

Good Products are Produced by Precise Carbide End Mills

CUTTING TOOLS 2015 VOL.4 CATALOG

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Chamfering

ドリル
Drill



		ラジウス Corner Radius End Mill			ボール Ball Nose End Mill				
用途 Work		高硬度鋼			グラファイト	一般鋼			
刃数 Flute		3	4	4	2	2	3	2	3
形状 Shape									
型番 Mode		CX500-HFR3	CX500-HFR4	CX200-SEM	DIA-BE2	BE2	BE3	CX200-BE2	CX200-BE3
表面処理 Coating		CX500 Coat	CX500 Coat	CX200 Coat	DIA Coat			CX200 Coat	CX200 Coat
炭素鋼 Carbon Steel		◎	◎	◎		◎	◎	◎	◎
合金鋼 Alloy Steel		◎	◎	◎		◎	◎	◎	◎
調質鋼 SUJ, NAK		◎	◎	◎		○	○	◎	◎
焼入れ鋼 Hardened Steels	~45HRC	◎	◎	◎		○	○	◎	◎
	~55HRC	◎	◎	○				○	○
	~60HRC	◎	◎						
	~65HRC	○	○	○					
鋳鉄 Cast Iron		◎	◎	◎		○	○	○	○
ステンレス Stainless Steels		○	○	○		○	○	○	○
アルミ合金 Aluminum Alloys					○	○	○	○	○
銅合金 Copper Alloys					○	○	○	○	○
チタン合金 耐熱合金 Ti/Ni Alloys									
グラファイト Graphite					◎				
樹脂 Resin					○				
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		ボール Ball Nose End Mill		ロングネック Long Neck End Mill				ラフィング Roughing End Mill		
用途 Work		高硬度鋼		一般鋼		高硬度鋼		一般鋼		ステンレス
刃数 Flute		2	3	4	3	2	2	3 4	3 4	3
形状 Shape										
型番 Mode		CX500-HBE2	CX500-HBE3	CX500-QEMSN	CX500-HMSN	CX500-HBSN	CX500-HBPN	CX200-RER	CX200-HRER	CX200-SURE
表面処理 Coating		CX500 Coat	CX500 Coat	CX500 Coat	CX500 Coat	CX500 Coat	CX500 Coat	CX200 Coat	CX200 Coat	CX200 Coat
炭素鋼 Carbon Steel		○	○	◎	◎	○	○	◎	◎	◎
合金鋼 Alloy Steel		○	○	◎	◎	○	○	◎	◎	◎
調質鋼 SUJ, NAK		○	○	◎	◎	○	○	◎	◎	◎
焼入れ鋼 Hardened Steels	~45HRC	◎	◎	◎	◎	○	○	◎	◎	○
	~55HRC	◎	◎		○	◎	◎	○	○	
	~60HRC	◎	◎			◎	◎			
	~65HRC	◎	◎			○	◎			
鋳鉄 Cast Iron		◎	◎	○	○	◎	◎	○	○	
ステンレス Stainless Steels		○	○	○	◎	○	○	○	○	◎
アルミ合金 Aluminum Alloys								○	○	○
銅合金 Copper Alloys								○	○	○
チタン合金 耐熱合金 Ti/Ni Alloys										
グラファイト Graphite										
樹脂 Resin										
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ドリル

Drill

		面取り加工 Chamfering	ドリル Drill						
用途 Work		ステンレス	一般鋼						
刃数 Flute		2	2	2	3	3	2	2	2
形状 Shape									
型番 Mode		CX200-SUCH	TA-DRS	TA-DRR	TA-3DS	TA-3DR	CX500-MD	TA-HSD	TA-WMD
表面処理 Coating		CX200 Coat	TiAlN Coat	TiAlN Coat	TiAlN Coat	TiAlN Coat	CX500 Coat	TiAlN Coat	TiAlN Coat
炭素鋼 Carbon Steel		◎	◎	◎	◎	◎	◎	◎	◎
合金鋼 Alloy Steel		◎	◎	◎	◎	◎	◎	◎	◎
調質鋼 SUJ, NAK		◎	◎	◎	◎	◎	◎	◎	◎
焼入れ鋼 Hardened Steels	~45HRC	◎	◎	◎	◎	◎	◎	◎	◎
	~55HRC	○	○	○	○	○	◎	○	○
	~60HRC						○		
	~65HRC								
鋳鉄 Cast Iron			○	○	○	○	○	○	○
ステンレス Stainless Steels		◎	◎	◎	○	○	◎	○	○
アルミ合金 Aluminum Alloys		○							
銅合金 Copper Alloys		○							
チタン合金 耐熱合金 Ti/Ni Alloys			○	○			◎		
グラファイト Graphite									
樹脂 Resin									
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コート特性 Coating Characteristic

コート Coating type	TiAlN Coat	CX200 Coat	CX400 Coat	CX500 Coat	DLC Coat	DIA Coat
表面硬度 (HV) Hardness(HV)	2,800HV	3,300HV	3,500HV	3,400HV	5,000HV	9,000HV
膜厚 (μm) Thickness(μm)	1~4	0.5~3	0.5~3	0.5~3	1.0~2.0	8
酸化開始温度 (°C) Oxidation Temp (°C)	800°C	1,100°C	1,100°C	1,300°C	550°C	600°C
摩擦係数 Friction Coefficient	0.35~0.40	0.30~0.35	0.30~0.35	0.25~0.35	≤0.10	0.15
色調 Color	暗紫色 Dark Violet	快灰色 Light grey	暗灰色 Dark grey	明銅色 Light brown	黒色 Black	黒色 Black
特性 Characteristic	一般 高耐熱性 耐摩耗性 Standard High heat resistance Wear resistance	一般 高耐熱性 耐摩耗性 Standard High heat resistance Wear resistance	高硬度 高耐熱性 高速切削向け High hardness High heat resistance High speed grade	高硬度 高耐熱性 高速切削向け High hardness High heat resistance High speed grade	非鉄金属 耐溶性 耐腐食性 Non-Ferrous Welding resistance corrosion resistance	高硬度 非鉄金属 耐溶性 耐腐食性 High hardness Non-Ferrous Welding resistance corrosion resistance
被削材 Work Materials	普通鋼 調質鋼 40-52HRC Steel Prehardened Steel	普通鋼 調質鋼 -45HRC Steel Prehardened Steel	調質鋼 高硬度鋼 40-65HRC Prehardened Steel Hardened Steel	調質鋼 高硬度鋼 40-65HRC Prehardened Steel Hardened Steel	アルミ合金 40-65HRC Non-Ferrous Aluminum	グラファイト 樹脂 アルミ合金 Graphite Non-Ferrous Aluminum
乾式 Dry cutting	◎	◎	◎	◎	◎	◎
湿式 Wet cutting	△	◎	◎	○	○	

※ ◎Best ○Good △Quite good ×No good

※ Regraining to the application implied datum, it shows a generally selected datum and could be changeable according to the applicable conditions.



安全使用注意事項

Attention on Safety

- 工具をケースから取り出す際は、工具の飛び出しや刃先が素手に直接触れないように十分注意して下さい。
When removing tool from case, be careful of getting-out of tools and don't touch directly the cutting edges.
- 切れ刃を直接素手で触れないようにしてください。
Never touch the cutting edges directly with bare hand.
- 工具を使用する際は破損する危険がありますので、必ずカバー・保護メガネ等を使用してください。
Use safety covers and eye protection, as tools may be broken.
- ホルダ等は、工具や加工内容に見合った物を使用してください。
工具はホルダにしっかりと固定し、振れを抑えるようにして下さい。
Use holders, etc. that match the tools and nature of the processing operations.
The tool should be firmly attached to the holder to prevent shaking.
- 被削材はしっかりと固定して下さい。
The work materials clamp firmly.
- 工具及び被削材の寸法はあらかじめ確認しておいて下さい。
Make sure of dimensions of tools work pieces before starting operation.
- 切削条件は加工物や使用機械に合わせて、調節する必要があります。
It is necessary to adjust conditions according to the dimensions of work materials and the machine.
- 用途に応じて切削油を選定して下さい。
不水溶性切削油を使用する場合は加工時に発生する火花や破損で引火、火災の危険があります。
防火対策を必ず行って下さい。
Select a cutting fluid appropriate to the particular usage.
Using a non-water cutting fluid could lead to fires due to sparks generated during processing or heat caused by breakage.
Ensure that you take proper fire-prevention measures.
- 使用中に異常（切削音・煙）が発生した場合は、ただちに機械を止めてください。
If abnormal sound, etc. occurs during processing, stop the machine immediately.
- 工具の改造はしないで下さい。
Don't modify tools.

アイコンガイド

Guide Lines to Icons

表面処理 Coating

TiAlN TiAlN コート
Coat TiAlN Coating

CX200 CX200 コート
Coat CX200 Coating

CX400 CX400 コート
Coat CX400 Coating

CX500 CX500 コート
Coat CX500 Coating

DLC DLC コート
Coat DLC Coating

DIA DIA コート
Coat DIA Coating

先端形状 Shape

ピンカド
Sharp Edge
Sharp Edge

アタリ付
Corner Protect
Corner Protect

ラジラス
Radius
Corner Radius

ボール
Ball
Ball Nose

先端角 140°
Point Angle
Point Angle 140°

先端角 145°
Point Angle
Point Angle 145°

工具材料 Tool Material

MG 超微粒子超硬合金
超微粒 Micro Grain Carbide

SMG 超々微粒子超硬合金
超々微粒 Super Micro Grain Carbide

刃数 Number of Flutes

2枚刃
2Flutes

3枚刃
3Flutes

4枚刃
4Flutes

6枚刃
6Flutes

8枚刃
8Flutes

ねじれ角 Helix Angle

20° 20°
Helix Angle 20°

30° 30°
Helix Angle 30°

40° 40°
Helix Angle 40°

45° 45°
Helix Angle 45°

50° 50°
Helix Angle 50°

53° 53°
Helix Angle 53°

CX500 3 枚刃高硬度用ラジアスエンドミル

CX500 Series 3-Flute Radius End Mill for Hard Material

CX500-HFR3



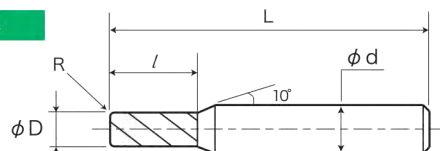
CX500-HFR3100

Model Flute D

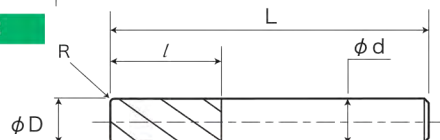
特性 Features

- CX500-Coating is new epoch-making coating developed for super-long tool life, High-speed processing and dry cutting due to the high acid resistance and hardening if compared with other conventional and popular coating which is existing in the market.
- Combination of negative radius blade and 45 degree helix blades enables high rigidity and sharpness by high feed speed, with high efficiency
- 3Flute eliminates chattering and suitable for drilling processing
- Universal applications for engraving, side milling, radius milling, rough milling and semi-finishing.

Type 1



Type 2

MG
超微粒

45°



Radius

CX500
Coat

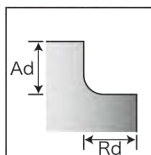
外径公差 Tolerance
0
-0.02

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	◎	◎	◎	◎	○					

◎ = Best ○ = Good

MODEL 型番	D 外径	R	l 刃長	L 全長	d シャンク径	Type
CX500-HFR3020	2	0.5	4	50	4	1
CX500-HFR3030	3	0.8	6	50	4	1
CX500-HFR3040	4	1	8	50	6	1
CX500-HFR3050	5	1.2	10	70	6	1
CX500-HFR3060	6	1.5	12	70	6	2
CX500-HFR3080	8	2	16	80	8	2
CX500-HFR3100	10	2	20	90	10	2
CX500-HFR3120	12	2	24	100	12	2

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	炭素鋼 carbon steel (40~55HRC)				合金工具鋼 tool steel (SKD.SUS.SCM)				調質鋼 (35~40HRC) (HPM.NAK)				高硬度鋼 hardened steel (40~60HRC)			
	送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution	
	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed
外径 (mm) Diameter																
2xR0.5	3795	6300	11500	19100	3210	5160	10700	17200	2280	3697	9500	15400	525	1200	4800	10400
3xR0.8	4335	7238	12700	20700	3622	5865	12100	19600	2685	4327	10300	16300	600	1350	5200	11900
4xR1.0	4620	7695	13700	22200	3817	6195	13000	20900	2737	4387	10700	17000	675	1425	5500	12600
5xR1.2	4552	7523	13200	21400	3870	6210	12700	20300	2737	4462	10500	16700	675	1425	5200	11900
6xR1.2	4785	8063	13800	22400	4102	6495	13000	20700	2880	4590	11000	17500	675	1500	5500	12600
8xR2.0	4875	8063	13800	22400	4132	6577	12700	20300	2880	4680	10700	17000	675	1500	5200	11900
10xR2.0	4830	7980	13300	21600	4035	6525	12100	19600	2850	4650	10300	16300	750	1500	5000	11400
12xR2.0	4560	7680	13000	21000	3945	6352	11800	19200	2737	4447	10000	16000	675	1425	5000	11400
16xR3.0	3780	6480	11000	18000	3195	5167	10700	17200	2302	3645	9500	15400	525	1200	4800	10400
20xR3.0	3000	5190	11000	18000	2737	4230	11000	17000	1950	2925	10000	15000	450	900	5000	11400
Ad	Standard						≤0.08D						≤0.04D			
	High Speed						≤0.06D						≤0.02D			
Rd							≤0.2D									

CX500 4 枚刃高硬度用ラジラスエンドミル

CX500 Series 3-Flute Radius End Mill for Hard Material

CX500-HFR4

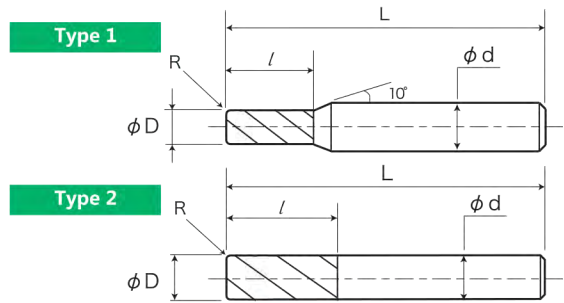


CX500-HFR4100

Model Flute D

特性 Features

- CX500-Coating is new epoch-making coating developed for super-long tool life, High-speed processing and dry cutting due to the high acid resistance and hardening if compared with other conventional and popular coating which is existing in the market.
- Combination of negative radius blade and 45 degree helix blades enables high rigidity and sharpness by high feed speed, with high efficiency
- 3Flute eliminates chattering and suitable for drilling processing
- Universal applications for engraving, side milling, radius milling, rough milling and semi-finishing.

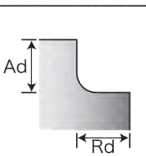


炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminum Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	◎	◎	◎	◎	○					

◎ = Best ○ = Good

MODEL 型番	D 外径	R	l 刃長	L 全長	d シャンク径	Type
CX500-HFR4020	2	0.5	4	50	4	1
CX500-HFR4020-6	2	0.5	4	50	6	1
CX500-HFR4030	3	0.8	6	50	4	1
CX500-HFR4030-6	3	0.8	6	50	6	1
CX500-HFR4040	4	1	8	50	6	1
CX500-HFR4050	5	1.2	10	70	6	1
CX500-HFR4060	6	1.5	12	70	6	2
CX500-HFR4080	8	2	16	80	8	2
CX500-HFR4100	10	2	20	90	10	2
CX500-HFR4120	12	2	24	100	12	2
CX500-HFR4160	16	3	32	120	16	2
CX500-HFR4200	20	3	40	130	20	2

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the Rotation could not be increased by the machine used, Please reduce feed speed and Rotation speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material		炭素鋼 carbon steel (40~55HRC)				合金工具鋼 tool steel (SKD,SUS,SCM)				調質鋼 (35~40HRC) (HPM,NAK)				高硬度鋼 hardened steel (40~60HRC)			
外径 (mm) Diameter	送り速度 (mm/min) Feed rate		回転数 (mm/1) Rotation		送り速度 (mm/min) Feed rate		回転数 (mm/1) Rotation		送り速度 (mm/min) Feed rate		回転数 (mm/1) Rotation		送り速度 (mm/min) Feed rate		回転数 (mm/1) Rotation		
	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	
2xR0.5	5060	8400	11500	19100	4280	6880	10700	17200	3040	4930	9500	15400	700	1600	4800	10400	
3xR0.8	5780	9650	7600	12700	4830	7820	7100	11500	3580	5770	6400	10300	800	1800	3200	6900	
4xR1.0	6160	10260	5700	9500	5090	8260	5300	8600	3650	5850	4800	7700	900	1900	2400	5200	
5xR1.2	6070	10030	4600	7600	5160	8260	4300	6900	3650	5950	3800	6200	900	1900	1900	4100	
6xR1.2	6380	10750	3800	6400	5470	8660	3600	5700	3840	6120	3200	5100	900	2000	1600	3500	
8xR2.0	6500	10750	2900	4800	5510	8770	2700	4300	3840	6240	2400	3900	900	2000	1200	2600	
10xR2.0	6440	10640	2300	3800	5380	8700	2100	3400	3800	6200	1900	3100	1000	2000	1000	2100	
12xR2.0	6080	10240	1900	3200	5260	8470	1800	2900	3650	5930	1600	2600	900	1900	800	1700	
16xR3.0	5040	8640	1400	2400	4260	6890	1300	2100	3070	4860	1200	1900	700	1600	600	1300	
20xR3.0	4000	6920	1100	1900	3650	5640	1100	1700	2600	3900	1000	1500	600	1200	500	1000	
Ad	Standard	≤0.08D												≤0.04D			
	High Speed	≤0.06D												≤0.02D			
Rd	≤0.2D																

