Carbide Ball End Mills for High Hardness Steels

高硬度钢用硬质合金球头铣刀

AE-BM-H · AE-BD-H · AE-LNBD-H

The A Brand

高硬度钢用硬质合金球头铣刀

Carbide Ball End Mills for High Hardness Steels

AE-BM-H · AE-BD-H · AE-LNBD-H

- 3种类型可对应广泛的加工方式
  3 types of end mills to accommodate a wide range of milling applications
- 高精度球头R
  High ball R precision
- 适用于高硬度钢的新型DUROREY涂层
  New innovative DUROREY coating for high-hardness steels

AE-BM-H

- R1 ～ R6
- 共8款
  Total of 8 items

AE-BD-H

- R0.5 ～ R6
- 共17款
  Total of 17 items

AE-LNBD-H

- R0.05 ～ R3
- 共261款
  Total of 261 items

预计2020年2月发售 Available from February 2020

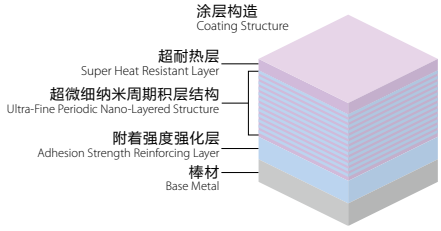
最适合高硬度钢加工用的超耐热性、高韧性DUROREY涂层诞生！

PAT.P in Japan

Newly developed DUROREY coating enables superior heat resistance and high toughness optimized for high-hardness steel milling!

含有SiC的超耐热层和超微细纳米周期积层结构，具有高耐热性和耐磨损性的同时，发挥优异的韧性。
即使在高硬度加工中也可抑制崩刃，实现工具的长寿命化。

Super heat resistant layer and ultra-fine periodic nano-layered structure provide superior toughness while maintaining high heat resistance and abrasion resistance.
Also suppresses chipping even in high hardness milling and achieves long tool life.



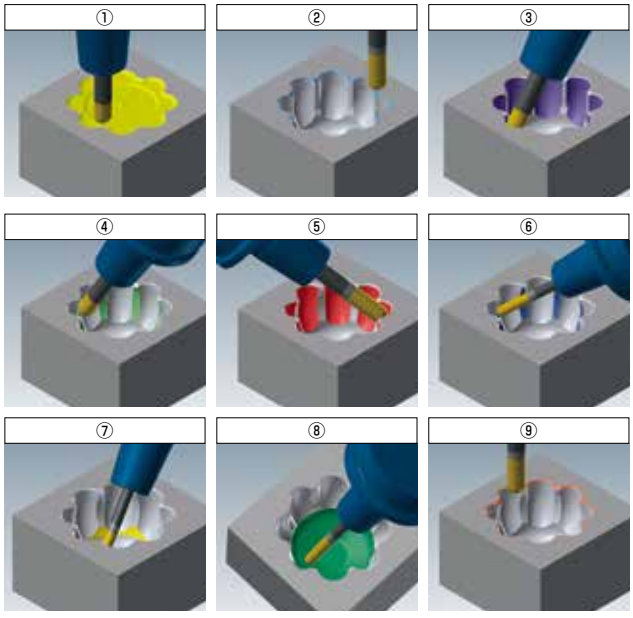
涂层色 Coating Color	涂层构造 Coating Structure	硬度(GPa) Hardness	氧化开始温度(℃) Oxidation Temperature	耐热性 Heat Resistance	附着力 Adhesion Strength	表面粗糙度 Surface Roughness	耐磨损性 Wear Resistance	耐溶着性 Welding Resistance	韧性 Toughness
黑灰色 Black Gray	超微细纳米周期积层 Ultra-Fine Periodic Nano-Layered	41	1,300	☆	◎	○	☆	◎	◎

(标准) ○→◎→☆(最佳)
Fair Best

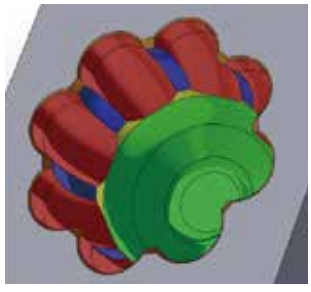
3种类型可对应广泛的加工方式

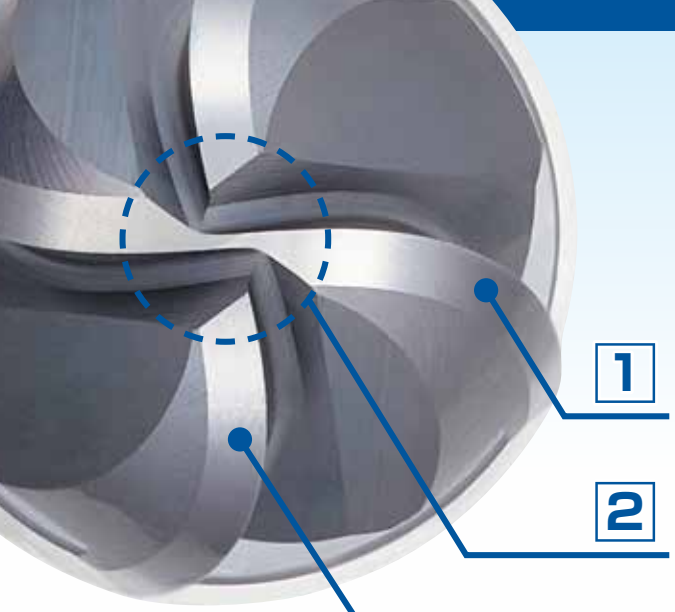
3 types of end mills to accommodate a wide range of milling applications

加工材料:YXR3(60HRC) 切削油剂：MQL
Work Material Coolant
使用机械：5轴加工中心 最高转速：25,000min^{-1}
Machine: Five-axis Machining Center Maximum RPM
主轴类型：HSK63 刀柄：热缩刀柄
Main Spindle Holder：Shrink Fit



工程编号 Process	加工部位 Milling Part	加工方式 Milling Method	加工内容 Milling Process	使用工具 Tool
①	全体 Overall	3轴 等高线加工 3-axis contouring line	高效率粗加工 High-efficiency roughing	AE-BM-H R5
②	倒角部 Chamfer	3轴 等高线加工 3-axis contouring line	半粗加工 Semi-roughing	
③	槽部 Groove	5轴 仿型加工 5-axis profiling	半粗加工 Semi-roughing	
④	筋部 Ridge	5轴 车铣 5-axis turn milling	粗・半粗加工 Roughing・Semi-roughing	
⑤	槽部 Groove	5轴 仿型加工 5-axis profiling	高精度精加工 High-precision finishing	AE-BD-H R5×30
⑥	筋部 Ridge	5轴 仿型加工 5-axis profiling	高精度精加工 High-precision finishing	AE-LNBD-H R3×40×6
⑦	中间底部 Middle bottom	5轴 车铣 5-axis turn milling	高精度精加工 High-precision finishing	
⑧	底部 Bottom	5轴 车铣 5-axis turn milling	高精度精加工 High-precision finishing	
⑨	倒角部 Chamfer	3轴 等高线加工 3-axis contouring line	高精度精加工 High-precision finishing	AE-BD-H R5×30





高硬度钢用硬质合金球头铣刀

高效率型4刃型

4-flute high-efficiency Carbide ball end mill for high-hardness steel

AE-BM-H

1 大螺旋设计
Sharp spiral curve

- 降低切削阻力，实现稳定的长寿命加工
- Reduces cutting resistance and enables stable performance with extended tool life.

2 中心部2刃式样
Center 2-flute specification

- 平面加工中可以加工出光洁表面，提高加工面精度
- 中心部2刃设计确保排屑槽，抑制切屑堵塞
- Controls tear when milling flat areas to improve surface accuracy.
- Secures chip pockets with the center 2-flute specification to control the clogging of chips.

3 优良的球头R精度
Superior ball R precision

- 可广泛适应粗加工至半精加工
- Suitable for a wide range of processes, from roughing to semi-roughing.

R ± 0.005	R ± 0.007	R ± 0.01
RE≦1.5	1.5<RE≦3	3<RE

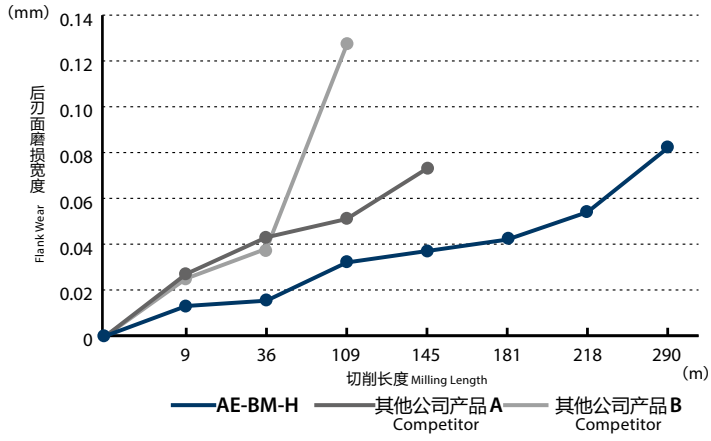
4 不等分割刃型
Unequal flute spacing

- 利用多刃化抑制振动，实现高效率加工
- Controls harmonic vibration commonly generated during milling with multiple flutes to enable high-efficiency milling.

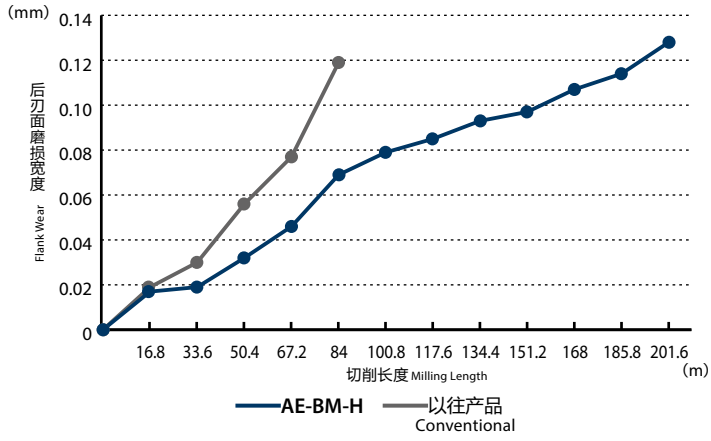
长寿命 Long Tool Life

在高硬度钢加工中，发挥优秀的耐久性
Exhibits superior endurance in high-hardness steel milling.

使用工具 Tool	AE-BM-H R5	其他公司 Competitor
加工材料 Work Material	SKD11(60HRC)	
切削方法 Milling Method	型腔加工 Pocket Milling	
切削速度 Cutting Speed	55m/min(1,750min^{-1})	
进给速度 Feed	875mm/min(0.125mm/t)	
切深量 Depth of Cut	ap=0.75mm、Pf=2.25mm	
切削油剂 Coolant	气冷 Air Blow	
使用机械 Machine	立式加工中心(BT40) Vertical Machining Center	



使用工具 Tool	AE-BM-H R5	以往产品 Conventional
加工材料 Work Material	SKH51(65HRC)	
切削方法 Milling Method	型腔加工 Pocket Milling	
切削速度 Cutting Speed	125m/min(4,000min^{-1})	
进给速度 Feed	2,000mm/min(0.125mm/t)	
切深量 Depth of Cut	ap=0.3mm、Pf=1.2mm	
切削油剂 Coolant	气冷 Air Blow	
使用机械 Machine	卧式加工中心(HSK63) Horizontal Machining Center	

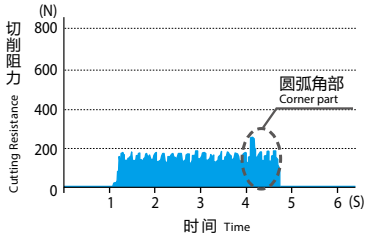


低阻力 Low Cutting Force

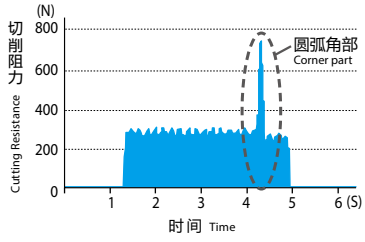
大螺旋设计和不等分割的效果，可低阻力稳定加工
Effects of sharp spiral curve and unequal flute spacing enable stable milling with low resistance.

使用工具 Tool	AE-BM-H R5	以往产品 Conventional
加工材料 Work Material	SKD11(60HRC)	
切削方法 Milling Method	圆弧角加工 Corner R Milling	
切削速度 Cutting Speed	80m/min(2,550min^{-1})	
进给速度 Feed	2,000mm/min(0.196mm/t)	
切深量 Depth of Cut	ap=5mm、Pf=0.1mm	
切削油剂 Coolant	气冷 Air Blow	
使用机械 Machine	立式加工中心(BT40) Vertical Machining Center	

AE-BM-H



以往产品 Conventional

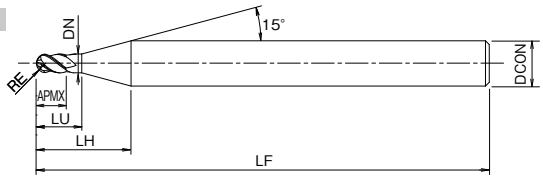


高效率4刃型 4-flute type for high-efficiency processing

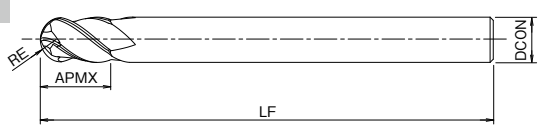
AE-BM-H

CARBIDE | DURAREY | R ±0.005 (RE≦1.5) | R ±0.007 (1.5<RE≦3) | R ±0.01 (3<RE) | SHRINK FIT | 40° | SPEED FEED P6~P8

Type1



Type2

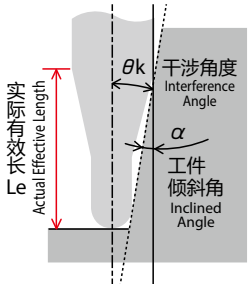


单位:mm Unit:mm

商品号 EDP No.	球半径 × 颈长 RE × LU	全长 LF	刃长 APMX	LH	柄径 DCON	颈径 DN	干涉角度 θk	相对于工件倾斜角α的实际有效长Le 注1 Effective length by inclined angles 0.5°	1°	1.5°	2°	3°	形状 Type	库存 Stock
8549602	R1 × 4	50	2	12	6	1.95	10.64°	4.19	4.3	4.42	4.55	4.85	1	○
8549603	R1.5 × 6	50	3	12	6	2.85	8.15°	6.44	6.61	6.79	7	7.45		
8549604	R2 × 8	60	4	12.1	6	3.85	5.65°	8.49	8.71	8.96	9.22	9.81		
8549605	R2.5 × 10	60	5	12.2	6	4.85	2.95°	10.54	10.82	11.12	11.45	—		
8549606	R3	60	9	—	6	—	—	—	—	—	—	—	2	
8549608	R4	70	12	—	8	—	—	—	—	—	—	—		
8549610	R5	80	15	—	10	—	—	—	—	—	—	—		
8549612	R6	90	18	—	12	—	—	—	—	—	—	—		

○=标准库存品 ○=Standard stock item

注 1：相对于工件倾斜角 α 的实际有效长 Le 栏中，如果无数值时表示加工时不存在干涉
Note：If there is no value in the actual effective length (Le column) for the work gradient angle α , it indicates no interference.



■ 标记种类 Guide for Icons

1 材质 Tool Materials

CARBIDE 硬质合金 Tungsten Carbide

2 表面处理 Surface Treatment

DURAREY DUROREY 涂层 DUROREY Coating

3 R许容差 Tolerance of Radius

R ±0.01 表示铣刀的 R 许容差 Identifies the tolerance of the radius for end mills

4 柄部 Shank

SHANK h4 表示柄部精度 Tolerance for Shank Diameter

SHRINK FIT 推荐热缩刀柄 Suitable for the shrink holder system

5 螺旋角 Helix Angle

40° 表示铣刀沟槽的螺旋角 Helix angle of flute for end mills

6 切削条件 Cutting Conditions

SPEED FEED 表示切削条件基准表所在页码 Indicates page number for cutting conditions

AE-BM-H 切削条件基准表 Cutting Condition

粗加工 Roughing

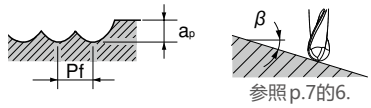
加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation.

