国内销售热线
Domestic sales hotline
0731-22673988　22673899
国际销售热线
International sales hotline
+86-731-22673987　22673898
地址（总　部）：湖南省株洲市炎陵县中小企业创业园创业路（P.C.412500）
（分公司）：湖南省株洲市芦淞区创业四路8号（P.C.412008）
Add（Head　Office）：Chuangye Rd,Chuangye Park for SMEs,Yanling County,Zhuzhou,Hunan,China.
（Branch Office）：#8,Chuangye Rd,Lusong area,Zhuzhou,Hunan,China.
官方网站（Web）：www.oke-carbide.com
邮箱（E-mail）：may@oke-carbide.com　info@oke-carbide.com
企业QQ：800060226
传真（Fax）：0731-22673966

责任铸就**卓越**
Obligation Keeps Excellence

WSF ISO9001

CEMENTED CARBIDE RODS
硬质合金圆棒

网址：www.oke-carbide.com

株洲欧科亿数控精密刀具股份有限公司

OKE 株洲欧科亿数控精密刀具股份有限公司
OKE PRECISION CUTTING TOOLS CO., LTD.

About us
关于我们

株洲欧科亿数控精密刀具股份有限公司（原名“株洲欧科亿硬质合金有限公司”）成立于1996年1月23日，注册资金7,500万元，是一家专业研发、生产、销售高精数控刀片（刀具）和小型精密切削刀片的民营高新技术企业。

公司地处株洲炎陵县，现已在株洲炎陵县和芦淞区建成两大生产基地，总占地面积约110亩。公司现拥有约40,000m²的现代化标准厂房，3,000多台（套）国际一流水准的加工制造装备及研发、检测设备，资产总额6.2亿元以上。

公司在册员工700余人，其中技术研发的人员80多人，组建了湖南省认定企业技术中心，在高精数控刀具基体材质与涂层工艺设计、刀片基体成形关键技术等方面的研究取得了数十项拥有自主知识产权的科研成果，技术水平处于国内行业领先水平。公司现已获得正式授权的有效专利共计54件，包括8件发明专利，26件实用新型专利及20件外观设计专利。

经过二十多年的发展，公司不仅拥有国际一流水准的装备，而且也掌握了行业全球最先进的工艺制造技术，主导产品“高精数控刀片（刀具）”的销量已抢占国内第一梯队，OKE已成功地跻身国产品牌前三甲；另一主导产品“小型精密切削刀片”的国内市场占有率达20%以上，成为行业细分领域的全球引领者，公司迅速崛起成为国内知名的精密数控切削刀片生产企业。

公司始终秉承“责任铸就卓越”的经营理念，切合中国高端制造产业导向，专注于高精数控刀具国产化和进口替代，打造工业4.0智能数控刀具优势企业，成为中国智能数控刀具领域的引领者和国际知名的智能数控刀具中国民族品牌。

Established in Jan. 23,1996, OKE Precision Cutting Tools Co., Ltd.(Hereinafter referred to as "OKE"), formerly known as OKE Carbide Co., LTD., the registered capital of 75 million CNY, a professional research, development, production and sales of High precision cutting inserts(tools), carbide rods, carbide saw tips and other carbide products of high-tech private enterprises.

OKE located in Yanling County, built two big production bases in Yanling county and Lusong area in Zhuzhou city where covered an area of more than 73,300m², included 40,000m² modern standard workshop, over 3,000 (sets) international first-class level of processing and manufacturing facilities and research & development testing equipments. The total assets are over 620 million yuan.

Now, OKE has over 700 employees, include over 80 technology research and development personnel. OKE set up the enterprise technology center recognized by Hunan province, had achieved over 10 research achievements in High precision inserts tools substrate material, coating technique, forming and other aspects. OKE already have 54 patents, include 8 invent patents, 26 practical patents, and 20 appearance patents.

Over twenty years development, OKE not only has the world first class facility, but also mastered the world leading manufacturing techniques. The leading products sales of high precision CNC inserts and tools have seized the first echelon. Now OKE is the top 3 carbide insert Chinese brand in china. Meanwhile, another leading products sales of small precision cutting blades are more than 20% in the domestic market share and become the global leader in the field of segmentation. OKE rapidly rise to a well know carbide insert company.

OKE insists its business conception: “Obligation Keeps Excellence”, and following Chinese high-end manufacturing industry guide, focuses on high precision CNC tools localization and import substitution, builds industrial 4.0 intelligent CNC cutting tool superior enterprise. Now OKE has become a leader in the field of intelligent CNC tools and a famous national brand of intelligent CNC tools in China.

Contents
目录

Development
发展历程

1996.1
株洲精诚实业
有限公司成立；
占地8.5亩；

2000.9
公司
建立合金二厂，
占地12.6亩；

2003.6
公司通过
ISO9001：2000
质量管理体系认证；

2010.1
公司建立合金三厂，
共占地41亩；更名株洲欧科亿
硬质合金有限公司

2010.1
公司通过
ISO9001：2008
质量管理体系认证；

2011.1
公司扩展
合金三厂场地，
建立数控刀片生产线；

2012.7
公司
与湖南工业大学建成
产、学、研基地；

2017.8
2017年8月，公司更名为：
株洲欧科亿数控精密刀具
股份有限公司

OKE 株洲欧科亿数控精密刀具股份有限公司
OKE PRECISION CUTTING TOOLS CO., LTD.

Jan.1996	Established Zhuzhou Jingcheng Industrial Co., Ltd. covered area of 5660 square meters;
Sep.2000	Established our 2nd factory, covered area of 8400 square meters;
Jun.2003	Passed ISO9001:2000 quality management system certification;
Jan.2010	Established our 3rd factory, covered area of 27000 square meters; Zhuzhou Jingcheng industrial Co.,LTD. was named to OKE Carbide Co.,Ltd;
Jan.2010	Passed ISO9001:2008 quality management system certification;
Jan.2011	Expanded our 3rd factory building area; Established an indexable inserts production line;
Jul.2012	Set up production ,study and research base with Hunan University of Technology;
Aug.2017	The company name is officially renamed OKE Precision Cutting Tools Co., Ltd.