ラジラス Radius

スクエア Square

ラジラス Radius

ボール Ball

ロングネック Long Neck

ラフィング Roughing

面取り加工用 Chamfering

ドリル Drill

CX200 4枚刃側面刃無しラジラスエンドミル

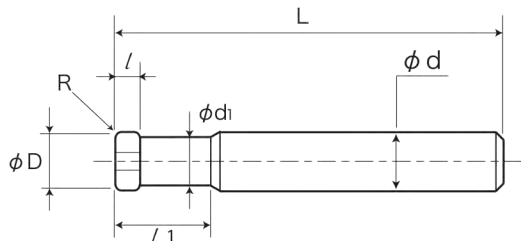
CX200 Series 4-Flute No peripheral cutting edge Radius End Mill for high feed

CX200-SEM



CX200-SEM4100

Model Flute D



特性 Features

- CX200-Coating have high oxidation resistance and hardening which exceeds the existing coating and provides long tool life, and suitable for high speed processing and dry milling.
- Negative designed radius flutes and short blade length realize high rigidity and minimize chattering in the pocket corner processing
- Back taper provide fine processing which peripheral blade does not touch with side of work piece
- shorten the processing time from medium finishing to final finishing in the bottom processing



外径公差 Tolerance
0
-0.02

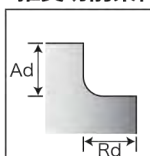


炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	○	◎	◎	◎	○					

◎ = Best ○ = Good

MODEL 型番	D 外径	R	/ 刃長	d 1	/ 1	L 全長	d 柄径
CX200-SEM4030	3	0.75	1.2	2.7	7.5	60	6
CX200-SEM4040	4	1	1.6	3.6	10	70	6
CX200-SEM4050	5	1.2	2	4.5	12	80	6
CX200-SEM4060	6	1.5	2.5	5.4	12	90	6
CX200-SEM4080	8	2	3.5	7.2	16	100	8
CX200-SEM4100	10	2	4	9	20	100	10
CX200-SEM4120	12	2	5	11	24	110	12

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and Revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	炭素鋼 carbon steel (40～55HRC)				合金鋼 工具鋼 Alloy steel Tool steel (SKD.SUS.SCM)				調質鋼 (35～40HRC) (HPM.NAK)				高硬度鋼 hardened steel (40～60HRC)			
	送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution	
	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed
外径 (mm) Diameter																
4	6600	13000	7950	16000	6000	12000	7950	16000	4800	12000	6350	16000	1050	3350	2400	7950
5	7000	14000	6350	12500	6350	12500	6350	12500	5100	12500	5100	12500	1150	3800	1900	6350
6	7000	14000	5300	10600	6350	12700	5300	10600	5100	12700	4250	10600	1150	3800	1600	5300
8	7000	14000	4000	7950	6350	12700	4000	7950	5100	12700	3200	7950	1150	3800	1200	4000
10	7000	14000	3200	6350	6350	12700	3200	6350	5100	12700	2550	6350	1150	3800	955	3200
12	7000	14000	2650	5300	6350	12700	2650	5300	5100	12700	2100	5300	1150	3800	795	2650
Ad	≤0.04D				≤0.025D				≤0.02D				≤0.01D			
Rd	≤0.4D															

グラファイト用2枚刃ボールエンドミル DIAコート

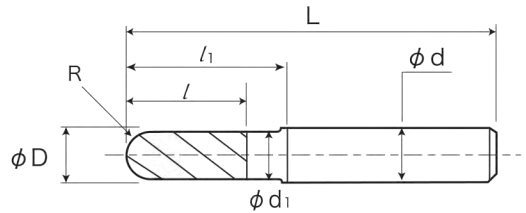
2-Flute Ball Nose End Mill for Graphite / DIA coat

DIA-BE2



DIA-BE2040

Model Flute R



特性 Features

- Diamond coating have surface hardness comparable natural diamond and achieves a miraculous durability in processing of graphite/resin aluminum and copper etc.
- long type provides deep die-shink processing



外径公差 Tolerance
0
-0.02

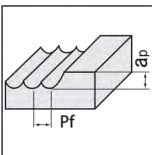
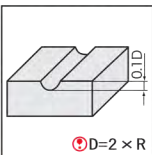


炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
			~45HRC	~55HRC	~60HRC	~65HRC				○	○	◎	○

◎ = Best ○ = Good

MODEL 型番	D 外径	R	/ 刃長	d 1	/ 1	L 全長	d 柄径
DIA-BE2010	2	1	10	1.9	20	100	4
DIA-BE2015	3	1.5	15	2.9	25	100	4
DIA-BE2020	4	2	20	3.9	30	100	4
DIA-BE2030	6	3	30	5.8	40	120	6
DIA-BE2040	8	4	40	7.8	50	150	8
DIA-BE2050	10	5	50	9.7	60	180	10
DIA-BE2060	12	6	55	11.7	65	200	12

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the Revolution could not be increased by the machine used, Please reduce feed speed and Revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	グラファイト Graphite	
	送り速度 (mm/min) Feed rate	回転数 (min ⁻¹) Revolution
R 値 (mm)		
1	250	8000
1.5	380	8000
2	510	8000
3	765	8000
4	1000	8000
5	1250	8000
6	1500	8000
Ad	≤0.1D	
Pf	≤0.03D	

ボール
Ball

スクエア
Square

ラジアス
Radius

ボール
Ball

ロングネック
Long Neck

ラフニング
Roughing

面取り加工用
Chamfering

ドリル
Drill

2枚刃ボールエンドミル

2-Flute Ball Nose End Mill

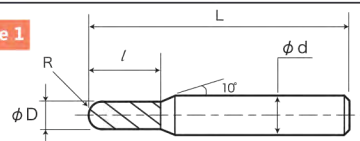
BE2



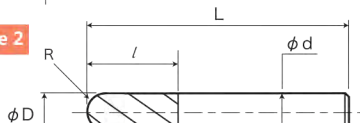
BE2060S

Model Flute R

Type 1



Type 2



特性 Features

- A highly rigid long necked, short tooth endmill.
- The optimum tool for alloy steel, S45C/SCM440
- Recommend oil or water soluble coolant for copper milling.



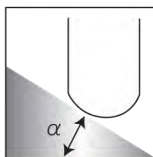
R 値 Radius	R 精度 Accuracy
0.5~2	+0.005 -0.005
3~6	+0.003 -0.003
8~10	+0.007 -0.010

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
~45HRC	~55HRC	~60HRC	~65HRC										
◎	◎	○	○				○	○	○	○			

◎ = Best ○ = Good

MODEL 型番	R	l 刃長	L 全長	d 柄径	Type
BE2005S	0.5	2.5	50	4	1
BE20075S	0.75	4	50	4	1
BE2010S	1	4	50	4	1
BE2015S	1.5	6	60	4	1
BE2020S	2	8	60	4	2
BE2025S	2.5	10	80	6	2
BE2030S	3	12	80	6	2
BE2040S	4	14	90	8	2
BE2050S	5	18	100	10	2
BE2060S	6	22	100	12	1
BE2080S	8	30	100	16	1
BE2100S	10	38	105	20	1

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and Revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	炭素鋼・合金鋼 Carbon steel・Alloy steel (~30HRC) S55C, SCM AISI 1055		合金鋼・工具鋼 Alloy steel・Tool steel プレハードン鋼 Pre-hardend steel (30~45HRC) SKD61, NAK AISI H13		炭素鋼・合金鋼 Carbon steel・Alloy steel (~30HRC) S55C, SCM AISI 1055		合金鋼・調質鋼・プレハードン鋼 Alloy steel・Tool steel・Pre-hardend steel (30~45HRC) SKD61, NAK AISI H13, AISI D2	
	a ≤ 15°		a > 15°		a ≤ 15°		a > 15°	
	R 値 (mm) Radius	回転数 (mm/min) Revolution Feed rate	送り速度 (mm/min) Feed rate	送り速度 (mm/min) Feed rate	回転数 (mm/min) Revolution Feed rate	送り速度 (mm/min) Feed rate	回転数 (mm/min) Revolution Feed rate	送り速度 (mm/min) Feed rate
R 0.5	-	-	-	-	14000	180	10000	120
R 1	4100	70	2800	40	10500	350	7300	210
R 2	2600	120	1650	85	7200	500	5100	300
R 3	1900	150	1200	95	5200	560	3600	350
R 4	1400	160	900	105	4000	640	2700	380
R 5	1100	140	710	95	3200	700	2200	380
R 6	940	130	600	85	2600	640	1750	350
R 8	700	100	450	60	1900	620	1300	330
R 10	560	80	360	50	1500	590	1000	310

粗加工 (取代 ≤ 0.8R) Roughing (Large depth of cut ≤ 0.05R)

精加工 (取代 ≤ 0.05R) Finishing (Large depth of cut ≤ 0.05R)

3 枚刃ボールエンドミル

3-Flute Ball Nose End Mill

BE3



BE3060S

Model Flute R

特性 Features

- A highly rigid long necked, short tooth endmill.
- The optimum tool for alloy steel, S45C/SCM440
- Recommend oil or water soluble coolant for copper milling.



MG
超微粒



R 精度 Accuracy	
+0.010	
-0.010	



30°

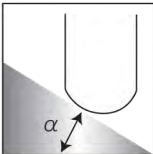


炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
~45HRC	~55HRC	~60HRC	~65HRC										
◎	◎	○	○				○	○	○	○			

◎ = Best ○ = Good

MODEL 型番	R	l 刃長	L 全長	d 柄径	Type
BE3005S	0.5	2.5	50	4	1
BE30075S	0.75	4	50	4	1
BE3010S	1	4	50	4	1
BE3015S	1.5	6	60	4	1
BE3020S	2	8	60	4	2
BE3025S	2.5	10	80	6	2
BE3030S	3	12	80	6	2
BE3040S	4	14	90	8	2
BE3050S	5	18	100	10	2
BE3060S	6	22	100	12	1
BE3080S	8	30	100	16	1
BE3100S	10	38	105	20	1

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the Revolution could not be increased by the machine used, Please reduce feed speed and Revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	炭素鋼・合金鋼 Carbon steel, Alloy steel (~30HRC) S55C, SCM AISI 1055		合金鋼・工具鋼 Alloy steel, Tool steel プレハードン鋼 Pre-hardend steel (30~45HRC) SKD61, NAK AISI H13		炭素鋼・合金鋼 Carbon steel, Alloy steel (~30HRC) S55C, SCM AISI 1055				合金鋼・調質鋼・プレハードン鋼 Alloy steel, Tool steel, Pre-hardend steel (30~45HRC) SKD61, NAK AISI H13, AISI D2				
					a≤15°		a>15°		a≤15°		a>15°		
	R 値 (mm) Radius	回転数 (mm ²) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ²) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ²) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ²) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ²) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ²) Revolution	送り速度 (mm/min) Feed rate
R 1	4100	90	2800	55	10500	455	7300	270	8400	290	5500		
R 2	2600	160	1650	110	7200	650	5100	390	5900	470	4300		
R 3	1900	200	1200	125	5200	730	3600	460	4200	530	2900		
R 4	1400	210	900	135	4000	830	2700	500	3100	570	2200		
R 5	1100	180	710	125	3200	910	2200	500	2500	600	1750		
R 6	940	230	600	110	2600	830	1750	450	2100	560	1450		
R 8	700	130	450	80	1900	810	1300	430	1550	560	1100		
R 10	560	100	360	65	1500	770	1000	400	1250	530	860		
粗加工 (取代 ≤0.8 R)		Roughing (Large depth of cut ≤ 0.05R)				精加工 (取代 ≤0.05 R) Finishing (Large depth of cut ≤ 0.05R)							

粗加工 (取代 ≤ 0.8R) Roughing (Large depth of cut ≤ 0.05R)

精加工 (取代 ≤ 0.05R) Finishing (Large depth of cut ≤ 0.05R)

ボール
Ball

スクエア
Square

ラジアス
Radius

ボール
Ball

ロングネック
Long Neck

ラフィング
Roughing

面取り加工用
Chamfering

ドリル
Drill

CX200 2枚刃ボールエンドミル

CX200 Series 2-Flute Ball Nose End Mill

CX200-BE2



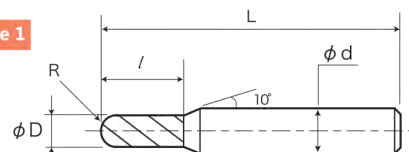
CX200-BE2060S

Model Flute R

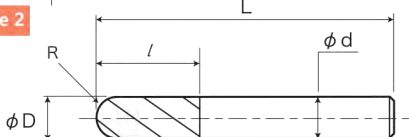
特性 Features

- A highly rigid long necked, short tooth endmill.
- The optimum tool for alloy steel, S45C/SCM440, NAK to HRC45
- Recommend oil or water soluble coolant for copper milling.
- Employs TiAlN Coating and is applicable for high speed and high feed operations

Type 1



Type 2



MG
超微粒



30°

R
Ball

CX200
Coat

R 値 Radius	R 精度 Accuracy
0.5~2	+0.005 -0.005
3~6	+0.003 -0.007
8~10	+0.010 -0.010

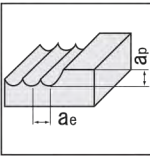
炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	○			○	○	○	○			

◎ = Best ○ = Good

MODEL 型番	R	l 刃長	L 全長	d 柄径	Type
CX200-BE2005S	0.5	2.5	50	4	1
CX200-BE20075S	0.75	4	50	4	1
CX200-BE2010S	1	4	50	4	1
CX200-BE2015S	1.5	6	60	4	1
CX200-BE2020S	2	8	60	4	1
CX200-BE2025S	2.5	10	80	6	1
CX200-BE2030S	3	12	80	6	2
CX200-BE2040S	4	14	90	8	2
CX200-BE2050S	5	18	100	10	2
CX200-BE2060S	6	22	100	12	2
CX200-BE2080S	8	30	100	16	2
CX200-BE2100S	10	38	105	20	2

CX200-BE2

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	合金鋼, 工具鋼 Alloy steel, Tool steel SCM, SKD, ARK1 (25~35HRC)		プレハードン鋼, 焼き入れ鋼 Pre-Harden Steel, Hardened Steel CEN A1, NAK80, SKD (35~45HRC)		鋳鉄, 炭素鋼, 合金鋼, 工具鋼 Cast Iron, Carbon Steel, Alloy Steel, Tool Steel FC250, SS400, S50C, SCM440, SNCM, SKD (~35HRC)			
	High Speed		Standard		High Speed		Standard	
R 値 (mm) Radius	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate
R 0.5	47700	3820	47700	2390	50000	4000	50000	4000
R 1	23900	2870	23900	1910	47700	5720	31800	3800
R 2	11900	2390	11900	1670	23900	4780	15900	3200
R 3	7960	2230	7960	1430	15900	4450	10600	2970
R 4	5970	1910	5970	1310	11900	3810	7960	2550
R 5	4770	1720	4770	1240	9550	3440	6370	2290
R 6	3980	1590	3980	1190	7960	3180	5310	2120
R 8	2980	1340	2980	1010	5970	2690	3980	1790
R 10	2390	1070	2390	810	4770	2150	3180	1430
粗加工 (ap=0.1Dc ae=0.3Dc) Roughing (ap=0.1Dc ae=0.3Dc)					精加工 (ap=0.05Dc ap=0.05Dc) Finishing (ap=0.05Dc ap=0.05Dc)			

被削材 Work Material	プレハードン鋼 Pre-Harden Steel HPM1, NAK55 (35~45HRC)				焼き入れ鋼 Hardened Steel SKD61, SKT4 (45~55HRC)			
	High Speed		Standard		High Speed		Standard	
R 値 (mm) Radius	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate
R 0.5	47700	3820	47700	2390	50000	4000	50000	4000
R 1	23900	2870	23900	1910	47700	5720	31800	3800
R 2	11900	2390	11900	1670	23900	4780	15900	3200
R 3	7960	2230	7960	1430	15900	4450	10600	2970
R 4	5970	1910	5970	1310	11900	3810	7960	2550
R 5	4770	1720	4770	1240	9550	3440	6370	2290
R 6	3980	1590	3980	1190	7960	3180	5310	2120
R 8	2980	1340	2980	1010	5970	2690	3980	1790
R 10	2390	1070	2390	810	4770	2150	3180	1430
精加工 (ap=0.05Dc ap=0.05Dc) Finishing (ap=0.05Dc ap=0.05Dc)								

ボール
Ball

スクエア
Square

ラジアス
Radius

ボール
Ball

ロングネック
Long Neck

ラフィング
Roughing

面取り加工用
Chamfering

ドリル
Drill

CX200 3枚刃ボールエンドミル

CX200 Serie 3-Flute Ball Nose End Mill

CX200-BE3



CX200-BE3060S

Model Flute R

特性 Features

- A highly rigid long necked, short tooth endmill.
- The optimum tool for alloy steel, S45C/SCM440, NAK to HRC45
- Recommend oil or water soluble coolant for copper milling.
- Employs TiAlN Coating and is applicable for high speed and high feed operations



MG
超微粒



R 精度 Accuracy
+0.010
-0.010



炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
~45HRC	~55HRC	~60HRC	~65HRC										
◎	◎	◎	◎	○			○	○	○	○			

