



Size $\phi 0.1 \sim \phi 20$

C-CES2000

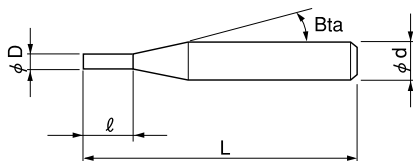


Material Applications (☆ Highly Recommended ○ Recommended ○ Suggested)

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
			~55HRC	~60HRC	~70HRC										
○	○	○	○			○			○			○	○		

Features

Broad application range from Carbon Steels up to Hardened Steels (55HRC).
Excellent performance/quality to price ratio.
Refer to page 94 for 4 flute C-CES.



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 207 models

Unit (mm)

Model Number	Outside Diameter ϕD	Length of Cut ℓ	Shank Taper Angle Bta	Overall Length L	Shank Diameter ϕd	Price (¥)
C-CES 2001-0015	0.1	0.15	16°	45	4	7,800
C-CES 2001-0020		0.2		45	4	7,800
C-CES 2001-0030		0.3		45	4	7,800
C-CES 2002-0030	0.2	0.3	16°	45	4	4,680
C-CES 2002		0.4		38	3	4,680
C-CES 2002-0040		0.4		45	4	4,680
C-CES 2002-0050		0.5		45	4	4,680
C-CES 2002-0060		0.6		45	4	4,680
C-CES 2002-0080		0.8		45	4	7,930

Next Page ➡

Unit (mm)

Model Number	Outside Diameter ϕD	Length of Cut ℓ	Shank Taper Angle Bta	Overall Length L	Shank Diameter ϕd	Price (¥)
C-CES 2003-0045	0.3	0.45	16°	45	4	4,080
C-CES 2003		0.6		38	3	4,080
C-CES 2003-0060		0.6		45	4	4,080
C-CES 2003-0075		0.75		45	4	4,080
C-CES 2003-0090		0.9		45	4	4,080
C-CES 2003-0120		1.2		45	4	6,120
C-CES 2004-0060	0.4	0.6	16°	45	4	4,560
C-CES 2004		0.8		38	3	4,560
C-CES 2004-0080		0.8		45	4	4,560
C-CES 2004-0100		1		45	4	4,560
C-CES 2004-0120		1.2		45	4	4,560
C-CES 2004-0160		1.6		45	4	6,120
C-CES 2005-0075	0.5	0.75	16°	45	4	2,280
C-CES 2005		0.8		38	3	2,280
C-CES 2005-0100		1		45	4	2,280
C-CES 2005-0125		1.25		45	4	2,280
C-CES 2005-0150		1.5		45	4	2,280
C-CES 2005-0200		2		45	4	3,840
C-CES 2006-0090	0.6	0.9	16°	45	4	3,480
C-CES 2006		1		38	3	3,480
C-CES 2006-0120		1.2		45	4	3,480
C-CES 2006-0150		1.5		45	4	3,480
C-CES 2006-0180		1.8		45	4	3,480
C-CES 2006-0240		2.4		45	4	3,480
C-CES 2007	0.7	1	16°	38	3	3,840
C-CES 2007-0140		1.4		45	4	3,840
C-CES 2007-0175		1.75		45	4	3,840
C-CES 2007-0210		2.1		45	4	3,840
C-CES 2007-0280		2.8		45	4	3,840
C-CES 2008	0.8	1.2	16°	38	3	2,280
C-CES 2008-0120		1.2		45	4	2,280
C-CES 2008-0160		1.6		45	4	2,280
C-CES 2008-0200		2		45	4	2,280
C-CES 2008-0240		2.4		45	4	2,280
C-CES 2008-0320		3.2		45	4	3,840
C-CES 2009	0.9	1.2	16°	38	3	3,840
C-CES 2009-0180		1.8		45	4	3,840
C-CES 2009-0225		2.25		45	4	3,840
C-CES 2009-0270		2.7		45	4	3,840
C-CES 2009-0360		3.6		45	4	3,840

