800	650	7.5	0.5			
2060-0900	6	9	5,000	800	9	0.9	4,000	600	9	0.9	4,000	650	9	0.6			
2080-1200	8	12	3,500	700	12	1.2	2,700	525	12	1.2	2,400	600	12	0.8			
2100-1500	10	15	2,300	600	15	1.5	1,900	450	15	1.5	1,400	500	15	1			
2120-1800	12	18	1,850	550	18	1.8	1,550	400	18	1.8	1,250	450	18	1.2			

WORK MATERIAL			PREHARDENED STEELS HPM / NAK (30~45HRC)				HARDENED STEELS SKD / SKT / STAVAX (45~55HRC)					
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)	
				Side Milling	a_p	a_e	Side Milling		a_p	a_e		
2001-0015	0.1	0.15	30,000	40	0.15	0.005	24,000	25	0.15	0.004		
2002-0030	0.2	0.3	30,000	80	0.3	0.01	23,000	35	0.3	0.008		
2003-0045	0.3	0.45	30,000	120	0.45	0.015	20,000	45	0.45	0.012		
2004-0060	0.4	0.6	30,000	150	0.6	0.02	16,800	55	0.6	0.016		
2005-0075	0.5	0.75	24,000	210	0.75	0.025	14,400	65	0.75	0.02		
2006-0090	0.6	0.9	20,000	265	0.9	0.03	12,000	80	0.9	0.024		
2007-0100	0.7	1	17,800	265	1	0.035	10,000	80	1	0.028		
2008-0120	0.8	1.2	16,700	265	1.2	0.04	8,500	80	1.2	0.032		
2009-0120	0.9	1.2	15,600	265	1.2	0.045	7,300	80	1.2	0.036		
2010-0150	1	1.5	14,500	300	1.5	0.05	6,550	80	1	0.045		
2015-0225	1.5	2.25	12,000	450	2.25	0.075	4,400	100	1.5	0.068		
2020-0300	2	3	9,000	450	3	0.1	3,300	115	2	0.09		
2025-0375	2.5	3.75	7,900	450	3.75	0.13	2,750	120	2.5	0.11		
2030-0450	3	4.5	6,800	450	4.5	0.15	2,200	130	3	0.135		
2040-0600	4	6	5,100	350	6	0.4	1,650	150	4	0.18		
2050-0750	5	7.5	4,050	425	7.5	0.5	1,300	160	5	0.225		
2060-0900	6	9	3,300	500	9	0.6	1,100	180	6	0.27		
2080-1200	8	12	2,300	450	12	0.8	800	130	12	0.36		
2100-1500	10	15	1,500	450	15	1	690	110	15	0.45		
2120-1800	12	18	1,200	400	18	1.2	550	110	18	0.54		

Ø3mm Shank
V SeriesUDC-PCD
SeriesCBN
Series

Square

Long Neck
Square

Radius

Long Neck
RadiusTaper Neck
RadiusBall / Long
Shank BallLong Neck
BallTaper Neck
Ball