◎ = Best ○ = Good

MODEL 型番	R	/ 刃長	L 全長	d 柄径	Type
CX200-BE3005S	0.5	2.5	50	4	1
CX200-BE30075S	0.75	4	50	4	1
CX200-BE3010S	1	4	50	4	1
CX200-BE3015S	1.5	6	60	4	1
CX200-BE3020S	2	8	60	4	2
CX200-BE3025S	2.5	10	80	6	2
CX200-BE3030S	3	12	80	6	2
CX200-BE3040S	4	14	90	8	2
CX200-BE3050S	5	18	100	10	2
CX200-BE3060S	6	22	100	12	1
CX200-BE3080S	8	30	100	16	1
CX200-BE3100S	10	38	105	20	1

ボール
Ball

スクエア
Square

ラジウス
Radius

ボール
Ball

ロングネック
Long Neck

ラフニング
Roughing

面取り加工
Chamfering

ドリル
Drill

CX500 2枚刃高硬度ボールエンドミル

CX500 2-Flute Ball Nose End Mill for hard material

CX500-HBE2



CX500-HBE2005-6

Model Flute R d

特性 Features

- CX500-Coating is new epoch-making coating developed for super-long tool life, High-speed processing and dry cutting due to the high acid resistance and hardening if compared with other conventional and popular coating which is existing in the market.-The optimum tool for alloy steel, S45C/SCM440, NAK to HRC45
- CKK Original design Chip pocket enables similar or same cutting depth which 3-flutes could realize
- Surface finish is very accurate after reprocessing
- Suitable for hardened steel processing (up to 65 HRC)



R 値 Radius	R 精度 Accuracy
0.15~2.5	+0.005 -0.005
3~6	+0.003 -0.007



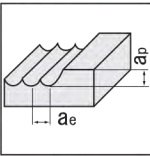
炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
			~45HRC	~55HRC	~60HRC	~65HRC							
○	○	○	◎	◎	◎	◎	◎	○					

◎ = Best ○ = Good

MODEL 型番	R	D 外径	l 刃長	L 全長	d 柄径	Type
CX500-HBE20015	0.15	0.3	0.45	50	4	1
CX500-HBE20015-6	0.15	0.3	0.45	50	6	1
CX500-HBE2002-4	0.2	0.4	0.6	50	4	1
CX500-HBE2002-6	0.2	0.4	0.6	50	6	1
CX500-HBE2003-4	0.3	0.6	0.9	50	4	1
CX500-HBE2003-6	0.3	0.6	0.9	50	6	1
CX500-HBE2004-4	0.4	0.8	1.2	50	4	1
CX500-HBE2004-6	0.4	0.8	1.2	50	6	1
CX500-HBE2005-4	0.5	1	1.5	50	4	1
CX500-HBE2005-6	0.5	1	1.5	50	6	1
CX500-HBE20075	0.75	1.5	2	50	6	1
CX500-HBE2010	1	2	3	50	6	1
CX500-HBE2015	1.5	3	4.5	60	6	1
CX500-HBE2020	2	4	6	70	6	1
CX500-HBE2025	2.5	5	7.5	80	6	1
CX500-HBE2030	3	6	9	90	6	2
CX500-HBE2040	4	8	12	100	8	2
CX500-HBE2050	5	10	15	100	10	2
CX500-HBE2060	6	12	18	110	12	2
CX500-HBE2080	8	16	24	140	16	2

CX200-BE3

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed sped and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	合金鋼, 工具鋼 Alloy steel, Tool steel SCM, SKD, ARK1 (25~35HRC)		プレハードン鋼, 焼き入れ鋼 Pre-Harden Steel, Hardened Steel CEN, A1, NAK80, SKD (35~45HRC)		鋳鉄, 炭素鋼, 合金鋼, 工具鋼 Cast Iron, Carbon Steel, Alloy Steel, Tool Steel FC250, SS400, S50C, SCM440, SNCM, SKD (~35HRC)			
	High Speed		Standard		High Speed		Standard	
R 値 (mm) Radius	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate
R 1	23900	3730	23900	2480	47700	7430	31800	4940
R 2	11900	3100	11900	2170	23900	6210	15900	4160
R 3	7960	2890	7960	1850	15900	5780	10600	3860
R 4	5970	2480	5970	1700	11900	4950	7960	3310
R 5	4770	2230	4770	1610	9550	4470	6370	2970
R 6	3980	2060	3980	1540	7960	4130	5310	2750
R 8	2980	1740	2980	1310	5970	3490	3980	2320
R 10	2390	1390	2390	1050	4770	2790	3180	1850
粗加工 (ap=0.1Dc ae=0.3Dc) Roughing (ap=0.1Dc ae=0.3Dc)					精加工 (ap=0.05Dc ap=0.05Dc) Finishing (ap=0.05Dc ap=0.05Dc)			

被削材 Work Material	プレハードン鋼 Pre-Harden Steel HPM1, NAK55 (35~45HRC)				焼き入れ鋼 Hardened Steel SKD61, SKT4 (45~55HRC)			
	High Speed		Standard		High Speed		Standard	
R 値 (mm) Radius	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate
R 1	47700	4960	31800	3300	39800	4130	23900	2480
R 2	23900	4350	15900	2890	19900	3620	11900	2170
R 3	15900	3710	10600	2480	13300	3100	7960	1850
R 4	11900	3400	7960	2270	9950	2840	5970	1700
R 5	9550	3220	6370	2150	7960	2690	4770	1610
R 6	7960	3100	5310	2060	6630	2580	3980	1540
R 8	5970	2630	3980	1750	4970	2190	2980	1310
R 10	4770	2100	3180	1400	3980	1750	2390	1050
精加工 (ap=0.05Dc ap=0.05Dc) Finishing (ap=0.05Dc ap=0.05Dc)								

ボール
Ball

スクエア
Square

ラジアス
Radius

ボール
Ball

ロングネック
Long Neck

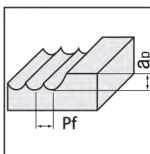
ラフィング
Roughing

面取り加工用
Chamfering

ドリル
Drill

CX500-HBE2

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	高硬度鋼 Hardened Steel (40 ~ 55HRC)				高硬度鋼 Hardened Steel (55 ~ 60HRC)				高硬度鋼 Hardened Steel (60 ~ 65HRC)			
	送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution	
	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed
0.2	650	-	50000	-	600	-	50000	-	550	-	50000	-
0.3	1040	-	50000	-	960	-	50000	-	780	-	50000	-
0.4	1460	-	50000	-	1180	-	43800	-	900	-	38200	-
0.5	2240	2650	47700	50000	1430	2300	35000	50000	1120	1950	30600	50000
0.75	2310	4800	31800	50000	1450	3900	23300	50000	1460	2740	20400	38200
1	1740	3670	23900	43000	1080	2620	17500	36600	1000	1940	15300	28600
1.5	1730	3430	15900	28600	1080	2570	11700	24400	950	1880	10200	19100
2	1590	3280	11900	21500	1020	2510	8800	18300	930	1820	7600	14300
2.5	1540	3620	9500	17200	990	2600	7000	14600	1040	1900	6100	11500
3	1390	2860	8000	14300	890	2200	5800	12200	840	1670	5100	9500
4	1250	2710	6000	10700	800	2110	4400	9200	760	1570	3800	7200
5	1130	2530	4800	8600	700	1910	3500	7300	700	1440	3100	5700
6	1010	2340	4000	7200	600	1670	2900	6100	620	1280	2500	4800
加工内容 Processing	Ad		Pf		Ad		Pf		Ad		Pf	
粗加工	≤0.1D	≤0.08D	≤0.3D	≤0.24D	≤0.07D	≤0.05D	≤0.21D	≤0.15D	≤0.07D	≤0.05D	≤0.21D	≤0.15D
精加工	≤0.03D	≤0.02D	≤0.1D	≤0.05D	≤0.02D	≤0.01D	≤0.05D	≤0.05D	≤0.02D	≤0.01D	≤0.05D	≤0.05D

ボール
Ballスクエア
Squareラジウス
Radiusボール
Ballロングネック
Long Neckラフニング
Roughing面取り加工用
Chamferingドリル
Drill

CX500 3枚刃高硬度ボールエンドミル

CX500 3-Flute Ball Nose End Mill for hard material

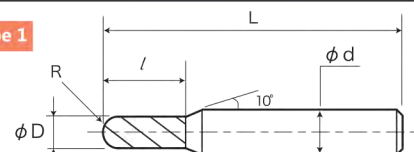
CX500-HBE3



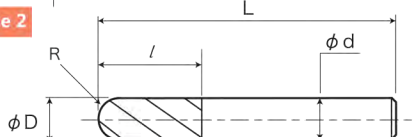
CX500-HBE3050

Model Flute R

Type 1



Type 2



特性 Features

- CX500-Coating is new epoch-making coating developed for super long tool life, High-speed processing and dry cutting due to the high acid resistance and hardening if compared with other conventional and popular coating which is existing in the market.-The optimum tool for alloy steel, S45C/SCM440, NAK to HRC45
- CKK Original design Chip pocket enables similar or same cutting depth which 3-flutes could realize
- Surface finish is very accurate after reprocessing
- Suitable for hardened steel processing (up to 65 HRC)

SMG
超超微粒

30°



R Ball

R 値 Radius	R 精度 Accuracy
0.5~2	+0.005 -0.005
3~6	+0.003 -0.007



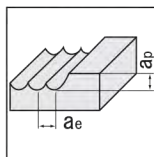
CX500 Coat

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
~45HRC	~55HRC	~60HRC	~65HRC										
○	○	○	◎	◎	◎	◎	◎	○					

◎ = Best ○ = Good

MODEL 型番	R	D 外径	l 刃長	L 全長	d 柄径	Type
CX500-HBE3005	0.5	1	1.5	50	4	1
CX500-HBE3010	1	2	3	50	6	1
CX500-HBE3015	1.5	3	4.5	60	6	1
CX500-HBE3020	2	4	6	70	6	1
CX500-HBE3025	2.5	5	7.5	80	6	1
CX500-HBE3030	3	6	9	90	6	2
CX500-HBE3040	4	8	12	100	8	2
CX500-HBE3050	5	10	15	100	10	2
CX500-HBE3060	6	12	18	110	12	2

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed sped and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	高硬度鋼 Hardened Steel (40 ~ 55HRC)				高硬度鋼 Hardened Steel (55 ~ 60HRC)				高硬度鋼 Hardened Steel (60 ~ 65HRC)			
	送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm ⁻¹) Revolution	
	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed
R 値 (mm) Radius												
0.5	3360	3975	47700	50000	2145	3450	35000	50000	1680	2925	30600	50000
1	2610	5505	23900	43000	1620	3930	17500	36600	1500	2910	15300	28600
1.5	2595	5145	15900	28600	1620	3855	11700	24400	1425	2820	10200	19100
2	2385	4920	11900	21500	1530	3765	8800	18300	1395	2730	7600	14300
2.5	2310	5430	9500	17200	1485	3900	7000	14600	1560	2850	6100	11500
3	2085	4290	8000	14300	1335	3300	5800	12200	1260	2505	5100	9500
4	1875	4065	6000	10700	1200	3165	4400	9200	1140	2355	3800	7200
5	1695	3795	4800	8600	1050	2865	3500	7300	1050	2160	3100	5700
6	1515	3510	4000	7200	900	2502	2900	6100	930	1920	2500	4800
加工内容 Processing	Ad		Pf		Ad		Pf		Ad		Pf	
粗加工	≤0.1D	≤0.08D	≤0.3D	≤0.24D	≤0.07D	≤0.05D	≤0.21D	≤0.15D	≤0.07D	≤0.05D	≤0.21D	≤0.15D
精加工	≤0.03D	≤0.02D	≤0.1D	≤0.05D	≤0.02D	≤0.01D	≤0.05D	≤0.05D	≤0.02D	≤0.01D	≤0.05D	≤0.05D

CX500 4枚刃ロングネックラジアスエンドミル

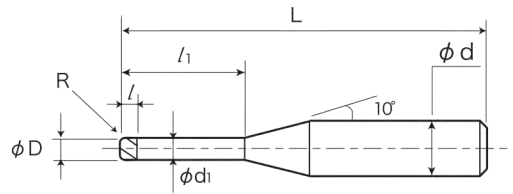
CX500 4-Flute Long Neck Radius End Mill

CX500-QEMSN



CX500-QEMSN4-2-10-R0.3

Model Flute D / 1 R



特性 Features

- Provide high accurate deep rib processing with $\pm 5\mu\text{m}$ radius accuracy
- Suitable for carbon steel processing and radius positive blade designed for tougher and shaper cutting
- Seamless shape (from peripheral blade to radius blade and bottom center are made by one process)
- Minimize deflection of tool due to tapered radius neck design
- Improvement of CX500-Coating having high oxidation resistance (1300°C) and high hardening exceeding the existing coating meet our own high rig requirement to ensure exceptional piece-to-piece conformity in the processing of prehardened steel and carbon steel



外径公差 Tolerance
0
-0.02

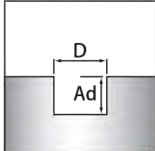


炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ = Best ○ = Good

MODEL 型番	D 外径	R	/ 刃長	/ 1	d 1	L 全長	d 柄径	Actual effective length in incline angles			
CX500-QEMSN4-2-10	2	0.2 0.5	3	10	1.95	50	4	30°	1	2	3
CX500-QEMSN4-2-12				12				10.47	10.99	12.21	13.73
CX500-QEMSN4-2-16				16				12.57	13.19	14.65	16.48
CX500-QEMSN4-2-20				20				16.75	17.58	19.53	Free
CX500-QEMSN4-3-16	3	0.3 0.5	4.5	16	2.9	70	6	20.94	21.98	24.41	Free
CX500-QEMSN4-3-20				20				16.75	17.58	19.53	21.97
CX500-QEMSN4-3-25				25				20.94	21.98	24.41	27.46
CX500-QEMSN4-3-30				30				26.18	27.47	30.51	Free
CX500-QEMSN4-3-40	4	0.2 0.5	6	40	3.8	100	6	31.41	32.97	36.62	Free
CX500-QEMSN4-4-16				16				41.88	43.96	Free	Free
CX500-QEMSN4-4-20				20				16.75	17.58	19.53	Free
CX500-QEMSN4-4-30				30				20.94	21.98	24.41	Free
CX500-QEMSN4-4-40	4	0.2 0.5	6	40		100	6	31.41	32.97	36.62	Free
CX500-QEMSN4-4-40				40				41.88	43.96	Free	Free

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material			炭素鋼 Carbon Steel (S45C~S55C)		合金鋼・工具鋼 Alloy steel・Tool steel (SKD.SUS.SCM)		調質鋼 (35~40HRC) (HRM.NAK)	
D	/ 1	Ad (mm)	送り速度 (mm/min) Feed rate	回転数 (min ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (min ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (min ⁻¹) Revolution
2	10	0.037~0.088	1000	13000	700	10500	500	8900
	12	0.018~0.044	830	11700	580	9500	420	8000
	16	0.018~0.044	630	9500	440	7700	310	6500
	20	0.010~0.025	500	7700	350	6200	250	5300
3	16	0.028~0.067	1000	8900	700	7200	500	5900
	20	0.028~0.067	800	8000	560	6500	400	5300
	25	0.015~0.036	640	7200	450	5900	320	4800
	30	0.015~0.036	530	6500	370	5300	270	4300
4	16	0.005~0.012	400	5900	280	4800	200	3900
	20	0.045~0.015	1000	6500	700	5400	500	4450
	20	0.045~0.015	1000	6500	700	5400	500	4450
	30	0.023~0.076	670	6000	470	4900	330	4000
4	40	0.017~0.046	500	5400	350	4400	250	3600

ロングネック Long Neck

スクエア Square

ラジアス Radius

ボール Ball

ロングネック Long Neck

ラフィング Roughing

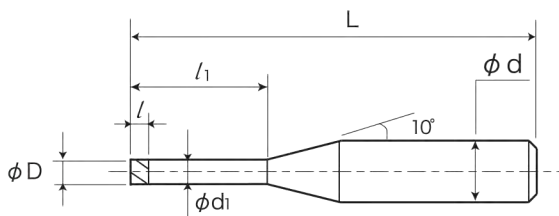
面取り加工用 Chamfering

ドリル Drill

CX500 3枚刃ロングネックスクエアエンドミル

CX500 3-Flute Long Neck Square End Mill

CX500-HMSN



特性 Features

- CX500-Coating have high oxidation resistance and hardening which exceeds existing coating and provides long tool life and suitable for high speed processing and dry milling
- Best for rib groove processing of plastic mold (Please select long neck length according to the work piece)
- Long neck prevents tool interference when applying for deep rib processing
- Enable high-efficiency surface finishing of work-piece



