



Size $\phi 0.2 \sim \phi 12$

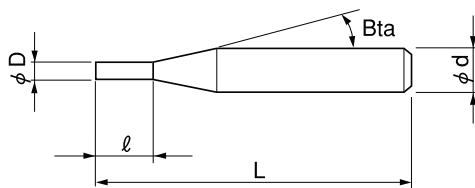
C-CES2000S



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 2 flute C-CES with a sharp corner design.
 Broad application range from Copper and Carbon Steels up to Hardened Steels (55HRC).
 Excellent performance/quality to price ratio.
 Refer to page 162 for 4 flute C-CES-S.



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 35 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 2002-0030S	0.2	0.3	16°	45	4	4,680
C-CES 2002-0060S		0.6		45	4	4,680
C-CES 2003-0045S	0.3	0.45	16°	45	4	4,080
C-CES 2003-0090S		0.9		45	4	4,080
C-CES 2004-0060S	0.4	0.6	16°	45	4	4,560
C-CES 2004-0120S		1.2		45	4	4,560
C-CES 2005-0075S	0.5	0.75	16°	45	4	2,280
C-CES 2005-0150S		1.5		45	4	2,280
C-CES 2006-0090S	0.6	0.9	16°	45	4	3,480
C-CES 2007-0105S	0.7	1.05	16°	45	4	3,840
C-CES 2008-0120S	0.8	1.2	16°	45	4	2,280
C-CES 2008-0240S		2.4		45	4	2,280
C-CES 2009-0135S	0.9	1.35	16°	45	4	3,840
C-CES 2010-0150S	1	1.5	16°	45	4	2,040
C-CES 2010-0300S		3		45	4	2,040
C-CES 2012-0180S	1.2	1.8	16°	45	4	2,280
C-CES 2012-0360S		3.6		45	4	2,280

Next Page ➡

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 2015-0225S	1.5	2.25	16°	45	4	2,040
C-CES 2015-0450S		4.5		45		
C-CES 2018-0270S	1.8	2.7	16°	45	4	2,280
C-CES 2018-0540S		5.4		45		
C-CES 2020-0300S	2	3	16°	45	4	2,040
C-CES 2020-0600S		6		45		
C-CES 2025-0375S	2.5	3.75	16°	45	4	2,040
C-CES 2030-0450S	3	4.5	16°	45	6	2,640
C-CES 2030-0900S		9		45		
C-CES 2040-0600S	4	6	16°	50	6	2,880
C-CES 2040-1200S		12		50		
C-CES 2050-0750S	5	7.5	16°	50	6	3,120
C-CES 2050-1500S		15		50		
C-CES 2060-0900S	6	9	—	50	6	3,360
C-CES 2060-1800S		18		50		
C-CES 2080-2400S	8	24	—	80	8	6,320
C-CES 2100-3000S	10	30	—	80	10	7,580
C-CES 2120-3600S	12	36	—	90	12	11,170

UDC Series

Square

Square

Long Neck Square

Radius

Radius

Long Neck Radius

Taper Neck Radius

Ball

Ball / Long Shank Ball

Long Neck Ball

Taper Neck Ball

Taper

Taper

Spiral V Cutter

Drill

EURO Series

Technical Data

Milling Conditions for C-CES-S (2 Flutes)