Square
Square
Long Neck Square

Radius
Radius
Long Neck Radius

Ball / Long Shank Ball
Ball
Long Neck Ball
Taper Neck Ball

Taper
Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

Next Page ➡

Model Number	Outside Diameter ϕD	Length of Cut ℓ	Shank Taper Angle $B\alpha$	Overall Length L	Shank Diameter ϕd	Price (¥)
C-CES 2010-0150	1	1.5	16°	45	4	2,040
C-CES 2010-0200		2		45	4	2,040
C-CES 2010		2.5		45	4	2,040
C-CES 2010-0300		3		45	4	2,040
C-CES 2010-0400		4		45	4	3,480
C-CES 2011	1.1	2.5	16°	45	4	4,320
C-CES 2012-0180	1.2	1.8	16°	45	4	2,280
C-CES 2012-0240		2.4		45	4	2,280
C-CES 2012-0300		3		45	4	2,280
C-CES 2012-0360		3.6		45	4	2,280
C-CES 2012		4		45	4	2,280
C-CES 2012-0480		4.8		45	4	3,480
C-CES 2013	1.3	4	16°	45	4	4,320
C-CES 2014	1.4	4	16°	45	4	4,320
C-CES 2015-0225	1.5	2.25	16°	45	4	2,040
C-CES 2015-0300		3		45	4	2,040
C-CES 2015-0375		3.75		45	4	2,040
C-CES 2015		4		45	4	2,040
C-CES 2015-0450		4.5		45	4	2,040
C-CES 2015-0600		6		45	4	3,480
C-CES 2016	1.6	5	16°	45	4	4,320
C-CES 2017	1.7	5	16°	45	4	4,320
C-CES 2018-0270	1.8	2.7	16°	45	4	2,280
C-CES 2018-0360		3.6		45	4	2,280
C-CES 2018-0450		4.5		45	4	2,280
C-CES 2018		5		45	4	2,280
C-CES 2018-0540		5.4		45	4	2,280
C-CES 2018-0720		7.2		45	4	4,200
C-CES 2019	1.9	5	16°	45	4	4,440
C-CES 2020-0300	2	3	16°	45	4	2,040
C-CES 2020-0400		4		45	4	2,040
C-CES 2020-0500		5		45	4	2,040
C-CES 2020		6		45	4	2,040
C-CES 2020-0800		8		45	4	3,480
C-CES 2021	2.1	6	16°	45	4	4,320
C-CES 2022	2.2	6	16°	45	4	4,320
C-CES 2023	2.3	6	16°	45	4	4,320
C-CES 2024	2.4	8	16°	45	4	4,320

 Square
 Long Neck Square

 Radius
 Long Neck Radius

 Ball / Long Shank Ball
 Long Neck Ball
 Taper Neck Ball

Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

Unit (mm)

Model Number	Outside Diameter ϕD	Length of Cut ℓ	Shank Taper Angle Bta	Overall Length L	Shank Diameter ϕd	Price (¥)
C-CES 2025-0375	2.5	3.75	16°	45	4	2,040
C-CES 2025-0500		5		45	4	2,040
C-CES 2025-0625		6.25		45	4	2,040
C-CES 2025-0750		7.5		45	4	2,040
C-CES 2025		8		45	4	2,040
C-CES 2025-1000		10		50	4	3,480
C-CES 2026	2.6	8	16°	45	6	5,520
C-CES 2027	2.7	8	16°	45	6	5,520
C-CES 2028	2.8	8	16°	45	6	5,520
C-CES 2029	2.9	8	16°	45	6	5,520
C-CES 2030-0450	3	4.5	16°	45	6	2,640
C-CES 2030-0600		6		45	6	2,640
C-CES 2030-0750		7.5		45	6	2,640
C-CES 2030		8		45	6	2,640
C-CES 2030-0900		9		45	6	2,640
C-CES 2030-1200		12		50	6	4,320
C-CES 2031	3.1	10	16°	45	6	5,760
C-CES 2032	3.2	10	16°	45	6	5,760
C-CES 2033	3.3	10	16°	45	6	5,760
C-CES 2034	3.4	10	16°	45	6	5,760
C-CES 2035	3.5	10	16°	45	6	4,680
C-CES 2036	3.6	10	16°	45	6	5,760
C-CES 2037	3.7	10	16°	45	6	5,760
C-CES 2038	3.8	11	16°	45	6	5,760
C-CES 2039	3.9	11	16°	45	6	5,760
C-CES 2040-0600	4	6	16°	50	6	2,880
C-CES 2040-0800		8		50	6	2,880
C-CES 2040-1000		10		50	6	2,880
C-CES 2040		11		45	6	2,880
C-CES 2040-1200		12		50	6	2,880
C-CES 2040-1600		16		60	6	4,680
C-CES 2041	4.1	11	16°	45	6	5,760
C-CES 2042	4.2	11	16°	45	6	5,760
C-CES 2043	4.3	11	16°	45	6	5,760
C-CES 2044	4.4	11	16°	45	6	5,760
C-CES 2045	4.5	11	16°	45	6	5,400
C-CES 2046	4.6	11	16°	45	6	6,600
C-CES 2047	4.7	11	16°	45	6	6,600
C-CES 2048	4.8	13	16°	50	6	6,600
C-CES 2049	4.9	13	16°	50	6	6,600