外径公差 Tolerance
0
-0.02



炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	○			○	◎					

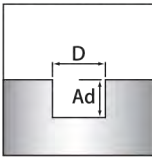
◎ = Best ○ = Good

MODEL 型番	D 外径	/ 刃長	/ 1	d 1	L 全長	d 柄径	Actual effective length in incline angles							
							30°	1	2	3				
CX500-HMSN3-1-4	1	1.5	4	0.95	50	4	4.19	4.4	4.88	5.49				
CX500-HMSN3-1-6			6				6.28	6.59	7.32	8.24				
CX500-HMSN3-1-8			8				8.38	8.79	9.76	10.98				
CX500-HMSN3-1-10			10				10.47	10.99	12.21	13.73				
CX500-HMSN3-1-12			12				12.57	13.19	14.65	16.48				
CX500-HMSN3-1-14			14				14.66	15.39	17.09	19.22				
CX500-HMSN3-1-16			16				16.75	17.58	19.53	21.97				
CX500-HMSN3-1-20			20				20.94	21.98	24.41	27.46				
CX500-HMSN3-1-25			25				26.18	27.47	30.51	Free				
CX500-HMSN3-1-30			30				31.41	32.97	36.61	Free				
CX500-HMSN3-1.2-6	1.2	1.8	6	1.15	50	4	6.28	6.59	7.32	8.24				
CX500-HMSN3-1.2-8			8				8.34	8.79	9.76	10.98				
CX500-HMSN3-1.2-10			10				10.47	10.99	12.21	13.73				
CX500-HMSN3-1.2-12			12				12.57	13.19	14.65	16.48				
CX500-HMSN3-1.2-16			16				16.75	17.58	19.53	21.97				
CX500-HMSN3-1.5-6	1.5	2.3	6	1.45	50	4	6.28	6.59	7.32	8.24				
CX500-HMSN3-1.5-8			8				8.38	8.79	9.76	10.98				
CX500-HMSN3-1.5-10			10				10.47	10.99	12.21	13.73				
CX500-HMSN3-1.5-12			12				12.57	13.19	14.65	16.48				
CX500-HMSN3-1.5-14			14				14.66	15.39	17.09	19.22				
CX500-HMSN3-1.5-16			16		16.75		17.58	19.53	21.97					
CX500-HMSN3-1.5-18			18		18.85		19.78	21.97	24.71					
CX500-HMSN3-1.5-20			20		20.94		21.98	24.41	Free					
CX500-HMSN3-2-6			6		6.28		6.59	7.32	8.24					
CX500-HMSN3-2-8			8		8.38		8.79	9.76	10.98					
CX500-HMSN3-2-10	2	3	10	1.95	50	4	10.47	10.99	12.21	13.73				
CX500-HMSN3-2-12			12				12.57	13.19	14.65	16.48				
CX500-HMSN3-2-14			14				14.66	15.39	17.09	19.22				
CX500-HMSN3-2-16			16				16.75	17.58	19.53	Free				
CX500-HMSN3-2-18			18				20.94	21.98	24.41	Free				
CX500-HMSN3-2-20			20		26.18		27.47	Free	Free					
CX500-HMSN3-2-25			25		31.41		32.97	Free	Free					
CX500-HMSN3-2-30			30		31.41		32.97	Free	Free					
CX500-HMSN3-2.5-8			2.5		3.75		8	2.4	50	4	8.38	8.79	9.76	10.98
CX500-HMSN3-2.5-12							12				12.57	13.19	14.65	16.48
CX500-HMSN3-2.5-16	16	16.75		17.58		19.53	Free							
CX500-HMSN3-2.5-20	20	20.94		21.98		24.41	Free							
CX500-HMSN3-2.5-25	25	26.18		27.47		Free	Free							
CX500-HMSN3-2.5-30	30	31.41		32.97		Free	Free							
CX500-HMSN3-3-8	3	4.5	8	2.9	70	6	8.38	8.79	9.76	10.98				
CX500-HMSN3-3-12			12				12.57	13.19	14.65	16.48				
CX500-HMSN3-3-16			16				16.75	17.58	19.53	Free				
CX500-HMSN3-3-20			20				20.94	21.98	24.41	Free				
CX500-HMSN3-3-25			25				26.18	27.47	Free	Free				
CX500-HMSN3-3-30			30				31.41	32.97	Free	Free				
CX500-HMSN3-3-40			40		100		41.88	43.96	Free	Free				

CX500-HMSN

MODEL 型番	D 外径	/ 刃長	/ 1	d 1	L 全長	d 柄径	Actual effective length in incline angles			
							30°	1	2	3
CX500-HMSN3-4-12	4	4.5	12	2.9	50	6	12.57	13.19	14.65	16.48
CX500-HMSN3-4-16			16				16.75	17.58	19.53	Free
CX500-HMSN3-4-20			20				20.94	21.98	24.41	Free
CX500-HMSN3-4-30			30				31.41	32.97	Free	Free
CX500-HMSN3-4-40			40				41.88	43.96	Free	Free
CX500-HMSN3-5-16	5	7.5	16	4.8	70	6	16.75	17.58	Free	Free
CX500-HMSN3-5-25			25				26.18	27.47	Free	Free
CX500-HMSN3-5-35			35				36.65	Free	Free	Free
CX500-HMSN3-5-50			50				52.35	Free	Free	Free
CX500-HMSN3-6-20	6	9	20	5.8	70	6	Free	Free	Free	Free
CX500-HMSN3-6-30			30				Free	Free	Free	Free
CX500-HMSN3-6-40			40				Free	Free	Free	Free
CX500-HMSN3-6-50			50				Free	Free	Free	Free
CX500-HMSN3-6-60			60				Free	Free	Free	Free

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material			炭素鋼 Carbon Steel (S45C ~ S55C)		合金鋼 工具鋼 Alloy steel - Tool steel (SKD.SUS.SCM)		調質鋼 (35~40HRC) (HRM.NAK)	
D	/ 1	Ad (mm)	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution
1	6	0.01 ~ 0.025	470	23900	330	19400	230	15800
	8	0.01 ~ 0.025	350	21500	250	17500	175	14200
	10	0.005 ~ 0.014	280	19400	750	19000	140	12800
	12	0.005 ~ 0.012	230	17500	160	14200	120	11500
1.5	6	0.03 ~ 0.075	700	17500	490	14000	350	11500
	8	0.016 ~ 0.038	700	17500	490	14000	350	11500
	10	0.016 ~ 0.038	560	15800	400	12600	280	10400
	12	0.016 ~ 0.038	470	14200	330	11300	230	9400
2	10	0.037 ~ 0.038	700	13000	490	10500	350	8900
	12	0.018 ~ 0.044	510	11700	400	9500	290	8000
	14	0.018 ~ 0.044	500	10500	350	8600	250	7200
	16	0.018 ~ 0.044	440	9500	310	7700	220	6500
3	20	0.01 ~ 0.025	350	7700	250	6200	180	5300
	16	0.028 ~ 0.067	700	8900	490	7200	350	5900
	20	0.028 ~ 0.067	560	8000	390	6500	280	5300
	25	0.015 ~ 0.036	450	7200	320	5900	220	4800
4	30	0.015 ~ 0.036	370	6500	260	5300	190	4300
	40	0.005 ~ 0.012	280	5900	200	4800	140	3900
	16	0.045 ~ 0.15	700	6650	490	5400	350	4450
	20	0.045 ~ 0.15	700	6650	490	5400	350	4450
5	30	0.023 ~ 0.076	470	6000	330	4900	230	4000
	40	0.017 ~ 0.046	350	5400	250	4400	180	3600
	25	0.079 ~ 0.189	700	5300	490	4300	350	3550
	35	0.04 ~ 0.096	340	4800	350	3900	250	3200
6	30	0.079 ~ 0.189	700	4450	490	3600	350	2950
	40	0.04 ~ 0.096	530	4000	370	3200	270	2700

ロングネック Long Neck

スクエア Square

ラジアス Radius

ボール Ball

ロングネック Long Neck

ラフニング Roughing

面取り加工用 Chamfering

ドリル Drill

CX500 2枚刃ロングネックボールエンドミル

CX500 4-Flute Long Neck Ball End Mill

CX500-HBSN



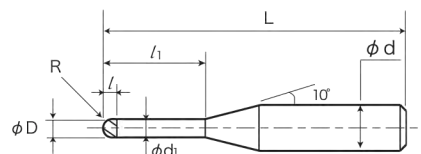
CX500-HBSN2-0.4-10-4

Model Flute R / 1 d

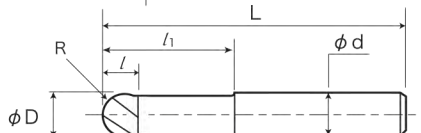
特性 Features

- CX500-Coating have high oxidation resistance and hardening which exceeds existing coating and provides long tool life and suitable for high speed processing and dry milling
- Suitable for high efficiency 3-D processing of Mold due to high chip ejection
- Enable high-efficiency surface finishing of work-piece
- Application for hardened steel processing up to 65HRC
- Long Neck prevent tool interference when processing deep holes
- Cutting edge chipping is minimum and stable high efficiency milling is possible in deep rib flute slotting of mold or radius milling of deep holes.

Type 1



Type 2



SMG
超々微粒



R 値 Radius	R 精度 Accuracy
0.5~2	+0.005 -0.005
3~6	+0.003 -0.007



炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
○	○	○	○	◎	◎	◎	◎	○					

◎ = Best ○ = Good

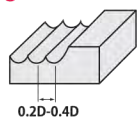
MODEL 型番	R	/ 刃長	/ 1	d 1	L 全長	d 柄径	Actual effective length in incline angles				Type
							30°	1	2	3	
CX500-HBSN2-0.1-0.5-4	0.1	0.15	0.5	0.18	50	4	0.52	0.54	0.59	0.65	1
CX500-HBSN2-0.1-1-4			1				1.04	1.08	1.18	1.31	
CX500-HBSN2-0.1-2-4			2				2.08	2.16	2.36	2.63	
CX500-HBSN2-0.15-1-4	0.15	0.20	1	0.28	50	4	1.04	1.08	1.18	1.31	1
CX500-HBSN2-0.15-1.5-4			1.5				1.56	1.62	1.77	1.97	
CX500-HBSN2-0.15-2-4			2				2.08	2.16	2.36	2.63	
CX500-HBSN2-0.2-1-4	0.2	0.3	1	0.37	50	4	1.04	1.08	1.18	1.31	1
CX500-HBSN2-0.2-1.5-4			1.5				1.56	1.62	1.77	1.97	
CX500-HBSN2-0.2-2-4			2				2.08	2.16	2.36	2.63	
CX500-HBSN2-0.2-3-4			3				3.12	3.24	3.55	3.94	
CX500-HBSN2-0.2-4-4			4				4.16	4.33	4.73	5.26	
CX500-HBSN2-0.2-5-4			5				5.2	5.41	5.91	6.57	
CX500-HBSN2-0.3-2-4	0.3	0.45	2	0.56	50	4	2.08	2.16	2.36	2.63	1
CX500-HBSN2-0.3-3-4			3				3.12	3.24	3.55	3.94	
CX500-HBSN2-0.3-4-4			4				4.16	4.33	4.73	5.26	
CX500-HBSN2-0.3-5-4			5				5.2	5.41	5.91	6.57	
CX500-HBSN2-0.3-6-4			6				6.24	6.49	7.1	7.89	
CX500-HBSN2-0.3-8-4			8				8.32	8.66	9.46	10.52	
CX500-HBSN2-0.4-4-4	0.4	0.6	4	0.76	50	4	4.16	4.33	4.73	5.26	1
CX500-HBSN2-0.4-6-4			6				6.24	6.49	7.1	7.89	
CX500-HBSN2-0.4-8-4			8				8.32	8.66	9.46	10.52	
CX500-HBSN2-0.4-10-4			10				10.4	10.83	11.83	13.15	

CX500-HBSN

MODEL 型番	R	/ 刃長	/ 1	d 1	L 全長	d 柄径	Actual effective length in incline angles				Type		
							30°	1	2	3			
CX500-HBSN2-0.5-3-4	0.5	0.75	3	0.95	50	4	3.12	3.24	3.55	3.94	1		
CX500-HBSN2-0.5-4-4			4			4.16	4.33	4.73	5.26				
CX500-HBSN2-0.5-4-6			6			4.1	4.22	4.48	4.83				
CX500-HBSN2-0.5-5-4			5			5.2	5.41	5.91	6.57				
CX500-HBSN2-0.5-6-4			6			6.24	6.49	7.1	7.89				
CX500-HBSN2-0.5-6-6			6			6.16	6.34	6.72	7.25				
CX500-HBSN2-0.5-7-4			7			7.28	7.58	8.28	9.2				
CX500-HBSN2-0.5-8-4			8			8.32	8.66	9.46	10.52				
CX500-HBSN2-0.5-8-6			8			8.21	8.45	8.96	9.66				
CX500-HBSN2-0.5-10-4			10			10.4	10.83	11.83	13.15				
CX500-HBSN2-0.5-10-6			10			10.26	10.56	11.21	12.08				
CX500-HBSN2-0.5-12-4			12			12.48	12.99	14.2	15.78				
CX500-HBSN2-0.5-14-4			14			14.57	15.16	16.57	18.41				
CX500-HBSN2-0.5-16-4			16			16.65	17.33	18.93	21.04				
CX500-HBSN2-0.5-18-4			18			18.73	19.49	21.3	23.67				
CX500-HBSN2-0.5-20-4			20		20.81	21.66	23.67	26.3					
CX500-HBSN2-0.6-4-4	0.6	0.9	6	1.15	50	4	6.24	6.49	7.1	7.89	1		
CX500-HBSN2-0.6-8-4			8			8.32	8.66	9.46	10.52				
CX500-HBSN2-0.6-10-4			10			10.4	10.83	11.83	13.15				
CX500-HBSN2-0.6-12-4			12			12.48	12.99	14.2	15.78				
CX500-HBSN2-0.75-6-4	0.75	1	6	1.45	50	4	6.24	6.49	7.1	7.89	1		
CX500-HBSN2-0.75-8-4			8			8.32	8.66	9.46	10.52				
CX500-HBSN2-0.75-10-4			10			10.4	10.83	11.83	13.15				
CX500-HBSN2-0.75-12-4			12			12.48	12.99	14.2	15.78				
CX500-HBSN2-0.75-16-4			16		16.65	17.33	18.93	21.04					
CX500-HBSN2-0.75-20-4			20		20.81	21.66	23.67	26.3					
CX500-HBSN2-0.8-8-4			8		1.55	50	4	8.32	8.66	9.46		10.52	1
CX500-HBSN2-0.8-12-4			12				12.48	12.99	14.2	15.78			
CX500-HBSN2-1-4-4	1	1.5	4	1.95	50	4	4.16	4.33	4.73	5.26	1		
CX500-HBSN2-1-6-4			6			6.24	6.49	7.1	7.89				
CX500-HBSN2-1-6-6			6			6.16	6.43	6.72	7.25				
CX500-HBSN2-1-8-4			8			4	8.32	8.66	9.46	10.52			
CX500-HBSN2-1-8-6			8			6	8.21	8.45	8.96	9.66			
CX500-HBSN2-1-10-4			10			4	10.4	10.83	11.83	13.15			
CX500-HBSN2-1-10-6			10			6	10.26	10.56	11.21	12.08			
CX500-HBSN2-1-12-4			12			4	12.48	12.99	14.2	15.78			
CX500-HBSN2-1-12-6			12			6	12.32	12.68	13.45	14.5			
CX500-HBSN2-1-14-4			14			4	14.57	15.16	16.57	18.41			
CX500-HBSN2-1-16-4			16				15.65	17.33	18.93	21.04			
CX500-HBSN2-1-18-4			18				18.73	19.49	21.3	Free			
CX500-HBSN2-1-20-4			20		20.81		21.66	23.67	Free				
CX500-HBSN2-1-22-4			22		70	4	22.89	23.83	26.04	Free			
CX500-HBSN2-1-25-4			25				26.02	27.08	29.59	Free			
CX500-HBSN2-1-30-4			30				31.22	32.49	35.51	Free			
CX500-HBSN2-1-35-4			35		110	6	36.42	37.91	Free	Free			
CX500-HBSN2-1-40-4			40				41.63	43.32	Free	Free			
CX500-HBSN2-1.5-8-6			8				50	8.32	8.66	9.46		10.52	
CX500-HBSN2-1.5-10-6			10		10.4	10.83		11.83	13.15				
CX500-HBSN2-1.5-16-6	16	16.65	17.33	18.93	21.04								
CX500-HBSN2-1.5-20-6	20	20.81	21.66	23.67	26.3								
CX500-HBSN2-1.5-25-6	25	70	6	26.02	27.08	29.59	32.87						
CX500-HBSN2-1.5-30-6	30			31.22	32.49	35.51	Free						
CX500-HBSN2-1.5-35-6	35			36.42	37.91	41.42	Free						
CX500-HBSN2-1.5-40-6	40			110	41.63	43.32	47.347	Free					
CX500-HBSN2-2-10-6	2	3	10	3.85	50	6	10.40	10.83	11.83	13.15	1		
CX500-HBSN2-2-12-6			12				12.48	12.99	14.2	15.78			
CX500-HBSN2-2-16-6			16				16.65	17.33	18.93	21.04			
CX500-HBSN2-2-20-6			20				20.81	21.66	23.67	Free			
CX500-HBSN2-2-25-6			25		26.02	27.08	29.59	Free					
CX500-HBSN2-2-30-6			30		31.22	32.49	35.51	Free					
CX500-HBSN2-2-35-6			35		36.42	37.91	Free	Free					
CX500-HBSN2-2-40-6			40		110	6	41.63	43.32	Free	Free			
CX500-HBSN2-2-45-6			45				46.83	48.74	Free	Free			
CX500-HBSN2-2-50-6			50				52.04	54.16	Free	Free			
CX500-HBSN2-3-30-6			30				70	Free	Free	Free		Free	
CX500-HBSN2-3-50-6			50		110	Free	Free	Free	Free				