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data

Milling Conditions for CSS

◆ 2D flute length type $1.5 < L/D \leq 2$

WORK MATERIAL			CARBON STEELS S45C / S50C Annealed Materials (~225HB)				ALLOY STEELS SK / SCM Annealed Materials (225~325HB)				STAINLESS STEELS SUS304 * Use water soluble or oil coolant.			
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate	Milling Amount		Spindle Speed (min ⁻¹)	Feed Rate	Milling Amount		Spindle Speed (min ⁻¹)	Feed Rate	Milling Amount	
				(mm/min)	Side Milling	a _p		a _e	(mm/min)	Side Milling		a _p	a _e	(mm/min)
2001-0020	0.1	0.2	30,000	50	0.15	0.006	30,000	50	0.15	0.006	30,000	45	0.15	0.005
2002-0040	0.2	0.4	30,000	150	0.3	0.012	30,000	140	0.3	0.012	30,000	105	0.3	0.01
2003-0060	0.3	0.6	30,000	230	0.45	0.018	30,000	185	0.45	0.018	30,000	165	0.45	0.015
2004-0080	0.4	0.8	30,000	315	0.6	0.024	30,000	240	0.6	0.02	30,000	225	0.6	0.016
2005-0080	0.5	0.8	27,000	490	0.75	0.03	24,000	360	0.75	0.025	24,000	315	0.75	0.02
2005-0100	0.5	1	27,000	400	0.75	0.03	24,000	300	0.75	0.025	24,000	260	0.75	0.02
2006-0100	0.6	1	24,000	600	1	0.036	20,000	450	1	0.03	20,000	400	1	0.024
2006-0120	0.6	1.2	24,000	500	1.2	0.036	20,000	360	1.2	0.03	20,000	315	1.2	0.024
2007-0140	0.7	1.4	22,500	500	1.4	0.042	17,800	360	1.4	0.035	17,800	315	1.4	0.028
2008-0160	0.8	1.6	21,000	500	1.6	0.048	16,700	360	1.6	0.04	16,700	315	1.6	0.032
2009-0180	0.9	1.8	19,500	500	1.8	0.054	15,600	360	1.8	0.045	15,600	315	1.8	0.036
2010-0200	1	2	18,000	600	1.5	0.09	14,500	450	1.5	0.09	14,500	500	1.5	0.06
2015-0300	1.5	3	16,000	900	2.25	0.135	13,000	600	2.25	0.135	13,000	750	2.25	0.09
2020-0400	2	4	12,000	900	3	0.18	10,000	600	3	0.18	10,000	750	3	0.12
2025-0500	2.5	5	10,200	900	3.75	0.23	8,400	600	3.75	0.23	8,400	750	3.75	0.15
2030-0600	3	6	8,500	900	4.5	0.27	6,800	600	4.5	0.27	6,800	750	4.5	0.18
2040-0800	4	8	7,200	675	6	0.6	5,700	500	6	0.6	5,700	575	6	0.4
2050-1000	5	10	6,000	750	7.5	0.75	4,800	550	7.5	0.75	4,800	650	7.5	0.5
2060-1200	6	12	5,000	800	9	0.9	4,000	600	9	0.9	4,000	650	9	0.6
2080-1600	8	16	3,500	700	12	1.2	2,700	525	12	1.2	2,400	600	12	0.8
2100-2000	10	20	2,300	600	15	1.5	1,900	450	15	1.5	1,400	500	15	1
2120-2400	12	24	1,850	550	18	1.8	1,550	400	18	1.8	1,250	450	18	1.2

WORK MATERIAL			PREHARDENED STEELS HPM / NAK (30~45HRC)				HARDENED STEELS SKD / SKT / STAVAX (45~55HRC)			
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate	Milling Amount		Spindle Speed (min ⁻¹)	Feed Rate	Milling Amount	
				(mm/min)	Side Milling	a _p		a _e	(mm/min)	Side Milling
2001-0020	0.1	0.2	30,000	30	0.15	0.005	24,000	10	0.2	0.003
2002-0040	0.2	0.4	30,000	70	0.3	0.01	23,000	30	0.4	0.006
2003-0060	0.3	0.6	30,000	110	0.45	0.015	20,000	40	0.6	0.009
2004-0080	0.4	0.8	30,000	150	0.6	0.016	16,800	50	0.8	0.012
2005-0080	0.5	0.8	24,000	210	0.75	0.02	14,400	65	0.8	0.015
2005-0100	0.5	1	24,000	175	0.75	0.02	14,400	50	1	0.015
2006-0100	0.6	1	20,000	265	1	0.024	12,000	80	1	0.018
2006-0120	0.6	1.2	20,000	210	1.2	0.024	12,000	60	1.2	0.018
2007-0140	0.7	1.4	17,800	210	1.4	0.028	10,000	60	1.4	0.021
2008-0160	0.8	1.6	16,700	210	1.6	0.032	8,500	60	1.6	0.024
2009-0180	0.9	1.8	15,600	210	1.8	0.036	7,300	60	1.8	0.027
2010-0200	1	2	14,500	300	1.5	0.06	6,550	80	1.5	0.045
2015-0300	1.5	3	12,000	450	2.25	0.09	4,400	100	2.25	0.068
2020-0400	2	4	9,000	450	3	0.12	3,300	115	3	0.09
2025-0500	2.5	5	7,900	450	3.75	0.15	2,750	120	3.75	0.11
2030-0600	3	6	6,800	450	4.5	0.18	2,200	130	4.5	0.135
2040-0800	4	8	5,100	350	6	0.4	1,650	150	6	0.18
2050-1000	5	10	4,050	425	7.5	0.5	1,300	160	7.5	0.225
2060-1200	6	12	3,300	500	9	0.6	1,100	180	9	0.27
2080-1600	8	16	2,300	450	12	0.8	800	130	12	0.36
2100-2000	10	20	1,500	450	15	1	690	110	15	0.45
2120-2400	12	24	1,200	400	18	1.2	550	110	18	0.54