加工材料 Work Material	工具钢·调质钢·预硬钢 Tool Steel ·Hardened Steel Prehardened Steel SKD11·SKD61·NAK80 (～45HRC)		调质钢 Hardened Steel							
			～55HRC		～62HRC		～66HRC		～70HRC	
RE	转速 Speed (min⁻¹)	进给速度 Feed (mm/min)	转速 Speed (min⁻¹)	进给速度 Feed (mm/min)	转速 Speed (min⁻¹)	进给速度 Feed (mm/min)	转速 Speed (min⁻¹)	进给速度 Feed (mm/min)	转速 Speed (min⁻¹)	进给速度 Feed (mm/min)
R1	20,700	3,310	18,300	1,830	15,900	1,590	14,300	1,140	9,600	770
R1.5	13,800	2,760	12,200	1,710	10,600	1,480	9,600	1,150	6,400	770
R2	10,400	2,500	9,200	1,660	8,000	1,440	7,200	1,150	4,800	770
R2.5	8,300	2,660	7,300	1,900	6,400	1,660	5,700	1,370	3,800	910
R3	6,900	2,760	6,100	1,950	5,300	1,700	4,800	1,340	3,200	900
R4	5,200	2,500	4,600	1,840	4,000	1,600	3,600	1,300	2,400	860
R5	4,500	2,340	4,000	1,760	3,500	1,540	3,200	1,280	2,200	850
R6	4,000	2,240	3,600	1,730	3,200	1,540	2,900	1,160	2,100	840
切深量 Depth of Cut										

	ap	Pf
RE<R3	0.15D	0.2D
R3≦RE	0.1D	0.2D

	ap	Pf
RE<R3	0.12D	0.15D
R3≦RE	0.07D	0.15D

ap	Pf
0.05D	0.15D



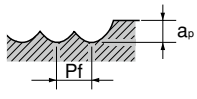
参照 p.7的6.

使用注意事项请参照 p.7。
See p.7 for precaution for use.

精加工 Finishing

加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation.

加工材料 Work Material	工具钢 · 调质钢 ·预硬钢 Tool Steel ·Hardened Steel Prehardened Steel SKD11·SKD61·NAK80 (～45HRC)		调质钢 Hardened Steel							
			～55HRC		～62HRC		～66HRC		～70HRC	
RE	转速 Speed (min⁻¹)	进给速度 Feed (mm/min)	转速 Speed (min⁻¹)	进给速度 Feed (mm/min)	转速 Speed (min⁻¹)	进给速度 Feed (mm/min)	转速 Speed (min⁻¹)	进给速度 Feed (mm/min)	转速 Speed (min⁻¹)	进给速度 Feed (mm/min)
R1	27,100	4,340	24,700	2,470	22,300	1,780	18,300	1,460	13,500	1,080
R1.5	18,000	3,600	16,500	2,310	14,900	1,780	12,200	1,460	9,000	1,080
R2	13,500	3,240	12,300	2,210	11,100	1,780	9,200	1,470	6,800	1,090
R2.5	10,800	3,460	9,900	2,570	8,900	2,140	7,300	1,750	5,400	1,300
R3	9,000	3,600	8,200	2,620	7,400	2,070	6,100	1,710	4,500	1,260
R4	6,800	3,260	6,200	2,480	5,600	1,790	4,600	1,470	3,400	1,090
R5	5,700	2,960	5,300	2,330	4,800	1,730	4,000	1,440	3,000	1,080
R6	5,000	2,800	4,600	2,210	4,200	1,680	3,500	1,400	2,800	1,120
切深量 Depth of Cut										



参照 p.7的6.

ap	Pf
0.02D	0.05D

使用注意事项请参照 p.8。
See p.8 for precaution for use.

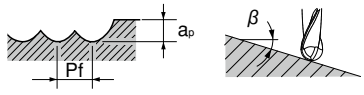
AE-BM-H 切削条件基准表 Cutting Condition

高速粗加工 High-Speed Roughing

⚠ 加工时产生的火花以及破损造成的发热现象有导致火灾的危险。
请做好防火措施。
使用高速高精度的加工中心的基准条件表。

Caution:Sparks generated during operation or heat caused by tool breakage can cause fire.
Be sure to use all proper fire - prevention measures.
The conditions below are for high speed / high precision machining centers.

加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation

加工材料 Work Material	工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)		调质钢 Hardened Steel							
			～55HRC		～62HRC		～66HRC		～70HRC	
RE	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)
R1	37,300	5,970	33,000	3,300	28,700	2,870	25,800	2,060	17,200	1,380
R1.5	24,800	4,960	22,000	3,080	19,100	2,670	17,200	2,060	11,500	1,380
R2	20,700	4,970	18,300	3,290	15,900	2,860	14,300	2,290	9,600	1,540
R2.5	16,600	5,310	14,600	3,800	12,700	3,300	11,500	2,760	7,600	1,820
R3	13,800	5,520	12,200	3,900	10,600	3,390	9,600	2,690	6,400	1,790
R4	10,400	4,990	9,200	3,680	8,000	3,200	7,200	2,590	4,800	1,730
R5	8,900	4,630	8,000	3,520	7,000	3,080	6,400	2,560	4,500	1,800
R6	8,000	4,480	7,200	3,460	6,400	3,070	5,800	2,320	4,200	1,680
切深量 Depth of Cut	ap: 0.1D	Pf: 0.2D	ap: 0.08D	Pf: 0.2D			ap: 0.05D	Pf: 0.1D		

1. 请使用刚性较高的机床和刀柄。
2. 推荐使用气冷或MQL(油雾冷却)。
3. 上表中铣刀的悬长是以 "外径×4倍以下" 为标准制订的。悬长过大时，请适当调整转速、进给速度和切深量。
4. 上表仅限用于等高线加工(侧面加工)等负荷小的加工。如因加工形状、切深量、设备刚性、工件夹持等使用情况，出现异常切削音、振动或振纹，可适当调整转速、进给速度和切深量。
5. 等高线加工中，角部的圆弧半径为刃径1.5 倍以下时，转速应按上表下调至50-80%,进给速度下调至50-80%，步距下调至20-60%。
6. 走查线加工中，加工斜角 (β) ≥15°时，上表中转速下调至40-60%，进给速度下调至 30-50%,轴向切深下调至30-80%。
7. 切深量较小时，可进一步提高转速，进给速度。

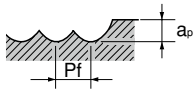
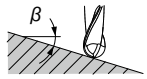
1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. These milling conditions are for an end mill where the tool extension length is 4 times the diameter of the end mill. When length of the tool extension from the machine is long, reduce the speed and feed and milling depth.
4. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut.
5. When the radius of curvature is less than 1.5 times the tool diameter, please reduce the speed to 50－80%, the feed rate to 50－80%, and the pick feed to 20－60% of the above shown cutting conditions.
6. When the machining incline angle (β) is more than 15˚, please reduce the speed to 40－60%, the feed 30－50%, and the axial cutting depth to 30－60% of the above shown cutting conditions.
7. If the cutting depth is small, it is possible to further increase the speed and feed.

高速精加工 High-Speed Finishing

⚠ 加工时产生的火花以及破损造成的发热现象有导致火灾的危险。
请做好防火措施。
使用高速高精度的加工中心的基准条件表。

Caution:Sparks generated during operation or heat caused by tool breakage can cause fire.
Be sure to use all proper fire - prevention measures.
The conditions below are for high speed / high precision machining centers.

加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation.

加工材料 Work Material	工具钢・调质钢・预硬钢 Tool Steel ·Hardened Steel Prehardened Steel SKD11·SKD61·NAK80 (～45HRC)		调质钢 Hardened Steel							
			～55HRC		～62HRC		～66HRC		～70HRC	
RE	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)
R1	40,610	6,500	37,020	3,700	33,440	2,680	27,470	2,200	20,300	1,620
R1.5	27,070	5,410	24,680	3,460	22,290	2,670	18,310	2,200	13,540	1,620
R2	24,360	5,850	22,210	4,000	20,060	3,210	16,480	2,640	12,180	1,950
R2.5	19,490	6,240	17,770	4,620	16,050	3,850	13,180	3,160	9,750	2,340
R3	16,240	6,500	14,810	4,740	13,380	3,750	10,990	3,080	8,120	2,270
R4	12,180	5,850	11,110	4,440	10,030	3,210	8,240	2,640	6,090	1,950
R5	10,320	5,370	9,460	4,160	8,600	3,100	7,170	2,580	5,450	1,960
R6	9,080	5,080	8,360	4,010	7,640	3,060	6,210	2,480	5,020	2,010
切深量 Depth of Cut	 									

ap	Pf
0.02D	0.05D

1. 请使用刚性较高的机床和刀柄。
2. 推荐使用气冷或MQL(油雾冷却)。
3. 上表中铣刀的悬长是以 "外径×4倍以下" 为标准制订的。悬长过大时，请适当调整转速、进给速度和切深量。
4. 上表仅限用于等高线加工(侧面加工)等负荷小的加工。如因加工形状、切深量、设备刚性、工件夹持等使用情况，出现异常切削音、振动或振纹，可适当调整转速、进给速度和切深量。
5. 等高线加工中，角部的圆弧半径为刃径1.5 倍以下时，转速应按上表下调至50-80%,进给速度下调至50-80%，步距下调至20-60%。
6. 走查线加工中，加工斜角 (β) ≥15°时，上表中转速下调至40-60%，进给速度下调至 30-50%,轴向切深下调至30-80%。
7. 切深量较小时，可进一步提高转速，进给速度。

1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. These milling conditions are for an end mill where the tool extension length is 4 times the diameter of the end mill. When length of the tool extension from the machine is long, reduce the speed and feed and milling depth.
4. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut.
5. When the radius of curvature is less than 1.5 times the tool diameter, please reduce the speed to 50－80%, the feed rate to 50－80%, and the pick feed to 20－60% of the above shown cutting conditions.
6. When the machining incline angle (β) is more than 15°, please reduce the speed to 40－60%, the feed 30－50%, and the axial cutting depth to 30－60% of the above shown cutting conditions.
7. If the cutting depth is small, it is possible to further increase the speed and feed.

高硬度钢用硬质合金球头铣刀

高精度精加工用2刃型

2-flute high-precision finishing Carbide ball end mill for high hardness steel

AE-BD-H

1 可变负前角螺旋月牙槽设计

Variable negative spiral gash

- 先端部为较大负前角，可抑制崩刃
- 越接近外周部，负前角越小，确保锋利的同时，通过与小螺旋搭配提高耐崩刃性

・Controls chipping with larger negative angle at tip of cutting edge.
・While securing cutting quality by making the negative angle weaker near the outer periphery, chipping resistance is enhanced in combination with the weaker helix angle specification.

2 中心部的厚度

Thickness at the center

- 中心部加厚可抑制球头先端变形或崩刃

・Thickening of the center core to prevent deformation of the ball tip and improve control of chipping.

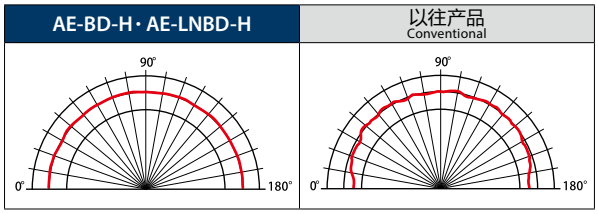
3 优良的球头R精度

Superior ball R precision

- 确保180°范围内稳定的R精度

・Secures stable R accuracy across 180°.

R
±0.005



4 优异的柄部精度

Superior shank accuracy

- 对应h4公差 (0/-0.004)

・Supports h4 tolerance (0/-0.004).

5 最适合热缩刀柄

Ideal for shrink fit holders

- 还有最适合热缩刀柄的短柄型

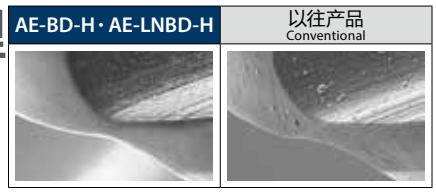
・Lineup of short-shank type suitable for shrink fit holders are also available.

6 光滑的表面处理

Smooth Surface Treatment

- 涂层表面光滑处理，提高加工面精度

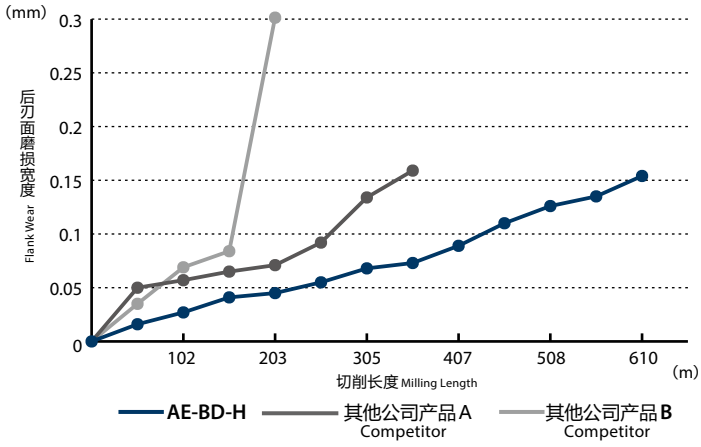
・Improves surface accuracy by smoothening the coating surface.



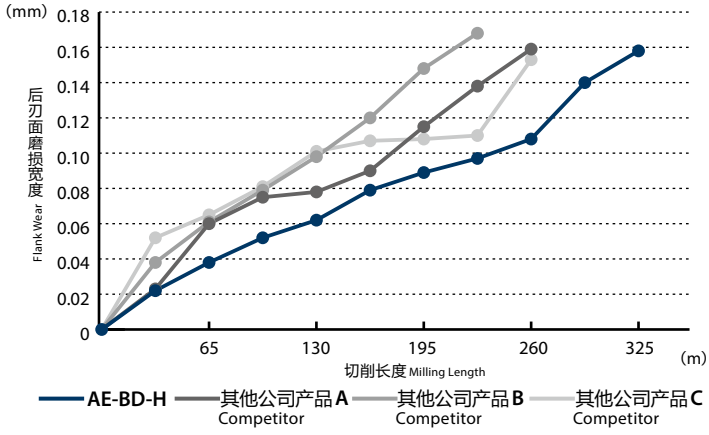
长寿命 Long Tool Life

在高硬度钢加工中，发挥优秀的耐久性
Exhibits superior endurance in high-hardness steel milling.

使用工具 Tool	AE-BD-H R5×30	其他公司产品 Competitor
加工材料 Work Material	SKD11(60HRC)	
切削方法 Milling Method	型腔加工 Pocket Milling	
切削速度 Cutting Speed	150m/min(4,800min^{-1})	
进给速度 Feed	870mm/min(0.09mm/t)	
切深量 Depth of Cut	ap=0.2mm、Pf=0.5mm	
切削油剂 Coolant	气冷 Air Blow	
使用机械 Machine	卧式加工中心(HSK63) Horizontal Machining Center	



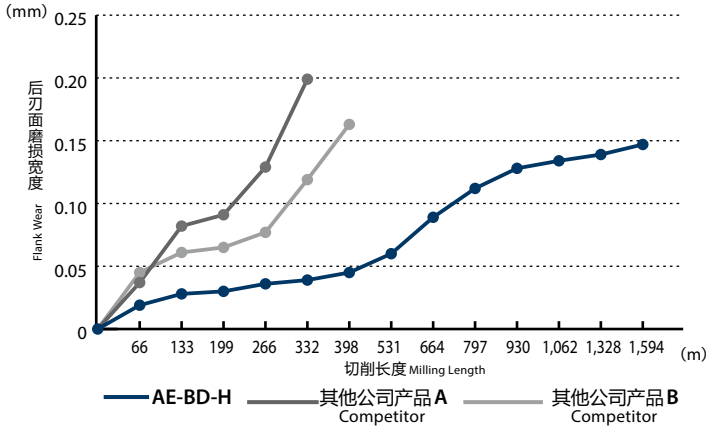
使用工具 Tool	AE-BD-H R5×30	其他公司产品 Competitor
加工材料 Work Material	SKH51(65HRC)	
切削方法 Milling Method	型腔加工 Pocket Milling	
切削速度 Cutting Speed	120m/min(3,850min^{-1})	
进给速度 Feed	700mm/min(0.09mm/t)	
切深量 Depth of Cut	ap=0.2mm、Pf=0.5mm	
切削油剂 Coolant	气冷 Air Blow	
使用机械 Machine	卧式加工中心(HSK63) Horizontal Machining Center	



高速加工 High-speed Milling

即使是STAVAX(53HRC)的高速加工，也能稳定加工
Enables stable machining even in high-speed milling of STAVAX (53 HRC).