推奨切削条件 Standard Milling Condition

① D=2 × R



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

ロングネック Long Neck

スクエア Square

ラジアス Radius

ボール Ball

ロングネック Long Neck

ラフニング Roughing

面取り加工用 Chamfering

ドリル Drill

推奨切削条件 Standard Milling Condition

CX500-HBSN

被削材 Work Material		炭素鋼 carbon steel (S45C~S55C)			高硬度鋼 hardened Steel (S5~60RHC)			高硬度鋼 hardened Steel (60~65RHC)		
R	/ 1	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	Ad (mm)	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	Ad (mm)	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	Ad (mm)
0.1	0.5	320	50000	0.015	320	50000	0.012	240	50000	0.011
0.1	1	320	50000	0.011	320	50000	0.008	240	50000	0.008
0.1	2	320	50000	0.011	320	50000	0.008	240	50000	0.008
0.15	1	480	50000	0.016	320	38200	0.013	270	34000	0.012
0.15	1.5	480	50000	0.011	320	38200	0.009	270	34000	0.008
0.15	2	480	50000	0.009	320	38200	0.007	270	34000	0.007
0.2	1	640	44600	0.030	360	28600	0.024	300	25500	0.022
0.2	1.5	640	44600	0.026	360	28600	0.021	300	25500	0.019
0.2	2	490	38000	0.021	260	23000	0.017	240	21000	0.015
0.2	3	490	38000	0.012	260	23000	0.010	240	21000	0.009
0.2	4	490	38000	0.012	260	23000	0.010	240	21000	0.009
0.2	5	490	38000	0.012	260	23000	0.010	240	21000	0.009
0.3	2	620	29700	0.032	350	19100	0.025	280	17000	0.023
0.3	3	620	29700	0.027	350	19100	0.022	280	17000	0.02
0.3	4	620	29700	0.018	350	19100	0.014	280	17000	0.013
0.3	5	620	29700	0.015	350	19100	0.012	280	17000	0.011
0.3	6	500	24000	0.011	290	16000	0.009	220	14000	0.008
0.3	8	500	24000	0.011	290	16000	0.009	220	14000	0.008
0.4	4	650	22300	0.042	360	14300	0.034	290	12700	0.031
0.4	6	640	22300	0.024	360	14300	0.019	280	12700	0.018
0.4	8	460	16000	0.015	270	10800	0.012	220	9800	0.011
0.4	10	460	16000	0.015	270	10800	0.012	220	9800	0.011
0.5	3	620	17800	0.075	350	11500	0.06	290	10200	0.055
0.5	4	620	17800	0.053	350	11500	0.042	290	10200	0.039
0.5	5	620	17800	0.045	350	11500	0.036	290	10200	0.033
0.5	6	530	15000	0.030	290	9600	0.024	260	9000	0.022
0.5	7	530	15000	0.030	290	9600	0.024	260	9000	0.022
0.5	8	530	15000	0.030	290	9600	0.024	260	9000	0.022
0.5	10	480	13800	0.019	260	8500	0.015	230	8100	0.014
0.5	12	480	13800	0.019	260	8500	0.015	230	8100	0.014
0.5	14	480	13800	0.015	260	8500	0.012	230	8100	0.011
0.5	16	460	13000	0.011	230	7600	0.009	210	7300	0.008
0.5	18	460	13000	0.010	230	7600	0.008	210	7300	0.007
0.5	20	460	13000	0.008	230	7600	0.006	210	7300	0.006
0.6	6	620	14900	0.030	350	9500	0.024	300	8500	0.022
0.6	8	620	14900	0.030	350	9500	0.024	300	8500	0.022
0.6	10	520	12500	0.030	270	8000	0.024	260	7300	0.022
0.6	12	520	12500	0.023	270	8000	0.018	260	7300	0.017
0.75	6	630	11900	0.045	350	7600	0.036	300	6800	0.033
0.75	8	630	11900	0.045	350	7600	0.036	300	6800	0.033
0.75	10	540	10200	0.045	290	6300	0.036	270	6100	0.033
0.75	12	540	10200	0.045	290	6300	0.036	270	6100	0.033
0.75	16	660	9600	0.029	270	5800	0.023	240	5500	0.021
0.75	20	660	9600	0.029	270	5800	0.023	240	5500	0.021
0.8	8	620	11100	0.083	350	7200	0.066	290	6400	0.061
0.8	12	620	11100	0.049	350	7200	0.039	290	6400	0.036
1	4	610	8900	0.150	340	5700	0.120	280	5100	0.110
1	6	610	8900	0.150	340	5700	0.120	280	5100	0.110
1	8	610	8900	0.105	340	5700	0.084	280	5100	0.077
1	10	520	7500	0.105	290	4800	0.084	240	4400	0.077
1	12	520	7500	0.060	290	4800	0.048	240	4400	0.044
1	14	520	7500	0.060	290	4800	0.048	240	4400	0.044
1	16	520	7500	0.060	290	4800	0.048	240	4400	0.044
1	18	520	7500	0.049	290	4800	0.039	240	4400	0.036
1	20	460	6600	0.038	240	4000	0.030	210	3700	0.028
1	22	460	6600	0.038	240	4000	0.030	210	3700	0.028
1	25	460	6600	0.038	240	4000	0.030	210	3700	0.028
1	30	370	5400	0.023	210	3500	0.018	180	3200	0.017
1	35	370	5400	0.023	210	3500	0.018	180	3200	0.017
1	40	370	5400	0.023	210	3500	0.018	180	3200	0.017
1.5	8	760	5900	0.225	420	3800	0.180	360	3400	0.165
1.5	10	760	5900	0.158	420	3800	0.126	360	3400	0.116
1.5	16	640	5000	0.158	360	3200	0.126	300	2900	0.116
1.5	20	640	5000	0.090	360	3200	0.072	300	2900	0.066
1.5	25	640	5000	0.060	360	3200	0.048	300	2900	0.044
1.5	30	350	4300	0.060	300	2700	0.048	250	2400	0.044
1.5	35	550	4300	0.060	300	2700	0.048	250	2400	0.044
1.5	10	500	3900	0.060	270	2400	0.048	220	2100	0.044
2	10	720	4500	0.300	410	2900	0.240	330	2500	0.220
2	12	720	4500	0.263	410	2900	0.210	330	2500	0.193
2	16	630	3900	0.210	320	2300	0.168	260	2000	0.154
2	20	630	3900	0.210	320	2300	0.168	260	2000	0.154
2	25	620	3900	0.120	320	2300	0.096	260	2000	0.088
2	30	540	3400	0.120	290	2100	0.096	240	1800	0.088
2	35	540	3400	0.075	290	2100	0.060	240	1800	0.055
2	40	450	2800	0.075	240	1700	0.060	210	1600	0.055
2	45	450	2800	0.075	240	1700	0.060	210	1600	0.055
2	50	400	2500	0.075	210	1500	0.060	170	1300	0.055
3	30	670	3000	0.315	370	1900	0.252	310	1700	0.231
3	50	670	3000	0.113	370	1900	0.090	310	1700	0.083

CX500 2枚刃テーパネックボールエンドミル

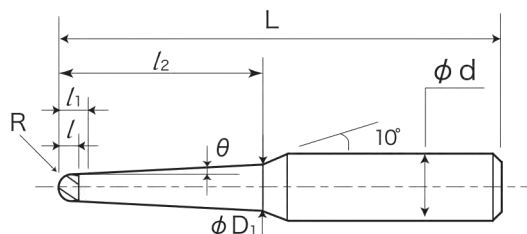
CX500 2-Flute Taper Neck Ball Nose End Mill

CX500-HBPN



CX500-HBPN2-1.5-1-50

Model Flute R θ / 2



特性 Features

- CX500-Coating have high oxidation resistance and hardening which exceeds existing coating and provides long tool life and suitable for high speed processing and dry milling
- Enable high-efficiency surface finishing of work-piece
- Taper neck prevent chattering
- Application for hardened steel processing up to 65HRC
- Long Neck prevent tool interference when processing deep holes



R 値 Radius	R 精度 Accuracy
0.5~2	+0.005 -0.005
3~6	+0.003 -0.007



炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
○	○	○	○	◎	◎	◎	◎	○					

◎ = Best ○ = Good

MODEL 型番	R	/ 刃長	/ 1	θ	/ 2	D1	L 全長	d 柄径
CX500-HBPN2-0.1-0.5-1.5	0.1	0.15	0.4	0.5°	1.5	0.22	50	4
CX500-HBPN2-0.1-0.5-2					2	0.23		
CX500-HBPN2-0.1-1-1.5				1°	1.5	0.24		
CX500-HBPN2-0.1-1-2					2	0.26		
CX500-HBPN2-0.1-1.5-1.5				1.5°	1.5	0.26		
CX500-HBPN2-0.1-1.5-2					2	0.29		
CX500-HBPN2-0.1-2-1.5				2°	1.5	0.28		
CX500-HBPN2-0.1-2-2					2	0.32		
CX500-HBPN2-0.1-3-1.5				3°	1.5	0.32		
CX500-HBPN2-0.1-3-2					2	0.37		
CX500-HBPN2-0.1-5-2				5°	2	0.48		
CX500-HBPN2-0.15-0.5-3	0.15	0.2	0.6	0.5°	3	0.35	50	4
CX500-HBPN2-0.15-1-2					2	0.35		
CX500-HBPN2-0.15-1-3				1°	3	0.39		
CX500-HBPN2-0.15-1.5-2					2	0.38		
CX500-HBPN2-0.15-1.5-3				1.5°	3	0.43		
CX500-HBPN2-0.15-2-3					3	0.47		
CX500-HBPN2-0.15-3-2				3°	2	0.45		
CX500-HBPN2-0.15-5-2					2	0.55		
CX500-HBPN2-0.2-0.5-2	0.2	0.3	0.8	0.5°	2	0.43	50	4
CX500-HBPN2-0.2-0.5-3					3	0.44		
CX500-HBPN2-0.2-0.5-4				1°	4	0.46		
CX500-HBPN2-0.2-1-2					2	0.45		
CX500-HBPN2-0.2-1-3				1.5°	3	0.48		
CX500-HBPN2-0.2-1-4					4	0.52		
CX500-HBPN2-0.2-1.5-2				2°	2	0.47		
CX500-HBPN2-0.2-1.5-3					3	0.52		
CX500-HBPN2-0.2-1.5-4				3°	4	0.57		
CX500-HBPN2-0.2-2-2					2	0.49		
CX500-HBPN2-0.2-2-3	0.25	0.35	1	0.5°	3	0.56	50	4
CX500-HBPN2-0.2-2-4					4	0.63		
CX500-HBPN2-0.2-3-2				1°	2	0.53		
CX500-HBPN2-0.2-3-4					4	0.74		
CX500-HBPN2-0.2-5-4				1.5°	4	0.96		
CX500-HBPN2-0.25-0.5-4					4	0.56		
CX500-HBPN2-0.25-0.5-6				2°	6	0.59		
CX500-HBPN2-0.25-0.5-8					8	0.63		
CX500-HBPN2-0.25-1-4				3°	4	0.61		
CX500-HBPN2-0.25-1-6					6	0.68		
CX500-HBPN2-0.25-1-8				5°	8	0.75		
CX500-HBPN2-0.25-1.5-4					4	0.66		
CX500-HBPN2-0.25-1.5-6				1°	6	0.77		
CX500-HBPN2-0.25-1.5-8					8	0.87		
CX500-HBPN2-0.25-2-4				1.5°	4	0.71		
CX500-HBPN2-0.25-2-6					6	0.85		
CX500-HBPN2-0.25-3-4				2°	4	0.82		
CX500-HBPN2-0.25-3-6					6	1.03		
CX500-HBPN2-0.25-5-6				5°	6	1.38		

テーパネック Taper Neck

スクエア Square

ラジアス Radius

ボール Ball

ロングネック Long Neck

ラフィング Roughing

面取り加工用 Chamfering

ドリル Drill

CX500-HBPN

テーパ
ネック
Taper Neck

スクエア
Square

ラジウス
Radius

ボール
Ball

ロングネック
Long Neck

ラフニング
Roughing

面取り加工
Chamfering

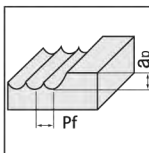
ドリル
Drill

MODEL 型番	R	/ 刃長	/ 1	θ	/ 2	D1	L 全長	d 柄径
CX500-HBPN2-0.3-0.5-4	0.3	0.45	1.2	0.5°	4	0.65	50	4
CX500-HBPN2-0.3-0.5-6					6	0.69		
CX500-HBPN2-0.3-0.5-8					8	0.72		
CX500-HBPN2-0.3-0.5-10					10	0.76		
CX500-HBPN2-0.3-1-4				1°	4	0.7		
CX500-HBPN2-0.3-1-6					6	0.77		
CX500-HBPN2-0.3-1-8					8	0.84		
CX500-HBPN2-0.3-1.5-6					6	0.86		
CX500-HBPN2-0.3-1.5-8				1.5°	8	0.96		
CX500-HBPN2-0.3-2-6					6	0.94		
CX500-HBPN2-0.3-2-8				2°	8	1.08		
CX500-HBPN2-0.3-3-6					6	1.11		
CX500-HBPN2-0.3-3-8	3°	8	1.32					
CX500-HBPN2-0.3-5-8		8	1.79					
CX500-HBPN2-0.4-0.5-8	0.4	0.6	1.6	0.5°	8	0.92	50	4
CX500-HBPN2-0.4-0.5-10					10	0.95		
CX500-HBPN2-0.4-1-8				1°	8	1.03		
CX500-HBPN2-0.4-1-10					10	1.1		
CX500-HBPN2-0.4-1.5-8				1.5°	8	1.14		
CX500-HBPN2-0.4-1.5-10					10	1.24		
CX500-HBPN2-0.4-2-10				2°	10	1.39		
CX500-HBPN2-0.4-3-10					10	1.69		
CX500-HBPN2-0.5-0.5-10	0.5	0.75	2	0.5°	10	1.14	50	4
CX500-HBPN2-0.5-0.5-15					15	1.23	70	
CX500-HBPN2-0.5-0.5-20					20	1.32	70	
CX500-HBPN2-0.5-1-5					1°	5	1.11	
CX500-HBPN2-0.5-1-10				10		1.28	50	
CX500-HBPN2-0.5-1-15				15		1.46	70	
CX500-HBPN2-0.5-1-20				20		1.63	70	
CX500-HBPN2-0.5-1-25				1.5°	25	1.18	70	
CX500-HBPN2-0.5-1.5-5					5	1.16	50	
CX500-HBPN2-0.5-1.5-10					10	1.42	50	
CX500-HBPN2-0.5-1.5-15					15	1.69	70	
CX500-HBPN2-0.5-1.5-20				2°	20	1.95	70	
CX500-HBPN2-0.5-2-15					15	1.91	50	
CX500-HBPN2-0.5-2-20					20	2.26	70	
CX500-HBPN2-0.5-3-15					3°	15	2.37	
CX500-HBPN2-0.5-3-20				20		2.89	70	
CX500-HBPN2-0.5-5-25	25	5.03	70	6				
CX500-HBPN2-0.6-0.5-15	0.6	0.9	2.4	0.5°		15	1.42	50
CX500-HBPN2-0.6-0.5-20					20	1.51	70	
CX500-HBPN2-0.6-1-10				1°	10	1.47	50	
CX500-HBPN2-0.6-1-20					20	1.82	70	
CX500-HBPN2-0.6-1.5-10				1.5°	10	1.6	50	
CX500-HBPN2-0.6-1.5-20					20	2.13	70	
CX500-HBPN2-0.6-2-10				2°	10	1.74	50	
CX500-HBPN2-0.6-2-20					20	2.43	70	
CX500-HBPN2-0.6-3-15				3°	15	2.53	50	
CX500-HBPN2-0.6-5-15					15	3.41	50	
CX500-HBPN2-0.75-0.5-10	0.75	1.1	3	0.5°	10	1.63	50	4
CX500-HBPN2-0.75-0.5-15					15	1.71	50	
CX500-HBPN2-0.75-0.5-20					20	1.8	70	
CX500-HBPN2-0.75-1-10					1°	10	1.75	
CX500-HBPN2-0.75-1-15				15		1.92	70	
CX500-HBPN2-0.75-1-20				20		2.1	70	
CX500-HBPN2-0.75-1.5-10				1.5°		10	1.87	
CX500-HBPN2-0.75-1.5-15					15	2.13	70	
CX500-HBPN2-0.75-1.5-20					20	2.39	70	
CX500-HBPN2-0.75-2-10					2°	10	1.99	
CX500-HBPN2-0.75-2-15				15		2.34	70	
CX500-HBPN2-0.75-2-20				20		2.69	70	
CX500-HBPN2-0.75-3-30				3°		30	3.39	
CX500-HBPN2-0.75-3-15					15	2.76	50	
CX500-HBPN2-0.75-3-20					20	3.29	70	
CX500-HBPN2-0.75-5-15					15	3.6	50	
CX500-HBPN2-1-0.5-15	1	1.5	4	0.5°	15	2.20	50	6
CX500-HBPN2-1-0.5-20					20	2.28	70	
CX500-HBPN2-1-0.5-30					30	2.46	70	
CX500-HBPN2-1-0.5-40					40	2.63	110	
CX500-HBPN2-1-0.5-50					50	2.81	110	
CX500-HBPN2-1-1-15					1°	15	2.39	
CX500-HBPN2-1-1-20				20		2.56	70	
CX500-HBPN2-1-1-25				25		2.74	70	
CX500-HBPN2-1-1-30				30		2.91	70	
CX500-HBPN2-1-1-35				35		3.09	110	
CX500-HBPN2-1-1-40				40		3.26	110	
CX500-HBPN2-1-1-50				50	3.61	110		