Square
Square
Long Neck Square

Radius
Radius
Long Neck Radius

Ball / Long Shank Ball
Ball
Long Neck Ball
Taper Neck Ball

Taper
Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

Next Page ➡

Model Number	Outside Diameter ϕD	Length of Cut ℓ	Shank Taper Angle Bta	Overall Length L	Shank Diameter ϕd	Price (¥)
C-CES 2050-0750	5	7.5	16°	50	6	3,120
C-CES 2050-1000		10		50	6	3,120
C-CES 2050-1250		12.5		50	6	3,120
C-CES 2050		13		50	6	3,120
C-CES 2050-1500		15		50	6	3,120
C-CES 2050-2000		20		60	6	5,280
C-CES 2051	5.1	13	16°	50	6	6,600
C-CES 2052	5.2	13	16°	50	6	6,600
C-CES 2053	5.3	13	16°	50	6	6,600
C-CES 2054	5.4	13	16°	50	6	6,600
C-CES 2055	5.5	13	16°	50	6	5,640
C-CES 2056	5.6	13	16°	50	6	5,640
C-CES 2057	5.7	13	16°	50	6	5,640
C-CES 2058	5.8	13	16°	50	6	5,640
C-CES 2059	5.9	13	16°	50	6	5,640
C-CES 2060-0900	6	9	—	50	6	3,360
C-CES 2060-1200		12		50	6	3,360
C-CES 2060		13		50	6	3,360
C-CES 2060-1500		15		50	6	3,360
C-CES 2060-1800		18		50	6	3,360
C-CES 2060-2400		24		60	6	5,400
C-CES 2061	6.1	16	16°	60	8	10,340
C-CES 2062	6.2	16	16°	60	8	10,340
C-CES 2063	6.3	16	16°	60	8	10,340
C-CES 2064	6.4	16	16°	60	8	10,340
C-CES 2065	6.5	16	16°	60	8	9,280
C-CES 2066	6.6	16	16°	60	8	10,340
C-CES 2067	6.7	16	16°	60	8	10,340
C-CES 2068	6.8	16	16°	60	8	10,340
C-CES 2069	6.9	16	16°	60	8	10,340
C-CES 2070	7	16	16°	60	8	8,700
C-CES 2071	7.1	16	16°	60	8	10,340
C-CES 2072	7.2	16	16°	60	8	10,340
C-CES 2073	7.3	16	16°	60	8	10,340
C-CES 2074	7.4	16	16°	60	8	10,340
C-CES 2075	7.5	16	16°	60	8	10,360
C-CES 2076	7.6	19	16°	60	8	11,550
C-CES 2077	7.7	19	16°	60	8	11,550
C-CES 2078	7.8	19	16°	60	8	11,550
C-CES 2079	7.9	19	16°	60	8	11,550

Square
Long Neck Square

Radius
Long Neck Radius

Ball / Long Shank Ball
Long Neck Ball
Taper Neck Ball

Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

Unit (mm)