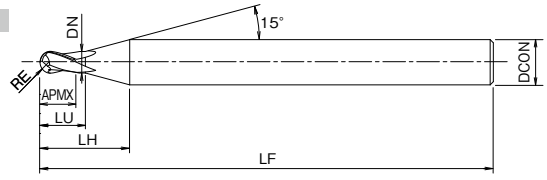
使用工具 Tool	AE-BD-H R5×30	其他公司产品 Competitor
加工材料 Work Material	STAVAX(53HRC)	
切削方法 Milling Method	型腔加工 Pocket Milling	
切削速度 Cutting Speed	300m/min(9,550min^{-1})	
进给速度 Feed	2,670mm/min(0.14mm/t)	
切深量 Depth of Cut	ap=0.2mm、Pf=0.5mm	
切削油剂 Coolant	气冷 Air Blow	
使用机械 Machine	卧式加工中心(HSK63) Horizontal Machining Center	



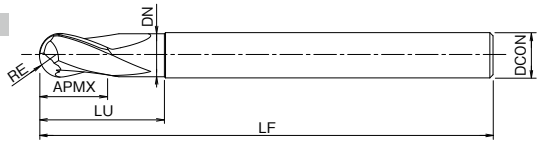
AE-BD-H

CARBIDE | DUROREY | R ±0.005 | SHANK h4 | SHRINK FIT | 25° | SPEED FEED P12

Type1



Type2



单位:mm Unit:mm

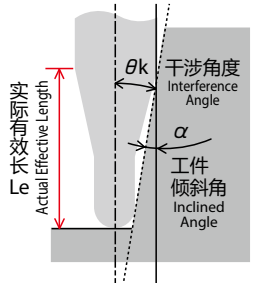
商品号 EDP No.	球半径 × 颈长 RE × LU	短柄 Short Shank	全长 LF	刃长 APMX	LH	柄径 DCON	颈径 DN	干涉角度 θk	相对于工件倾斜角α的实际有效长Le 注1 Effective length by inclined angles 0.5°	1°	1.5°	2°	3°	形状 Type	库存 Stock
3042001	R0.5 × 2	—	50	0.8	7.7	4	0.95	11.71°	2.14	2.2	2.26	2.33	2.48	1	○
3042002	R0.75 × 3	—	50	1.2	7.9	4	1.45	10.03°	3.17	3.25	3.34	3.44	3.66		
3042003	R1 × 4	—	50	1.6	12	6	1.95	10.64°	4.19	4.3	4.42	4.55	4.85		
3042004	R1.5 × 6	—	60	2.4	11.9	6	2.85	8.15°	6.44	6.61	6.79	7	7.45		
3042005	R2 × 8-4	—	60	3.2	—	4	3.85	—	—	—	—	—	—	2	
3042006	R2 × 8	—	70		12.1	6		5.65°	8.49	8.71	8.96	9.22	9.81	1	
3042007	R2 × 8-S	○	45												
3042008	R2.5 × 10	—	80	4	12.2	6	4.8	2.92°	10.63	10.9	11.22	11.55	—		
3042009	R2.5 × 10-S	○	50												
3042010	R3 × 18	—	90	9	—	6	5.8	—	—	—	—	—	—	2	
3042011	R3 × 18-S	○	55												
3042012	R4 × 24	—	100	12	—	8	7.7	—	—	—	—	—	—		
3042013	R4 × 24-S	○	75												
3042014	R5 × 30	—	100	15	—	10	9.7	—	—	—	—	—	—		
3042015	R5 × 30-S	○	75												
3042016	R6 × 36	—	110	18	—	12	11.7	—	—	—	—	—	—		
3042017	R6 × 36-S	○	80												

・标识说明请参考 P.5。 See p.5 for explanation of icons.

○=标准库存品 ○=Standard stock item

注 1：相对于工件倾斜角 α 的实际有效长 Le 栏中，如果无数值时表示加工时不存在干涉

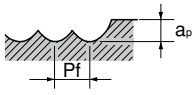
Note：If there is no value in the actual effective length (Le column) for the work gradient angle α, it indicates no interference.



AE-BD-H 切削条件基准表 Cutting Condition

精加工 Finishing

加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation.

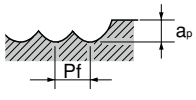
加工材料 Work Material	工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)		调质钢 Hardened Steel							
			～55HRC		～62HRC		～66HRC		～70HRC	
RE	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)
R0.5	38,400	2,350	38,400	2,350	38,400	2,000	38,400	1,600	38,400	1,450
R0.75	38,400	3,050	38,400	3,050	38,400	2,500	31,800	1,900	25,200	1,450
R1	38,400	3,600	38,400	3,550	28,800	2,200	24,000	1,750	19,200	1,250
R1.5	31,800	4,000	25,200	3,200	19,200	2,000	16,200	1,600	12,600	1,200
R2	24,000	3,650	19,200	2,950	14,400	1,900	11,900	1,500	9,500	1,150
R2.5	19,200	3,500	15,000	2,650	11,500	1,700	9,500	1,350	7,600	1,000
R3	16,200	3,350	12,600	2,300	9,500	1,550	8,000	1,250	6,400	955
R4	11,900	2,850	9,500	2,050	7,100	1,350	5,900	1,050	4,800	830
R5	9,500	2,550	7,600	1,800	5,800	1,150	4,800	875	3,800	700
R6	8,000	2,400	6,400	1,650	4,800	955	4,000	795	3,200	635
切深量 Depth of Cut			ap: 0.05D, Pf: 0.1D		ap: 0.03D, Pf: 0.1D		ap: 0.02D, Pf: 0.5D			

高速精加工 High-Speed Finishing

⚠ 加工时产生的火花以及破损造成的发热现象有导致火灾的危险。
请做好防火措施。
使用高速高精度的加工中心的基准条件表。

Caution:Sparks generated during operation or heat caused by tool breakage can cause fire.
Be sure to use all proper fire - prevention measures.
The conditions below are for high speed / high precision machining centers.

加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation.

加工材料 Work Material	工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)		调质钢 Hardened Steel							
			～55HRC		～62HRC		～66HRC		～70HRC	
RE	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)
R0.5	50,000	3,700	50,000	3,700	50,000	3,100	50,000	2,600	50,000	2,400
R0.75	50,000	4,800	50,000	4,800	50,000	3,900	50,000	3,050	38,400	2,300
R1	50,000	5,600	50,000	5,350	48,000	3,650	38,400	2,800	28,800	2,100
R1.5	49,800	6,200	38,400	4,800	31,800	3,350	25,200	2,550	19,200	1,900
R2	37,200	5,700	28,800	4,400	24,000	3,200	19,200	2,400	14,400	1,800
R2.5	30,000	5,450	22,800	4,000	19,200	2,850	15,600	2,150	11,500	1,600
R3	24,600	5,200	19,200	3,450	16,200	2,550	12,600	2,050	9,500	1,550
R4	18,600	4,450	14,400	3,050	11,900	2,250	9,500	1,800	7,100	1,350
R5	15,000	3,950	11,500	2,650	9,500	1,900	7,600	1,550	5,800	1,150
R6	12,600	3,700	9,500	2,500	8,000	1,600	6,400	1,350	4,800	995
切深量 Depth of Cut			ap: 0.02D, Pf: 0.05D				ap: 0.01D, Pf: 0.05D			

1. 请使用刚性较高的机床和刀柄。
2. 推荐使用气冷或是MQL（油雾冷却）。
3. 上表仅限用于等高线加工（侧面加工）等负荷小的加工。如因加工形状、切深量、设备刚性、工件夹持等使用情况，出现异常切削音、振动或振纹，可适当调整转速、进给速度和切深量。
4. 切深量较小时，可进一步提高转速，进给速度。

1. Use a rigid and precise machine and holder.
2. Using air blow or MQL (oil mist coolant) is recommended.
3. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut.
4. Cutting speed and feed rate can be increased in case of lower depth of cut.

高硬度钢用硬质合金球头铣刀

高精度精加工用2刃长颈型

2-flute high-precision finishing long neck Carbide ball end mill for high-hardness steel

AE-LNBD-H

1 中心部的厚度
Thickness at the center

- 中心部加厚可抑制球头先端变形或崩刃
- Thickening of the center core to prevent deformation of the ball tip and improve control of chipping.

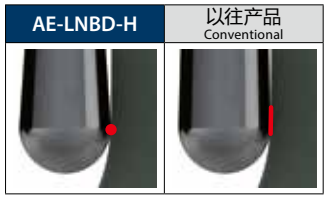
2 优良的球头R精度
Superior ball R precision

- 确保180°范围内稳定的R精度 (参照P.9)
- Secures stable R accuracy across 180° (refer p.9).

R ±0.003	R ±0.005
RE≦0.25	0.25<RE

3 水滴形外周部
Teardrop-shaped outer periphery

- 大倒锥在红点处的切削可抑制振动，防止崩刃，提高加工面精度。
- Strong back taper geometry enables milling by point, which prevents chattering and chipping, resulting in improvement of surface accuracy.



4 优异的柄部精度
Superior shank accuracy

- 对应h4公差 (0/-0.004)
- Supports h4 tolerance (0/-0.004).

5 光滑的表面处理 (参照P.9)
Smooth Surface Treatment (refer p.9)

- 涂层表面光滑处理，提高加工面精度 (R0.3以上)
- Improves surface accuracy by smoothening the coating surface (R0.3 or above).

6 丰富的尺寸类型
Abundant variations

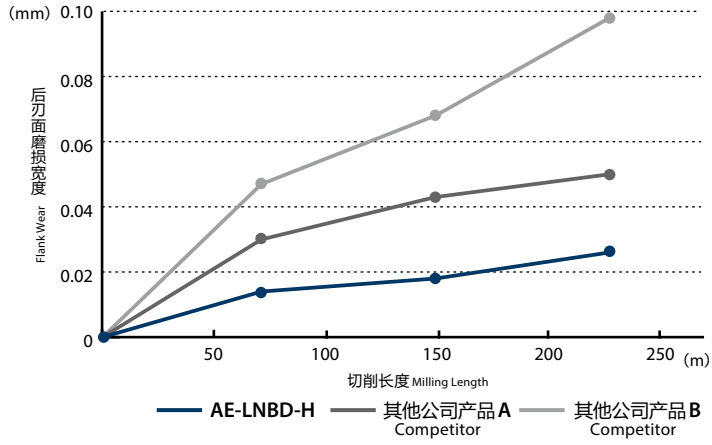
- 261款 (R0.05~R3) 可应对广泛的加工
- 261 items (R0.05 to R3) are available to accommodate a wide range of applications.

加工数据 Cutting Data

稳定加工 Stable Performance

SKD11(60HRC) 加工中，发挥优秀的耐久性
Exhibits superior durability in SKD11 (60 HRC).

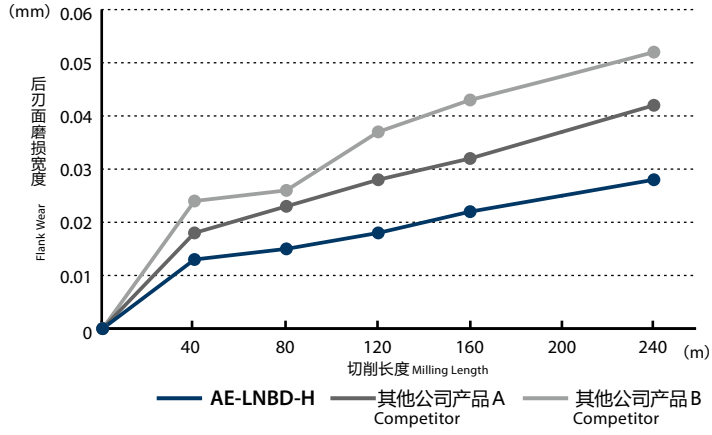
使用工具 Tool	AE-LNBD-H R1×10×4	其他公司产品 Competitor
加工材料 Work Material	SKD11(60HRC)	
切削方法 Milling Method	走查线加工 Scanning Line Cutting	
切削速度 Cutting Speed	107m/min(17,000min^{-1})	
进给速度 Feed	1,400mm/min(0.041mm/t)	
切深量 Depth of Cut	ap=0.05mm、Pf=0.1mm	
切削油剂 Coolant	气冷 Air Blow	
使用机械 Machine	立式加工中心(HSK32) Vertical Machining Center	



长寿命 Long Tool Life

热处理模具钢DH31S加工中，实现优良的耐久性
Enables superior durability in hot die steel DH31S.

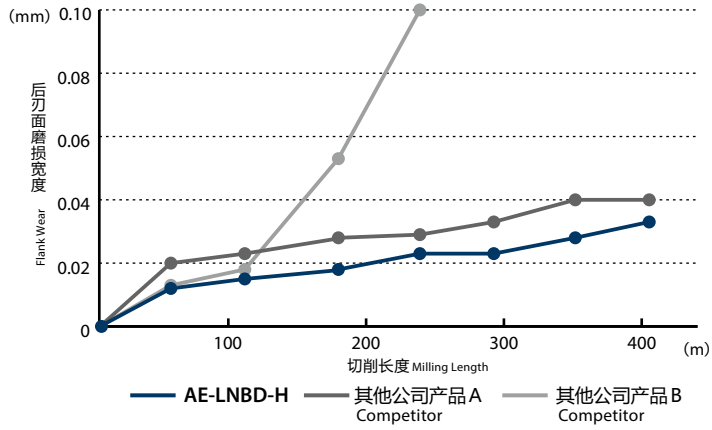
使用工具 Tool	AE-LNBD-H R1×10×4	其他公司产品 Competitor
加工材料 Work Material	DH31S(43HRC)	
切削方法 Milling Method	型腔加工 Pocket Milling	
切削速度 Cutting Speed	88m/min(14,000min^{-1})	
进给速度 Feed	1,000mm/min(0.036mm/t)	
切深量 Depth of Cut	ap=0.05mm、Pf=0.1mm	
切削油剂 Coolant	气冷 Air Blow	
使用机械 Machine	卧式加工中心(HSK63) Horizontal Machining Center	



精加工 Finishing

STAVAX(53HRC)加工中，实现良好的耐久性和加工表面
Enables excellent durability and surface finish in STAVAX (53 HRC).

使用工具 Tool	AE-LNBD-H R1×10×4	其他公司产品 Competitor
加工材料 Work Material	STAVAX(53HRC)	
切削方法 Milling Method	走查线加工 Scanning Line Cutting	
切削速度 Cutting Speed	150m/min(24,000min^{-1})	
进给速度 Feed	2,400mm/min(0.05mm/t)	
切深量 Depth of Cut	ap=0.05mm、Pf=0.1mm	
切削油剂 Coolant	气冷 Air Blow	
使用机械 Machine	立式加工中心(HSK32) Vertical Machining Center	



AE-LNBD-H	其他公司产品A Competitor	其他公司产品B Competitor
		

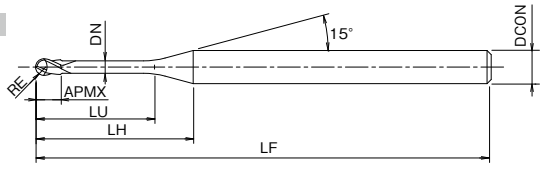
AE-LNBD-H

预计2020年2月发售
Available from February 2020

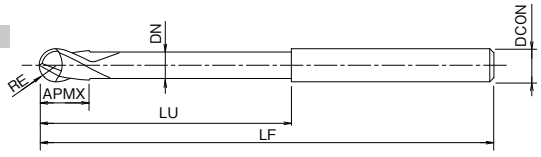
CARBIDE | DUROREY | R ±0.003 | R ±0.005 | SHANK h4 | SHRINK FIT | 30° | SPEED FEED P21~P29

RE≦0.25 0.25<RE

Type1



Type2



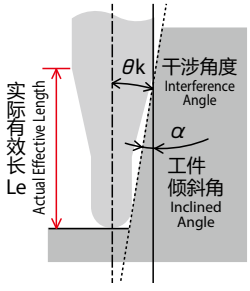
单位:mm Unit:mm

商品号 EDP No.	球半径 × 颈长 × 柄径 RE × LU × DCON	全长 LF	刃长 APMX	LH	颈径 DN	干涉角度 θk	相对于工件倾斜角α的实际有效长Le 注1 Effective length by inclined angles 0.5°	1°	1.5°	2°	3°	形状 Type	库存 Stock
3056100	R0.05 × 0.2 × 4	45	0.08	7.5	0.095	14.69°	0.21	0.22	0.22	0.23	0.24	1	
3056101	R0.05 × 0.3 × 4			7.6		14.52°	0.3	0.31	0.32	0.33	0.36		
3056102	R0.05 × 0.5 × 4			7.8		14.16°	0.51	0.53	0.54	0.56	0.6		
3056103	R0.1 × 0.3 × 4	45	0.16	7.4	0.19	14.55°	0.32	0.33	0.34	0.35	0.37	1	
3056104	R0.1 × 0.5 × 4			7.6		14.18°	0.53	0.54	0.56	0.58	0.62		
3056105	R0.1 × 0.75 × 4			7.9		13.74°	0.79	0.81	0.84	0.86	0.93		
3056106	R0.1 × 1 × 4			8.1		13.33°	1.04	1.08	1.11	1.15	1.24		
3056107	R0.1 × 1 × 6			11.8		13.86°							
3056108	R0.1 × 1.25 × 4			8.4		12.94°	1.3	1.35	1.39	1.44	1.55		
3056109	R0.1 × 1.5 × 4			8.6		12.58°	1.56	1.61	1.67	1.73	1.86		
3056110	R0.1 × 1.75 × 4			8.9		12.23°	1.82	1.88	1.94	2.01	2.17		
3056111	R0.1 × 2 × 4			9.1		11.9°	2.08	2.15	2.22	2.3	2.48		
3056112	R0.1 × 2.5 × 4			9.6		11.29°	2.6	2.68	2.78	2.88	3.1		
3056113	R0.1 × 3 × 4			10.1		10.74°	3.11	3.22	3.33	3.45	3.72		
3056114	R0.15 × 0.5 × 4	45	0.24	7.4	0.29	14.24°	0.53	0.54	0.55	0.57	0.6	1	○
3056115	R0.15 × 0.6 × 4			7.5		14.06°	0.63	0.65	0.66	0.68	0.73		
3056116	R0.15 × 0.75 × 4			7.7		13.79°	0.78	0.81	0.83	0.86	0.92		
3056117	R0.15 × 1 × 4			7.9		13.36°	1.04	1.07	1.11	1.14	1.23		
3056118	R0.15 × 1.25 × 4			8.2		12.96°	1.3	1.34	1.39	1.43	1.54		
3056119	R0.15 × 1.5 × 4			8.4		12.59°	1.56	1.61	1.66	1.72	1.85		
3056120	R0.15 × 1.5 × 6			12.2		13.34°							
3056121	R0.15 × 1.75 × 4			8.7		12.23°	1.82	1.88	1.94	2.01	2.16		
3056122	R0.15 × 2 × 4			8.9		11.89°	2.08	2.14	2.22	2.29	2.47		
3056123	R0.15 × 2.25 × 4			9.2		11.57°	2.34	2.41	2.49	2.58	2.78		
3056124	R0.15 × 2.5 × 4			9.4		11.27°	2.59	2.68	2.77	2.87	3.09		
3056125	R0.15 × 3 × 4			9.9		10.71°	3.11	3.21	3.32	3.44	3.71		
3056126	R0.15 × 3.5 × 4			10.4		10.2°	3.63	3.75	3.88	4.02	4.33		
3056127	R0.15 × 4 × 4			10.9		9.74°	4.14	4.28	4.43	4.59	4.96		
3056128	R0.15 × 4.5 × 4			11.4		9.31°	4.66	4.82	4.99	5.17	5.58		
3056129	R0.15 × 5 × 4			11.9		8.93°	5.18	5.35	5.54	5.74	6.2		

・标识说明请参考 P.5。 See p.5 for explanation of icons.