WORK MATERIAL				CARBON STEELS S45C / S50C (~225HB)						ALLOY STEELS SK / SCM / SUS (225~325HB)							
Model Number	Outside Diameter (mm)	Length of Cut (mm)	L/D	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)	Slotting a _p (mm)	Side Milling a _p (mm)	a _e (mm)	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)	Slotting a _p (mm)	Side Milling a _p (mm)	a _e (mm)		
2002	0.2	0.3	1.5	27,000	15~35	60	0.02	0.3	0.02	27,000	15~35	60	0.02	0.3	0.02		
		0.6	3	27,000		60	0.01	0.5	0.01	27,000		60	0.01	0.5	0.01		
2003	0.3	0.45	1.5	27,000		77	0.03	0.45	0.03	27,000		77	0.03	0.45	0.03		
		0.9	3	27,000		77	0.015	0.75	0.015	27,000		77	0.015	0.75	0.015		
2004	0.4	0.6	1.5	27,000		84	0.04	0.6	0.04	27,000		84	0.04	0.6	0.04		
		1.2	3	27,000		84	0.02	1	0.02	27,000		84	0.02	1	0.02		
2005	0.5	0.75	1.5	27,000		84	0.05	0.75	0.05	26,100		84	0.05	0.75	0.05		
		1.5	3	27,000		84	0.025	1.25	0.025	26,100		84	0.025	1.25	0.025		
2006	0.6	0.9	1.5	27,000		84	0.06	0.9	0.06	21,600		84	0.06	0.9	0.06		
2007	0.7	1.05	1.5	24,750		84	0.07	1.05	0.07	18,900		84	0.07	1.05	0.07		
2008	0.8	1.2	1.5	21,600		84	0.08	1.2	0.08	17,100		84	0.08	1.2	0.08		
		2.4	3	21,600		84	0.04	2	0.04	17,100		84	0.04	2	0.04		
2009	0.9	1.35	1.5	19,350	88	0.09	1.35	0.09	14,850	84	0.09	1.35	0.09				
2010	1	1.5	1.5	18,000	40~60	88	0.25	1.5	0.1	13,500	40~45	84	0.25	1.5	0.1		
		3	3	18,000		88	0.125	2.5	0.05	13,500		84	0.125	2.5	0.05		
2012	1.2	1.8	1.5	15,030		91	0.3	1.8	0.12	11,250		84	0.3	1.8	0.12		
		3.6	3	15,030		91	0.15	3	0.06	11,250		84	0.15	3	0.06		
2015	1.5	2.25	1.5	12,150		91	0.375	2.25	0.15	9,000		84	0.375	2.25	0.15		
		4.5	3	12,150		91	0.1875	3.75	0.075	9,000		84	0.1875	3.75	0.075		
2018	1.8	2.7	1.5	10,350		91	0.45	2.7	0.18	7,920		84	0.45	2.7	0.18		
		5.4	3	10,350		91	0.225	4.5	0.09	7,920		84	0.225	4.5	0.09		
2020	2	3	1.5	9,900		60~75	91	0.5	3	0.2		7,650	50~60	84	0.5	3	0.2
		6	3	9,900			91	0.25	5	0.1		7,650		84	0.25	5	0.1
2025	2.5	3.75	1.5	7,920			137	0.625	3.75	0.25		6,300		95	0.625	3.75	0.25
2030	3	4.5	1.5	6,660			137	1.5	4.5	0.3		5,760		102	1.5	4.5	0.3
		9	3	6,660	137		0.9	7.5	0.15	5,760	102	0.9		7.5	0.15		
2040	4	6	1.5	5,310	161		2	6	0.4	4,500	133	2		6	0.4		
		12	3	5,310	161		1.2	10	0.2	4,500	133	1.2		10	0.2		
2050	5	7.5	1.5	4,770	217		2.5	7.5	0.5	3,780	161	2.5		7.5	0.5		
		15	3	4,770	217		1.5	12.5	0.25	3,780	161	1.5		12.5	0.25		
2060	6	9	1.5	3,960	214		3	9	0.6	3,150	161	3		9	0.6		
		18	3	3,960	214		1.8	15	0.3	3,150	161	1.8		15	0.3		
2080	8	24	3	2,970	203		2.4	20	0.4	2,340	161	2.4		20	0.4		
2100	10	30	3	2,340	193	3	25	0.5	1,890	158	3	25	0.5				
2120	12	36	3	1,980	193	3.6	30	0.6	1,575	158	3.6	30	0.6				

- UDC Series
- Square
- Long Neck Square
- Radius
- Long Neck Radius
- Taper Neck Radius
- Ball / Long Shank Ball
- Long Neck Ball
- Taper Neck Ball
- Taper
- Spiral V Cutter
- Drill
- EURO Series
- Technical Data

Milling Conditions for C-CES-S (2 Flutes)