Model Number	Outside Diameter ϕD	Length of Cut ℓ	Shank Taper Angle $B\alpha$	Overall Length L	Shank Diameter ϕd	Price (¥)
C-CES 2080-1600	8	16	—	60	8	6,320
C-CES 2080		19		60	8	6,320
C-CES 2080-2000		20		60	8	6,320
C-CES 2080-2400		24		80	8	6,320
C-CES 2080-3200		32		80	8	11,520
C-CES 2081	8.1	19	16°	70	10	13,860
C-CES 2082	8.2	19	16°	70	10	13,860
C-CES 2083	8.3	19	16°	70	10	13,860
C-CES 2084	8.4	19	16°	70	10	13,860
C-CES 2085	8.5	19	16°	70	10	12,420
C-CES 2086	8.6	19	16°	70	10	13,860
C-CES 2087	8.7	19	16°	70	10	13,860
C-CES 2088	8.8	19	16°	70	10	13,860
C-CES 2089	8.9	19	16°	70	10	13,860
C-CES 2090	9	19	16°	70	10	12,420
C-CES 2091	9.1	19	16°	70	10	13,860
C-CES 2092	9.2	19	16°	70	10	13,860
C-CES 2093	9.3	19	16°	70	10	13,860
C-CES 2094	9.4	19	16°	70	10	13,860
C-CES 2095	9.5	19	16°	70	10	12,870
C-CES 2096	9.6	22	16°	70	10	14,300
C-CES 2097	9.7	22	16°	70	10	14,300
C-CES 2098	9.8	22	16°	70	10	14,300
C-CES 2099	9.9	22	16°	70	10	14,300
C-CES 2100-2000	10	20	—	70	10	7,580
C-CES 2100		22		70	10	7,580
C-CES 2100-2500		25		70	10	7,580
C-CES 2100-3000		30		80	10	7,580
C-CES 2100-4000		40		90	10	12,600
C-CES 2105	10.5	22	16°	75	12	18,920
C-CES 2110	11	22	16°	75	12	17,160
C-CES 2115	11.5	22	16°	75	12	19,580
C-CES 2120-2400	12	24	—	75	12	11,170
C-CES 2120		26		75	12	11,170
C-CES 2120-3000		30		75	12	11,170
C-CES 2120-3600		36		90	12	11,170
C-CES 2120-4800		48		100	12	22,490
C-CES 2160	16	32	—	110	16	35,530
C-CES 2180	18	32	16°	110	20	55,880
C-CES 2200	20	38	—	110	20	60,500

Square

Square
Long Neck
Square

Radius

Radius
Long Neck
RadiusBall / Long
Shank BallBall
Long Neck
BallTaper Neck
BallTaper
TaperSpiral
V CutterDrill
Thread Mill

EURO Series

Technical Data

Milling Conditions for C-CES (2 Flutes)

WORK MATERIAL		CARBON STEELS S45C / S50C (~225HB)			ALLOY STEELS SK / SCM / SUS (225~325HB)			PREHARDENED STEELS HARDENED STEELS NAK / SKD (30~45HRC)			HARDENED STEELS SKD11 / 61 / SKT (45~55HRC)		
Model Number	Outside Diameter (mm)	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)
2001	0.1	30,000	(10~20)	30	30,000	(10~20)	30	30,000	(10~20)	15	30,000	(10)	10
2002	0.2	30,000		85	30,000		85	30,000		30	30,000		25
2003	0.3	30,000	(20~40)	110	30,000	(20~40)	110	30,000	(20~40)	55	22,000	(20)	25
2004	0.4	30,000		120	30,000		120	27,000		60	17,000		25
2005	0.5	30,000		120	29,000		120	21,500		60	13,000		25
2006	0.6	30,000		120	24,000		120	18,000		60	11,000		25
2007	0.7	27,500		120	21,000		120	15,500		60	10,000		25
2008	0.8	24,000		120	19,000		120	13,800		60	8,800		30
2009	0.9	21,500	(45~65)	125	16,500	(45~50)	120	12,000	(35~40)	65	7,800	(20~25)	30
2010	1	20,000		125	15,000		120	11,000		65	7,100		30
2012	1.2	16,700		130	12,500		120	9,400		65	6,000		30
2015	1.5	13,500		130	10,000		120	8,000		70	5,100		35
2018	1.8	11,500		130	8,800		120	7,000		70	4,400		35
2020	2	11,000		130	8,500		120	6,400		70	4,000		40
2025	2.5	8,800		195	7,000		135	5,000		70	3,200		40
2030	3	7,400		195	6,400		145	4,500		80	2,800		45
2040	4	5,900		230	5,000		190	3,500		90	2,150		50
2050	5	5,300	(70~84)	310	4,200	(55~65)	230	2,950	(40~45)	90	1,850	(25~30)	55
2060	6	4,400		305	3,500		230	2,450		100	1,500		55
2080	8	3,300		290	2,600		230	1,850		95	1,200		50
2100	10	2,600		275	2,100		225	1,450		95	950		50
2120	12	2,200		275	1,750		225	1,200		90	800		45