○=标准库存品 ○=Standard stock item

注 1：相对于工件倾斜角 α 的实际有效长 Le 栏中，如果无数值时表示加工时不存在干涉。
Note：If there is no value in the actual effective length (Le column) for the work gradient angle α, it indicates no interference.



NEXT

FROM

单位:mm Unit:mm

商品号 EDP No.	球半径 × 颈长 × 柄径 RE × LU × DCON	全长 LF	刃长 APMX	LH	颈径 DN	干涉角度 θk	相对于工件倾斜角α的实际有效长Le 注1 Effective length by inclined angles					形状 Type	库存 Stock
							0.5°	1°	1.5°	2°	3°		
3056130	R0.2 × 0.5 ×4	45	0.3	7.3	0.38	14.27°	0.54	0.56	0.57	0.58	0.62	1	○
3056131	R0.2 × 0.75 ×4			7.5		13.8°	0.8	0.82	0.85	0.87	0.93		
3056132	R0.2 × 0.8 ×4			7.6		13.71°	0.85	0.88	0.9	0.93	0.99		
3056133	R0.2 × 1 ×4			7.8		13.37°	1.06	1.09	1.12	1.16	1.24		
3056134	R0.2 × 1 ×6			11.5		13.91°							
3056135	R0.2 × 1.5 ×4			8.3		12.57°	1.58	1.63	1.68	1.73	1.86		
3056136	R0.2 × 2 ×4			8.8		11.86°	2.09	2.16	2.23	2.31	2.48		
3056137	R0.2 × 2 ×6			12.5		12.82°							
3056138	R0.2 × 2.5 ×4			9.3		11.22°	2.61	2.7	2.79	2.88	3.1		
3056139	R0.2 × 3 ×4			9.8		10.65°	3.13	3.23	3.34	3.46	3.72		
3056140	R0.2 × 3.5 ×4			10.3		10.14°	3.64	3.76	3.89	4.03	4.35		
3056141	R0.2 × 4 ×4			10.8		9.67°	4.16	4.3	4.45	4.61	4.97		
3056142	R0.2 × 4.5 ×4			11.3		9.24°	4.68	4.83	5	5.18	5.59		
3056143	R0.2 × 5 ×4			11.8		8.85°	5.2	5.37	5.56	5.76	6.21		
3056144	R0.2 × 5.5 ×4			12.3		8.49°	5.71	5.9	6.11	6.33	6.83		
3056145	R0.2 × 6 ×4			12.8		8.15°	6.23	6.44	6.66	6.91	7.45		
3056146	R0.25 × 0.75 ×4	45	0.4	7.3	0.48	13.85°	0.8	0.82	0.84	0.86	0.91	1	
3056147	R0.25 × 1 ×4			7.6		13.4°	1.06	1.09	1.12	1.15	1.23		
3056148	R0.25 × 1.5 ×4			8.1		12.58°	1.58	1.62	1.67	1.73	1.85		
3056149	R0.25 × 2 ×4			8.6		11.85°	2.09	2.16	2.23	2.3	2.47		
3056150	R0.25 × 2.5 ×4			9.1		11.2°	2.61	2.69	2.78	2.88	3.09		
3056151	R0.25 × 3 ×4			9.6		10.62°	3.13	3.23	3.33	3.45	3.71		
3056152	R0.25 × 3.5 ×4			10.1		10.09°	3.64	3.76	3.89	4.03	4.33		
3056153	R0.25 × 4 ×4			10.6		9.61°	4.16	4.3	4.44	4.6	4.95		
3056154	R0.25 × 4.5 ×4			11.1		9.18°	4.68	4.83	5	5.18	5.58		
3056155	R0.25 × 5 ×4			11.6		8.78°	5.19	5.37	5.55	5.75	6.2		
3056156	R0.25 × 5.5 ×4			12.1		8.41°	5.71	5.9	6.11	6.33	6.82		
3056157	R0.25 × 6 ×4			12.6		8.08°	6.23	6.44	6.66	6.9	7.44		
3056158	R0.25 × 7 ×4			13.6		7.48°	7.26	7.51	7.77	8.05	8.68		
3056159	R0.25 × 8 ×4			14.6		6.97°	8.29	8.58	8.88	9.2	9.93		
3056160	R0.25 × 9 ×4			15.6		6.52°	9.33	9.64	9.98	10.35	11.17		
3056161	R0.25 × 10 ×4			16.6		6.12°	10.36	10.71	11.09	11.5	12.41		
3056162	R0.3 × 0.75 ×4	45	0.5	7.2	0.55	13.8°	0.86	0.88	0.9	0.92	0.97	1	
3056163	R0.3 × 1 ×4			7.4		13.34°	1.12	1.14	1.17	1.21	1.28		
3056164	R0.3 × 1.2 ×4			7.6		12.99°	1.32	1.36	1.4	1.44	1.53		
3056165	R0.3 × 1.5 ×4			7.9		12.5°	1.63	1.68	1.73	1.78	1.9		
3056166	R0.3 × 2 ×4			8.4		11.76°	2.15	2.21	2.28	2.36	2.53		
3056167	R0.3 × 2 ×6			12.2		12.78°							
3056168	R0.3 × 2.5 ×4			8.9		11.1°	2.67	2.75	2.84	2.93	3.15		
3056169	R0.3 × 3 ×4			9.4		10.51°	3.18	3.28	3.39	3.51	3.77		
3056170	R0.3 × 3 ×6			13.2		11.83°							
3056171	R0.3 × 3.5 ×4			9.9		9.98°	3.7	3.82	3.95	4.08	4.39		
3056172	R0.3 × 4 ×4			10.4		9.5°	4.22	4.35	4.5	4.66	5.01		
3056173	R0.3 × 4 ×6			14.2		11°							
3056174	R0.3 × 4.5 ×4			10.9		9.06°	4.73	4.89	5.05	5.23	5.63		
3056175	R0.3 × 5 ×4			11.4		8.67°	5.25	5.42	5.61	5.81	6.26		
3056176	R0.3 × 5.5 ×4			11.9		8.3°	5.77	5.96	6.16	6.38	6.88		
3056177	R0.3 × 6 ×4			12.4		7.96°	6.28	6.49	6.72	6.96	7.5		
3056178	R0.3 × 6.5 ×4			12.9		7.65°	6.8	7.03	7.27	7.53	8.12		
3056179	R0.3 × 7 ×4			13.4		7.37°	7.32	7.56	7.82	8.11	8.74		
3056180	R0.3 × 7.5 ×4			13.9		7.1°	7.83	8.1	8.38	8.68	9.36		
3056181	R0.3 × 8 ×4			14.4		6.85°	8.35	8.63	8.93	9.26	9.99		
3056182	R0.3 × 8.5 ×4			14.9		6.62°	8.87	9.17	9.49	9.83	10.61		
3056183	R0.3 × 9 ×4			15.4		6.41°	9.38	9.7	10.04	10.41	11.23		
3056184	R0.3 × 9.5 ×4			15.9		6.2°	9.9	10.24	10.6	10.98	11.85		
3056185	R0.3 × 10 ×4			16.4		6.01°	10.42	10.77	11.15	11.56	12.47		
3056186	R0.3 × 11 ×4	50		17.4		5.67°	11.45	11.84	12.26	12.71	13.71		
3056187	R0.3 × 12 ×4			18.4		5.36°	12.49	12.91	13.37	13.86	14.96		

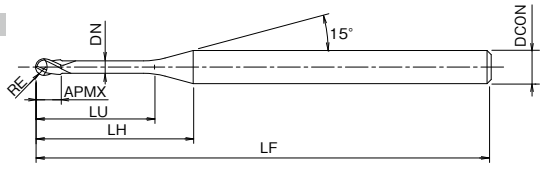
○＝标准库存品 ○=Standard stock item

AE-LNBD-H

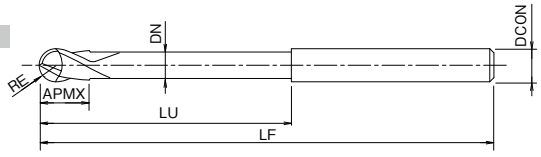
预计2020年2月发售
Available from February 2020

CARBIDE | DUROREY | R ±0.003 (RE≦0.25) | R ±0.005 (0.25<RE) | SHANK h4 | SHRINK FIT | 30° | SPEED FEED P21~P29

Type1



Type2



FROM

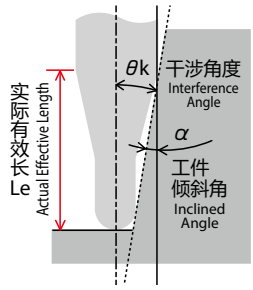
单位:mm Unit:mm

商品号 EDP No.	球半径 × 颈长 × 柄径 RE × LU × DCON	全长 LF	刃长 APMX	LH	颈径 DN	干涉角度 θk	相对于工件倾斜角α的实际有效长Le 注1 Effective length by inclined angles 0.5°	1°	1.5°	2°	3°	形状 Type	库存 Stock
3056188	R0.4 × 1 ×4	45	0.6	7.1	0.75	13.41°	1.11	1.14	1.16	1.19	1.26	1	○
3056189	R0.4 × 1.5 ×4			7.6		12.52°	1.63	1.67	1.72	1.77	1.88		
3056190	R0.4 × 2 ×4			8.1		11.74°	2.15	2.21	2.27	2.34	2.5		
3056191	R0.4 × 2 ×6			11.8		12.81°							
3056192	R0.4 × 2.5 ×4			8.6		11.04°	2.66	2.74	2.83	2.92	3.12		
3056193	R0.4 × 3 ×4			9.1		10.42°	3.18	3.28	3.38	3.49	3.75		
3056194	R0.4 × 4 ×4			10.1		9.37°	4.21	4.35	4.49	4.64	4.99		
3056195	R0.4 × 5 ×4			11.1		8.51°	5.25	5.42	5.6	5.79	6.23		
3056196	R0.4 × 6 ×4			12.1		7.8°	6.28	6.49	6.71	6.94	7.48		
3056197	R0.4 × 7 ×4			13.1		7.19°	7.31	7.55	7.81	8.09	8.72		
3056198	R0.4 × 8 ×4			14.1		6.67°	8.35	8.62	8.92	9.24	9.96		
3056199	R0.4 × 9 ×4			15.1		6.22°	9.38	9.69	10.03	10.39	11.2		
3056200	R0.4 × 10 ×4			16.1		5.83°	10.41	10.76	11.14	11.54	12.45		
3056201	R0.4 × 12 ×4	50		18.1		5.18°	12.48	12.9	13.36	13.84	14.93		
3056202	R0.5 × 1.5 ×4	45	0.8	7.2	0.95	12.54°	1.63	1.66	1.71	1.75	1.86	1	
3056203	R0.5 × 2 ×4			7.7		11.71°	2.14	2.2	2.26	2.33	2.48		
3056204	R0.5 × 2 ×6			11.4		12.83°							
3056205	R0.5 × 2.5 ×4			8.2		10.97°	2.66	2.73	2.82	2.9	3.1		
3056206	R0.5 × 3 ×4			8.7		10.33°	3.18	3.27	3.37	3.48	3.72		
3056207	R0.5 × 3 ×6			12.4		11.8°							
3056208	R0.5 × 4 ×4			9.7		9.23°	4.21	4.34	4.48	4.63	4.97		
3056209	R0.5 × 4 ×6			13.4		10.91°							
3056210	R0.5 × 5 ×4			10.7		8.35°	5.24	5.41	5.59	5.78	6.21		
3056211	R0.5 × 5 ×6			14.4		10.15°							
3056212	R0.5 × 6 ×4			11.7		7.62°	6.28	6.48	6.69	6.93	7.45		
3056213	R0.5 × 6 ×6			15.4		9.49°							
3056214	R0.5 × 7 ×4			12.7		7°	7.31	7.55	7.8	8.08	8.69		
3056215	R0.5 × 7 ×6			16.4		8.91°							
3056216	R0.5 × 8 ×4			13.7		6.48°	8.34	8.62	8.91	9.23	9.94		
3056217	R0.5 × 8 ×6			17.4		8.39°							
3056218	R0.5 × 9 ×4			14.7		6.03°	9.38	9.69	10.02	10.38	11.18		
3056219	R0.5 × 10 ×4			15.7		5.64°	10.41	10.76	11.13	11.53	12.42		
3056220	R0.5 × 10 ×6	50		19.4		7.52°							
3056221	R0.5 × 12 ×4	45		17.7		4.99°	12.48	12.9	13.34	13.83	14.91		
3056222	R0.5 × 13 ×4	50		18.7		4.71°	13.51	13.97	14.45	14.98	16.15		
3056223	R0.5 × 14 ×4			19.7		4.47°	14.55	15.04	15.56	16.13	17.4		
3056224	R0.5 × 16 ×4			21.7		4.05°	16.61	17.18	17.78	18.43	19.88		
3056225	R0.5 × 18 ×4	55		23.7		3.7°	18.68	19.31	19.99	20.73	22.37		
3056226	R0.5 × 20 ×4			25.7		3.41°	20.75	21.45	22.21	23.03	24.86		
3056227	R0.5 × 22 ×4	60		27.7		3.16°	22.82	23.59	24.43	25.33	27.34		
3056228	R0.5 × 22 ×6			31.4		4.62°							

・标识说明请参考 P.5。 See p.5 for explanation of icons.

○=标准库存品 ○=Standard stock item

NEXT



注 1：相对于工件倾斜角 α 的实际有效长 Le 栏中，如果无数值时表示加工时不存在干涉
Note：If there is no value in the actual effective length (Le column) for the work gradient angle α, it indicates no interference.