WORK MATERIAL				PREHARDENED STEELS HARDENED STEELS NAK / SKD (30~45HRC)						HARDENED STEELS SKD11 / 61 / SKT (45~55HRC)					
Model Number	Outside Diameter (mm)	Length of Cut (mm)	L/D	Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)	Slotting			Spindle Speed (min ⁻¹)	Velocity (m/min)	Feed Rate (mm/min)	Side Milling		
							a _p (mm)	a _p (mm)	a _e (mm)				a _p (mm)	a _p (mm)	a _e (mm)
2002	0.2	0.3	1.5	24,000	15~25	21	0.02	0.3	0.02	24,000	15	18	0.004	0.2	0.01
		0.6	3	24,000		21	0.01	0.5	0.01	24,000		18	0.002	0.4	0.004
2003	0.3	0.45	1.5	24,000		39	0.03	0.45	0.03	17,600		18	0.006	0.3	0.015
		0.9	3	24,000		39	0.015	0.75	0.015	17,600		18	0.003	0.6	0.006
2004	0.4	0.6	1.5	21,600		42	0.04	0.6	0.04	13,600		18	0.008	0.4	0.02
		1.2	3	21,600		42	0.02	1	0.02	13,600		18	0.004	0.8	0.008
2005	0.5	0.75	1.5	17,200		42	0.05	0.75	0.05	10,400		18	0.01	0.5	0.025
		1.5	3	17,200		42	0.025	1.25	0.025	10,400		18	0.005	1	0.01
2006	0.6	0.9	1.5	14,400		42	0.06	0.9	0.06	8,800		18	0.012	0.6	0.03
2007	0.7	1.05	1.5	12,400		42	0.07	1.05	0.07	8,000		18	0.014	0.7	0.035
2008	0.8	1.2	1.5	11,040		42	0.08	1.2	0.08	7,040		21	0.016	0.8	0.04
		2.4	3	11,040		42	0.04	2	0.04	7,040		21	0.008	1.6	0.016
2009	0.9	1.35	1.5	9,600	46	0.09	1.35	0.09	6,240	21	0.018	0.9	0.045		
2010	1	1.5	1.5	8,800	46	0.25	1.5	0.1	5,680	21	0.05	1	0.05		
		3	3	8,800	46	0.125	2.5	0.05	5,680	21	0.02	2	0.02		
2012	1.2	1.8	1.5	7,520	46	0.3	1.8	0.12	4,800	21	0.06	1.2	0.06		
		3.6	3	7,520	46	0.15	3	0.06	4,800	21	0.024	2.4	0.024		
2015	1.5	2.25	1.5	6,400	49	0.375	2.25	0.15	4,080	25	0.075	1.5	0.075		
		4.5	3	6,400	49	0.1875	3.75	0.075	4,080	25	0.03	3	0.03		
2018	1.8	2.7	1.5	5,600	49	0.45	2.7	0.18	3,520	25	0.09	1.8	0.09		
		5.4	3	5,600	49	0.225	4.5	0.09	3,520	25	0.036	3.6	0.036		
2020	2	3	1.5	5,120	49	0.5	3	0.2	3,200	28	0.1	2	0.1		
		6	3	5,120	49	0.25	5	0.1	3,200	28	0.04	4	0.04		
2025	2.5	3.75	1.5	4,000	49	0.625	3.75	0.25	2,560	28	0.125	2.5	0.125		
2030	3	4.5	1.5	3,600	56	1.5	4.5	0.3	2,240	32	0.15	3	0.15		
		9	3	3,600	56	0.9	7.5	0.15	2,240	32	0.06	6	0.06		
2040	4	6	1.5	2,800	63	2	6	0.4	1,720	35	0.2	4	0.2		
		12	3	2,800	63	1.2	10	0.2	1,720	35	0.08	8	0.08		
2050	5	7.5	1.5	2,360	63	2.5	7.5	0.5	1,480	39	0.25	5	0.25		
		15	3	2,360	63	1.5	12.5	0.25	1,480	39	0.1	10	0.1		
2060	6	9	1.5	1,960	70	3	9	0.6	1,200	39	0.3	6	0.3		
		18	3	1,960	70	1.8	15	0.3	1,200	39	0.12	12	0.12		
2080	8	24	3	1,480	67	2.4	20	0.4	960	35	0.16	16	0.16		
2100	10	30	3	1,160	67	3	25	0.5	760	35	0.2	20	0.2		
2120	12	36	3	960	63	3.6	30	0.6	640	32	0.24	24	0.24		

UDC Series

Square

Long Neck Square

Radius

Long Neck Radius

Taper Neck Radius

Ball / Long Shank Ball

Long Neck Ball

Taper Neck Ball

Taper

Spiral V Cutter

Drill

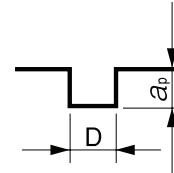
EURO Series

Technical Data

Milling Conditions for C-CES-S (2 Flutes)

Milling amount for slotting (mm)
 $D < \phi 1$

Work Material	Length of Cut	
	2D or below	3D or below
45HRC or below	$a_p=0.1D$	$a_p=0.05D$
45HRC or above	$a_p=0.02D$	$a_p=0.01D$



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

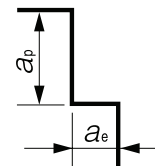
Work Material	Length of Cut	
	2D or below	3D or below
45HRC or below	$a_p=0.25D$	$a_p=0.125D$
45HRC or above	$a_p=0.05D$	$a_p=0.02D$

$\phi 3 \leq D$

Work Material	Length of Cut	
	2D or below	3D or below
45HRC or below	$a_p=0.5D$	$a_p=0.3D$
45HRC or above	$a_p=0.05D$	$a_p=0.02D$

Milling amount for side milling (mm)

Work Material	Length of Cut	
	2D or below	3D or below
45HRC or below	$a_e=0.1D$ $a_p=1.5D$	$a_e=0.05D$ $a_p=2.5D$
45HRC or above	$a_e=0.05D$ $a_p=1D$	$a_e=0.02D$ $a_p=2D$



D : Outside Diameter (mm)

Ex.) 2D or below : Flute Length = Diameter × 2 or below

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.