Corporate Culture
企业文化

公司以“军队、学校、家庭、品牌”作为企业文化，对员工遵循“军队”“学校”“家庭”“品牌”式管理模式。军队般的纪律与执行力，学校般的学习氛围，家庭般的温暖，让每一位员工拥有宽松和谐的发展空间，快乐、健康的工作和生活；坚持“以人为本”，不断提升企业文化建设水平。以特种部队步调一致、雷厉风行的纪律严格要求，将整个公司建成为一个高效率的组织。对员工进行各种技能及专业知识培训，实现员工跟随公司不断成长。公司为员工提供多项福利，鼓励员工之间互相团结，让每一位员工充满归属感，再配合激励机制，力将OKE打造成为员工们自由施展的舞台。让每个员工都有施展自己才能的机会和平台。员工良好的执行力使企业管理制度得到高效执行，个人价值在企业整体发展中得到实现。

We takes "army, school, family" as the enterprise culture, following "army" "school", "family" management model. Under the military discipline and execution, the school study atmosphere, and the family warmth, the employees have developing opportunities in such a harmonious environment, working and living happily and healthily.
Adhere to people oriented policy and promote enterprise culture construction level constantly. In conformity with Special Forces, highly effective discipline and strict requirements, we build an efficient organization of the entire company.
Employees participate in all kinds of skills and professional knowledge training, along with the rise of company. Providing several benefits for employees, encouraging them work in unity and help one another, to make everyone full of the sense of belonging. Cooperating with incentive mechanism, aim to make OKE into a free stage, in which employee can show their talents. Staff good execution makes our enterprise management system implemented efficiently, personal value achieved in the development of whole enterprise.

Obligation Keeps Excellence
责任铸就卓越

“责任铸就卓越”，我们以维护客户利益为已任，我们以提供优质、高效率的产品为追求，我们以快速、准确的服务为理念，以满足客户需求为导向，锐意进取，高度的责任感，为用户提供最优的产品及服务。跻身强势企业，打造国际品牌，是我公司恒久不变的追求。

"Obligation keeps Excellence", we maintain the interests for our customers as our mission; we provide high quality and efficient products as our pursuit, quick and accurate service as our idea to meet customer demand as the guidance in order to bring the best products and services to our customs through determined progression, full enthusiasm and high sense of responsibility. Squeezing our way into the ranks of strong enterprises and building a famous world brand are the eternal pursuit of our company.

R&D Centre
研发中心

一、与高校建立战略合作关系

2012年7月公司与湖南工业大学建成“产、学、研”基地，与高校合作共同研发硬质合金材料、技术领域新课题和项目，推进科研开发和科技成果向生产领域的转化。湖南工业大学长期向我公司输送专业技术人才。战略联盟集项目、人才、基地和产业于一体，形成了完整的“开发—试制—产品—商品”产学研合作系统。

1.Established a strategy cooperation relationship with university

We set up production ,study and research base with Hunan University of Technology in Jul. 2012.We start new projects and items that research together in carbide material and technology ,which puts forward production conversion of scientific research and result. Our factory receive professional and technical personnel from Hunan University of Technology.League of strategy combines with project ,person ,base and industry all together,which formed an integrated "develop –trial manufacture–product–goods" system.

二、专业的研发团队

公司拥有一支由国内行业专家、高级工程师、研究生组成的强大研发团队，装备国际一流的研发设备，具备业内一流的研发能力，研发团队秉承“贴近市场做开发”的宗旨，不断更新升级改善产品性能，研发出符合市场和客户需求的新产品。

2. Professional R&D team

OKE owned by a strong R&D team of domestic industry experts, senior engineer, graduate student, equipped with the international first rate research and development equipment, and domestic first rate R&D ability, and the team adhering to the principle of close to the market development, constantly update to improve product performance, develop in line with market and customer demand of our new products.

三、建立切削实验室，严把新品测试关

对于公司研发的各类新品，在投入市场前，均在切削实验室模拟产品的实际切削条件，反复进行测试与论证，确保新品投入市场后工作稳定可靠，寿命经久耐用。

3.Setting up cutting laboratory to guarantee the quality of new products.

To every new product, we simulate the actual cutting condition for every new products our company developed, test and demonstrate again and again before launch on the market in our laboratory, to ensure the stability, reliability and durability of new procucts when used in market.

Analyzing and Inspecting Centre

分析检测中心

原料检测

对每一批入库的原料不仅做常规的化学分析，还引入了球磨实验这种比较科学的原料检测手段，以球磨实验的结果来判别原料是否合格，并指导配料，积累了大量关于原料特性的数据，对每一个牌号均制定了严格的原料标准，极大的保证了各牌号内在性能稳定、产品使用可靠。

Raw materials Inspection

We will not only make the conventional chemical analysis for each batch of incoming raw materials , but also introduce the mixing milling trial , a more scientific inspection method, which results are proved to be qualified or not, then dosing of guidance, and accumulating the huge data about the feature of raw material . We set up a strict standard to every grade , which assure the stable performance and reliability of product for every grade.