FROM

单位:mm　Unit:mm

商品号 EDP No.	球半径 × 颈长 × 柄径 RE × LU × DCON	全长 LF	刃长 APMX	LH	颈径 DN	干涉角度 θk	相对于工件倾斜角α的实际有效长Le 注1 Effective length by inclined angles 0.5°	1°	1.5°	2°	3°	形状 Type	库存 Stock
3056229	R0.6 × 2 ×4	45	1	7.3	1.15	11.67°	2.14	2.19	2.25	2.31	2.46	1	○
3056230	R0.6 × 2 ×6			11.1		12.86°							
3056231	R0.6 × 2.4 ×4			7.7		11.04°	2.55	2.62	2.69	2.77	2.95		
3056232	R0.6 × 2.5 ×4			7.8		10.9°	2.66	2.73	2.81	2.89	3.08		
3056233	R0.6 × 3 ×4			8.3		10.22°	3.17	3.26	3.36	3.46	3.7		
3056234	R0.6 × 4 ×4			9.3		9.08°	4.21	4.33	4.47	4.61	4.94		
3056235	R0.6 × 4 ×6			13.1		10.87°							
3056236	R0.6 × 6 ×4			11.3		7.42°	6.27	6.47	6.68	6.91	7.43		
3056237	R0.6 × 8 ×4			13.3		6.27°	8.34	8.61	8.9	9.21	9.91		
3056238	R0.6 × 10 ×4			15.3		5.43°	10.41	10.75	11.12	11.51	12.4		
3056239	R0.6 × 12 ×4			17.3		4.78°	12.48	12.89	13.33	13.81	14.89		
3056240	R0.6 × 14 ×4	50		19.3		4.28°	14.54	15.03	15.55	16.11	17.37		
3056241	R0.6 × 16 ×4			21.3		3.87°	16.61	17.17	17.77	18.41	19.86		
3056242	R0.6 × 18 ×4	55		23.3		3.53°	18.68	19.31	19.98	20.71	22.35		
3056243	R0.6 × 20 ×4			25.3		3.24°	20.74	21.45	22.2	23.01	24.83		
3056244	R0.75 × 2 ×4	45	1.2	6.8	1.45	11.61°	2.13	2.18	2.23	2.29	2.42	1	
3056245	R0.75 × 2.5 ×4			7.3		10.76°	2.65	2.72	2.79	2.87	3.04		
3056246	R0.75 × 3 ×4			7.8		10.03°	3.17	3.25	3.34	3.44	3.66		
3056247	R0.75 × 3 ×6			11.5		11.75°							
3056248	R0.75 × 4 ×4			8.8		8.81°	4.2	4.32	4.45	4.59	4.91		
3056249	R0.75 × 5 ×4			9.8		7.86°	5.23	5.39	5.56	5.74	6.15		
3056250	R0.75 × 5 ×6			13.5		9.97°							
3056251	R0.75 × 6 ×4			10.8		7.09°	6.27	6.46	6.67	6.89	7.39		
3056252	R0.75 × 6 ×6			14.5		9.26°							
3056253	R0.75 × 8 ×4			12.8		5.93°	8.34	8.6	8.88	9.19	9.88		
3056254	R0.75 × 8 ×6			16.5		8.11°							
3056255	R0.75 × 10 ×4			14.8		5.09°	10.4	10.74	11.1	11.49	12.36		
3056256	R0.75 × 12 ×4			16.8		4.46°	12.47	12.88	13.32	13.79	14.85		
3056257	R0.75 × 14 ×4	50		18.8		3.97°	14.54	15.02	15.53	16.09	17.34		
3056258	R0.75 × 16 ×4			20.8		3.58°	16.6	17.16	17.75	18.39	19.82		
3056259	R0.75 × 18 ×4	55		22.8		3.25°	18.67	19.3	19.97	20.69	22.31		
3056260	R0.75 × 20 ×4			24.8		2.98°	20.74	21.44	22.18	22.99	—		
3056261	R0.75 × 22 ×4	60		26.8		2.75°	22.81	23.58	24.4	25.29			
3056262	R0.75 × 25 ×4	65		29.8		2.47°	25.91	26.79	27.73	28.74			
3056263	R0.75 × 30 ×4	70		34.8		2.11°	31.08	32.13	33.27	34.49			
3056264	R0.8 × 4 ×4	45	1.3	8.6	1.55	8.72°	4.2	4.32	4.45	4.58	4.89	1	
3056265	R0.8 × 8 ×4			12.6		5.81°	8.33	8.6	8.88	9.18	9.87		
3056266	R0.8 × 12 ×4			16.6		4.35°	12.47	12.88	13.31	13.78	14.84		
3056267	R0.8 × 16 ×4	50		20.6		3.47°	16.6	17.15	17.75	18.38	19.81		
3056268	R0.8 × 20 ×4	55		24.6		2.89°	20.74	21.43	22.18	22.98	—		

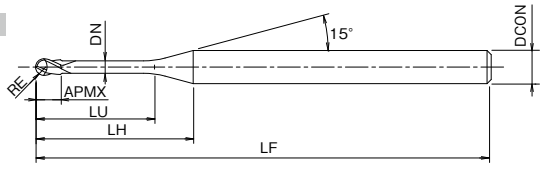
○＝标准库存品 ○=Standard stock item

AE-LNBD-H

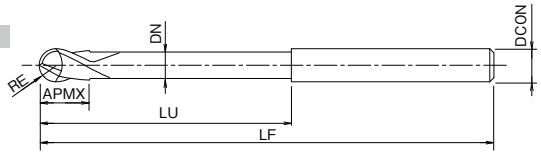
预计2020年2月发售
Available from February 2020

CARBIDE | DUROREY | R ±0.003 (RE≦0.25) | R ±0.005 (0.25<RE) | SHANK h4 | SHRINK FIT | 30° | SPEED FEED P21~P29

Type1



Type2



FROM

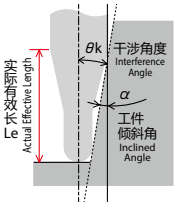
单位:mm Unit:mm

商品号 EDP No.	球半径 × 颈长 × 柄径 RE × LU × DCON	全长 LF	刃长 APMX	LH	颈径 DN	干涉角度 θk	相对于工件倾斜角α的实际有效长Le 注1 Effective length by inclined angles 0.5°	1°	1.5°	2°	3°	形状 Type	库存 Stock
3056269	R1 × 2.5 × 4	45	1.6	6.3	1.95	10.46°	2.64	2.7	2.76	2.83	2.98	1	○
3056270	R1 × 3 × 4			6.8		9.61°	3.16	3.23	3.32	3.4	3.6		
3056271	R1 × 3 × 6			10.6		11.7°							
3056272	R1 × 4 × 4			7.8		8.25°	4.19	4.3	4.42	4.55	4.85		
3056273	R1 × 4 × 6			11.6		10.64°							
3056274	R1 × 5 × 4			8.8		7.23°	5.23	5.37	5.53	5.7	6.09		
3056275	R1 × 6 × 4			9.8		6.43°	6.26	6.44	6.64	6.85	7.33		
3056276	R1 × 6 × 6			13.6		9°							
3056277	R1 × 8 × 4			11.8		5.26°	8.33	8.58	8.86	9.15	9.82		
3056278	R1 × 8 × 6			15.6		7.79°							
3056279	R1 × 10 × 4			13.8		4.45°	10.39	10.72	11.07	11.45	12.31		
3056280	R1 × 10 × 6	50		17.6		6.87°							
3056281	R1 × 12 × 4	45		15.8		3.86°	12.46	12.86	13.29	13.75	14.79		
3056282	R1 × 12 × 6	50		19.6		6.14°							
3056283	R1 × 13 × 4			16.8		3.61°	13.5	13.93	14.4	14.9	16.04		
3056284	R1 × 14 × 4			17.8		3.4°	14.53	15	15.51	16.05	17.28		
3056285	R1 × 16 × 4			19.8		3.04°	16.6	17.14	17.72	18.35	19.76		
3056286	R1 × 16 × 6	55		23.6		5.06°							
3056287	R1 × 18 × 4			21.8		2.75°	18.66	19.28	19.94	20.65	—		
3056288	R1 × 20 × 4			23.8		2.51°	20.73	21.42	22.16	22.95			
3056289	R1 × 20 × 6	60		27.6		4.31°					24.74		
3056290	R1 × 22 × 4			25.8		2.31°	22.8	23.56	24.37	25.25	—		
3056291	R1 × 25 × 4	65		28.8		2.06°	25.9	26.77	27.7	28.7			
3056292	R1 × 25 × 6			32.6		3.63°					30.95		
3056293	R1 × 30 × 4	70		33.8		1.75°	31.07	32.12	33.24	—	—		
3056294	R1 × 35 × 4			38.8		1.52°	36.24	37.46	38.78				
3056295	R1 × 40 × 4	80		43.8		1.34°	41.4	42.81	—				
3056296	R1.25 × 6 × 4	45	2	9.1	2.35	5.44°	6.44	6.63	6.82	7.03	7.51	1	
3056297	R1.25 × 8 × 4			11.1		4.35°	8.51	8.77	9.04	9.33	9.99		
3056298	R1.25 × 10 × 4			13.1		3.62°	10.58	10.9	11.25	11.63	12.48		
3056299	R1.25 × 15 × 4	50		18.1		2.55°	15.75	16.25	16.8	17.38	—		
3056300	R1.25 × 20 × 4	55		23.1		1.97°	20.92	21.6	22.34	—			
3056301	R1.25 × 25 × 4	65		28.1		1.61°	26.08	26.95	27.88				
3056302	R1.25 × 30 × 4	70		33.1		1.35°	31.25	32.3	—				
3056303	R1.25 × 35 × 4			38.1		1.17°	36.42	37.65					

・标识说明请参考 P.5。 See p.5 for explanation of icons.

○=标准库存品 ○=Standard stock item

注 1：相对于工件倾斜角 α 的实际有效长 Le 栏中，如果无数值时表示加工时不存在干涉
Note：If there is no value in the actual effective length (Le column) for the work gradient angle α, it indicates no interference.



NEXT

FROM

单位:mm Unit:mm

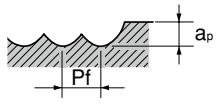
商品号 EDP No.	球半径 × 颈长 × 柄径 RE × LU × DCON	全长 LF	刃长 APMX	LH	颈径 DN	干涉角度 θk	相对于工件倾斜角α的实际有效长Le 注1 Effective length by inclined angles 0.5°	1°	1.5°	2°	3°	形状 Type	库存 Stock
3056304	R1.5 × 6 ×6	50	2.4	11.9	2.85	8.15°	6.44	6.61	6.79	7	7.45	1	○
3056305	R1.5 × 8 ×6			13.9		6.87°	8.5	8.75	9.01	9.29	9.93		
3056306	R1.5 × 10 ×6			15.9		5.93°	10.57	10.89	11.23	11.59	12.42		
3056307	R1.5 × 12 ×6	55		17.9		5.22°	12.64	13.03	13.44	13.89	14.91		
3056308	R1.5 × 13 ×6			18.9		4.92°	13.67	14.1	14.55	15.04	16.15		
3056309	R1.5 × 14 ×6			19.9		4.66°	14.71	15.17	15.66	16.19	17.39		
3056310	R1.5 × 15 ×6			20.9		4.42°	15.74	16.24	16.77	17.34	18.63		
3056311	R1.5 × 16 ×6			21.9		4.2°	16.77	17.31	17.88	18.49	19.88		
3056312	R1.5 × 20 ×6	60		25.9		3.52°	20.91	21.58	22.31	23.09	24.85		
3056313	R1.5 × 25 ×6	65		30.9		2.92°	26.08	26.93	27.85	28.84	—		
3056314	R1.5 × 30 ×6	70		35.9		2.5°	31.24	32.28	33.39	34.59			
3056315	R1.5 × 35 ×6	80		40.9		2.18°	36.41	37.63	38.94	40.34			
3056316	R1.5 × 40 ×6	90		45.9		1.94°	41.58	42.98	44.48	—			
3056317	R1.75 × 10 ×6	50	2.8	14.9	3.35	5.38°	10.56	10.87	11.2	11.56	12.36	1	
3056318	R1.75 × 15 ×6	55		19.9		3.92°	15.73	16.22	16.74	17.31	18.58		
3056319	R1.75 × 16 ×6			20.9		3.72°	16.76	17.29	17.85	18.46	19.82		
3056320	R1.75 × 20 ×6	60		24.9		3.08°	20.9	21.57	22.28	23.06	24.79		
3056321	R1.75 × 25 ×6	65		29.9		2.54°	26.07	26.92	27.83	28.81	—		
3056322	R1.75 × 30 ×6	70		34.9		2.16°	31.24	32.26	33.37	34.55			
3056323	R1.75 × 35 ×6	80		39.9		1.88°	36.4	37.61	38.91	—			
3056324	R1.75 × 40 ×6	90		44.9		1.66°	41.57	42.96	44.45				
3056325	R1.75 × 45 ×6			49.9		1.49°	46.74	48.31	—				
3056326	R2 × 8 ×4	55	3.2	—	3.85	—	—	—	—	—	—	2	
3056327	R2 × 8 ×6			12		5.65°	8.49	8.71	8.96	9.22	9.81	1	
3056328	R2 × 10 ×6	60		14		4.73°	10.55	10.85	11.17	11.52	12.3		
3056329	R2 × 12 ×6			16		4.07°	12.62	12.99	13.39	13.82	14.79		
3056330	R2 × 13 ×6			17		3.8°	13.65	14.06	14.5	14.97	16.03		
3056331	R2 × 14 ×6			18		3.56°	14.69	15.13	15.61	16.12	17.27		
3056332	R2 × 15 ×6			19		3.36°	15.72	16.2	16.72	17.27	18.52		
3056333	R2 × 16 ×6			20		3.17°	16.76	17.27	17.82	18.42	19.76		
3056334	R2 × 20 ×6	65		24		2.6°	20.89	21.55	22.26	23.02	—		
3056335	R2 × 25 ×6	70		29		2.12°	26.06	26.9	27.8	28.77			
3056336	R2 × 30 ×6	80		34		1.79°	31.23	32.25	33.34	—			
3056337	R2 × 35 ×6			39		1.55°	36.4	37.6	38.88				
3056338	R2 × 40 ×6	90		44		1.37°	41.56	42.94	—				
3056339	R2 × 45 ×6			49		1.22°	46.73	48.29					
3056340	R2 × 50 ×6	100		54		1.11°	51.9	53.64					
3056341	R2.5 × 10 ×6	60	4	12.1	4.85	2.95°	10.54	10.82	11.12	11.45	—	1	
3056342	R2.5 × 15 ×6			17.1		1.95°	15.71	16.17	16.66	—			
3056343	R2.5 × 20 ×6	70		22.1		1.46°	20.87	21.52	—				
3056344	R2.5 × 25 ×6			27.1		1.17°	26.04	26.86					
3056345	R2.5 × 30 ×6	80		32.1		0.97°	31.21	—					
3056346	R2.5 × 35 ×6			37.1		0.83°	36.38						
3056347	R2.5 × 40 ×6	90		42.1		0.73°	41.55						
3056348	R2.5 × 45 ×6	100		47.1		0.65°	46.72						
3056349	R2.5 × 50 ×6			52.1		0.58°	51.88						
3056350	R3 × 10 ×6	60	4.8	—	5.85	—	—	—	—	—	—	2	
3056351	R3 × 12 ×6			—									
3056352	R3 × 15 ×6	65		—									
3056353	R3 × 20 ×6	70		—									
3056354	R3 × 25 ×6			—									
3056355	R3 × 30 ×6	80		—									
3056356	R3 × 35 ×6			—									
3056357	R3 × 40 ×6	90		—									
3056358	R3 × 45 ×6	100		—									
3056359	R3 × 50 ×6	120		—									
3056360	R3 × 60 ×6			—									

○=标准库存品 ○=Standard stock item

AE-LNBD-H 切削条件基准表 Cutting Condition

加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation

加工材料 Work Material		工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)				调质钢 Hardened Steel															
		～55HRC				～62HRC				～66HRC				～70HRC							
RE	颈长 LU (mm)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf
0.05	0.2	50,000	80	0.003	0.003	50,000	70	0.003	0.003	50,000	70	0.003	0.003	50,000	60	0.003	0.003	50,000	50	0.003	0.003
	0.3	50,000	70	0.003	0.003	50,000	60	0.003	0.003	50,000	60	0.003	0.003	50,000	50	0.003	0.003	50,000	40	0.003	0.003
	0.5	50,000	50	0.003	0.003	50,000	40	0.003	0.003	50,000	40	0.003	0.003	50,000	30	0.003	0.003	50,000	20	0.003	0.003
0.1	0.3	50,000	400	0.005	0.005	50,000	280	0.005	0.005	50,000	220	0.004	0.005	50,000	190	0.004	0.005	50,000	140	0.004	0.005
	0.5	50,000	380	0.005	0.005	50,000	260	0.005	0.005	50,000	200	0.004	0.005	50,000	170	0.004	0.005	50,000	130	0.004	0.005
	0.75	50,000	340	0.005	0.005	50,000	230	0.005	0.005	50,000	180	0.004	0.005	50,000	150	0.004	0.005	50,000	110	0.004	0.005
	1	50,000	340	0.005	0.005	50,000	230	0.005	0.005	50,000	180	0.004	0.005	50,000	150	0.004	0.005	45,000	110	0.004	0.005
	1.25	50,000	300	0.005	0.005	50,000	210	0.005	0.005	50,000	150	0.004	0.005	46,500	130	0.004	0.005	37,200	100	0.004	0.005
	1.5	50,000	280	0.005	0.005	50,000	190	0.005	0.005	49,200	130	0.004	0.005	44,300	110	0.004	0.005	35,500	80	0.004	0.005
	1.75	50,000	240	0.005	0.005	50,000	170	0.005	0.005	45,600	120	0.004	0.005	41,100	100	0.004	0.005	32,900	80	0.004	0.005
	2	45,600	210	0.005	0.005	44,500	140	0.005	0.005	39,600	100	0.004	0.005	35,700	90	0.004	0.005	28,600	70	0.004	0.005
	2.5	38,400	160	0.004	0.005	37,200	100	0.004	0.005	37,200	80	0.004	0.005	33,500	70	0.004	0.005	26,800	50	0.004	0.005
	3	38,400	140	0.004	0.005	37,200	90	0.004	0.005	37,200	70	0.004	0.005	33,500	60	0.004	0.005	26,800	50	0.004	0.005
0.15	0.5	50,000	600	0.005	0.1	50,000	400	0.005	0.01	50,000	300	0.005	0.01	50,000	260	0.005	0.01	50,000	200	0.01	0.01
	0.6	50,000	570	0.005	0.1	50,000	390	0.005	0.01	50,000	300	0.005	0.01	50,000	260	0.005	0.01	50,000	200	0.01	0.01
	0.75	50,000	570	0.005	0.1	50,000	390	0.05	0.01	50,000	300	0.005	0.01	50,000	260	0.005	0.01	50,000	200	0.01	0.01
	1	50,000	570	0.005	0.01	50,000	390	0.005	0.01	50,000	300	0.005	0.01	50,000	260	0.005	0.01	50,000	200	0.01	0.01
	1.25	50,000	570	0.005	0.01	50,000	380	0.005	0.01	50,000	300	0.005	0.01	50,000	260	0.005	0.01	50,000	200	0.01	0.01
	1.5	50,000	570	0.005	0.01	50,000	370	0.005	0.01	50,000	290	0.005	0.01	50,000	250	0.005	0.01	46,500	190	0.01	0.01
	1.75	50,000	480	0.005	0.01	50,000	310	0.005	0.01	50,000	220	0.005	0.01	46,500	190	0.005	0.01	37,200	140	0.01	0.01
	2	50,000	450	0.005	0.005	50,000	290	0.005	0.005	49,200	210	0.004	0.005	44,300	180	0.004	0.005	35,500	140	0.004	0.005
	2.25	50,000	380	0.005	0.005	50,000	250	0.005	0.005	49,200	180	0.004	0.005	44,300	150	0.004	0.005	35,500	110	0.004	0.005
	2.5	48,000	280	0.005	0.005	48,000	190	0.005	0.005	43,200	130	0.004	0.005	38,900	110	0.004	0.005	31,200	80	0.004	0.005
	3	45,600	230	0.005	0.005	44,400	150	0.005	0.005	39,600	100	0.004	0.005	35,700	90	0.004	0.005	28,600	70	0.004	0.005
	3.5	40,800	190	0.004	0.005	39,600	120	0.004	0.005	39,600	95	0.004	0.005	35,700	80	0.004	0.005	28,600	60	0.004	0.005
	4	38,400	140	0.004	0.005	37,200	90	0.004	0.005	37,200	70	0.004	0.005	33,500	60	0.004	0.005	26,800	50	0.004	0.005
	4.5	38,400	120	0.004	0.005	37,200	80	0.004	0.005	37,200	60	0.004	0.005	33,500	50	0.004	0.005	26,800	40	0.004	0.005
	5	34,800	95	0.004	0.005	33,600	60	0.004	0.005	33,600	50	0.004	0.005	30,300	40	0.004	0.005	24,200	30	0.004	0.005