Milling Conditions for CSS

◆ 2.5D flute length type $2.5 < L/D \leq 3$

WORK MATERIAL			CARBON STEELS S45C / S50C Annealed Materials (~225HB)				ALLOY STEELS SK / SCM Annealed Materials (225~325HB)				STAINLESS STEELS SUS304 * Use water soluble or oil coolant.						
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)	
				Side Milling	a_p	a_e	Side Milling		a_p	a_e	Side Milling	a_p		a_e	Side Milling	a_p	a_e
2001-0025	0.1	0.25	30,000	40	0.2	0.005	30,000	40	0.2	0.005	30,000	25	0.2	0.004			
2002-0050	0.2	0.5	30,000	150	0.4	0.008	30,000	120	0.4	0.01	30,000	65	0.4	0.008			
2003-0075	0.3	0.75	30,000	230	0.6	0.012	30,000	160	0.6	0.015	30,000	100	0.6	0.012			
2004-0100	0.4	1	30,000	315	0.8	0.016	30,000	220	0.8	0.016	30,000	140	0.8	0.012			
2005-0125	0.5	1.25	27,000	400	1	0.02	24,000	260	1	0.02	24,000	155	1	0.015			
2006-0150	0.6	1.5	24,000	500	1.5	0.024	20,000	360	1.5	0.024	20,000	210	1.5	0.018			
2007-0175	0.7	1.75	22,500	500	1.75	0.028	17,800	360	1.75	0.028	17,800	210	1.75	0.021			
2008-0200	0.8	2	21,000	500	2	0.032	16,700	360	2	0.032	16,700	210	2	0.024			
2009-0225	0.9	2.25	19,500	500	2.25	0.036	15,600	360	2.25	0.036	15,600	210	2.25	0.027			
2010-0250	1	2.5	20,000	700	2.5	0.05	15,000	500	2.5	0.05	11,000	200	2.5	0.05			
2015-0375	1.5	3.75	12,800	710	3.75	0.075	10,000	500	3.75	0.075	7,000	210	3.75	0.075			
2020-0500	2	5	9,300	720	5	0.1	7,500	510	5	0.1	5,000	230	5	0.1			
2025-0625	2.5	6.25	7,600	725	6.25	0.13	6,250	515	6.25	0.13	4,100	250	6.25	0.13			
2030-0750	3	7.5	5,900	730	7.5	0.15	5,000	520	7.5	0.15	3,200	275	7.5	0.15			
2040-1000	4	10	4,200	740	10	0.4	3,750	520	10	0.4	2,250	300	10	0.2			
2050-1250	5	12.5	3,200	750	12.5	0.5	3,000	530	12.5	0.5	1,700	330	12.5	0.25			
2060-1500	6	15	2,500	750	15	0.6	2,500	530	15	0.6	1,350	350	15	0.3			
2070-1750	7	17.5	2,270	700	17.5	0.7	2,270	495	17.5	0.7	1,150	350	17.5	0.35			
2080-2000	8	20	2,100	660	20	0.8	2,100	470	20	0.8	1,000	350	20	0.4			
2090-2250	9	22.5	1,935	615	22.5	0.9	1,935	440	22.5	0.9	895	350	22.5	0.45			
2100-2500	10	25	1,800	580	25	1	1,800	410	25	1	810	350	25	0.5			
2110-2750	11	27.5	1,635	545	27.5	1.1	1,635	375	27.5	1.1	735	335	27.5	0.55			
2120-3000	12	30	1,500	520	30	1.2	1,500	350	30	1.2	670	320	30	0.6			