CX500-HBPN

MODEL 型番	R	/ 刃長	/ 1	θ	/ 2	D1	L 全長	d 柄径	
CX500-HBPN2-1-1.5-15	1	1.5	4	1.5°	15	2.58	50	6	
CX500-HBPN2-1-1.5-20					20	2.84	70		
CX500-HBPN2-1-1.5-25					25	3.10			
CX500-HBPN2-1-1.5-30					30	3.37			
CX500-HBPN2-1-1.5-40					40	3.89	110		
CX500-HBPN2-1-1.5-50				50	4.41				
CX500-HBPN2-1-2-30				2°	30	3.82	70		
CX500-HBPN2-1-2-40					40	4.52	110		
CX500-HBPN2-1-3-30				3°	30	4.73	70		
CX500-HBPN2-1-3-40					40	5.78	110		
CX500-HBPN2-1.5-0.5-20	1.5	2.5	6	0.5°	20	3.25	70	6	
CX500-HBPN2-1.5-0.5-30					30	3.42	110		
CX500-HBPN2-1.5-0.5-40					40	3.6			
CX500-HBPN2-1.5-0.5-50					50	3.77			
CX500-HBPN2-1.5-1-20					1°	20	3.49		70
CX500-HBPN2-1.5-1-30				30		3.84	110		
CX500-HBPN2-1.5-1-40				40		4.19			
CX500-HBPN2-1.5-1-50				50		4.54			
CX500-HBPN2-1.5-1.5-20				1.5°	20	3.74	70		
CX500-HBPN2-1.5-1.5-30					30	4.26	110		
CX500-HBPN2-1.5-1.5-40					40	4.79			
CX500-HBPN2-1.5-1.5-50					50	5.31			
CX500-HBPN2-1.5-2-40					40	5.38			
CX500-HBPN2-1.5-2-48				48	5.94				
CX500-HBPN2-1.5-3-34				3°	34	5.94	110		
CX500-HBPN2-2-0.5-40				0.5°	40	4.56			
CX500-HBPN2-2-0.5-50					50	4.47			
CX500-HBPN2-2-0.5-60					60	4.91			
CX500-HBPN2-2-1-40				1°	40	5.12			110
CX500-HBPN2-2-1-50					50	5.47			
CX500-HBPN2-2-1-60	60	5.82							
CX500-HBPN2-2-1.5-40	1.5°	40	5.68	110					
CX500-HBPN2-2-1.5-46		46	6.00						
CX500-HBPN2-2-3-27	3°	27	6.00						
CX500-HBPN2-3-1-40	3	6	12		1°	40	6.98	110	8
CX500-HBPN2-3-1-50						50	7.33		
CX500-HBPN2-3-1-60				60		7.68			
CX500-HBPN2-3-1.5-40				1.5°	40	7.47			
CX500-HBPN2-3-1.5-50					50	8.00			
CX500-HBPN2-3-3-31					31	8.00			
CX500-HBPN2-5-1.5-54	5	8	16	1.5°	54	12.00	110	12	
CX500-HBPN2-5-2-44				2°	44	11.96			
CX500-HBPN2-5-3-35				3°	35	12.00			

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

加工材 Work Material	高炭素鋼 (40 ~ 55HRC)				高硬度鋼 Hardened Steel (55 ~ 60HRC)				高硬度鋼 Hardened Steel (60 ~ 65HRC)			
	送り速度 (mm/min) Feed rate		回転数 (mm/rev) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm/rev) Revolution		送り速度 (mm/min) Feed rate		回転数 (mm/rev) Revolution	
	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed	Standard	High Speed
0.2	320	-	25000	-	300	-	25000	-	270	-	25000	-
0.3	520	-	25000	-	480	-	25000	-	390	-	25000	-
0.4	730	-	25000	-	590	-	21900	-	450	-	19100	-
0.5	1120	1320	23850	25000	710	1150	17500	25000	560	970	15300	25000
0.75	1150	2400	15900	25000	720	1850	11650	25000	730	1370	10200	19100
1	870	1830	11950	21500	540	1310	8750	18300	500	970	7650	14300
1.5	860	1710	7950	14300	540	1280	5850	1200	470	940	5100	9550
2	800	1640	5950	10750	510	1250	4400	9150	460	910	3800	7150
2.5	770	1810	4750	8600	490	1300	3500	7300	420	950	3050	5750
3	700	1430	4000	7150	440	1100	2900	6100	420	830	2550	4750
4	620	1350	3000	5350	400	1050	2200	4600	380	780	1900	3600
5	560	1260	2400	4300	350	950	1750	3650	350	720	1550	2850
6	500	1170	2000	3600	300	830	1450	3050	310	640	1250	2400
加工内容 Processing	Ad		Pf		Ad		Pf		Ad		Pf	
粗加工	≤0.1D	≤0.08D	≤0.3D	≤0.24D	≤0.07D	≤0.05D	≤0.21D	≤0.15D	≤0.07D	≤0.05D	≤0.21D	≤0.15D
精加工	≤0.03D	≤0.02D	≤0.1D	≤0.05D	≤0.02D	≤0.01D	≤0.05D	≤0.05D	≤0.02D	≤0.01D	≤0.05D	≤0.05D

テーパネック Taper Neck

Square スクエア

Radius ラジオス

Ball ボール

Long Neck ロングネック

Roughing ロファイニング

Chamfering 面取り加工用

Drill ドリル

CX200 3枚刃 / 4枚刃 20° ラフィングエンドミル

CX200 3・4-Flute 20° Roughing End Mill

CX200-RER

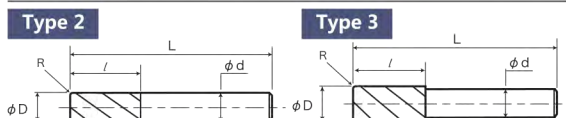
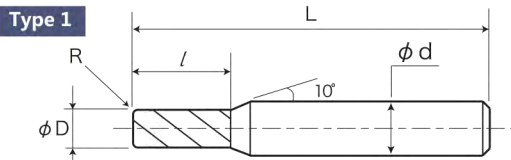


CX200-RER4100

Model Flute D

特性 Features

- CX200-Coating have high oxidation resistance and hardening which exceeds the existing coating and provides long tool life, and suitable for high speed processing and dry milling.
- Best for high speed processing and groove milling due to the high chip ejection.
- The fine pitch nick, will hardly cause chipping when processing stainless steel, alloy steel and other hard-to-cut material, also, ensure tool long life and high-efficiency surface finishing after processing.
- CKK Original design Chip pocket enables similar or same cutting depth which 3-flutes could realize



外径公差 Tolerance
+0.06
-0.06



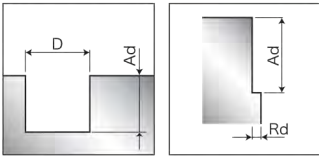
炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	○			○	○	○	○			

◎ = Best ○ = Good

MODEL 型番	D 外径	l 刃長	L 全長	d シャンク径	Flute	Type
CX200-RER3030	3	15	60	6	3	1
CX200-RER3040	4	15	60	6	3	1
CX200-RER3050	5	15	60	6	3	1
CX200-RER3060	6	15	60	6	3	2
CX200-RER4080	8	20	75	8	4	2
CX200-RER4090	9	20	75	10	4	1
CX200-RER4100	10	25	75	10	4	2
CX200-RER4110	11	25	75	12	4	1
CX200-RER4120	12	30	100	12	4	2
CX200-RER4130	13	30	100	12	4	3
CX200-RER4140	14	35	100	12	4	3
CX200-RER4160	16	40	110	16	4	2
CX200-RER4180	18	45	110	16	4	3
CX200-RER4200	20	45	130	20	4	2

CX200-RER

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

溝切削 Slotting

被削材 Work Material	炭素鋼 Carbon Steel S45~S55C		合金工具鋼 Alloy Steel Tool Steel SKD.SCM		調質鋼 Prehardened Steel 35~40HRC.HP.M.NAK	
	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution
3	340	6800	240	5500	190	4800
4	340	5100	230	4100	190	3600
5	340	4500	240	3300	170	3100
6	340	4000	240	2500	190	2800
8	380	2900	270	2200	210	2100
9	400	2700	290	2000	230	1800
10	390	2400	280	1700	230	1700
11	400	2200	270	1600	230	1500
12	390	2000	280	1400	220	1400
13	350	1800	250	1400	210	1300
14	330	1700	250	1200	190	1200
16	290	1500	210	1200	160	1000
18	270	1400	190	1100	160	1000
20	230	1200	180	1000	140	900
Ad	≤0.4D				≤0.3D	

側面切削 Side Milling

被削材 Work Material	炭素鋼 Carbon Steel S45~S55C		合金工具鋼 Alloy Steel Tool Steel SKD.SCM		調質鋼 Prehardened Steel 35~40HRC.HP.M.NAK	
	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution
3	530	8500	370	6900	290	5900
4	530	6400	370	5200	290	4500
5	530	5600	370	4500	290	4200
6	530	5000	370	4100	290	3500
8	600	3700	420	3100	330	2600
9	610	3300	440	2700	360	2300
10	610	3000	440	2500	360	2100
11	610	2700	440	2200	360	1900
12	610	2500	440	2000	360	1800
13	560	2300	400	1800	320	1600
14	510	2100	400	1800	300	1500
16	460	1900	330	1500	260	1300
18	410	1700	310	1400	240	1200
20	370	1500	260	1200	220	1100
Ad	≤1.5D				≤1.5D	
Rd	≤0.3D				≤0.2D	

ラフィング
Roughingスクエア
Squareラジアス
Radiusボール
Ballロングネック
Long Neckラフィング
Roughing面取り加工用
Chamferingドリル
Drill

CX200 3枚刃 / 4枚刃 45° ラフィングエンドミル

CX200 3・4-Flute 45° Roughing End Mill

CX200-HRER



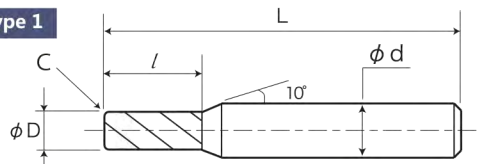
CX200-HRER4100

Model Flute D

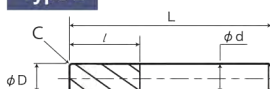
特性 Features

- CX200 Coating have high oxidation resistance and hardening which exceed the existing coating and provides long tool life, and suitable for high speed processing and dry milling
- 45° Helix blade achieves high-feed operation.
- The fine pitch nick achieves high accurate surface roughness after processing

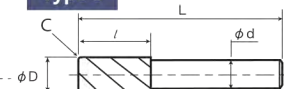
Type 1



Type 2



Type 3



MG
超微粒



外径公差 Tolerance
+0.06
-0.06



CX200
Coat

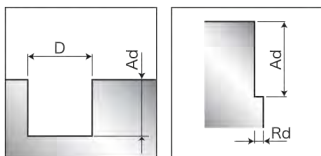
炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
			~45HRC	~55HRC	~60HRC	~65HRC							
◎	◎	◎	◎	○			○	○	○	○			

◎ = Best ○ = Good

MODEL 型番	D 外径	l 刃長	L 全長	d シャンク径	Flute	Type
CX200-HRER3030	3	15	60	6	3	1
CX200-HRER3040	4	15	60	6	3	1
CX200-HRER3050	5	15	60	6	3	1
CX200-HRER3060	6	15	60	6	3	2
CX200-HRER4080	8	20	75	8	4	2
CX200-HRER4090	9	20	75	10	4	1
CX200-HRER4100	10	25	75	10	4	2
CX200-HRER4110	11	25	75	12	4	1
CX200-HRER4120	12	30	100	12	4	2
CX200-HRER4130	13	30	100	12	4	3
CX200-HRER4140	14	35	100	12	4	3
CX200-HRER4160	16	40	110	16	4	2
CX200-HRER4180	18	45	110	16	4	3
CX200-HRER4200	20	45	130	20	4	2

CX200-HRER

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

溝切削 Slotting

被削材 Work Material	炭素鋼 Carbon Steel S 45~S55 C		合金鋼 工具鋼 Alloy Steel Tool Steel SKD,SCM		調質鋼 Prehardened Steel 35~40HRC,HPM,NAK	
外径 (mm) Diameter	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution
3	680	11500	420	8500	330	7100
4	680	9500	420	7100	330	6000
5	680	8100	430	6000	330	5000
6	680	7500	430	5600	340	4700
8	770	5600	480	4200	380	3500
9	770	5000	480	3700	380	3100
10	770	4500	480	3300	380	2800
11	770	4100	490	3100	380	2500
12	760	3700	490	2800	380	2300
13	720	3500	430	2500	360	2200
14	660	3200	420	2400	330	2000
16	720	2800	370	2100	300	1800
18	640	2500	310	1800	260	1600
20	570	2200	300	1700	230	1400
Ad	≤0.4D				≤0.3D	

側面切削 Side Milling

被削材 Work Material	炭素鋼 Carbon Steel S 45~S55 C		合金鋼 工具鋼 Alloy Steel Tool Steel SKD,SCM		調質鋼 Prehardened Steel 35~40HRC,HPM,NAK	
外径 (mm) Diameter	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution	送り速度 (mm/min) Feed rate	回転数 (mm ⁻¹) Revolution
3	900	15900	660	10600	520	8900
4	900	11900	660	8800	520	7500
5	900	9500	660	7400	520	6300
6	900	9300	660	6900	520	5800
8	1200	7000	750	5200	600	4400
9	1200	6200	750	4600	600	3900
10	1200	5600	750	4100	600	3500
11	1200	5100	750	3800	600	3200
12	1200	4700	750	3400	600	2900
13	1100	4300	690	3200	560	2700
14	1030	4000	640	3000	520	2500
16	900	3500	560	2600	460	2200
18	800	3100	500	2300	390	1900
20	720	2800	450	2100	370	1800
Ad	≤1.5D				≤1.5D	
Rd	≤0.3D				≤0.2D	

ラフィング
Roughingスクエア
Squareラジアス
Radiusボール
Ballロングネック
Long Neckラフィング
Roughing面取り加工用
Chamferingドリル
Drill

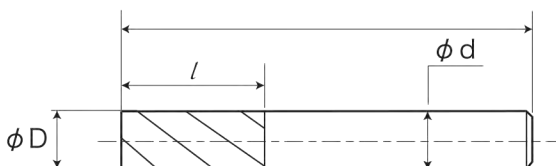
CX200 3枚刃ステンレス加工用ラフィングエンドミル

CX200 3-Flute Roughing End Mill for Stainless steel

CX200-SURE


CX200-SURE3100

Model Flute D



特性 Features

- CX200 Coating have high oxidation resistance and hardening which exceed the existing coating and provides long tool life, and suitable for high speed processing and dry milling
- Flat shape of peripheral blade nick divides chips and minimizes cutting resistance.
- Deep chip pocket design gives efficient chip flow
- 3Flutes minimize chattering when processing and achieves stable processing


MG
超微粒


外径 Diameter	公差 Tolerance
6	$\begin{smallmatrix} 0 \\ -0.035 \end{smallmatrix}$
8・10	$\begin{smallmatrix} 0 \\ -0.040 \end{smallmatrix}$
12・16・20	$\begin{smallmatrix} 0 \\ -0.045 \end{smallmatrix}$

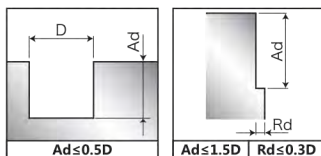
40°
CX200
Coat

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
			~45HRC	~55HRC	~60HRC	~65HRC							
◎	◎	◎	○					◎	○	○			

◎ = Best ○ = Good

MODEL 型番	D 外径	l 刃長	L 全長	d シャンク径
CX200-SURE3060	6	15	60	6
CX200-SURE3080	8	20	75	8
CX200-SURE3100	10	25	75	10
CX200-SURE3120	12	30	100	12
CX200-SURE3160	16	40	100	16

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	ステンレス (SUS303/304)			
	送り速度 Feed Rate (mm/min)		回転数 Revolution (min ⁻¹)	
	溝切削 Slotting	側面切削 Side Milling	溝切削 Slotting	側面切削 Side Milling
外径 (mm) Diameter				
6	180	590	3690	4100
8	190	600	2790	3100
10	200	610	2250	2500
12	190	610	1800	2000
16	190	610	1350	1500

CX200 ステンレス用面取り加工エンドミル

CX200 Chamfering End Mill for Stainless steel

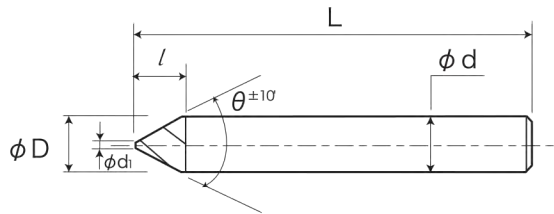
CX200-SUCH



CX200-SUCH10

Model

d



特性 Features

- CX200 Coating have high oxidation resistance and hardening which exceed the existing coating and provides long tool life, and suitable for high speed processing and dry milling
- Sharp helical blades design minimize deburring after processing and achieves high accurate surface finishing

外径公差 Tolerance
0
-0.02

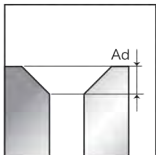


炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
~45HRC	~55HRC	~60HRC	~65HRC										
◎	◎	◎	◎	○				◎	○	○			

◎ = Best ○ = Good

MODEL 型番	d1	D 外径	θ	l 刃長	L 全長	d シャンク径
CX200-SUCH3	0.8	3	90	1.1	50	3
CX200-SUCH4	0.8	4	90	1.6	50	4
CX200-SUCH6	1	6	90	2.5	60	6
CX200-SUCH8	1	8	90	3.5	60	8
CX200-SUCH10	1	10	90	4.5	65	10
CX200-SUCH12	1	12	90	5.5	75	12

推奨切削条件 Standard Milling Condition



- The table show standard milling guidance of perforating process as written picture
- Use a rigid and precise machine and tool holder
- Select a cutting fluid appropriate to the particular usage
- In case the revolution could not be increased by the machine used, Please reduce feed speed and revolution speed at same ration
- When mounting End Mills, The run out of the till will have to be set within 0.01mm

被削材 Work Material	ステンレス (SUS303/304)			
外径 (mm) Diameter	送り速度 Feed Rate (mm/min)		回転数 Revolution (min ⁻¹)	
	穴面取り	角面取り	穴面取り	角面取り
3	360	140	4070	
4	350	170	3380	
6	290	190	2040	
8	280	190	1540	
10	260	180	1210	
12	260	170	1050	
Ad	≤0.1D			

面取り加工用 Chamfering

スクエア Square

ラジアス Radius

ボール Ball

ロングネック Long Neck

ラフィング Roughing

面取り加工用 Chamfering

ドリル Drill

複合ネジレドリル ショート

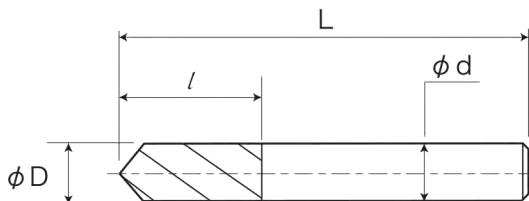
Dual Lead Drill Short

TA-DRS



TA-DRS 5

Model D



特 性 Features

- Apply variable lead type technology use helix degree 30° at the edge of drill and 20° from middle of drill until shank
- CKK Original design 20° of helix from middle of drill until shank can use extend tool life belong.
- Employs TiAlN Coating.