1. 请使用刚性较高的机床和刀柄。
2. 推荐使用MQL (油雾冷却) 或气冷加工碳素钢、淬火钢。
3. 请根据加工材料使用气冷或发烟性少的切削油剂。
4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。数值为参考值，实际加工中的切削条件请参考上表并根据状况进行设定。
5. 根据加工精度、加工形状、加工路径适当调整加工条件。
6. φ0.5 (R0.25)以下或悬长 (L/D) 大于10时、微小的负荷增大也会导致折损、根据切削状况适当调节切削条件。
7. 转速不足的情况下，请按上表同比率下调转速和进给速度。

NEXT

FROM

加工材料 Work Material		工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)				调质钢 Hardened Steel															
						～55HRC				～62HRC				～66HRC				～70HRC			
RE	颈长 LU (mm)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf
0.2	0.5	50,000	900	0.01	0.02	50,000	630	0.01	0.02	50,000	500	0.008	0.015	50,000	430	0.008	0.015	50,000	320	0.008	0.015
	0.75	50,000	850	0.01	0.02	50,000	590	0.01	0.02	50,000	470	0.008	0.015	50,000	400	0.008	0.015	50,000	300	0.008	0.015
	0.8	50,000	850	0.01	0.02	50,000	590	0.01	0.02	50,000	470	0.008	0.015	50,000	400	0.008	0.015	50,000	300	0.008	0.015
	1	50,000	850	0.01	0.02	50,000	550	0.01	0.02	50,000	440	0.008	0.015	50,000	370	0.008	0.015	50,000	280	0.008	0.015
	1.5	50,000	760	0.01	0.02	50,000	520	0.01	0.02	50,000	410	0.008	0.015	50,000	350	0.008	0.015	46,500	260	0.008	0.015
	2	50,000	660	0.01	0.02	50,000	460	0.01	0.02	50,000	330	0.008	0.015	48,600	280	0.008	0.015	38,900	210	0.008	0.015
	2.5	50,000	520	0.008	0.015	50,000	360	0.008	0.015	49,200	260	0.008	0.015	44,300	220	0.008	0.015	35,500	170	0.008	0.015
	3	50,000	470	0.005	0.01	50,000	320	0.005	0.01	45,600	220	0.005	0.01	41,100	190	0.005	0.01	32,900	140	0.005	0.01
	3.5	48,000	400	0.005	0.01	48,000	280	0.005	0.01	43,200	200	0.005	0.01	38,900	170	0.005	0.01	31,200	130	0.005	0.01
	4	43,200	350	0.005	0.005	42,000	230	0.005	0.005	37,200	160	0.005	0.005	33,500	140	0.005	0.005	26,800	110	0.005	0.005
	4.5	38,400	270	0.004	0.005	37,200	180	0.004	0.005	33,600	130	0.004	0.005	30,300	110	0.004	0.005	24,200	80	0.004	0.005
	5	38,400	260	0.004	0.005	37,200	170	0.004	0.005	33,600	120	0.004	0.005	30,300	100	0.004	0.005	24,200	80	0.004	0.005
	5.5	36,000	210	0.004	0.005	34,800	140	0.004	0.005	31,200	100	0.004	0.005	28,100	90	0.004	0.005	22,500	70	0.004	0.005
	6	36,000	190	0.004	0.005	34,800	120	0.004	0.005	31,200	100	0.004	0.005	28,100	90	0.004	0.005	22,500	70	0.004	0.005
0.25	0.75	50,000	1,100	0.015	0.03	50,000	750	0.015	0.03	50,000	590	0.01	0.02	50,000	500	0.01	0.02	50,000	380	0.01	0.02
	1	50,000	1,050	0.015	0.03	50,000	730	0.015	0.03	50,000	580	0.01	0.02	50,000	490	0.01	0.02	50,000	370	0.01	0.02
	1.5	50,000	1,050	0.015	0.03	50,000	700	0.015	0.03	50,000	560	0.01	0.02	50,000	480	0.01	0.02	48,000	360	0.01	0.02
	2	50,000	950	0.015	0.03	50,000	650	0.015	0.03	50,000	520	0.01	0.02	48,600	440	0.01	0.02	38,900	330	0.01	0.02
	2.5	50,000	950	0.015	0.03	50,000	600	0.015	0.03	50,000	430	0.01	0.02	46,500	370	0.01	0.02	37,200	280	0.01	0.02
	3	50,000	850	0.01	0.02	50,000	550	0.01	0.02	48,000	390	0.01	0.02	43,200	330	0.01	0.02	34,600	250	0.01	0.02
	3.5	50,000	650	0.01	0.02	50,000	450	0.01	0.02	45,600	320	0.01	0.02	41,100	270	0.01	0.02	32,900	200	0.01	0.02
	4	50,000	570	0.01	0.01	50,000	390	0.01	0.01	40,800	270	0.01	0.01	36,800	230	0.01	0.01	29,400	170	0.01	0.01
	4.5	45,600	470	0.01	0.01	45,600	320	0.01	0.01	31,200	220	0.01	0.01	28,100	190	0.01	0.01	22,500	140	0.01	0.01
	5	36,000	380	0.005	0.01	34,800	250	0.005	0.01	28,800	170	0.005	0.01	26,000	140	0.005	0.01	20,800	110	0.005	0.01
	5.5	33,600	280	0.004	0.005	32,400	180	0.004	0.005	26,400	120	0.004	0.005	23,800	100	0.004	0.005	19,100	80	0.004	0.005
	6	31,200	230	0.004	0.005	30,000	150	0.004	0.005	24,000	100	0.004	0.005	21,600	90	0.004	0.005	17,300	70	0.004	0.005
	7	28,800	190	0.004	0.005	27,600	130	0.004	0.005	24,000	100	0.004	0.005	21,600	90	0.004	0.005	17,300	70	0.004	0.005
	8	26,400	150	0.004	0.005	25,200	110	0.004	0.005	24,000	100	0.004	0.005	21,600	90	0.004	0.005	17,300	70	0.004	0.005
	9	24,000	110	0.004	0.005	25,200	100	0.004	0.005	24,000	90	0.004	0.005	21,600	80	0.004	0.005	17,300	60	0.004	0.005
	10	24,000	95	0.004	0.005	25,200	100	0.004	0.005	24,000	90	0.004	0.005	21,600	80	0.004	0.005	17,300	60	0.004	0.005

1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / oil mist coolant) or air blow is recommended.
3. Use an air blow or a suitable cutting fluid with high smoke retardant properties.
4. The above cutting conditions are for contouring operation with low-load and stable condition. Refer to the table above to set the milling conditions in accordance with the actual situation.
5. Please adjust conditions based on machining accuracy, machining shape and machining path.
6. When using a tool with a diameter of ϕ 0.5 (R0.25) or less, or L/D (aspect ratio) is greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
7. When RPM are insufficient, please reduce the RPM and feed rates at same ratio as listed above.

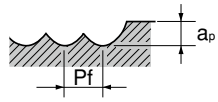
NEXT

AE-LNBD-H 切削条件基准表 Cutting Condition

FROM

加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation

加工材料 Work Material		工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)				调质钢 Hardened Steel															
						～55HRC				～62HRC				～66HRC				～70HRC			
RE	颈长 LU (mm)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf
0.3	0.75	50,000	1,250	0.03	0.05	50,000	880	0.03	0.05	50,000	700	0.01	0.02	50,000	600	0.01	0.02	50,000	450	0.01	0.02
	1	50,000	1,200	0.03	0.05	50,000	840	0.03	0.05	50,000	670	0.01	0.02	50,000	570	0.01	0.02	50,000	430	0.01	0.02
	1.2	50,000	1,200	0.03	0.05	50,000	840	0.03	0.05	50,000	670	0.01	0.02	50,000	570	0.01	0.02	50,000	430	0.01	0.02
	1.5	50,000	1,200	0.03	0.05	50,000	830	0.03	0.05	50,000	660	0.01	0.02	50,000	560	0.01	0.02	50,000	420	0.01	0.02
	2	50,000	1,200	0.03	0.05	50,000	820	0.03	0.05	50,000	650	0.01	0.02	50,000	550	0.01	0.02	50,000	410	0.01	0.02
	2.5	50,000	1,100	0.03	0.05	50,000	770	0.03	0.05	50,000	610	0.01	0.02	50,000	520	0.01	0.02	48,000	390	0.01	0.02
	3	50,000	1,100	0.02	0.03	50,000	750	0.02	0.03	50,000	540	0.01	0.02	48,600	460	0.01	0.02	38,900	350	0.01	0.02
	3.5	50,000	950	0.02	0.03	50,000	660	0.02	0.03	49,200	480	0.01	0.02	44,300	410	0.01	0.02	35,500	310	0.01	0.02
	4	48,000	850	0.01	0.02	48,000	590	0.01	0.02	43,200	420	0.01	0.02	38,900	360	0.01	0.02	31,200	270	0.01	0.02
	4.5	40,800	740	0.01	0.02	40,800	510	0.01	0.02	37,200	370	0.01	0.02	33,500	310	0.01	0.02	26,800	230	0.01	0.02
	5	36,000	640	0.01	0.02	36,000	440	0.01	0.02	32,400	310	0.01	0.02	29,200	260	0.01	0.02	23,400	200	0.01	0.02
	5.5	33,600	610	0.01	0.02	33,600	420	0.01	0.02	30,000	300	0.01	0.02	27,000	260	0.01	0.02	21,600	200	0.01	0.02
	6	31,200	570	0.01	0.02	30,000	380	0.01	0.02	26,400	260	0.01	0.02	23,800	220	0.01	0.02	19,100	170	0.01	0.02
	6.5	28,800	520	0.01	0.01	27,600	340	0.01	0.01	24,000	230	0.01	0.01	21,600	200	0.01	0.01	17,300	150	0.01	0.01
	7	27,600	420	0.01	0.01	26,400	280	0.01	0.01	22,800	190	0.01	0.01	20,600	160	0.01	0.01	16,500	120	0.01	0.01
	7.5	27,600	380	0.01	0.01	26,400	250	0.01	0.01	22,800	170	0.01	0.01	20,600	140	0.01	0.01	16,500	110	0.01	0.01
	8	24,000	300	0.005	0.01	22,800	200	0.005	0.01	20,400	140	0.005	0.01	18,400	120	0.005	0.01	14,700	90	0.005	0.01
	8.5	24,000	280	0.005	0.01	22,800	180	0.005	0.01	20,400	130	0.005	0.01	18,400	110	0.005	0.01	14,700	80	0.005	0.01
	9	24,000	260	0.005	0.01	22,800	170	0.005	0.01	20,400	120	0.005	0.01	18,400	100	0.005	0.01	14,700	80	0.005	0.01
	9.5	24,000	220	0.005	0.008	22,800	140	0.005	0.008	20,400	110	0.005	0.008	18,400	90	0.005	0.008	14,700	70	0.005	0.008
	10	24,000	190	0.005	0.008	22,800	120	0.005	0.008	20,400	100	0.005	0.008	18,400	90	0.005	0.008	14,700	70	0.005	0.008
	11	21,600	140	0.005	0.008	20,400	90	0.005	0.008	20,400	80	0.005	0.008	18,400	70	0.005	0.008	14,700	50	0.005	0.008
	12	21,600	110	0.005	0.005	20,400	80	0.005	0.005	20,400	70	0.004	0.005	18,400	60	0.004	0.005	14,700	50	0.004	0.005



1. 请使用刚性较高的机床和刀柄。
2. 推荐使用MQL (油雾冷却) 或气冷加工碳素钢、淬火钢。
3. 请根据加工材料使用气冷或发烟性少的切削油剂。
4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。数值为参考值，实际加工中的切削条件请参考上表并根据状况进行设定。
5. 根据加工精度、加工形状、加工路径适当调整加工条件。
6. φ0.5 (R0.25)以下或悬长 (L/D) 大于10时、微小的负荷增大也会导致折损、根据切削状况适当调节切削条件。
7. 转速不足的情况下，请按上表同比率下调转速和进给速度。