WORK MATERIAL			PREHARDENED STEELS HPM / NAK (30~45HRC)				HARDENED STEELS SKD / SKT / STAVAX (45~55HRC)					
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)	
				Side Milling	a_p	a_e	Side Milling		a_p	a_e		
2001-0025	0.1	0.25	30,000	25	0.2	0.004	24,000	10	0.25	0.002		
2002-0050	0.2	0.5	30,000	65	0.4	0.008	23,000	25	0.5	0.004		
2003-0075	0.3	0.75	30,000	100	0.6	0.012	20,000	35	0.75	0.006		
2004-0100	0.4	1	30,000	140	0.8	0.012	16,800	45	1	0.008		
2005-0125	0.5	1.25	24,000	155	1	0.015	14,400	50	1.25	0.01		
2006-0150	0.6	1.5	20,000	210	1.5	0.018	12,000	60	1.5	0.012		
2007-0175	0.7	1.75	17,800	210	1.75	0.021	10,000	60	1.75	0.014		
2008-0200	0.8	2	16,700	210	2	0.024	8,500	60	2	0.016		
2009-0225	0.9	2.25	15,600	210	2.25	0.027	7,300	60	2.25	0.018		
2010-0250	1	2.5	11,000	200	2.5	0.05	5,500	60	2.5	0.05		
2015-0375	1.5	3.75	7,500	210	3.75	0.075	3,750	65	3.75	0.075		
2020-0500	2	5	5,700	230	5	0.1	2,850	70	5	0.1		
2025-0625	2.5	6.25	4,800	240	6.25	0.13	2,400	70	6.25	0.13		
2030-0750	3	7.5	3,900	250	7.5	0.15	1,950	75	7.5	0.15		
2040-1000	4	10	2,900	270	10	0.3	1,450	80	10	0.3		
2050-1250	5	12.5	2,400	290	12.5	0.375	1,200	90	12.5	0.375		
2060-1500	6	15	2,000	300	15	0.45	1,000	100	15	0.45		
2070-1750	7	17.5	1,630	285	17.5	0.525	815	85	17.5	0.525		
2080-2000	8	20	1,350	270	20	0.6	675	70	20	0.6		
2090-2250	9	22.5	1,135	255	22.5	0.675	565	60	22.5	0.675		
2100-2500	10	25	960	240	25	0.75	480	50	25	0.75		
2110-2750	11	27.5	845	220	27.5	0.825	425	45	27.5	0.825		
2120-3000	12	30	750	200	30	0.9	375	40	30	0.9		

Ø3mm Shank
V SeriesUDC-PCD
SeriesCBN
Series

Square

Long Neck
Square

Radius

Long Neck
RadiusTaper Neck
RadiusBall / Long
Shank BallLong Neck
BallTaper Neck
Ball