配套完善的分析检测中心

Comprehensive and advanced analyzing and inspecting centre

混合料鉴定

严格对各牌号、每批次混合料进行物理性能和金相检测，确保其符合相应技术工艺参数方能入库。

产品检测

1、使用全自动检测设备对产品几何尺寸及外观缺陷进行检测，确保产品的外在质量；

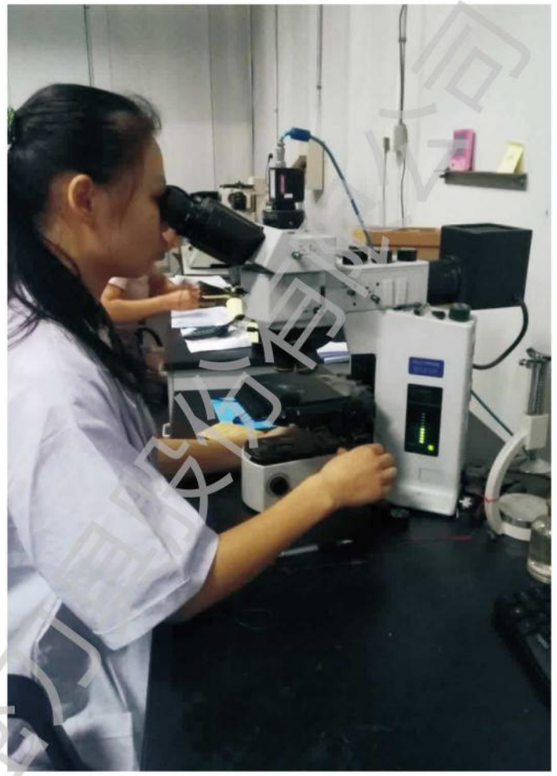
2、使用高精度分析检测设备对产品的物理性能和金相进行检测，确保产品性能的稳定性。

Identification of granulated carbide powder

Strictly physical performance and metallographic test for every grade, each batch carbide granulated powder to ensure it confor-med to the technical parameters, which can be put in storage.

Products Inspection

Using automatic test equipment to test the product geometry size and appearance defects, ensure the external quality of the products. Using high-precision testing equipment on the physical properties of the product and metallographic test, to ensure the stability of product performance.



配套完善的分析检测中心

Comprehensive and advanced analyzing and inspecting centre

Die and Mould Workshop

模具制造中心

国际先进的线切割设备，保障模具的高精度和产品尺寸高精密性。

The advanced wire cutting machine in the world,

to ensure the high accuracy of moulds and products.

模具库储备万套以上模具，可以满足不同需求。

Ten thousands of sets of moulds in our stock can meet customers different demands.

可根据客户需求量身定做模具。

We can make any moulds according to every customer’s demands.

Carbide Rods

实心圆棒

牌号介绍

Grade Introduction

牌号 Grade	ISO牌号 ISO	晶粒度 Grain Size (μm)	钴含量 Cobalt Content (%)	硬度 Hardness (HRA)	密度 Density (g/cm^3)	抗弯强度 T.R.S (N/mm^2)	推荐应用 Recommended cutting applications
MC06U	K05-K10	0.4	6.3	94.0	14.82	3800	高耐磨性、高韧性；制作钻石涂层刀具、PCB刀具、适用于加工PCB、复合材料、纤维强化塑料。 High wear resistance, high toughness; Used for diamond coating tools. PCB tools, suitable for cutting PCB, composite material and fiber reinforced plastics.
MC08U	K10-K20	0.4	8.3	93.6	14.55	3800	耐磨性能好，高韧性；制作耐磨性要求高的立铣刀，雕刻刀，适用于加工PCB、塑胶、7系铝合金。 Excellent wear resistance, high toughness; Used for high wear resistance endmill,engraving cutter, suitable for cutting PCB, plastic and Al alloy of 7 series.
MC12U	K20-K40	0.4	12.0	92.6	14.15	4200	高速切削、精加工，材质耐磨性和韧性达到理想的平衡，制作高性能立铣刀和铰刀，适合加工材质：碳钢、合金钢（HRC：45°-58°）、6/7系铝合金、镍基合金、钛合金等。 High speed milling, finishing, with excellent hardness and toughness; Used for endmill and reamer, suitable for processing carbon steel, alloy steel (HRC：45°-58°), Al alloy of 6/7 series, nickel base alloy and Ti alloy.
MC10UF	K20-K40	0.6	10	92.4	14.32	3800	用于制作通用加工钻头，立铣刀，特别适用于不锈钢、耐热合金、铸铁等。 Used for drill and endmill, especially suitable for cutting stainless steel, heat resistant alloy and cast iron.
MC20F	K20-K40	0.8	10	91.8	14.45	3600	材质通用性强，适用于制作钻头，立铣刀，适用于普通合金钢（HRC<48°),灰口铸铁，不锈钢的加工。 With a strong universality, used for drill and endmill. especially suitable for cutting ordinary alloyed steel(HRC<48°), grey cast iron, stainless steel.
MC30	K15	1.0	6.0	92.5	14.95	2600	制作钻头，立铣刀和旋转锉刀，加工灰口铸铁、冷硬铸铁、合金钢、有色金属，制作钻石涂层刀具。 Used for Drill, endmill and burrs ;Suitable for cutting grey cast iron, chilled cast iron, alloy steel, nonferrous metal;used to make diamond coating tools.

牌号推荐
Grade Selection Guide

加工材料 Workpiece		刀具类别 Type of Cutting Tools		MC06U	MC08U	MC12U	MC10UF	MC20F	MC30
P	钢 Steel	钻头 Drill					★	★★	
		立铣刀 Endmill	粗加工Roughing					★★	
			精加工Finishing			★★	★★	★	
M	不锈钢 Stainless Steel	钻头 Drill					★	★★	
		立铣刀 Endmill	粗加工Roughing					★	
			精加工Finishing				★★		
K	铸铁 Cast Iron	钻头 Drill					★	★★	
		立铣刀 Endmill	粗加工Roughing					★★	
			精加工Finishing				★	★	★★
N	有色金属 Nonferrous Material	钻头 Drill						★★	●
		立铣刀 Endmill	粗加工Roughing					★★	
			精加工Finishing			★★			●
S	耐热合金 Heat Resistance Material	钻头 Drill					★	★★	
		立铣刀 Endmill	粗加工Roughing				★	★	
			精加工Finishing			★★	★	★	
H	高硬材料 Hardened Material	钻头 Drill		★★	★★		★		
		立铣刀 Endmill	粗加工Roughing	★	★				
			精加工Finishing	★	★	★			
Others	复合材料 Composite Material	钻头 Drill		★★	★★		★		
		立铣刀 Endmill	粗加工Roughing	★★	★				
			精加工Finishing	★	★★	★			