NEXT

FROM

加工材料 Work Material		工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)				调质钢 Hardened Steel															
		～55HRC				～62HRC				～66HRC				～70HRC							
RE	颈长 LU (mm)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf
0.4	1	50,000	2,200	0.04	0.08	50,000	1,800	0.04	0.08	50,000	1,400	0.04	0.08	50,000	1,190	0.04	0.08	50,000	890	0.04	0.08
	1.5	50,000	2,000	0.04	0.08	50,000	1,700	0.04	0.08	50,000	1,300	0.04	0.08	50,000	1,110	0.04	0.08	50,000	830	0.04	0.08
	2	50,000	1,900	0.04	0.08	50,000	1,600	0.04	0.08	50,000	1,200	0.015	0.03	50,000	1,020	0.015	0.03	50,000	770	0.015	0.03
	2.5	50,000	1,700	0.04	0.08	50,000	1,400	0.04	0.08	50,000	1,000	0.015	0.03	50,000	850	0.015	0.03	41,500	640	0.015	0.03
	3	50,000	1,500	0.04	0.08	50,000	1,100	0.04	0.08	50,000	820	0.015	0.03	48,600	700	0.015	0.03	38,900	530	0.015	0.03
	4	48,000	1,100	0.04	0.08	48,000	1,000	0.04	0.08	45,600	760	0.015	0.03	41,100	650	0.015	0.03	32,900	490	0.015	0.03
	5	40,800	900	0.03	0.05	40,800	800	0.03	0.05	37,200	580	0.015	0.03	33,500	490	0.015	0.03	26,800	370	0.015	0.03
	6	36,000	760	0.03	0.05	36,000	650	0.03	0.05	32,400	460	0.015	0.03	29,200	390	0.015	0.03	23,400	290	0.015	0.03
	7	30,000	570	0.01	0.02	30,000	450	0.01	0.02	26,400	310	0.01	0.02	23,800	260	0.01	0.02	19,100	200	0.01	0.02
	8	27,600	420	0.005	0.01	27,600	300	0.005	0.01	24,000	200	0.005	0.01	21,600	170	0.005	0.01	17,300	130	0.005	0.01
	9	25,200	360	0.005	0.009	24,000	250	0.005	0.009	22,200	190	0.005	0.009	20,000	160	0.005	0.009	16,000	120	0.005	0.009
	10	21,600	300	0.005	0.008	20,400	200	0.005	0.008	20,400	170	0.005	0.008	18,400	140	0.005	0.008	14,700	110	0.005	0.008
	12	20,400	230	0.005	0.005	19,200	160	0.005	0.005	19,200	110	0.005	0.005	17,300	90	0.005	0.005	13,900	70	0.005	0.005
0.5	1.5	50,000	3,900	0.05	0.1	50,000	3,900	0.05	0.1	50,000	3,100	0.02	0.05	50,000	2,640	0.02	0.05	50,000	1,980	0.02	0.05
	2	50,000	3,700	0.05	0.1	50,000	3,700	0.05	0.1	50,000	3,000	0.02	0.05	50,000	2,550	0.02	0.05	50,000	1,910	0.02	0.05
	2.5	50,000	3,350	0.05	0.1	50,000	3,100	0.05	0.1	50,000	2,500	0.02	0.05	50,000	2,130	0.02	0.05	48,000	1,600	0.02	0.05
	3	50,000	3,000	0.05	0.1	50,000	2,400	0.05	0.1	50,000	1,900	0.02	0.05	48,600	1,620	0.02	0.05	38,900	1,220	0.02	0.05
	4	48,000	2,850	0.05	0.1	48,000	2,200	0.05	0.1	48,000	1,700	0.02	0.05	43,200	1,450	0.02	0.05	34,600	1,090	0.02	0.05
	5	43,200	2,100	0.05	0.1	43,200	1,600	0.05	0.1	43,200	1,200	0.02	0.05	38,900	1,020	0.02	0.05	31,200	770	0.02	0.05
	6	36,000	1,900	0.05	0.1	36,000	1,500	0.05	0.1	36,000	1,200	0.02	0.05	32,400	1,020	0.02	0.05	26,000	770	0.02	0.05
	7	32,400	1,600	0.05	0.1	32,400	1,300	0.05	0.1	32,400	1,000	0.02	0.05	29,200	850	0.02	0.05	23,400	640	0.02	0.05
	8	31,200	1,500	0.05	0.1	31,200	1,200	0.05	0.1	31,200	960	0.02	0.05	28,100	820	0.02	0.05	22,500	620	0.02	0.05
	9	28,800	1,100	0.03	0.05	28,800	880	0.03	0.05	28,800	700	0.02	0.05	26,000	600	0.02	0.05	20,800	450	0.02	0.05
	10	26,400	1,000	0.01	0.02	25,200	760	0.01	0.02	21,600	520	0.01	0.02	19,500	440	0.01	0.02	15,600	330	0.01	0.02
	12	24,000	760	0.01	0.01	22,800	570	0.01	0.01	20,400	400	0.01	0.01	18,400	340	0.01	0.01	14,700	260	0.01	0.01
	13	22,800	670	0.005	0.01	21,600	500	0.005	0.01	19,200	350	0.005	0.01	17,300	300	0.005	0.01	13,900	230	0.005	0.01
	14	21,600	570	0.005	0.01	20,400	430	0.005	0.01	18,000	300	0.005	0.01	16,200	260	0.005	0.01	13,000	200	0.005	0.01
	16	19,200	400	0.005	0.01	18,000	300	0.005	0.01	15,600	200	0.005	0.01	14,100	170	0.005	0.01	11,300	130	0.005	0.01
	18	16,800	300	0.005	0.005	15,600	220	0.005	0.005	14,400	160	0.004	0.005	13,000	140	0.004	0.005	10,400	110	0.004	0.005
	20	15,600	285	0.005	0.005	14,400	180	0.005	0.005	14,400	140	0.004	0.005	13,000	120	0.004	0.005	10,400	90	0.004	0.005
	22	14,400	190	0.005	0.005	14,400	110	0.005	0.005	14,400	100	0.004	0.005	13,000	90	0.004	0.005	10,400	70	0.004	0.005

1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / oil mist coolant) or air blow is recommended.
3. Use an air blow or a suitable cutting fluid with high smoke retardant properties.
4. The above cutting conditions are for contouring operation with low-load and stable condition. Refer to the table above to set the milling conditions in accordance with the actual situation.
5. Please adjust conditions based on machining accuracy, machining shape and machining path.
6. When using a tool with a diameter of ϕ 0.5 (R0.25) or less, or L/D (aspect ratio) is greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
7. When RPM are insufficient, please reduce the RPM and feed rates at same ratio as listed above.

NEXT

AE-LNBD-H 切削条件基准表 Cutting Condition

FROM

加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation

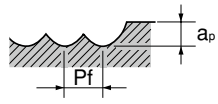
加工材料 Work Material		工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)				调质钢 Hardened Steel															
		～ 55HRC				～ 62HRC				～ 66HRC				～ 70HRC							
RE	颈长 LU (mm)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf
0.6	2	50,000	3,800	0.06	0.12	50,000	3,800	0.06	0.12	50,000	3,200	0.02	0.05	50,000	2,720	0.02	0.05	50,000	2,040	0.02	0.05
	2.4	50,000	3,600	0.06	0.12	50,000	3,600	0.06	0.12	50,000	3,000	0.02	0.05	50,000	2,550	0.02	0.05	50,000	1,910	0.02	0.05
	2.5	50,000	3,600	0.06	0.12	50,000	3,600	0.06	0.12	50,000	3,000	0.02	0.05	50,000	2,550	0.02	0.05	48,000	1,910	0.02	0.05
	3	50,000	3,200	0.06	0.12	50,000	3,200	0.06	0.12	50,000	2,600	0.02	0.05	46,500	2,210	0.02	0.05	37,200	1,660	0.02	0.05
	4	48,000	2,850	0.06	0.12	48,000	2,300	0.06	0.12	45,600	1,750	0.02	0.05	41,100	1,490	0.02	0.05	32,900	1,120	0.02	0.05
	6	38,400	2,000	0.06	0.12	38,400	1,600	0.06	0.12	36,000	1,200	0.02	0.05	32,400	1,020	0.02	0.05	26,000	770	0.02	0.05
	8	30,000	1,600	0.06	0.12	30,000	1,200	0.06	0.12	30,000	960	0.02	0.05	27,000	820	0.02	0.05	21,600	620	0.02	0.05
	10	24,000	1,100	0.05	0.1	21,600	800	0.05	0.1	19,200	560	0.02	0.05	17,300	480	0.02	0.05	13,900	360	0.02	0.05
	12	20,400	850	0.03	0.05	19,200	640	0.03	0.05	16,800	440	0.02	0.05	15,200	370	0.02	0.05	12,100	280	0.02	0.05
	14	19,200	610	0.03	0.05	18,000	450	0.03	0.05	15,600	310	0.02	0.05	14,100	260	0.02	0.05	11,300	200	0.02	0.05
	16	18,000	420	0.02	0.05	16,800	300	0.02	0.05	14,400	200	0.02	0.05	13,000	170	0.02	0.05	10,400	130	0.02	0.05
	18	18,000	330	0.005	0.005	16,800	200	0.005	0.005	14,400	130	0.004	0.005	13,000	110	0.004	0.005	10,400	80	0.004	0.005
	20	15,600	300	0.005	0.005	14,400	180	0.005	0.005	12,000	120	0.004	0.005	10,800	100	0.004	0.005	8,700	80	0.004	0.005
0.75	2	50,000	5,200	0.075	0.15	50,000	5,200	0.075	0.15	50,000	4,200	0.03	0.06	50,000	3,570	0.03	0.06	50,000	2,680	0.03	0.06
	2.5	50,000	5,000	0.075	0.15	50,000	5,000	0.075	0.15	50,000	4,000	0.03	0.06	50,000	3,400	0.03	0.06	50,000	2,550	0.03	0.06
	3	50,000	4,800	0.075	0.15	50,000	4,800	0.075	0.15	50,000	3,900	0.03	0.06	50,000	3,320	0.03	0.06	48,000	2,490	0.03	0.06
	4	48,000	3,700	0.075	0.15	48,000	2,900	0.075	0.15	45,600	2,200	0.03	0.06	41,100	1,870	0.03	0.06	32,900	1,400	0.03	0.06
	5	42,000	3,200	0.075	0.15	42,000	2,600	0.075	0.15	39,600	1,900	0.03	0.06	35,700	1,620	0.03	0.06	28,600	1,220	0.03	0.06
	6	36,000	2,700	0.075	0.15	36,000	2,200	0.075	0.15	32,400	1,500	0.03	0.06	29,200	1,280	0.03	0.06	23,400	960	0.03	0.06
	8	28,800	2,100	0.075	0.15	28,800	1,700	0.075	0.15	25,200	1,100	0.03	0.06	22,700	940	0.03	0.06	18,200	710	0.03	0.06
	10	28,800	1,900	0.075	0.15	28,800	1,500	0.075	0.15	25,200	1,000	0.03	0.06	22,700	850	0.03	0.06	18,200	640	0.03	0.06
	12	25,200	1,300	0.075	0.1	25,200	1,000	0.075	0.1	21,600	680	0.03	0.06	19,500	580	0.03	0.06	15,600	440	0.03	0.06
	14	20,400	1,100	0.05	0.1	20,400	900	0.05	0.1	18,000	630	0.03	0.06	16,200	540	0.03	0.06	13,000	410	0.03	0.06
	16	16,800	760	0.05	0.1	15,600	560	0.05	0.1	12,000	340	0.03	0.05	10,800	290	0.03	0.05	8,700	220	0.03	0.05
	18	15,600	470	0.03	0.05	14,400	350	0.03	0.05	12,000	230	0.03	0.05	10,800	200	0.03	0.05	8,700	150	0.03	0.05
	20	14,400	340	0.02	0.05	13,200	240	0.02	0.05	10,800	150	0.02	0.05	9,800	130	0.02	0.05	7,800	100	0.02	0.05
	22	14,400	300	0.02	0.05	13,200	220	0.02	0.05	10,800	140	0.02	0.05	9,800	120	0.02	0.05	7,800	90	0.02	0.05
	25	13,800	250	0.02	0.05	12,600	180	0.02	0.05	10,800	120	0.02	0.05	9,800	100	0.02	0.05	7,800	80	0.02	0.05
	30	13,200	190	0.005	0.01	12,000	120	0.005	0.01	10,800	90	0.005	0.01	9,800	80	0.005	0.01	7,800	60	0.01	0.01

1. 请使用刚性较高的机床和刀柄。
2. 推荐使用MQL (油雾冷却) 或气冷加工碳素钢、淬火钢。
3. 请根据加工材料使用气冷或发烟性少的切削油剂。
4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。数值为参考值，实际加工中的切削条件请参考上表并根据状况进行设定。
5. 根据加工精度、加工形状、加工路径适当调整加工条件。
6. φ0.5 (R0.25)以下或悬长 (L/D) 大于10时、微小的负荷增大也会导致折损、根据切削状况适当调节切削条件。
7. 转速不足的情况下，请按上表同比率下调转速和进给速度。

NEXT

FROM

加工材料 Work Material		工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)				调质钢 Hardened Steel													
		～55HRC				～62HRC				～66HRC				～70HRC					
RE	颈长 LU (mm)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf
0.8	4	36,000	3,500	0.08	0.16	34,800	2,700	0.08	0.16	31,200	2,000	0.03	0.08	28,100	1,700	0.03	0.08	22,500	1,280	0.03	0.08
	8	28,800	2,800	0.08	0.16	27,600	2,100	0.08	0.16	24,000	1,400	0.03	0.08	21,600	1,190	0.03	0.08	17,300	890	0.03	0.08
	12	25,200	1,700	0.05	0.1	24,000	1,380	0.05	0.1	21,600	990	0.03	0.08	19,500	840	0.03	0.08	15,600	630	0.03	0.08
	16	16,800	760	0.05	0.1	15,600	600	0.05	0.1	13,200	400	0.03	0.08	11,900	340	0.03	0.08	9,600	260	0.03	0.08
	20	14,400	360	0.03	0.05	13,200	280	0.03	0.05	12,000	200	0.03	0.05	10,800	170	0.03	0.05	8,700	130	0.03	0.05
1	2.5	50,000	6,400	0.1	0.2	50,000	6,000	0.1	0.2	50,000	4,400	0.05	0.1	50,000	3,740	0.05	0.1	43,200	2,810	0.05	0.1
	3	50,000	6,000	0.1	0.2	50,000	5,700	0.1	0.2	50,000	4,000	0.05	0.1	48,600	3,400	0.05	0.1	38,900	2,550	0.05	0.1
	4	50,000	5,600	0.1	0.2	50,000	5,300	0.1	0.2	48,000	3,600	0.05	0.1	43,200	3,060	0.05	0.1	34,600	2,300	0.05	0.1
	5	48,000	4,500	0.1	0.2	46,800	4,300	0.1	0.2	40,800	2,700	0.05	0.1	36,800	2,300	0.05	0.1	29,400	1,730	0.05	0.1
	6	43,200	2,800	0.1	0.2	42,000	2,700	0.1	0.2	36,000	1,800	0.05	0.1	32,400	1,530	0.05	0.1	26,000	1,150	0.05	0.1
	8	30,000	2,400	0.1	0.2	28,800	2,300	0.1	0.2	24,000	1,500	0.05	0.1	21,600	1,280	0.05	0.1	17,300	960	0.05	0.1
	10	24,000	2,200	0.1	0.2	22,800	2,000	0.1	0.2	20,400	1,400	0.05	0.1	18,400	1,190	0.05	0.1	14,700	890	0.05	0.1
	12	19,200	1,900	0.1	0.2	18,000	1,700	0.1	0.2	15,600	1,100	0.05	0.1	14,100	940	0.05	0.1	11,300	710	0.05	0.1
	13	19,200	1,800	0.1	0.2	18,000	1,600	0.1	0.2	15,600	1,050	0.05	0.1	14,100	890	0.05	0.1	11,300	670	0.05	0.1
	14	18,000	1,700	0.1	0.2	16,800	1,500	0.1	0.2	14,400	1,000	0.05	0.1	13,000	850	0.05	0.1	10,400	640	0.05	0.1
	16	16,800	1,600	0.1	0.1	15,600	1,400	0.1	0.1	13,200	950	0.05	0.1	11,900	810	0.05	0.1	9,600	610	0.05	0.1
	18	15,600	1,500	0.1	0.1	14,400	1,200	0.1	0.1	12,000	800	0.05	0.1	10,800	680	0.05	0.1	8,700	510	0.05	0.1
	20	13,200	1,100	0.05	0.1	12,000	890	0.05	0.1	10,800	640	0.05	0.1	9,800	540	0.05	0.1	7,800	410	0.05	0.1
	22	10,800	950	0.05	0.1	10,800	860	0.05	0.1	9,000	570	0.05	0.1	8,100	480	0.05	0.1	6,500	360	0.05	0.1
	25	10,800	760	0.03	0.05	10,800	680	0.03	0.05	9,000	450	0.03	0.05	8,100	380	0.03	0.05	6,500	290	0.03	0.05
	30	10,800	470	0.02	0.05	10,800	360	0.02	0.05	9,000	240	0.02	0.05	8,100	200	0.02	0.05	6,500	150	0.02	0.05
	35	9,000	230	0.02	0.03	8,400	130	0.02	0.03	7,200	100	0.02	0.03	6,500	90	0.02	0.03	5,200	70	0.02	0.03
	40	7,200	140	0.02	0.03	7,200	100	0.02	0.03	7,200	90	0.02	0.03	6,500	80	0.02	0.03	5,200	60	0.02	0.03



1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / oil mist coolant) or air blow is recommended.
3. Use an air blow or a suitable cutting fluid with high smoke retardant properties.
4. The above cutting conditions are for contouring operation with low-load and stable condition. Refer to the table above to set the milling conditions in accordance with the actual situation.
5. Please adjust conditions based on machining accuracy, machining shape and machining path.
6. When using a tool with a diameter of ϕ 0.5 (R0.25) or less, or L/D (aspect ratio) is greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
7. When RPM are insufficient, please reduce the RPM and feed rates at same ratio as listed above.

