

微粒子超硬合金 KD 类

FINE-GRAIN CEMENTED CARBIDE - KD GRADE

LINE UP..... KD05, KD10, KD20, KD30, KD40, KD50

用于IC引线框架冲压的标准硬质合金材料。“EVERLOY”的“KD20”类材料因其高品质和高性能在海内外业界享有非常高的知名度。

KD类超硬质合金是以提高耐剥落性及韧性为目的所研发的材料，是一种Co含量较高，含有微粒子WC（直径0.5-1.5 μ m）的微粒子超硬合金。

多用于半导体的IC引线框架、连接器、电动机的电磁钢板以及粉末成型等冲压模具。

具有卓越的耐剥落性及韧性，在精密加工及使用时不易产生剥落，可延长精密模具的使用寿命。

Standard cemented carbide grade for IC lead frame industry.

"EVERLOY""KD20" cemented carbide is well known as high quality and performance around the world.

Be often adopted for press mold of IC lead frame, magnetic steel sheet and powder compacting.

Excellent balance of wear-resistance, toughness, mold life and machinability.



产品说明
Explanation

通过使用微粒WC，获得了高硬度和高强度，具有良好的耐磨损性和耐剥落性。
High performance of hardness, toughness, wear and chipping resistance by fine grain WC.

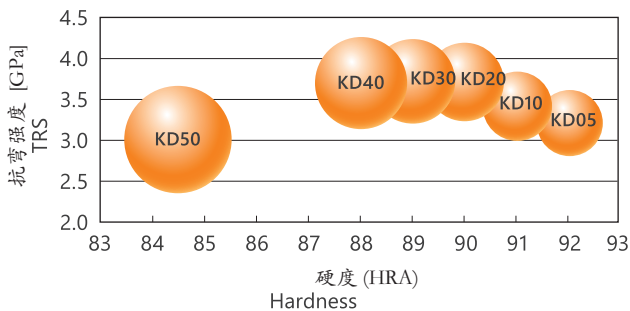


用途/实例
Applications

用于电子元件，电磁性钢板冲压模具，粉末成型模具等。
Mold for Electronic component, Magnetic steel sheet, Powder compacting, etc.

KD类加工性能和耐磨损间的关系

Relation between wear-resistance and machining property for KD grade



抗弯强度高、球越大=加工性良好

硬度高=耐磨损性良好

High TRS/Larger circle = Excellent machining property

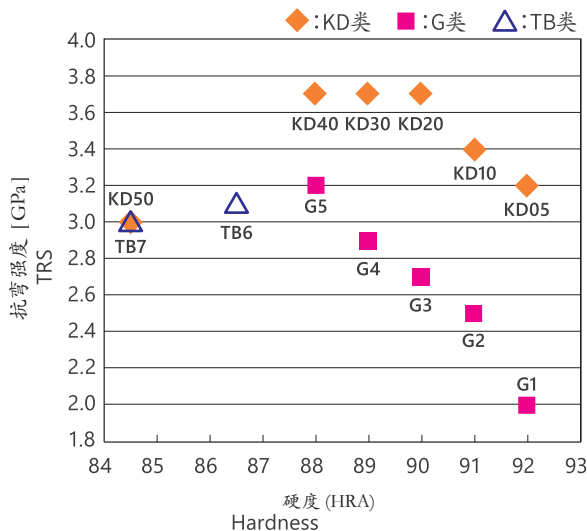
High Hardness = Excellent wear-resistance

*球的大小反映的是材料的破坏韧性值

Circle size indicates fracture toughness value.

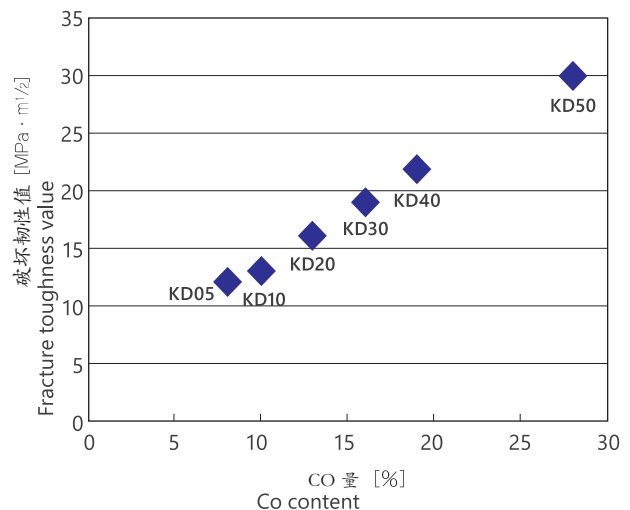
物理特性 (HRA硬度和抗弯强度)