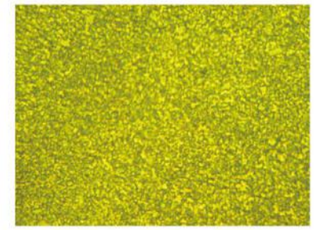
推荐图例Notes　可用Acceptable★优选Good★★涂层Coating●

S系列高性能不锈钢加工专用硬质合金牌号
For Stainless Steel Cutting

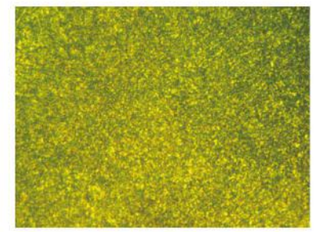
SG20

整硬铣刀	牌号	Grade	SG20	显微组织 Microstructure
通用加工不锈钢专用牌号 Grade for carbide mill General machining stainless steel	密度	Density	14.4	
	硬度	Hardness	91.8	
	强度	T.R.S	3800	
	断裂韧性	Kic	10.7	
	金相孔隙度 Porosity	A	≤02	
		B	00	
		C	00	

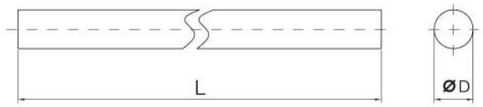
SR10

整硬铣刀	牌号	Grade	SR10	显微组织 Microstructure
粗加工不锈钢专用牌号 Grade for carbide mill Roughing stainless steel	密度	Density	14.45	
	硬度	Hardness	91.2	
	强度	T.R.S	4000	
	断裂韧性	Kic	11	
	金相孔隙度 Porosity	A	≤02	
		B	00	
		C	00	

SF08

整硬铣刀	牌号	Grade	SF08	显微组织 Microstructure
精加工不锈钢专用牌号 Grade for carbide mill Finishing stainless steel	密度	Density	14.2	
	硬度	Hardness	92.2	
	强度	T.R.S	3800	
	断裂韧性	Kic	10.2	
	金相孔隙度 Porosity	A	≤02	
		B	00	
		C	00	

公制长棒
Solid Rods-Metric



毛坯Unground

精磨Ground

直径ΦD	长度L	MC20F/MC12U	MC10UF
2	330	●	○
3	310	●	●
3	330	●	●
4	310	●	●
4	330	●	●
5	310	●	●
5	330	●	●
6	310	●	●
6	330	●	●
7	330	●	○
8	310	●	●
8	330	●	●
9	330	●	○

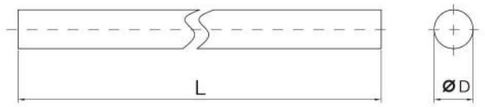
直径ΦD	长度L	MC20F/MC12U	MC10UF
10	310	●	●
10	330	●	●
11	330	●	●
12	310	●	●
12	330	●	●
13	330	●	○
14	310	●	●
14	330	●	●
15	330	●	○
16	310	●	●
16	330	●	●
17	330	●	○
18	330	●	●

●=有库存Stock ○=需订货Order 单位unit(mm)

毛坯Unground ΦD(mm)		精磨Ground ΦD(mm)		长度L(mm)
范围(Range)	公差(Tol.)	范围(Range)	公差(Tol.)	公差(Tol.)
2≤ΦD<3	+0.15，+0.30	2≤ΦD≤42	h5/h6	0,+5
3≤ΦD≤6	+0.30，+0.50			
6<ΦD≤12	+0.30，+0.60			
12<ΦD≤16	+0.30，+0.70			
16<ΦD≤42	+0.30，+0.80			

OBLIGATION KEEPS EXCELLENCE

公制长棒
Solid Rods-Metric



毛坯Unground

精磨Ground

直径ΦD	长度L	MC20F/MC12U	MC10UF
19	330	●	○
20	310	●	○
20	330	●	●
21	330	○	○
22	330	○	○
23	330	○	○
24	330	○	○
25	330	●	○
26	330	○	○
27	330	○	○
28	330	○	○
29	330	○	○
30	330	○	○

直径ΦD	长度L	MC20F/MC12U	MC10UF
31	330	○	○
32	330	○	○
33	330	○	○
34	330	○	○
35	330	○	○
36	330	○	○
37	330	○	○
38	330	○	○
39	330	○	○
40	330	○	○
41	330	○	○
42	330	○	○

●=有库存Stock ○=需订货Order 单位unit(mm)

毛坯Unground ΦD(mm)		精磨Ground ΦD(mm)		长度L(mm)
范围(Range)	公差(Tol.)	范围(Range)	公差(Tol.)	公差(Tol.)
2≤ΦD<3	+0.15，+0.30	2≤ΦD≤42	h5/h6	0,+5
3≤ΦD≤6	+0.30，+0.50			
6<ΦD≤12	+0.30，+0.60			
12<ΦD≤16	+0.30，+0.70			
16<ΦD≤42	+0.30，+0.80			

英制长棒
Solid Rods-Inch

毛坯 Unground

精磨 Ground

直径ΦD	长度L	MC20F/MC12U	MC10UF
0.1250	13-1/8	○	○
0.1406	13-1/8	○	○
0.1563	13-1/8	○	○
0.1719	13-1/8	○	○
0.1875	13-1/8	○	○
0.2188	13-1/8	○	○
0.2344	13-1/8	○	○
0.2500	13-1/8	○	○
0.2813	12-1/8	○	○
0.2969	12-1/8	○	○
0.3125	12-1/8	○	○
0.3281	12-1/8	○	○
0.3438	12-1/8	○	○
0.3594	12-1/8	○	○
0.3750	12-1/8	○	○
0.3906	12-1/8	○	○