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data

Milling Conditions for CSS

◆ 3D flute length type L/D=3

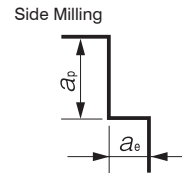
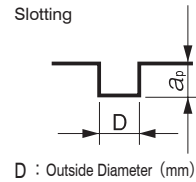
WORK MATERIAL			CARBON STEELS S45C / S50C Annealed Materials (~225HB)				ALLOY STEELS SK / SCM Annealed Materials (225~325HB)				STAINLESS STEELS SUS304 * Use water soluble or oil coolant.						
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)	
				Side Milling	a _p	a _e	Side Milling		a _p	a _e	Side Milling	a _p		a _e			
2001-0030	0.1	0.3	30,000	30	0.25	0.005	30,000	30	0.25	0.005	30,000	20	0.25	0.004			
2002-0060	0.2	0.6	30,000	110	0.5	0.008	30,000	85	0.5	0.01	30,000	50	0.5	0.008			
2003-0090	0.3	0.9	30,000	180	0.75	0.012	30,000	135	0.75	0.015	30,000	80	0.75	0.012			
2004-0120	0.4	1.2	30,000	250	1	0.016	30,000	170	1	0.016	30,000	100	1	0.012			
2005-0150	0.5	1.5	27,000	320	1.25	0.02	24,000	200	1.25	0.02	24,000	125	1.25	0.015			
2006-0180	0.6	1.8	24,000	400	1.8	0.024	20,000	280	1.8	0.024	20,000	170	1.8	0.018			
2007-0210	0.7	2.1	22,500	400	2.1	0.028	17,800	280	2.1	0.028	17,800	170	2.1	0.021			
2008-0240	0.8	2.4	21,000	400	2.4	0.032	16,700	280	2.4	0.032	16,700	170	2.4	0.024			
2009-0270	0.9	2.7	19,500	400	2.7	0.036	15,600	280	2.7	0.036	15,600	170	2.7	0.027			
2010-0300	1	3	20,000	700	3	0.05	15,000	500	3	0.05	11,000	200	3	0.05			
2015-0450	1.5	4.5	12,800	710	4.5	0.075	10,000	500	4.5	0.075	7,000	210	4.5	0.075			
2020-0600	2	6	9,300	720	6	0.1	7,500	510	6	0.1	5,000	230	6	0.1			
2025-0750	2.5	7.5	7,600	725	7.5	0.13	6,250	515	7.5	0.13	4,100	250	7.5	0.13			
2030-0900	3	9	5,900	730	9	0.15	5,000	520	9	0.15	3,200	275	9	0.15			
2040-1200	4	12	4,200	740	12	0.4	3,750	520	12	0.4	2,250	300	12	0.2			
2050-1500	5	15	3,200	750	15	0.5	3,000	530	15	0.5	1,700	330	15	0.25			
2060-1800	6	18	2,500	750	18	0.6	2,500	530	18	0.6	1,350	350	18	0.3			
2070-2100	7	21	2,270	700	21	0.7	2,270	495	21	0.7	1,150	350	21	0.35			
2080-2400	8	24	2,100	660	24	0.8	2,100	470	24	0.8	1,000	350	24	0.4			
2090-2700	9	27	1,935	615	27	0.9	1,935	440	27	0.9	895	350	27	0.45			
2100-3000	10	30	1,800	580	30	1	1,800	410	30	1	810	350	30	0.5			
2110-3300	11	33	1,635	545	33	1.1	1,635	375	33	1.1	735	335	33	0.55			
2120-3600	12	36	1,500	520	36	1.2	1,500	350	36	1.2	670	320	36	0.6			

WORK MATERIAL			PREHARDENED STEELS HPM / NAK (30~45HRC)				HARDENED STEELS SKD / SKT / STAVAX (45~55HRC)					
Model Number	Outside Diameter (mm)	Length of Cut (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/min)		Milling Amount (mm)	
				Side Milling	a _p	a _e	Side Milling		a _p	a _e		
2001-0030	0.1	0.3	30,000	20	0.25	0.004	24,000	10	0.3	0.002		
2002-0060	0.2	0.6	30,000	50	0.5	0.008	23,000	20	0.6	0.004		
2003-0090	0.3	0.9	30,000	80	0.75	0.012	20,000	35	0.9	0.003		
2004-0120	0.4	1.2	30,000	100	1	0.012	16,800	40	1.2	0.004		
2005-0150	0.5	1.5	24,000	125	1.25	0.015	14,400	50	1.5	0.005		
2006-0180	0.6	1.8	20,000	170	1.8	0.018	12,000	60	1.8	0.006		
2007-0210	0.7	2.1	17,800	170	2.1	0.021	10,000	60	2.1	0.007		
2008-0240	0.8	2.4	16,700	170	2.4	0.024	8,500	60	2.4	0.008		
2009-0270	0.9	2.7	15,600	170	2.7	0.027	7,300	60	2.7	0.009		
2010-0300	1	3	11,000	200	3	0.05	5,500	60	3	0.05		
2015-0450	1.5	4.5	7,500	210	4.5	0.075	3,750	65	4.5	0.075		
2020-0600	2	6	5,700	230	6	0.1	2,850	70	6	0.1		
2025-0750	2.5	7.5	4,800	240	7.5	0.13	2,400	70	7.5	0.13		
2030-0900	3	9	3,900	250	9	0.15	1,950	75	9	0.15		
2040-1200	4	12	2,900	270	12	0.3	1,450	80	12	0.3		
2050-1500	5	15	2,400	290	15	0.375	1,200	90	15	0.375		
2060-1800	6	18	2,000	300	18	0.45	1,000	100	18	0.45		
2070-2100	7	21	1,630	285	21	0.525	815	85	21	0.525		
2080-2400	8	24	1,350	270	24	0.6	675	70	24	0.6		
2090-2700	9	27	1,135	255	27	0.675	565	60	27	0.675		
2100-3000	10	30	960	240	30	0.75	480	50	30	0.75		
2110-3300	11	33	845	220	33	0.825	425	45	33	0.825		
2120-3600	12	36	750	200	36	0.9	375	40	36	0.9		