Hardness and TRS



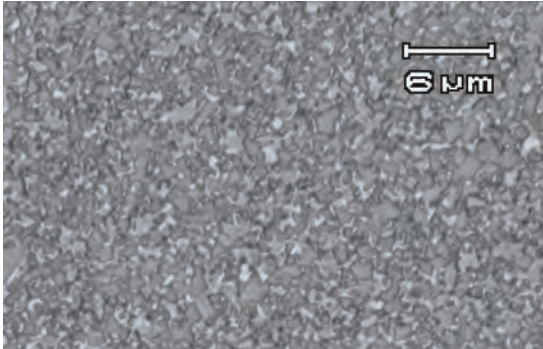
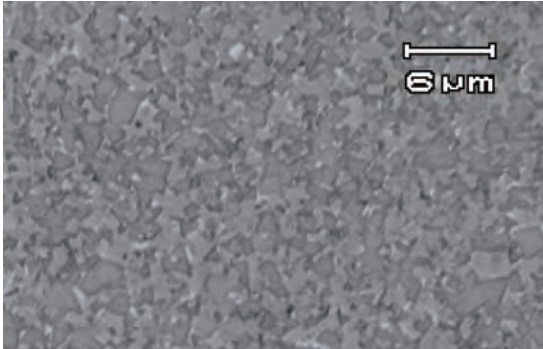
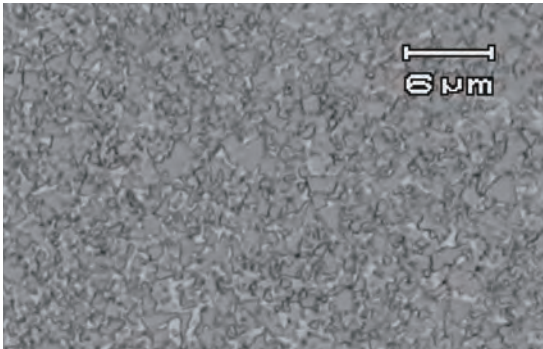
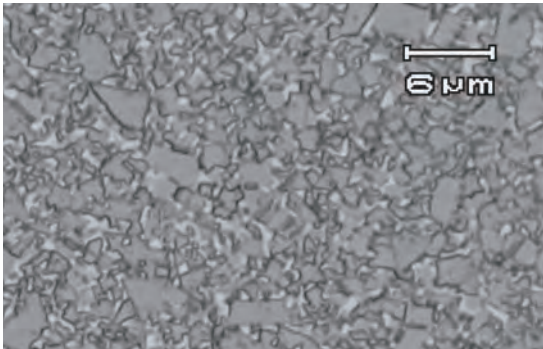
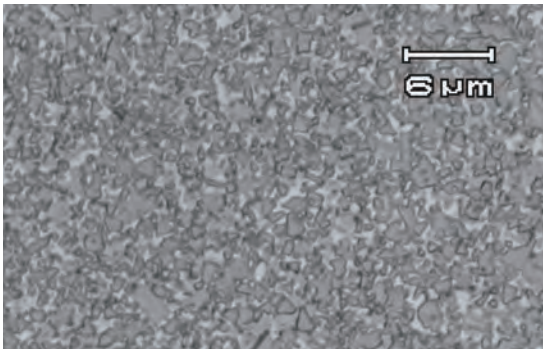
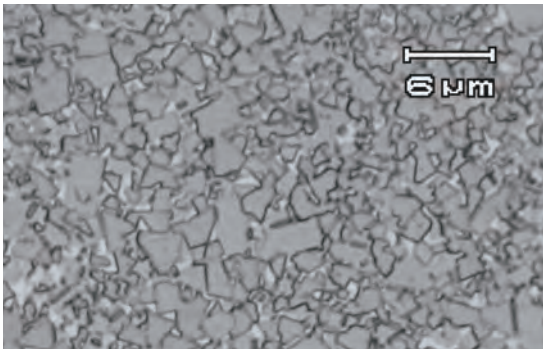
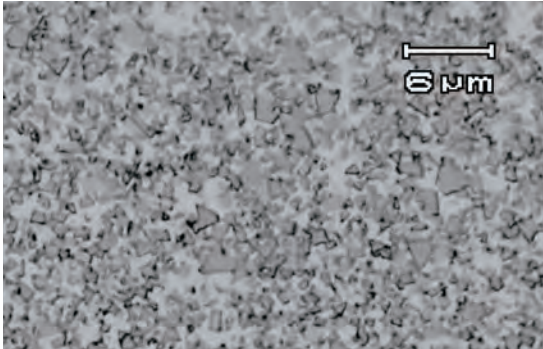
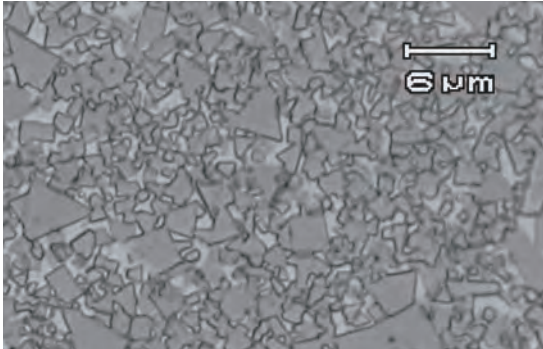
物理特性 (破坏韧性值)