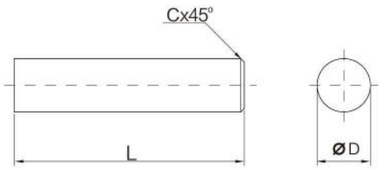
直径ΦD	长度L	MC20F/MC12U	MC10UF
0.4063	12-1/8	○	○
0.4219	12-1/8	○	○
0.4375	12-1/8	○	○
0.4531	12-1/8	○	○
0.4688	12-1/8	○	○
0.4844	12-1/8	○	○
0.5000	12-1/8	○	○
0.5313	12-1/8	○	○
0.5625	12-1/8	○	○
0.6250	12-1/8	○	○
0.6875	12-1/8	○	○
0.7500	12-1/8	○	○
0.8125	12-1/8	○	○
0.8750	12-1/8	○	○
0.9375	12-1/8	○	○
1.0000	12-1/8	○	○

●=有库存Stock ○=需订货Order

单位unit(inch)

毛坯Unground ΦD(mm)		精磨Ground ΦD(mm)		长度L(mm)
范围(Range)	公差(Tol.)	范围(Range)	公差(Tol.)	公差(Tol.)
1/8≤ΦD≤1/4	+0.012,+0.020	1/8≤ΦD≤1	h5/h6	+1/8,+3/8
1/4< ΦD≤31/64	+0.012,+0.024			
31/64< ΦD≤5/8	+0.012,+0.028			
5/8< ΦD≤1	+0.012,+0.032			

精磨倒角短棒（公制）
Ground Rods with Chamfer-Metric



直径ΦD	长度 L (公差Tol./0,+1)	倒角尺寸 C (公差Tol./±0.1)	倒角角度 Angle of Chamfer (公差Tol./±3°)
3	40	0.4	45°
3	50	0.4	45°
3	70	0.4	45°
3	100	0.4	45°
3	150	0.4	45°
4	40	0.4	45°
4	50	0.4	45°
4	75	0.4	45°
4	100	0.4	45°
4	150	0.4	45°
5	50	0.5	45°
5	55	0.5	45°
5	60	0.5	45°
5	70	0.5	45°
5	80	0.5	45°
5	100	0.5	45°
5	150	0.5	45°
6	50	0.5	45°
6	60	0.5	45°
6	75	0.5	45°
6	100	0.5	45°
6	150	0.5	45°
7	55	0.6	45°
7	60	0.6	45°
8	60	0.6	45°
8	75	0.6	45°

单位unit(mm)

精磨倒角短棒（公制）
Ground Rods with Chamfer-Metric

直径ΦD	长度 L (公差Tol./0,+1)	倒角尺寸 C (公差Tol./±0.1)	倒角角度 Angle of Chamfer (公差Tol./±3°)
8	80	0.6	45°
8	90	0.6	45°
8	100	0.6	45°
8	150	0.6	45°
10	70	0.6	45°
10	75	0.6	45°
10	90	0.6	45°
10	100	0.6	45°
10	125	0.6	45°
11	110	0.8	45°
12	75	0.8	45°
12	90	0.8	45°
12	100	0.8	45°
12	120	0.8	45°
14	75	0.8	45°
14	110	0.8	45°
14	125	0.8	45°
16	100	0.8	45°
16	125	0.8	45°
18	100	0.8	45°
18	150	0.8	45°
20	100	1.0	45°
20	120	1.0	45°
20	150	1.0	45°
25	100	1.0	45°
25	150	1.0	45°

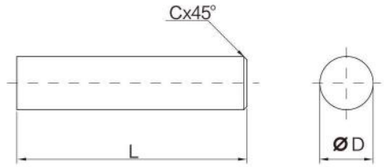
单位unit(mm)

精磨倒角短棒（英制）
Ground Rods with Chamfer-Inch

直径ΦD	长度 L (公差Tol./0,+1/16)	倒角尺寸		倒角角度 Angle of Chamfer (公差Tol./±3°)
		C	公差Tol	
0.1250	1-1/2	0.015	±0.004	45°
0.1250	2	0.015	±0.004	45°
0.1250	2-1/2	0.015	±0.004	45°
0.1250	3	0.015	±0.004	45°
0.1875	2	0.015	±0.004	45°
0.1875	3	0.015	±0.004	45°
0.2500	2	0.015	±0.004	45°
0.2500	2-1/2	0.015	±0.004	45°
0.2500	3	0.015	±0.004	45°
0.2500	4	0.015	±0.004	45°
0.3125	2-1/2	0.015	±0.004	45°
0.3750	2-1/2	0.015	±0.004	45°
0.3750	3	0.015	±0.004	45°
0.5000	2-1/2	0.031	±0.008	45°
0.5000	3	0.031	±0.008	45°
0.5000	4	0.031	±0.008	45°
0.6250	3-1/2	0.031	±0.008	45°
0.7500	4	0.031	±0.008	45°
0.7500	5	0.031	±0.008	45°
1.0000	4	0.031	±0.008	45°

单位unit(inch)