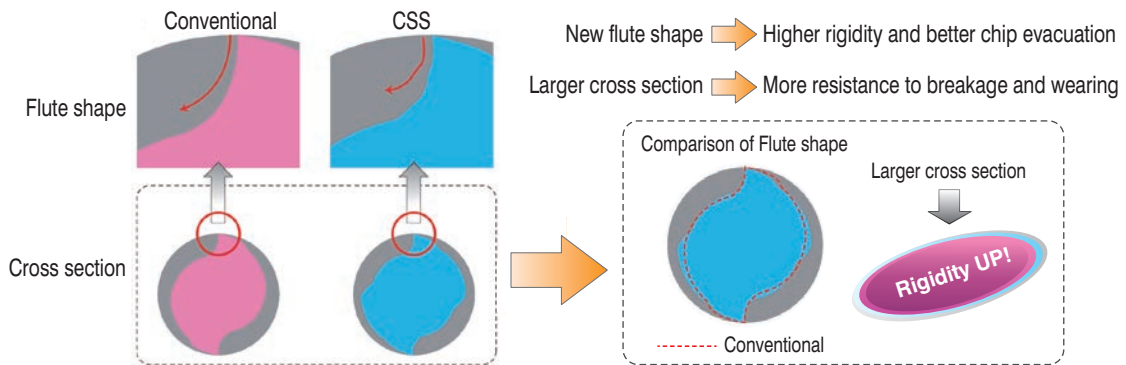
Milling Conditions for CSS

Note:

- Decrease both spindle speed and feed rate proportionally in case of chattering.
- These milling parameters are calculated based on the shortest overhang length. Longer overhangs may require an adjustment to the milling parameters.
- Reduce the milling amount and feed rate in accordance with required milling precision.
- Recommend water soluble or oil coolant.
- Recommend oil coolant for Titanium Alloys and Heat Resistant Alloys.



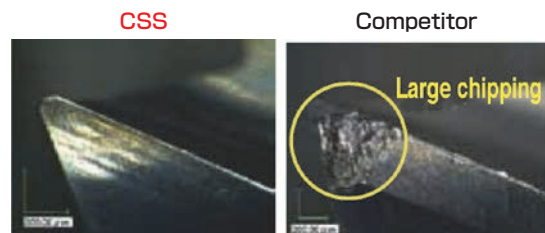
Unique Cross Section design



Milling Example: Slotting Comparison

Tool	$\phi 6 \times L12$ mm
Spindle Speed	1,100 min^{-1}
Feed Rate	40 mm/min
a_p	1.8 mm
Coolant	Air Blow (Through Spindle)
Cycle Time	28 min

STAVAX (53HRC)



$\phi 3$ mm Shank
V Series

UDC-PCD
Series

CBN
Series

Square

Square

Long Neck
Square

Radius

Radius

Long Neck
Radius

Taper Neck
Radius

Ball

Ball / Long
Shank Ball

Ball

Long Neck
Ball

Taper Neck
Ball

Taper

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data