Fracture toughness value



KD 类与G 类之显微镜组织图

Micrographs of the KD grade and G grade

KD类 KD grade	G类 G grade
 KD05	 G1
 KD10	 G2
 KD20	 G3
 KD40	 G5

金属显微镜 (X1000)
By metallurgical microscope (x1000)

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平面研磨时产生之剥落比较实验结果（根据显微镜照片）

Comparison test results of the chipping generated during the surface grinding (micrographs)

■ 试件 Sample

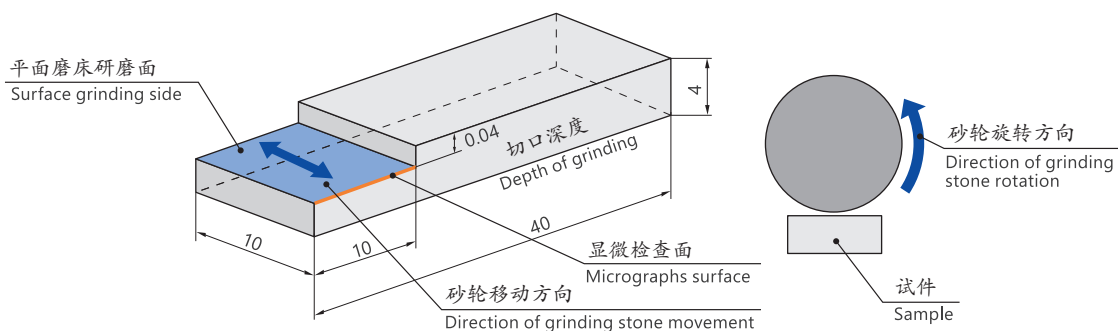
KD类	KD grade	KD20	KD30	KD50
G类	G grade	G5		
EF类	EF grade	EF10		

■ 平面磨床研磨条件 Surface grinding conditions

加工量 Amount moved	0.04 mm (0.004mm /次 重复10次) 0.04 mm (10 × 0.004 mm)
进给速度 Speed	17 m/min
使用砂轮 Grinding stone	#600 φ180 mm
砂轮转数 Grinding stone revolutions	3200 rpm

■ 显微检查面: 砂轮离开侧之侧面边缘

Micrograph surface : Escape side edge of grinding stone



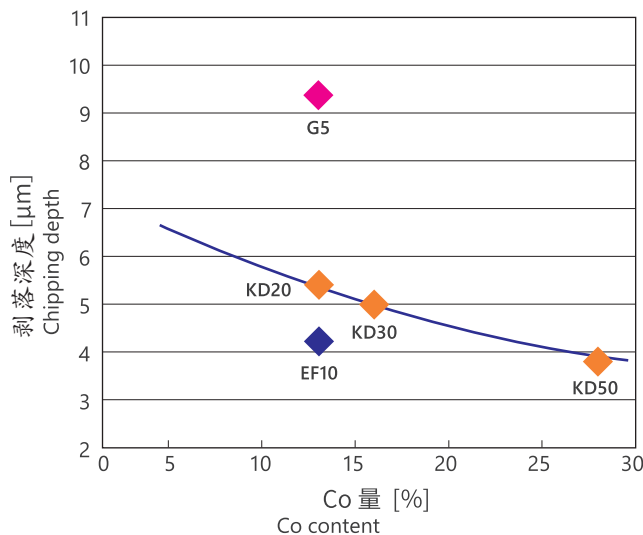
■ 实验结果 Test results

剥落评价结果 Chipping test results

材质 Grade	Co量[%] Cobalt content	剥落深度 [μm] Chipping depth
KD20	13	5.4
KD30	16	5.0
KD50	28	3.8
G5	13	9.4
EF10	13	4.2

耐剥落特性 Chipping-resistance characteristics

粒子径越细、钴含量越多、耐剥落性越强。
The finer grain and the more cobalt contained, the greater chipping-resistance it has.