精磨倒角短棒（DIN）
Ground Rods with Chamfer-DIN

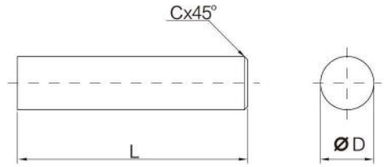


直径ΦD	长度 L (公差Tol./0,+1)	倒角尺寸 C (公差Tol./±0.1)	倒角角度 Angle of Chamfer (公差Tol./±3°)	标准 Standard
3	38	0.4	45°	D6527K/D6527L
3.5	50	0.4	45°	D6528
4	50	0.4	45°	D6528
4.5	50	0.5	45°	D6528
5	50	0.5	45°	D6528
5.5	57	0.5	45°	D6528
6	50	0.5	45°	D6527K
6	57	0.5	45°	D6527L/D6528
6	54	0.5	45°	D6527K
6.5	60	0.6	45°	D6528
7	60	0.6	45°	D6528
7.5	63	0.6	45°	D6528
8	58	0.6	45°	D6527K
8	63	0.6	45°	D6527L/D6528
8.5	67	0.6	45°	D6528
9	67	0.6	45°	D6528
9.5	72	0.6	45°	D6528
10	66	0.6	45°	D6527K
10	72	0.6	45°	D6527L/D6528
11	83	0.8	45°	D6528
12	73	0.8	45°	D6527K
12	83	0.8	45°	D6527L/D6528
13	83	0.8	45°	D6528
14	75	0.8	45°	D6527K
14	83	0.8	45°	D6527L/D6528
15	92	0.8	45°	D6528
16	82	0.8	45°	D6527K
16	92	0.8	45°	D6527L/D6528
18	84	0.8	45°	D6527K
18	92	0.8	45°	D6527L/D6528
20	92	1.0	45°	D6527K
20	104	1.0	45°	D6527L/D6528

单位unit(mm)

OBLIGATION KEEPS EXCELLENCE

精磨倒角短棒（DIN）
Ground Rods with Chamfer-DIN



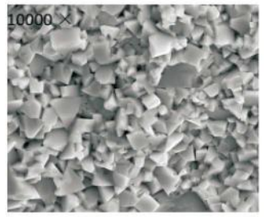
直径ΦD	长度 L (公差Tol./0,+1)	倒角尺寸 C (公差Tol./±0.1)	倒角角度 Angle of Chamfer (公差Tol./±3°)	标准 Standard
3	47	0.4	45°	D6539
4	56	0.4	45°	D6539
5	63	0.5	45°	D6539
6	63	0.5	45°	D6537K
6	67	0.5	45°	D6537K/D6537L/D6539
6	75	0.5	45°	D6537L
6	83	0.5	45°	D6537L
7	75	0.6	45°	D6539
8	80	0.6	45°	D6537K/D6539
8	92	0.6	45°	D6537L
9	85	0.6	45°	D6539
10	90	0.6	45°	D6537K/D6539
10	104	0.6	45°	D6537L
11	96	0.8	45°	D6539
12	103	0.8	45°	D6537K/D6539
12	119	0.8	45°	D6537L
13	103	0.8	45°	D6539
14	108	0.8	45°	D6537K/D6539
14	125	0.8	45°	D6537L
15	112	0.8	45°	D6539
16	116	0.8	45°	D6537K/D6539
16	134	0.8	45°	D6537L
17	120	0.8	45°	D6539
18	124	0.8	45°	D6537K/D6539
18	144	0.8	45°	D6537L
19	128	1.0	45°	D6539
20	132	1.0	45°	D6537K/D6539
20	154	1.0	45°	D6537L

单位unit(mm)

Wood Cutting

木工用整体硬质合金圆棒

木工用圆棒牌号介绍
Carbide Rod Grades for Wood Cutting

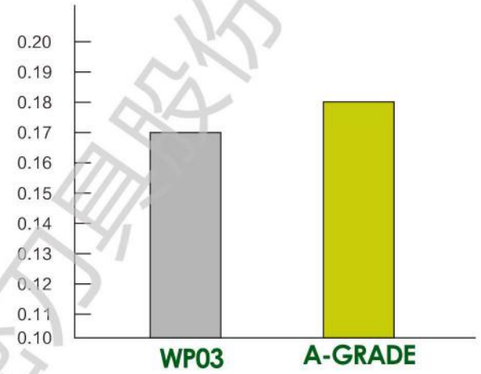
牌号Grade	显微组织 Microstructure	成分 Composition	Co:2.85%, WC balance,Other0.65%
WP03		晶粒度Grainsize	Ultrafinegrain 0.2-0.4um
		密度 Density	15.20g/cm^3
ISO:<K01		硬度 Hardness	94.5HRA
		强度 TRS	3200MPa
切削应用 Cutting Applications	刨花板，密度板 Chipboard,Density Board	断裂韧性Kic	8.5MPa.m$^{1/2}$

牌号Grade	显微组织 Microstructure	成分 Composition	Co:3%, WC balance,Other0.55%
WP10		晶粒度Grainsize	Ultrafinegrain 0.6um
		密度 Density	15.15g/cm^3
ISO:<K01		硬度 Hardness	93.8HRA
		强度 TRS	3400MPa
切削应用 Cutting Applications	密度板 Density Board	断裂韧性Kic	8.8MPa.m$^{1/2}$

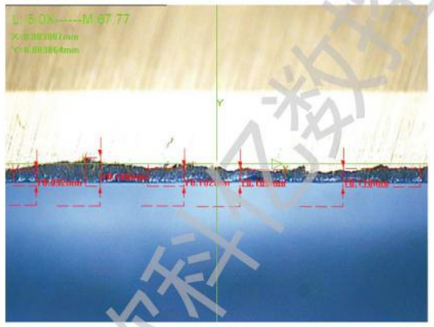
牌号Grade	显微组织 Microstructure	成分 Composition	Co:8%, WC balance
WP20		晶粒度Grainsize	Ultrafine grain 1.0-1.2um
		密度 Density	14.7g/cm^3
ISO: K20		硬度 Hardness	91.6HRA
		强度 TRS	3800MPa
切削应用 Cutting Applications	实木（软木、硬木） Wood(Soft wood、Hard wood)	断裂韧性Kic	11MPa.m$^{1/2}$

WP03 牌号切削实验数据对比
Cutting Experimental Data With WP03

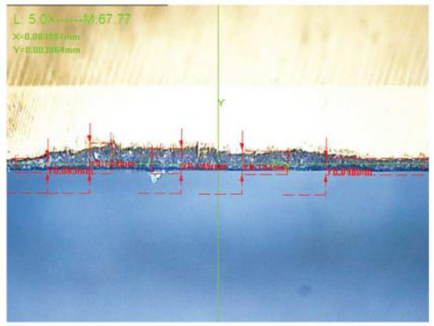
切削材质 Cutting Material	切削设备 Cutting Machine	切削刀具 Cutting Tool
刨花板 Chipboard	数控雕刻机 CNC Engraving Machine	三刃开料刀 TCT 3-Edge Straight Bit