NEXT

AE-LNBD-H 切削条件基准表 Cutting Condition

FROM

加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation

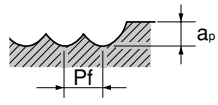
加工材料 Work Material		工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)				调质钢 Hardened Steel													
		～ 55HRC				～ 62HRC				～ 66HRC				～ 70HRC					
RE	颈长 LU (mm)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf
1.25	6	28,800	3,600	0.1	0.2	27,600	3,400	0.1	0.2	24,000	2,400	0.05	0.1	21,600	2,040	0.05	0.1	17,300	1,530	0.05	0.1
	8	26,400	3,350	0.1	0.2	25,200	3,150	0.1	0.2	21,600	2,150	0.05	0.1	19,500	1,830	0.05	0.1	15,600	1,370	0.05	0.1
	10	24,000	3,100	0.1	0.2	22,800	2,900	0.1	0.2	19,200	1,900	0.05	0.1	17,300	1,620	0.05	0.1	13,900	1,220	0.05	0.1
	15	20,400	2,600	0.1	0.2	19,200	2,400	0.1	0.2	16,800	1,600	0.05	0.1	15,200	1,360	0.05	0.1	12,100	1,020	0.05	0.1
	20	18,000	1,700	0.1	0.2	16,800	1,600	0.1	0.2	14,400	1,000	0.05	0.1	13,000	850	0.05	0.1	10,400	640	0.05	0.1
	25	13,200	950	0.03	0.05	12,000	830	0.03	0.05	10,800	590	0.03	0.05	9,800	500	0.03	0.05	7,800	380	0.03	0.05
	30	10,800	760	0.03	0.05	9,600	650	0.03	0.05	8,400	450	0.03	0.05	7,600	380	0.03	0.05	6,100	290	0.03	0.05
	35	9,000	470	0.02	0.03	8,400	430	0.02	0.03	7,200	290	0.02	0.03	6,500	250	0.02	0.03	5,200	190	0.02	0.03
1.5	6	49,800	6,200	0.15	0.3	38,400	4,800	0.15	0.3	31,800	3,300	0.06	0.15	28,700	2,810	0.06	0.15	22,900	2,110	0.06	0.15
	8	36,000	4,200	0.15	0.3	30,000	3,500	0.15	0.3	26,400	2,400	0.06	0.15	23,800	2,040	0.06	0.15	19,100	1,530	0.06	0.15
	10	30,000	3,600	0.15	0.3	24,000	2,800	0.15	0.3	21,600	2,000	0.06	0.15	19,500	1,700	0.06	0.15	15,600	1,280	0.06	0.15
	12	24,000	2,800	0.15	0.3	21,600	2,500	0.15	0.3	19,200	1,700	0.06	0.15	17,300	1,450	0.06	0.15	13,900	1,090	0.06	0.15
	13	22,800	2,650	0.15	0.3	19,800	2,250	0.15	0.3	17,400	1,500	0.06	0.15	15,700	1,280	0.06	0.15	12,600	960	0.06	0.15
	14	21,600	2,500	0.15	0.3	18,000	2,000	0.15	0.3	15,600	1,300	0.06	0.15	14,100	1,110	0.06	0.15	11,300	830	0.06	0.15
	15	19,200	2,200	0.1	0.3	15,600	1,800	0.1	0.3	13,200	1,200	0.06	0.15	11,900	1,020	0.06	0.15	9,600	770	0.06	0.15
	16	19,200	1,900	0.1	0.2	15,600	1,500	0.1	0.2	13,200	1,100	0.06	0.15	11,900	940	0.06	0.15	9,600	710	0.06	0.15
	20	16,800	1,700	0.1	0.2	13,200	1,600	0.1	0.2	12,000	1,000	0.06	0.15	10,800	850	0.06	0.15	8,700	640	0.06	0.15
	25	14,400	1,100	0.05	0.1	10,800	820	0.05	0.1	9,600	580	0.05	0.1	8,700	490	0.05	0.1	7,000	370	0.05	0.1
	30	10,800	760	0.03	0.05	8,400	590	0.03	0.05	7,200	400	0.03	0.05	6,500	340	0.03	0.05	5,200	260	0.03	0.05
	35	9,000	570	0.02	0.05	7,200	460	0.02	0.05	6,000	300	0.02	0.05	5,400	260	0.02	0.05	4,400	200	0.02	0.05
	40	7,800	470	0.02	0.03	6,000	360	0.02	0.03	4,800	230	0.02	0.03	4,400	200	0.02	0.03	3,500	150	0.02	0.03

1. 请使用刚性较高的机床和刀柄。
2. 推荐使用MQL (油雾冷却) 或气冷加工碳素钢、淬火钢。
3. 请根据加工材料使用气冷或发烟性少的切削油剂。
4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。数值为参考值，实际加工中的切削条件请参考上表并根据状况进行设定。
5. 根据加工精度、加工形状、加工路径适当调整加工条件。
6. φ0.5 (R0.25)以下或悬长 (L/D) 大于10时、微小的负荷增大也会导致折损、根据切削状况适当调节切削条件。
7. 转速不足的情况下，请按上表同比率下调转速和进给速度。

NEXT

FROM

加工材料 Work Material		工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)				调质钢 Hardened Steel															
		～55HRC				～62HRC				～66HRC				～70HRC							
RE	颈长 LU (mm)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf
1.75	10	24,000	3,100	0.1	0.3	19,200	2,200	0.1	0.3	16,800	1,500	0.07	0.15	15,200	1,280	0.07	0.15	12,100	960	0.07	0.15
	15	21,600	2,800	0.1	0.3	16,800	2,000	0.1	0.3	14,400	1,300	0.07	0.15	13,000	1,110	0.07	0.15	10,400	830	0.07	0.15
	16	20,400	2,700	0.1	0.3	15,600	1,900	0.1	0.2	13,200	1,250	0.07	0.15	11,900	1,060	0.07	0.15	9,600	800	0.07	0.15
	20	19,200	2,500	0.1	0.2	14,400	1,800	0.1	0.2	12,000	1,200	0.07	0.15	10,800	1,020	0.07	0.15	8,700	770	0.07	0.15
	25	14,400	1,900	0.1	0.1	10,800	1,300	0.1	0.1	9,600	920	0.07	0.15	8,700	780	0.07	0.15	7,000	590	0.07	0.15
	30	12,000	1,500	0.05	0.1	9,600	1,100	0.05	0.1	8,400	770	0.05	0.1	7,600	650	0.05	0.1	6,100	490	0.05	0.1
	35	10,800	950	0.05	0.05	8,400	700	0.05	0.05	6,000	400	0.05	0.05	5,400	340	0.05	0.05	4,400	260	0.05	0.05
	40	9,000	760	0.05	0.05	7,200	580	0.05	0.05	4,800	300	0.05	0.05	4,400	260	0.05	0.05	3,500	200	0.05	0.05
	45	7,800	570	0.03	0.03	6,000	420	0.03	0.03	4,800	260	0.03	0.03	4,400	220	0.03	0.03	3,500	170	0.03	0.03
2	8	37,200	5,700	0.2	0.5	28,800	4,400	0.2	0.5	24,000	3,200	0.08	0.2	21,600	2,720	0.08	0.2	17,300	2,040	0.08	0.20
	10	30,000	4,200	0.2	0.5	24,000	3,300	0.2	0.5	21,600	2,300	0.08	0.2	19,500	1,960	0.08	0.2	15,600	1,470	0.08	0.20
	12	24,000	3,400	0.2	0.5	20,400	2,900	0.2	0.5	16,800	1,900	0.08	0.2	15,200	1,620	0.08	0.2	12,100	1,220	0.08	0.20
	13	24,000	3,400	0.2	0.5	19,800	2,800	0.2	0.5	15,600	1,750	0.08	0.2	14,100	1,490	0.08	0.2	11,300	1,120	0.08	0.20
	14	24,000	3,400	0.2	0.5	19,800	2,800	0.2	0.5	15,600	1,750	0.08	0.2	14,100	1,490	0.08	0.2	11,300	1,120	0.08	0.20
	15	24,000	3,400	0.2	0.5	19,200	2,700	0.2	0.5	14,400	1,600	0.08	0.2	13,000	1,360	0.08	0.2	10,400	1,020	0.08	0.20
	16	21,600	3,000	0.2	0.5	18,000	2,500	0.2	0.5	12,000	1,300	0.08	0.2	10,800	1,110	0.08	0.2	8,700	830	0.08	0.20
	20	19,200	2,600	0.2	0.4	16,800	2,300	0.2	0.4	9,600	1,000	0.08	0.2	8,700	850	0.08	0.2	7,000	640	0.08	0.20
	25	19,200	2,600	0.1	0.3	15,600	2,200	0.1	0.3	7,200	810	0.08	0.2	6,500	690	0.08	0.2	5,200	520	0.08	0.20
	30	16,800	2,200	0.1	0.2	14,400	1,900	0.1	0.2	6,000	630	0.08	0.2	5,400	540	0.08	0.2	4,400	410	0.08	0.20
	35	14,400	1,700	0.1	0.2	10,800	1,200	0.1	0.2	4,800	420	0.08	0.2	4,400	360	0.08	0.2	3,500	270	0.08	0.20
	40	10,800	1,200	0.05	0.1	9,600	1,000	0.05	0.1	4,800	400	0.05	0.1	4,400	340	0.05	0.1	3,500	260	0.05	0.1
	45	9,000	950	0.05	0.05	8,400	890	0.05	0.05	4,400	360	0.05	0.05	3,900	310	0.05	0.05	3,200	230	0.05	0.05
	50	7,800	660	0.02	0.05	7,200	600	0.02	0.05	4,400	280	0.02	0.05	3,900	240	0.02	0.05	3,200	180	0.02	0.05



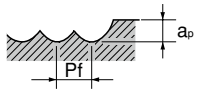
1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / oil mist coolant) or air blow is recommended.
3. Use an air blow or a suitable cutting fluid with high smoke retardant properties.
4. The above cutting conditions are for contouring operation with low-load and stable condition. Refer to the table above to set the milling conditions in accordance with the actual situation.
5. Please adjust conditions based on machining accuracy, machining shape and machining path.
6. When using a tool with a diameter of ϕ 0.5 (R0.25) or less, or L/D (aspect ratio) is greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
7. When RPM are insufficient, please reduce the RPM and feed rates at same ratio as listed above.

NEXT

AE-LNBD-H 切削条件基准表 Cutting Condition

FROM

加工路线以等高线加工为前提。 The machining path is on condition of contouring line operation

加工材料 Work Material		工具钢・调质钢・预硬钢 Tool Steel・Hardened Steel Prehardened Steel SKD11・SKD61・NAK80 (～45HRC)				调质钢 Hardened Steel													
						～55HRC				～62HRC				～66HRC				～70HRC			
RE	颈长 LU (mm)	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf	转速 Speed (min^{-1})	进给速度 Feed (mm/min)	ap	Pf
2.5	10	30,000	5,400	0.25	0.5	22,800	4,000	0.25	0.5	19,200	2,800	0.1	0.25	17,300	2,380	0.1	0.25	13,900	1,790	0.1	0.25
	15	24,000	3,900	0.25	0.5	20,400	3,300	0.25	0.5	15,600	2,000	0.1	0.25	14,100	1,700	0.1	0.25	11,300	1,280	0.1	0.25
	20	19,200	3,300	0.25	0.5	15,600	2,700	0.25	0.5	9,600	1,300	0.1	0.25	8,700	1,110	0.1	0.25	7,000	830	0.1	0.25
	25	18,000	3,000	0.2	0.3	14,400	2,400	0.2	0.3	7,200	960	0.1	0.25	6,500	820	0.1	0.25	5,200	620	0.1	0.25
	30	16,800	2,300	0.1	0.3	13,200	1,800	0.1	0.3	4,800	520	0.1	0.25	4,400	440	0.1	0.25	3,500	330	0.1	0.25
	35	14,400	1,500	0.1	0.3	12,000	1,100	0.1	0.3	3,900	280	0.1	0.25	3,500	240	0.1	0.25	2,800	180	0.1	0.25
	40	12,000	1,100	0.1	0.2	10,800	990	0.1	0.2	3,600	260	0.1	0.2	3,300	220	0.1	0.2	2,600	170	0.1	0.20
	45	10,800	850	0.1	0.1	9,600	660	0.1	0.1	3,600	200	0.1	0.1	3,300	170	0.1	0.1	2,600	130	0.1	0.1
	50	9,000	760	0.1	0.1	8,400	610	0.1	0.1	3,400	190	0.1	0.1	3,100	160	0.1	0.1	2,500	120	0.1	0.1
3	10	26,400	5,600	0.3	0.5	21,600	3,800	0.3	0.5	18,600	2,800	0.1	0.2	16,800	2,380	0.1	0.2	13,400	1,790	0.1	0.20
	12	24,000	5,200	0.3	0.5	19,200	3,400	0.3	0.5	16,200	2,500	0.1	0.2	14,600	2,130	0.1	0.2	11,700	1,600	0.1	0.20
	15	22,200	4,800	0.3	0.5	17,400	3,250	0.3	0.5	14,400	1,850	0.1	0.2	13,000	1,570	0.1	0.2	10,400	1,180	0.1	0.20
	20	19,200	3,900	0.3	0.5	14,400	3,000	0.3	0.5	9,600	1,600	0.1	0.2	8,700	1,360	0.1	0.2	7,000	1,020	0.1	0.20
	25	14,400	3,000	0.3	0.5	12,000	2,500	0.3	0.5	7,200	1,200	0.1	0.2	6,500	1,020	0.1	0.2	5,200	770	0.1	0.20
	30	12,000	2,400	0.3	0.5	10,800	2,100	0.3	0.5	4,800	740	0.1	0.2	4,400	630	0.1	0.2	3,500	470	0.1	0.20
	35	10,800	2,100	0.2	0.4	10,800	2,000	0.2	0.4	4,200	620	0.1	0.2	3,800	530	0.1	0.2	3,100	400	0.1	0.20
	40	10,800	1,900	0.2	0.3	10,800	1,800	0.2	0.3	3,600	480	0.1	0.2	3,300	410	0.1	0.2	2,600	310	0.1	0.20
	45	9,600	1,700	0.2	0.3	9,600	1,600	0.2	0.3	3,400	440	0.1	0.2	3,100	370	0.1	0.2	2,500	280	0.1	0.20
	50	8,400	1,500	0.2	0.3	8,400	1,400	0.2	0.3	3,000	400	0.1	0.2	2,700	340	0.1	0.2	2,200	260	0.1	0.20
	60	7,200	1,250	0.2	0.3	7,200	1,150	0.2	0.3	2,800	350	0.1	0.2	2,500	300	0.1	0.2	2,000	230	0.1	0.20
切深量 Depth of Cut																					

1. 请使用刚性较高的机床和刀柄。
2. 推荐使用MQL (油雾冷却) 或气冷加工碳素钢、淬火钢。
3. 请根据加工材料使用气冷或发烟性少的切削油剂。
4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。数值为参考值，实际加工中的切削条件请参考上表并根据状况进行设定。
5. 根据加工精度、加工形状、加工路径适当调整加工条件。
6. φ0.5 (R0.25)以下或悬长 (L/D) 大于10时、微小的负荷增大也会导致折损、根据切削状况适当调节切削条件。
7. 转速不足的情况下，请按上表同比率下调转速和进给速度。

1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / oil mist coolant) or air blow is recommended.
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7. When RPM are insufficient, please reduce the RPM and feed rates at same ratio as listed above.

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地址：上海市长宁区长宁路1133号 长宁来福士广场T1办公楼10层1003-07单元
电话：021-52552588；　传真：021-58883300；　邮编：200051

欧士机（上海）无锡事务所
地址：无锡市湖滨壹号花园1-2蠡湖大厦1004室
电话：0510-82739271；　传真：0510-82739220；　邮编：214074

欧士机（上海）芜湖事务所
地址：芜湖市镜湖区汇金广场B座1801室
电话：0553-5868160；　传真：0553-5868190；　邮编：241000

欧士机（上海）苏州事务所
地址：苏州工业园区翠园路181号商旅大厦1511室
电话：0512-62388327；　传真：0512-62388320；　邮编：215028

欧士机（上海）杭州萧山事务所
地址：杭州市萧山区建设一路66号华瑞中心3幢1703室
电话：0571-82757757；　传真：0571-82757767；　邮编：311215

欧士机（上海）宁波事务所
地址：浙江省宁波市鄞州区南部商务区汇港大厦401-3室
电话：0574-88161548；　传真：0574-88134670；　邮编：315199

欧士机（上海）广州分公司
地址：广州市天河区林和西路157号保利中汇大厦A1701房
电话：020-38210423；　传真：020-38210425；　邮编：510610

欧士机（上海）深圳事务所
地址：深圳市福田区福民路福民佳园2129C室（福民地铁站A出口）
电话：0755-83566532；　传真：0755-83558854；　邮编：518048

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电话：010-85261018；　传真：010-85261016；　邮编：100004

欧士机（上海）天津分公司
地址：天津市和平区南马路11号和平创新大厦10层1018室
电话：022-23037566；　邮编：300020

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地址：河南省郑州市陇海路与嵩山路溪山御府1号院3号楼1单元1002
电话：186-3092-1318；　邮编：450016

欧士机（上海）西安事务所
地址：西安市未央区凤城五路雅荷春天13号楼3单元301室
电话：029-88860594；　传真：029-88860594；　邮编：710000

欧士机（上海）大连分公司
地址：大连开发区凯伦国际大厦B2006
电话：0411-87655185；　传真：0411-87655186；　邮编：116600

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地址：青岛市市北区龙城路30号万达广场3号楼2单元1202室
电话：0532-66775787　传真：0532-66775797　邮编：266034

欧士机（上海）沈阳事务所
地址：沈阳市铁西区 兴华北街55号 华润置地广场南N号楼32-04
电话：024-22852762　传真：024-22852763　邮编：110021

欧士机（上海）长春事务所
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电话：0431-89388499；　传真：0431-89230366；　邮编：130012

欧士机（上海）成都事务所
地址：成都市武侯区人民南路四段27号商鼎国际2栋1单元803号
电话：028-65783992；　传真：028-85005292；　邮编：610042

欧士机（上海）重庆分公司
地址：重庆市渝北区龙溪街道金山路18号 中渝都会首站 4幢12-1
电话：023-67136872；　邮编：401120

欧士机（上海）武汉事务所
地址：武汉市江岸区三阳路新长江国际B1座2505室
电话：027-85557360；　传真：027-85557350；　邮编：430010

欧士机（上海）长沙事务所
地址：湖南长沙市天心区湘江中路36号华远SOHO 1613
电话：0731-88620770；　传真：0731-88620770；　邮编：410000

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