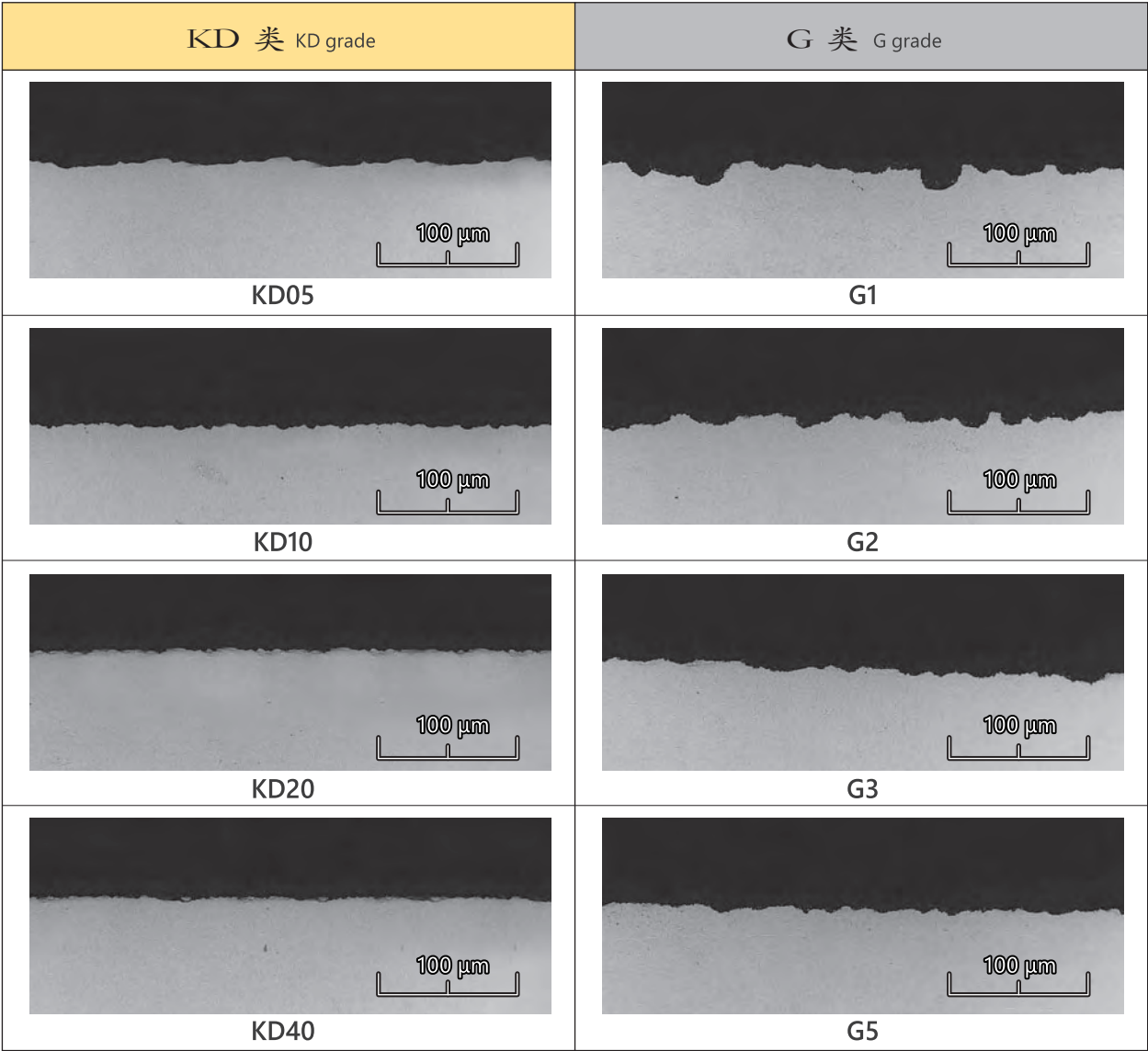


检查面的照片 (×500)

Micrographs surface (×500)

以下为针对各表面边缘部位中剥落明显可见之部位所拍摄之照片，虽然并不是所有的边缘都呈现这样的状态，但各种材料之剥落趋势与照片中所示呈现之趋势相同。

The following photos show the phases of the edges where chipping was notable and are not representative of all the edges. However, the photos do show the tendency for chipping in various types of materials.



■ 试件 Sample

KD 类 KD grade	KD05	KD10	KD20	KD40
G 类 G grade	G1	G2	G3	G5

■ 表面研磨条件

Surface grinding conditions

加工量 Amount moved	0.07 mm (0.02 mm/次 重复3次+0.01 mm/往返) 0.07 mm (3× 0.02 mm+ 0.01 mm / both ways)
进给速度 Speed	3.0 mm/min
使用砂轮 Grinding stone	#400 φ75 mm
砂轮转数 Grinding stone revolutions	3600 rpm
行程数 Number of strokes	85 spm
行程量 Amount of strokes	27 mm