WP03材质和A公司材质磨损值对比
Wean comparison of WP03 and A-GRADE



WP03牌号刀具刃口磨损图
WP03 cutter edge wear figure



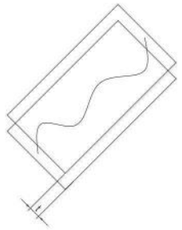
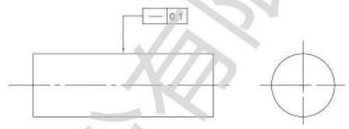
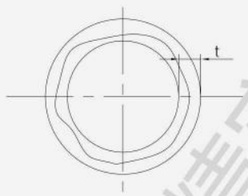
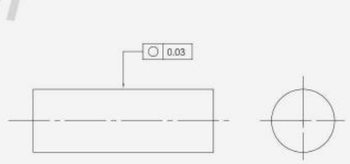
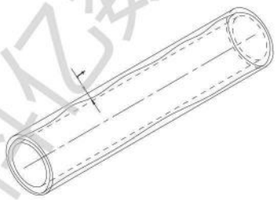
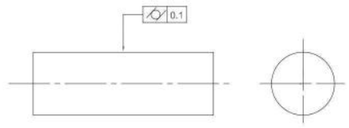
国外某公司牌号刀具刃口磨损图
A-grade cutter edge wear figure

木工圆棒常用规格型号
Carbide Rod Common Specifications for Wood Cutting

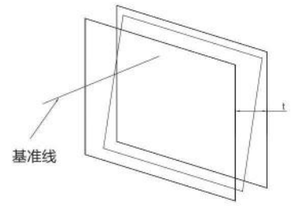
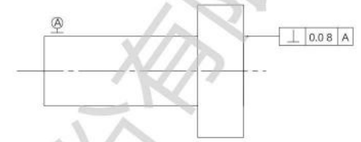
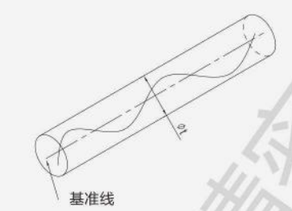
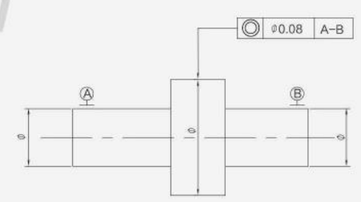
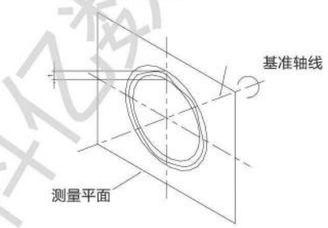
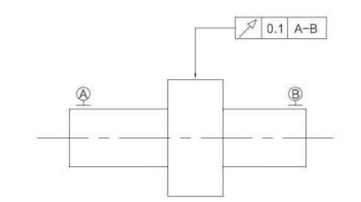
直径ΦD (mm)	长度 L(mm)	直径ΦD (mm)	长度 L(mm)	直径ΦD (mm)	长度 L(mm)
6.3	20	8.3	20	10.3	20
6.3	22	8.3	22	10.3	22
6.3	24	8.3	24	10.3	24
6.3	26	8.3	26	10.3	26
6.3	28	8.3	28	10.3	28
6.3	30	8.3	30	10.3	30
6.3	32	8.3	32	10.3	32
6.3	34	8.3	34	10.3	34
6.3	36	8.3	36	10.3	36
6.3	38	8.3	38	10.3	38
6.3	40	8.3	40	10.3	40
6.3	42	8.3	42	10.3	42
6.3	44	8.3	44	10.3	44
6.3	46	8.3	46	10.3	46

外径公差（mm） D(Tol.)	长度公差（mm） L(Tol.)
D (+0.05 / +0.0)	L (+0.3 / +0.0)

尺寸项目名词
Definitions of Geometrical Tolerance

	公差带定义 Definition of Tolerance Zone	标注和解释 Indication and Explanation
直线度 Straightness Tolerance	 在给定方向上公差带是距离为公差值t的两平行平面之间的区域 The tolerance zone, in the considered plane, is limited by two parallel straight lines a distance t apart and in the specified direction only.	 被测圆柱面的任一素线必须位于距离为公差值0.1的两平行平面之内 Any extracted (actual) line on the upper surface, parallel to the plane of projection in which the indication is shown, shall be contained between two parallel straight lines 0.1 apart.
圆度 Roundness Tolerance	 公差带是在同一正截面上，半径值差为公差值t的两同心圆之间的区域 The tolerance zone, in the considered cross-section, is limited by twoconcentric circles with a difference in radii of t.	 被测圆柱面任一正截面的圆周必须位于半径差为公差值0.03的两同心圆之间 The extracted (actual) circumferential line, in any cross-section of the cylindrical and conical surfaces, shall be contained between two co-planar concentric circles, with a difference in radii of 0.03.
圆柱度 Cylindricity	 公差带是半径差为公差值t的两同轴圆柱面之间的区域 The tolerance zone is limited by two coaxial cylinders with a difference in radii of t.	 公差带是在同一正截面上，半径值差为公差值t的两同心圆之间的区域 The tolerance zone, in the considered cross-section, is limited by twoconcentric circles with a difference in radii of t.