MG
超微粒

30°/20°

Point Angle
145°TiAlN
Coat

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ = Best ○ = Good

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-DRS3	3	20	50	4
TA-DRS3.3	3.3			
TA-DRS3.5	3.5			
TA-DRS4	4	24	60	6
TA-DRS4.2	4.2			
TA-DRS4.5	4.5			
TA-DRS5	5	30	80	8
TA-DRS5.5	5.5			
TA-DRS6	6			
TA-DRS6.5	6.5	34	80	8
TA-DRS6.8	6.8			

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-DRS7	7	42	90	8
TA-DRS7.5	7.5			
TA-DRS7.8	7.8			
TA-DRS8	8	47	105	10
TA-DRS8.5	8.5			
TA-DRS9	9			
TA-DRS10	10	55	115	12
TA-DRS10.3	10.3			
TA-DRS11	11			
TA-DRS12	12	60	120	14
TA-DRS13	13			

推奨切削条件 Standard Milling Condition

被削材 Work Material	深さ/加工径 L/D	切削速度 V(m/min)	N= 回転数 (min) f= 送り量 (mm/rev)						
			直径 D=3	4	5	6	8	10	13
一般鋼 (SS, Steel)	5 × D	100-120	N=10620 f=0.110	7960 0.125	6370 0.160	5310 0.160	3980 0.250	3190 0.300	2450 0.315
合金鋼, 工具鋼 (SUJ2, SKD11, SKD12)		50-70	N=5310 f=0.090	3980 0.125	3180 0.130	2650 0.150	1990 0.180	1590 0.200	1230 0.250
ステンレス鋼 (SUS303, SUS304, SUS416)		40-50	N=4250 f=0.096	3180 0.100	2550 0.100	2120 0.120	1590 0.160	1270 0.200	980 0.21
調質鋼 (40~48HRC)		35-45	N=3720 f=0.060	2790 0.100	2230 0.100	1860 0.120	1390 0.160	1120 0.200	860 0.210
アルミニウム合金 Aluminium Alloy		100-120	N=10620 f=0.160	7960 0.200	6370 0.250	5310 0.300	3980 0.315	3190 0.400	2450 0.500

複合ネジレドリル レギュラー

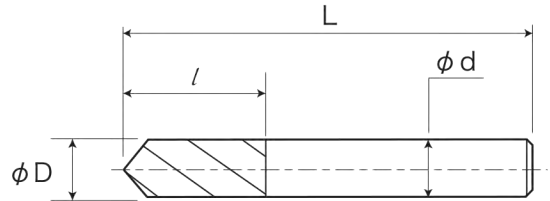
Dual Lead Drill Regular

TA-DRR



TA-DRR 5

Model D



特性 Features

- 2Flute eliminates chattering and design special gash for increase process efficiently.
- Design 2Flute for absorb resistance when processing
- Use material micro grain carbide.
- Employs TiAlN Coating

直径 D	公差 (h7)	柄径 d	公差 (h6)
3	0 - 0.010	4・6	0 - 0.008
3.3~6	0 - 0.012	8・10	0 - 0.009
6.5~10	0 - 0.015	12・14	0 - 0.011
10.3~13	0 - 0.018		

MG
超微粒

30°→20°

Point Angle
145°TiAlN
Coat

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
~45HRC	~55HRC	~60HRC	~65HRC										
◎	◎	◎	◎	○			○	◎			○		

◎ = Best ○ = Good

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-DRR3	3	28	60	4
TA-DRR3.3	3.3			
TA-DRR3.5	3.5			
TA-DRR4	4	36	80	6
TA-DRR4.2	4.2			
TA-DRR4.5	4.5			
TA-DRR5	5	44	90	8
TA-DRR5.5	5.5			
TA-DRR6	6			
TA-DRR6.5	6.5	53	110	8
TA-DRR6.8	6.8			

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-DRR7	7	53	110	8
TA-DRR7.5	7.5			
TA-DRR7.8	7.8			
TA-DRR8	8	61	120	10
TA-DRR8.5	8.5			
TA-DRR9	9			
TA-DRR10	10	71	130	12
TA-DRR10.3	10.3			
TA-DRR11	11			
TA-DRR12	12	73	140	14
TA-DRR13	13			

推奨切削条件 Standard Milling Condition

被削材 Work Material	深さ/加工径 L/D	切削速度 V(m/min)	N= 回転数 (min) f= 送り量 (mm/rev)						
			直径 D=3	4	5	6	8	10	13
普通鋼 (SS. 鋼)	5 × D	100-120	N=10620 f=0.110	7960 0.125	6370 0.160	5310 0.160	3980 0.250	3190 0.300	2450 0.315
合金工具鋼 (SUJ2.SKD11.SKD12)		50-70	N=5310 f=0.090	3980 0.125	3180 0.130	2650 0.150	1990 0.180	1590 0.200	1230 0.250
ステンレス鋼 (SUS303.SUS304.SUS416)		40-50	N=4250 f=0.096	3180 0.100	2550 0.100	2120 0.120	1590 0.160	1270 0.200	980 0.21
調質鋼 (40~48HRC)		35-45	N=3720 f=0.060	2790 0.100	2230 0.100	1860 0.120	1390 0.160	1120 0.200	860 0.210
アルミニウム合金 Aluminium Alloy		100-120	N=10620 f=0.160	7960 0.200	6370 0.250	5310 0.300	3980 0.315	3190 0.400	2450 0.500

ドリル Drill

スクエア Square

ラジアス Radius

ボール Ball

ロングネック Long Neck

ラフィング Roughing

面取り加工用 Chamfering

ドリル Drill

3 枚刃ドリル ショート

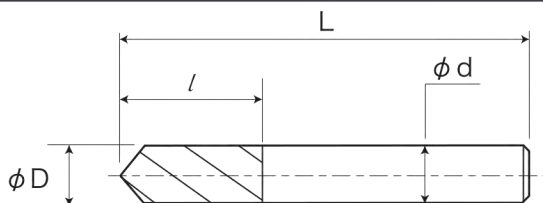
3-Flute Drill Short

TA-3DS



TA-3DS 5

Model D



特 性 Features

- 3Flute eliminates chattering and design special gash for increase process efficiently.
- Design 3Flute for absorb resistance when processing
- Use material micro grain carbide.
- Employs TiAlN Coating

直径 D 柄径 d	公差 (h6)
3	0 - 0.006
3.3 ~ 6	0 - 0.008
6.5 ~ 10	0 - 0.009
10.3 ~ 13	0 - 0.011

MG
超微粒

30°

Point Angle
140°TiAlN
Coat

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	○			○	○					

◎ = Best ○ = Good

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-3DS3	3	20	50	4
TA-3DS3.3	3.3			
TA-3DS3.5	3.5			
TA-3DS4	4	24	60	6
TA-3DS4.2	4.2			
TA-3DS4.5	4.5			
TA-3DS5	5	30	70	8
TA-3DS5.5	5.5			
TA-3DS6	6			
TA-3DS6.5	6.5	34	70	8
TA-3DS6.8	6.8			

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-3DS7	7	34	70	8
TA-3DS8	8	41	90	
TA-3DS8.5	8.5	47	100	10
TA-3DS9	9			
TA-3DS10	10			
TA-3DS10.3	10.3	55	105	12
TA-3DS11	11			
TA-3DS12	12			
TA-3DS13	13	60	110	14

推奨切削条件 Standard Milling Condition

被削材 Work Material	普通鋼 Steel S 45-S55 C		合金鋼 工具鋼 Alloy Steel Tool Steel SKD.SCM		調質鋼 Hardened Steel 35-40HRC.HPM.NAK	
切削速度 Cutting Speed	60~100(m/min)		70~70(m/min)		20~50(m/min)	
直径 (mm) Diameter	送り速度 (m/min) Feed rate	回転数 (min ⁻¹) Revolution	送り速度 (m/min) Feed rate	回転数 (min ⁻¹) Revolution	送り速度 (m/min) Feed rate	回転数 (min ⁻¹) Revolution
2	0.083	11090	0.075	7940	0.058	5550
3	0.10	7400	0.09	5300	0.08	3700
4	0.12	5600	0.10	4000	0.09	2800
5	0.14	4500	0.12	3200	0.10	2200
6	0.18	3700	0.16	2700	0.14	1900
8	0.20	2800	0.18	2000	0.16	1400
10	0.25	2200	0.20	1600	0.18	1100
12	0.30	1700	0.25	1200	0.20	900

3 枚刃ドリル レギュラー

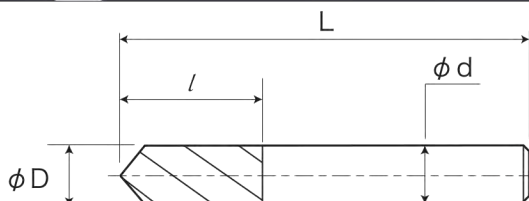
3-Flute Drill Regular

TA-3DR



TA-3DR 5

Model D



特性 Features

- 3Flute eliminates chattering and design special gash for increase process efficiently.
- Design 3Flute for absorb resistance when processing
- Use material micro grain carbide. And then Employs TiAIN Coating
- Suitable for S45C/SCM440 until steel

MG
超微粒

30°

Point Angle
140°TiAIN
Coat

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
			~45HRC	~55HRC	~60HRC	~65HRC							
◎	◎	◎	◎	○			○	○					

◎ = Best ○ = Good

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-3DR2	2	18	50	3
TA-3DR2.5	2.5	22		
TA-3DR3	3	28	60	4
TA-3DR3.3	3.3			
TA-3DR3.5	3.5			
TA-3DR4	4	36	80	6
TA-3DR4.2	4.2			
TA-3DR4.5	4.5			
TA-3DR5	5	44	90	
TA-3DR5.5	5.5			
TA-3DR6	6			

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-3DR6.5	6.5	53	110	8
TA-3DR6.8	6.8			
TA-3DR7	7			
TA-3DR8	8	61	120	10
TA-3DR8.5	8.5			
TA-3DR9	9			
TA-3DR10	10	71	130	12
TA-3DR10.3	10.3			
TA-3DR11	11			
TA-3DR12	12	77	140	14
TA-3DR13	13			

推奨切削条件 Standard Milling Condition

被削材 Work Material	普通鋼 Steel S45-S55C		合金鋼 工具鋼 Alloy Steel Tool Steel SKD, SCM		調質鋼 Prehardened Steel 35-40HRC, HPM, NAK	
切削速度 Cutting Speed	60~100(m/min)		70~70(m/min)		20~50(m/min)	
直径 (mm) Diameter	送り速度 (m/min) Feed rate	回転数 (min ⁻¹) Revolution	送り速度 (m/min) Feed rate	回転数 (min ⁻¹) Revolution	送り速度 (m/min) Feed rate	回転数 (min ⁻¹) Revolution
2	0.083	11090	0.075	7940	0.058	5550
3	0.10	7400	0.09	5300	0.08	3700
4	0.12	5600	0.10	4000	0.09	2800
5	0.14	4500	0.12	3200	0.10	2200
6	0.18	3700	0.16	2700	0.14	1900
8	0.20	2800	0.18	2000	0.16	1400
10	0.25	2200	0.20	1600	0.18	1100
12	0.30	1700	0.25	1200	0.20	900

ドリル Drill

スクエア Square

ラジアス Radius

ボール Ball

ロングネック Long Neck

ラフィング Roughing

面取り加工作 Chamfering

ドリル Drill

CX500 マイクロドリル

CX500 Micro Drill

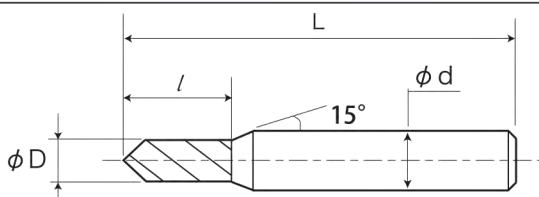
CX500-MD



CX500-MD 0.1

Model

D



特 性 Features

- Stable long-lived machining can be achieved for precision small hole drilling of steels.
- Wide Drilling application is available from Wrought steel to hardness steel (HRC50)

直径 D	公差 (h6)
0.1~0.5	$\begin{smallmatrix} 0 \\ -0.005 \end{smallmatrix}$
0.5~0.9	$\begin{smallmatrix} 0 \\ -0.01 \end{smallmatrix}$
1	$\begin{smallmatrix} 0 \\ -0.015 \end{smallmatrix}$



炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
~45HRC	~55HRC	~60HRC	~65HRC										
◎	◎	◎	◎	◎	○		○	◎			◎		

◎ = Best ○ = Good

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
CX500-MD0.1	0.1	1.2		
CX500-MD0.11	0.11			
CX500-MD0.12	0.12	1.4		
CX500-MD0.13	0.13			
CX500-MD0.14	0.14			
CX500-MD0.15	0.15	1.8		
CX500-MD0.16	0.16			
CX500-MD0.17	0.17			
CX500-MD0.18	0.18	2.1		
CX500-MD0.19	0.19			
CX500-MD0.2	0.2	2.4		
CX500-MD0.21	0.21			
CX500-MD0.22	0.22	2.6		
CX500-MD0.23	0.23			
CX500-MD0.24	0.24			
CX500-MD0.25	0.25	3		
CX500-MD0.26	0.26			
CX500-MD0.27	0.27	3.3		
CX500-MD0.28	0.28			
CX500-MD0.29	0.29			
CX500-MD0.3	0.3			
CX500-MD0.31	0.31			
CX500-MD0.32	0.32			
CX500-MD0.33	0.33			
CX500-MD0.34	0.34			
CX500-MD0.35	0.35			
CX500-MD0.36	0.36			
CX500-MD0.37	0.37			
CX500-MD0.38	0.38			
CX500-MD0.39	0.39			
CX500-MD0.4	0.4			
CX500-MD0.41	0.41			
CX500-MD0.42	0.42			
CX500-MD0.43	0.43			
CX500-MD0.44	0.44			
CX500-MD0.45	0.45			
CX500-MD0.46	0.46			
CX500-MD0.47	0.47			
CX500-MD0.48	0.48			
CX500-MD0.49	0.49			
CX500-MD0.5	0.5			
CX500-MD0.51	0.51			
CX500-MD0.52	0.52			
CX500-MD0.53	0.53			
CX500-MD0.54	0.54			
CX500-MD0.55	0.55			

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
CX500-MD0.56	0.56	6		
CX500-MD0.57	0.57			
CX500-MD0.58	0.58			
CX500-MD0.59	0.59			
CX500-MD0.6	0.6			
CX500-MD0.61	0.61			
CX500-MD0.62	0.62			
CX500-MD0.63	0.63			
CX500-MD0.64	0.64			
CX500-MD0.65	0.65			
CX500-MD0.66	0.66			
CX500-MD0.67	0.67			
CX500-MD0.68	0.68			
CX500-MD0.69	0.69			
CX500-MD0.7	0.7			
CX500-MD0.71	0.71			
CX500-MD0.72	0.72			
CX500-MD0.73	0.73			
CX500-MD0.74	0.74			
CX500-MD0.75	0.75			
CX500-MD0.76	0.76			
CX500-MD0.77	0.77			
CX500-MD0.78	0.78			
CX500-MD0.79	0.79			
CX500-MD0.8	0.8			
CX500-MD0.81	0.81			
CX500-MD0.82	0.82			
CX500-MD0.83	0.83			
CX500-MD0.84	0.84			
CX500-MD0.85	0.85			
CX500-MD0.86	0.86			
CX500-MD0.87	0.87			
CX500-MD0.88	0.88			
CX500-MD0.89	0.89			
CX500-MD0.9	0.9			
CX500-MD0.91	0.91			
CX500-MD0.92	0.92			
CX500-MD0.93	0.93			
CX500-MD0.94	0.94			
CX500-MD0.95	0.95			
CX500-MD0.96	0.96			
CX500-MD0.97	0.97			
CX500-MD0.98	0.98			
CX500-MD0.99	0.99			
CX500-MD1	1	10		