◆High speed milling

WORK MATERIAL		CARBON STEELS S45C / S50C (~225HB)			ALLOY STEELS SK / SCM / SUS (225~325HB)			PREHARDENED STEELS HARDENED STEELS NAK / SKD (30~45HRC)			HARDENED STEELS SKD11 / 61 / SKT (45~55HRC)		
Model Number	Outside Diameter (mm)	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)
2030	3	30,000		790	26,500		600	21,200		375	15,800		255
2040	4	23,800		930	19,800		750	15,800		405	11,900		275
2050	5	19,000		1,110	15,800		865	12,700		385	9,500		280
2060	6	15,900	(300)	1,100	13,200	(250)	865	10,600	(200)	435	7,900	(150)	290
2080	8	11,900		1,045	9,900		875	7,900		405	5,900		245
2100	10	9,500		1,005	7,900		845	6,300		415	4,700		245
2120	12	7,900		1,000	6,600		850	5,300		400	3,900		219

Milling Conditions for C-CES (2 Flutes)

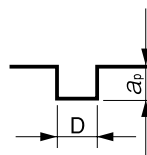
Milling amount for slotting (mm)

$D < \phi 1$

Work Material \ Length of Cut	Less than 2D	Less than 2.5D	Less than 3D	Less than 4D
	Less than 45HRC	$a_p=0.1D$	$a_p=0.07D$	$a_p=0.05D$
More than 45HRC	$a_p=0.02D$	$a_p=0.02D$	$a_p=0.01D$	$a_p=0.01D$

$\phi 1 \leq D < \phi 3$

Work Material \ Length of Cut	Less than 2D	Less than 2.5D	Less than 3D	Less than 4D
	Less than 45HRC	$a_p=0.25D$	$a_p=0.2D$	$a_p=0.125D$
More than 45HRC	$a_p=0.05D$	$a_p=0.03D$	$a_p=0.02D$	$a_p=0.01D$

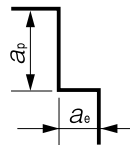


$\phi 3 \leq D$

Work Material \ Length of Cut	Less than 2D	Less than 2.5D	Less than 3D	Less than 4D
	Less than 45HRC	$a_p=0.5D$	$a_p=0.4D$	$a_p=0.3D$
More than 45HRC	$a_p=0.05D$	$a_p=0.03D$	$a_p=0.02D$	$a_p=0.01D$

Milling amount for side milling (mm)

Work Material \ Length of Cut	Less than 2D	Less than 2.5D	Less than 3D	Less than 4D
	Less than 45HRC	$a_e=0.1D$ $a_p=1.5D$	$a_e=0.07D$ $a_p=2D$	$a_e=0.05D$ $a_p=2.5D$
More than 45HRC	$a_e=0.05D$ $a_p=1D$	$a_e=0.03D$ $a_p=1.5D$	$a_e=0.02D$ $a_p=2D$	$a_e=0.01D$ $a_p=3D$



D : Outside Diameter

Ex.) Less than 2D, Flute Length = Less than Diameter x 2

a_p : Axial Depth (mm)

a_e : Radial Depth (mm)

Note:

- Recommend water soluble or oil coolant.
- Recommend oil coolant for Titanium Alloys and Heat Resistant Alloys.

Square

Square
Long Neck
Square

Radius

Radius
Long Neck
RadiusBall / Long
Shank BallBall
Long Neck
BallTaper Neck
Ball

Taper

Spiral
V CutterDrill
Thread Mill

EURO Series

Technical Data