尺寸项目名词
Definitions of Geometrical Tolerance

	公差带定义 Definition of Tolerance Zone	标注和解释 Indication and Explanation
垂直度 Perpendicularity Tolerance of a Surface	 公差带是距离为公差值t且垂直于基准线的两平行平面之间的区域 The tolerance zone is limited by two parallel planes a distance apart and perpendicular to the datum.	 被测面必须位于距离为公差值0.08且垂直于基准线A（基准轴线）的两平行平面之间 The extracted (actual) surface shall be contained between two parallel planes 0.08 apart that is perpendicular to datum axis A.
同轴度 Concentricity Tolerance of a Point	 公差带是直径为公差值Øt的圆柱面内区域，该圆柱面的轴线与基准轴线同轴 The tolerance zone is limited by a circle of diameter t; the tolerance value shall be preceded by the symbol Ø. The centre of the circular tolerance zone coincides with the datum point.	 大圆柱面的轴线必须位于直径为公差值Ø0.08且与公共基准线A-B（公共基准轴线）同轴的圆柱面内 The extracted (actual) median line of the tolerance cylinder shall be within a cylindrical zone of diameter 0.08 the axis of which is the common datum straight line A-B.
圆跳动 Circular run-out Tolerance	 公差带是在垂直于基准轴线的任一半径位置的测量平面内、半径差为公差值t且圆心在基准轴线上的两同心圆之间的区域 The tolerance zone is limited within any cross-section perpendicular to the datum axis by two concentric circles with a difference in radii of t , the centers of which coincide with the datum.	 当被测要素围绕公共基准线A-B（公共基准轴线）旋转一周时，在任一测量平面内的径向圆跳动均不得大于0.1 The extracted (actual) line in any cross-section plane perpendicular to common datum straight line A-B shall be contained between two coplanar concentric circles with a difference in radii of 0.1.

公差等级Carbide Rod Tolerances

精磨外径公差
Tol. of Ground Rods' Diameter

DIAMETER	h5	h6	h7
0–3.0mm	0.004mm	0.006mm	0.010mm
0–0.1181in.	0.00015in.	0.00024in.	0.00039in.
3.001–6.0mm	0.005mm	0.008mm	0.012mm
0.1181– 0.2362in.	0.00020in.	0.00031in.	0.00047in.
6.001–10.0mm	0.006mm	0.009mm	0.015mm
0.2363– 0.3937in.	0.00024in.	0.00035in.	0.00059in.
10.001–18.0mm	0.008mm	0.011mm	0.018mm
0.3938– 0.7087in.	0.00031in.	0.00043in.	0.00071in.
18.001–30.0mm	0.009mm	0.013mm	0.021mm
0.7088– 1.1811in.	0.00035in.	0.00051in.	0.00083in.
30.001–50.0mm	0.011mm	0.016mm	0.025mm
1.1812– 1.9685in.	0.00043in.	0.00063in.	0.00098in.

“h” 的公差均为+0.0/–
“h” Tolerance all +0.0/–

棒材表面粗糙度
Surface Roughness of Rods

类型 Type	精度 Accuracy
镜面棒材 Polished Rods	0.00–0.05 μm
亚光洁度 Dull Finished	0.10–0.20 μm
精磨棒材 Ground Rods	0.00–0.10 μm

圆度
Roundness Tolerance

精磨圆棒圆度标准均为0.002 mm
The standard roundness tolerance of the ground rod is 0.002 mm.

▶ 硬度对照表Hardness Comparison Table

硬度				抗拉强度	硬度				抗拉强度
洛氏		维氏	布氏		洛氏		维氏	布氏	
HRC	HRA	HV	HB		HRC	HRA	HV	HB	
70.0	86.6	1037	—	—	51.0	76.3	525	501	1780
69.5	86.3	1017	—	—	50.5	76.1	517	494	1750
69.0	86.1	997	—	—	50.0	75.8	509	488	1720
68.5	85.8	978	—	—	49.5	75.5	501	481	1690
68.0	85.5	959	—	—	49.0	75.3	493	474	1660
67.5	85.2	941	—	—	48.5	75.0	485	468	1630
67.0	85.0	923	—	—	48.0	74.7	478	461	1605
66.5	84.7	906	—	—	47.5	74.5	470	455	1575
66.0	84.4	889	—	—	47.0	74.2	463	449	1550
65.5	84.1	872	—	—	46.5	73.9	456	442	1525
65.0	83.9	856	—	—	46.0	73.7	449	436	1500
64.5	83.6	840	—	—	45.5	73.4	443	430	1475
64.0	83.3	825	—	—	45.0	73.2	436	424	1450
63.5	83.1	810	—	—	44.5	72.9	429	418	1430
63.0	82.8	795	—	—	44.0	72.6	423	413	1405
62.5	82.5	780	—	—	43.5	72.4	417	407	1385
62.0	82.2	766	—	—	43.0	72.1	411	401	1360
61.5	82.0	752	—	—	42.5	71.8	405	396	1340
61.0	81.7	739	—	—	42.0	71.6	399	391	1320
60.5	81.4	726	—	—	41.5	71.3	393	385	1300
60.0	81.2	713	—	2555	41.0	71.1	388	380	1280
59.5	80.9	700	—	2500	40.5	70.8	382	375	1260
59.0	80.6	688	—	2450	40.0	70.5	377	370	1245
58.5	80.3	676	—	2395	39.5	70.3	372	365	1225
58.0	80.1	664	—	2345	39.0	70.0	367	360	1210
57.5	79.8	653	—	2295	38.5	—	362	355	1190
57.0	79.5	642	—	2250	38.0	—	357	350	1175
56.5	79.3	631	—	2205	37.5	—	352	345	1160
56.0	79.0	620	—	2160	37.0	—	347	341	1140
55.5	78.7	609	—	2115	36.5	—	342	336	1125
55.0	78.5	599	—	2075	36.0	—	338	332	1110
54.5	78.2	589	—	2035	35.5	—	333	327	1095
54.0	77.9	579	—	1995	35.0	—	329	323	1080
53.5	77.7	570	—	1955	34.5	—	324	318	1065
53.0	77.4	561	—	1920	34.0	—	320	314	1050
52.5	77.1	551	—	1885	33.5	—	316	310	1035
52.0	76.9	543	—	1850	33.0	—	312	306	1020
51.5	76.6	534	—	1815	32.5	—	308	302	1010