推奨切削条件 Standard Milling Condition

CX500-MD

被削材 Work Material	炭素鋼 Carbon Steel S50C		合金鋼 Alloy Steel SCM5KS		調質鋼 Prehardend steel HPM, NAK		アルミニウム合金 Aluminium Alloy		ステンレス鋼 Stainless Steel SUS303, SUS304	
直径 (mm) Diameter	回転数 (min^{-1}) Revolution	送り速度 (mm/min) Feed rate	回転数 (min^{-1}) Revolution	送り速度 (mm/min) Feed rate	回転数 (min^{-1}) Revolution	送り速度 (mm/min) Feed rate	回転数 (min^{-1}) Revolution	送り速度 (mm/min) Feed rate	回転数 (min^{-1}) Revolution	送り速度 (mm/min) Feed rate
0.10	25000	50	20000	40	17000	35	25000	50	15000	30
0.15	25000	50	20000	40	17000	35	25000	50	15000	30
0.20	25000	75	20000	60	17000	50	25000	100	15000	45
0.25	25000	75	20000	60	17000	50	25000	100	15000	45
0.30	20000	120	15000	60	13000	50	22000	400	11000	45
0.35	20000	120	15000	60	13000	50	22000	400	11000	45
0.40	20000	160	15000	75	13000	65	22000	700	8500	45
0.45	20000	160	15000	75	13000	65	22000	700	8500	45
0.50	18000	180	13000	100	10000	80	20000	1000	7000	55
0.55	18000	180	13000	100	10000	80	20000	1000	7000	55
0.60	18000	360	13000	100	10000	80	20000	1000	7000	55
0.65	18000	360	13000	100	10000	80	20000	1000	7000	55
0.70	16000	480	11000	110	8000	80	18000	1100	6000	60
0.75	16000	480	11000	110	8000	80	18000	1100	6000	60
0.80	16000	640	11000	220	8000	160	18000	1100	6000	120
0.85	16000	640	11000	220	8000	160	18000	1100	6000	120
0.90	15000	750	9000	270	7000	210	16000	1200	5000	150
0.95	15000	750	9000	270	7000	210	16000	1200	5000	150
1.00	15000	750	9000	270	7000	210	16000	1200	5000	150

ドリル Drill

スクエア
Squareラジアス
Radiusボール
Ballロングネック
Long Neckラフニング
Roughing面取り加工用
Chamferingドリル
Drill

高速加工用ドリル

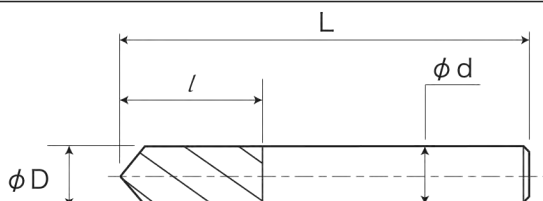
High Speed Drill

TA-HSD



TA-HSD 5

Model D



特性 Features

- Suitable for S45C/SCM440 until hardness steel (HRC45)
- Special design of character and then have merit for flow of cutting

直径 D	柄径 d	公差 (h6)
3		0 - 0.010
3.3~6		0 - 0.012
6.5~10		0 - 0.015
10.3~13		0 - 0.018

MG
超微粒

30°

Point Angle
140°TiAlN
Coat

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	○			○	○					

◎ = Best ○ = Good

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径		
TA-HSD3	3	25	50	3		
TA-HSD3.1	3.1	27	60	4		
TA-HSD3.2	3.2					
TA-HSD3.3	3.3	30				
TA-HSD3.4	3.4					
TA-HSD3.5	3.5	33	70	6		
TA-HSD3.6	3.6					
TA-HSD3.7	3.7	36				
TA-HSD3.8	3.8					
TA-HSD3.9	3.9	39	80	8		
TA-HSD4	4					
TA-HSD4.1	4.1	43			90	10
TA-HSD4.2	4.2					
TA-HSD4.3	4.3	47				
TA-HSD4.4	4.4					
TA-HSD4.5	4.5	52	100	12		
TA-HSD4.6	4.6					
TA-HSD4.7	4.7	56			110	14
TA-HSD4.8	4.8					
TA-HSD4.9	4.9	61	120	16		
TA-HSD5	5					
TA-HSD5.1	5.1	65			130	18
TA-HSD5.2	5.2					
TA-HSD5.3	5.3	71	140	20		
TA-HSD5.4	5.4					
TA-HSD5.5	5.5	77			150	22
TA-HSD5.6	5.6					
TA-HSD5.7	5.7	83	160	24		
TA-HSD5.8	5.8					
TA-HSD5.9	5.9	89			170	26
TA-HSD6	6					
TA-HSD6.1	6.1	95	180	28		
TA-HSD6.2	6.2					
TA-HSD6.3	6.3	101			190	30
TA-HSD6.4	6.4					
TA-HSD6.5	6.5	107	200	32		
TA-HSD6.6	6.6					
TA-HSD6.7	6.7	113			210	34
TA-HSD6.8	6.8					
TA-HSD6.9	6.9	119	220	36		
TA-HSD7	7					

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-HSD7	7	52	90	8
TA-HSD7.1	7.1			
TA-HSD7.2	7.2			
TA-HSD7.3	7.3			
TA-HSD7.4	7.4			
TA-HSD7.5	7.5			
TA-HSD7.6	7.6			
TA-HSD7.7	7.7			
TA-HSD7.8	7.8	56	100	
TA-HSD7.9	7.9			
TA-HSD8	8			
TA-HSD8.1	8.1			
TA-HSD8.2	8.2			
TA-HSD8.3	8.3			
TA-HSD8.4	8.4			
TA-HSD8.5	8.5			
TA-HSD8.6	8.6	61	100	10
TA-HSD8.7	8.7			
TA-HSD8.8	8.8			
TA-HSD8.9	8.9			
TA-HSD9	9			
TA-HSD9.1	9.1			
TA-HSD9.2	9.2			
TA-HSD9.3	9.3			
TA-HSD9.4	9.4	65	110	12
TA-HSD9.5	9.5			
TA-HSD9.6	9.6			
TA-HSD9.7	9.7			
TA-HSD9.8	9.8			
TA-HSD9.9	9.9			
TA-HSD10	10			
TA-HSD10.1	10.1			
TA-HSD10.2	10.2	71	120	
TA-HSD10.3	10.3			
TA-HSD10.4	10.4			
TA-HSD10.5	10.5			
TA-HSD10.6	10.6			
TA-HSD10.7	10.7			
TA-HSD10.8	10.8			
TA-HSD10.9	10.9			

TA-HSD

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-HSD11	11	71	120	12
TA-HSD11.1	11.1			
TA-HSD11.2	11.2			
TA-HSD11.3	11.3			
TA-HSD11.4	11.4			
TA-HSD11.5	11.5			
TA-HSD11.6	11.6			
TA-HSD11.7	11.7			
TA-HSD11.8	11.8			
TA-HSD11.9	11.9			
TA-HSD12	12	76	130	16
TA-HSD12.1	12.1			
TA-HSD12.2	12.2			
TA-HSD12.3	12.3			
TA-HSD12.4	12.4			
TA-HSD12.5	12.5			
TA-HSD12.6	12.6			
TA-HSD12.7	12.7			
TA-HSD12.8	12.8			
TA-HSD12.9	12.9			
TA-HSD13	13	80	135	16
TA-HSD13.1	13.1			
TA-HSD13.2	13.2			
TA-HSD13.3	13.3			
TA-HSD13.4	13.4			
TA-HSD13.5	13.5			
TA-HSD13.6	13.6			
TA-HSD13.7	13.7			
TA-HSD13.8	13.8			
TA-HSD13.9	13.9			

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-HSD14	14	80	135	16
TA-HSD14.1	14.1			
TA-HSD14.2	14.2			
TA-HSD14.3	14.3			
TA-HSD14.4	14.4			
TA-HSD14.5	14.5			
TA-HSD14.6	14.6			
TA-HSD14.7	14.7			
TA-HSD14.8	14.8			
TA-HSD14.9	14.9			
TA-HSD15	15	85	145	16
TA-HSD15.1	15.1			
TA-HSD15.2	15.2			
TA-HSD15.3	15.3			
TA-HSD15.4	15.4			
TA-HSD15.5	15.5			
TA-HSD15.6	15.6			
TA-HSD15.7	15.7			
TA-HSD15.8	15.8			
TA-HSD15.9	15.9			
TA-HSD16	16			

推奨切削条件 Standard Milling Condition

被削材 Work Material	炭素鋼、合金鋼 SS400, SCM		特殊鋼 SUJ2, SUS440		特殊鋼、調質鋼 SKD61(34~43HRC)		特殊鋼、調質鋼 (43~48HRC)		特殊鋼、調質鋼 SKD11(48~53HRC)		鋳鉄 FC250		ダクタイル鋳鉄 FCD400	
切削速度 Cutting Speed	25~36m/min		80~125m/min		25~36m/min		80~125m/min		25~36m/min		80~125m/min		63~90m/min	
直径 (mm) Diameter	送り量 (mm/min) Feed Rate	回転数 (min. ⁻¹) Revolution	送り量 (mm/min) Feed Rate	回転数 (min. ⁻¹) Revolution	送り量 (mm/min) Feed Rate	回転数 (min. ⁻¹) Revolution	送り量 (mm/min) Feed Rate	回転数 (min. ⁻¹) Revolution	送り量 (mm/min) Feed Rate	回転数 (min. ⁻¹) Revolution	送り量 (mm/min) Feed Rate	回転数 (min. ⁻¹) Revolution	送り量 (mm/min) Feed Rate	回転数 (min. ⁻¹) Revolution
3 ~	0.09~0.12	9600	0.09~0.12	7500	0.09~0.12	5300	0.07~0.11	4000	0.05~0.09	3200	0.09~0.12	10000	0.09~0.12	7600
4 ~	0.10~0.15	8000	0.10~0.15	5650	0.10~0.15	4000	0.08~0.13	3000	0.06~0.10	2600	0.10~0.15	8000	0.10~0.15	6000
5 ~	0.12~0.18	6400	0.12~0.18	4550	0.12~0.18	3300	0.10~0.15	2400	0.08~0.12	2000	0.12~0.18	6400	0.12~0.18	4800
6 ~	0.14~0.20	5300	0.14~0.20	3800	0.14~0.20	2750	0.12~0.18	2000	0.09~0.15	1700	0.14~0.20	5300	0.14~0.20	4000
8 ~	0.16~0.24	4000	0.16~0.24	2850	0.16~0.24	2100	0.14~0.22	1500	0.12~0.20	1300	0.16~0.24	4000	0.16~0.24	3000
10 ~	0.18~0.27	3200	0.18~0.27	2250	0.18~0.27	1700	0.15~0.25	1200	0.13~0.23	1000	0.18~0.27	3200	0.18~0.27	2400
12 ~	0.20~0.30	2650	0.20~0.30	1900	0.20~0.30	1400	0.17~0.26	1000	0.14~0.24	850	0.20~0.30	2700	0.20~0.30	2000
14 ~	0.22~0.35	2300	0.22~0.35	1600	0.22~0.35	1200	0.18~0.30	860	0.15~0.26	730	0.22~0.35	2300	0.22~0.35	1700
16 ~	0.25~0.36	2000	0.25~0.36	1400	0.25~0.36	1050	0.20~0.32	760	0.16~0.26	640	0.25~0.36	2000	0.25~0.36	1500

高速切削条件 High Speed Milling Condition

被削材 Work Material	炭素鋼、合金鋼 S5400, SCM		特殊鋼 SUJ2, SUJ5440		鋳鉄 FC250		ダクタイル鋳鉄 FCD400	
切削速度 Cutting Speed	125~150m/min		80~100m/min		125~150m/min		90~125m/min	
直径 (mm) Diameter	送り量 (mm/min) Feed Rate	回転数 (min ⁻¹) Revolution	送り量 (mm/min) Feed Rate	回転数 (min ⁻¹) Revolution	送り量 (mm/min) Feed Rate	回転数 (min ⁻¹) Revolution	送り量 (mm/min) Feed Rate	回転数 (min ⁻¹) Revolution
3 ~	0.09 ~ 0.12	13000	0.09 ~ 0.12	9500	0.09 ~ 0.12	14000	0.09 ~ 0.12	11000
4 ~	0.10 ~ 0.15	10000	0.10 ~ 0.15	7100	0.10 ~ 0.15	11000	0.10 ~ 0.15	8700
5 ~	0.12 ~ 0.18	8000	0.12 ~ 0.18	5700	0.12 ~ 0.18	9000	0.12 ~ 0.18	7000
6 ~	0.14 ~ 0.20	6650	0.14 ~ 0.20	4700	0.14 ~ 0.20	7500	0.14 ~ 0.20	5800
8 ~	0.16 ~ 0.24	5000	0.16 ~ 0.24	3600	0.16 ~ 0.24	5600	0.16 ~ 0.24	4400
10 ~	0.18 ~ 0.27	4000	0.18 ~ 0.27	2900	0.18 ~ 0.27	4500	0.18 ~ 0.27	3500
12 ~	0.20 ~ 0.30	3300	0.20 ~ 0.30	2400	0.20 ~ 0.30	3800	0.20 ~ 0.30	3000
14 ~	0.22 ~ 0.35	2900	0.22 ~ 0.35	2100	0.22 ~ 0.35	3200	0.22 ~ 0.35	2500
16	0.25 ~ 0.36	2500	0.25 ~ 0.36	1800	0.25 ~ 0.36	2800	0.25 ~ 0.36	2200

ドリル Drill

スクエア Square

ラジアス Radius

ボール Ball

ロングネック Long Neck

ラフィング Roughing

面取り加工用 Chamfering

ドリル Drill

ダブルマージンドリル

Double Margin Drill Regular

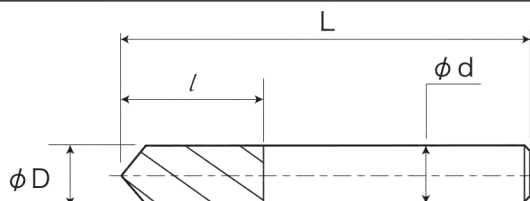
TA-WMD



TA-WMD 5

Model

D



特性 Features

- Suitable for S45C/SCM440 until Alloy steel
- Special design have efficacy for flow of cutting.
- Use material micro grain carbide. And then Employs TiAlN Coating

直径 D	柄径 d	公差 (h6)
3		0 - 0.006
3.3 ~ 6		0 - 0.008
6.5 ~ 10		0 - 0.009
10.3 ~ 13		0 - 0.011

MG
超微粒TiAlN
Coat

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Prehardened Steel	焼き入れ鋼 Hardened Steel				鋳鉄 Cast Iron	ステンレス鋼 Stainless Steels	アルミ合金 Aluminium Alloys	銅合金 Copper Alloys	チタン合金 耐熱合金 Ti/Ni Alloy	グラファイト Graphite	樹脂 Resin
◎	◎	◎	◎	○			○	○					

◎ = Best ○ = Good

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-WMD1	1	12	45	3
TA-WMD1.5	1.5	16		
TA-WMD2	2	20	50	
TA-WMD2.5	2.5	22		
TA-WMD3	3			
TA-WMD3.3	3.3	28	60	4
TA-WMD3.5	3.5			
TA-WMD4	4			
TA-WMD4.2	4.2	36	80	6
TA-WMD4.5	4.5			
TA-WMD5	5	44	90	
TA-WMD5.5	5.5			

MODEL 型番	D 直径	/ 刃長	L 全長	d 柄径
TA-WMD6	6	44	90	6
TA-WMD6.5	6.5			
TA-WMD6.8	6.8	53	110	8
TA-WMD7	7			
TA-WMD8	8			
TA-WMD8.5	8.5	61	120	10
TA-WMD9	9			
TA-WMD10	10			
TA-WMD10.3	10.3	71	130	12
TA-WMD11	11			
TA-WMD12	12	77	140	14
TA-WMD13	13			

推奨切削条件 Standard Milling Condition

被削材 Work Material	深さ/加工径 L/D	切削速度 V(m/min)	N=回転数 (min) f=送り量 (mm/rev)						
			直径 D=3	4	5	6	8	10	13
一般鋼 (SS, Steel)	5 × D	100-120	N=10620 f=0.110	7960 0.125	6370 0.160	5310 0.160	3980 0.250	3190 0.300	2450 0.315
合金鋼, 工具鋼 (SUJ2, SKD11, SKD12)		50-70	N=5310 f=0.090	3980 0.125	3180 0.130	2650 0.150	1990 0.180	1590 0.200	1230 0.250
ステンレス鋼 (SUS303, SUS304, SUS416)		40-50	N=4250 f=0.096	3180 0.100	2550 0.100	2120 0.120	1590 0.160	1270 0.200	980 0.21
調質鋼 (40~48HRC)		35-45	N=3720 f=0.060	2790 0.100	2230 0.100	1860 0.120	1390 0.160	1120 0.200	860 0.210
アルミニウム合金 Aluminium Alloy		100-120	N=10620 f=0.160	7960 0.200	6370 0.250	5310 0.300	3980 0.315	3190 0.400	2450 0.500



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