股票简称：章源钨业　　股票代码：002378
Stock Abbreviation：Zhangyuan Tungsten　　Stock Code：002378

崇义章源钨业股份有限公司
CHONGYI ZHANGYUAN TUNGSTEN CO.,LTD

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2026.10

地矿硬质合金球齿

CEMENTED CARBIDE BUTTONS



崇义章源钨业股份有限公司
CHONGYI ZHANGYUAN TUNGSTEN CO.,LTD

地矿硬质合金球齿
Cemented Carbide Buttons

公司简介
Enterprise Introduction

崇义章源钨业股份有限公司位于“世界钨都”——江西省赣州市的崇义县，始创于2000年。公司主要从事钨矿山资源的开发利用及以钨为原料的仲钨酸铵（APT）、氧化钨、钨粉、碳化钨粉、热喷涂粉、硬质合金、高强度钨丝以及金属陶瓷刀片、超硬刀片等产品的研发、生产及销售，具备完整的钨产业链生产能力，建立了从钨的探采选直至精深加工的一体化生产体系，拥有优质和稳定的产品性能。

Chongyi Zhangyuan Tungsten Co., Ltd. is located in Ganzhou, Jiangxi Province, the capital of tungsten, which was founded in 2000. It is mainly engages in the development and utilization of tungsten mine resources centered in developing, manufacturing and distributing tungsten products such as Ammonium Paratungstate (APT), Tungsten Oxide, Tungsten Powder, Tungsten Carbide Powder, Thermal Spray Powder, Cemented Carbides,High Tensile Tungsten Wire,Cermet Inserts,and Superhard Inserts. It has complete production capacity covering the whole tungsten industrial chain, and established an integrated production system from tungsten mining to deep processing, ensuring the products with high-quality and stable performance.

6 采矿权矿山
Wolfram mines with mining right

10 探矿权矿区
Exploration ore fields

4 钨冶炼精深加工厂
Tungsten matallurgic deep processing plants

7 分公司
Branches

4 全资子公司
Wholly-owned subsidiaries

2 参股公司
Joint-stocking corporations



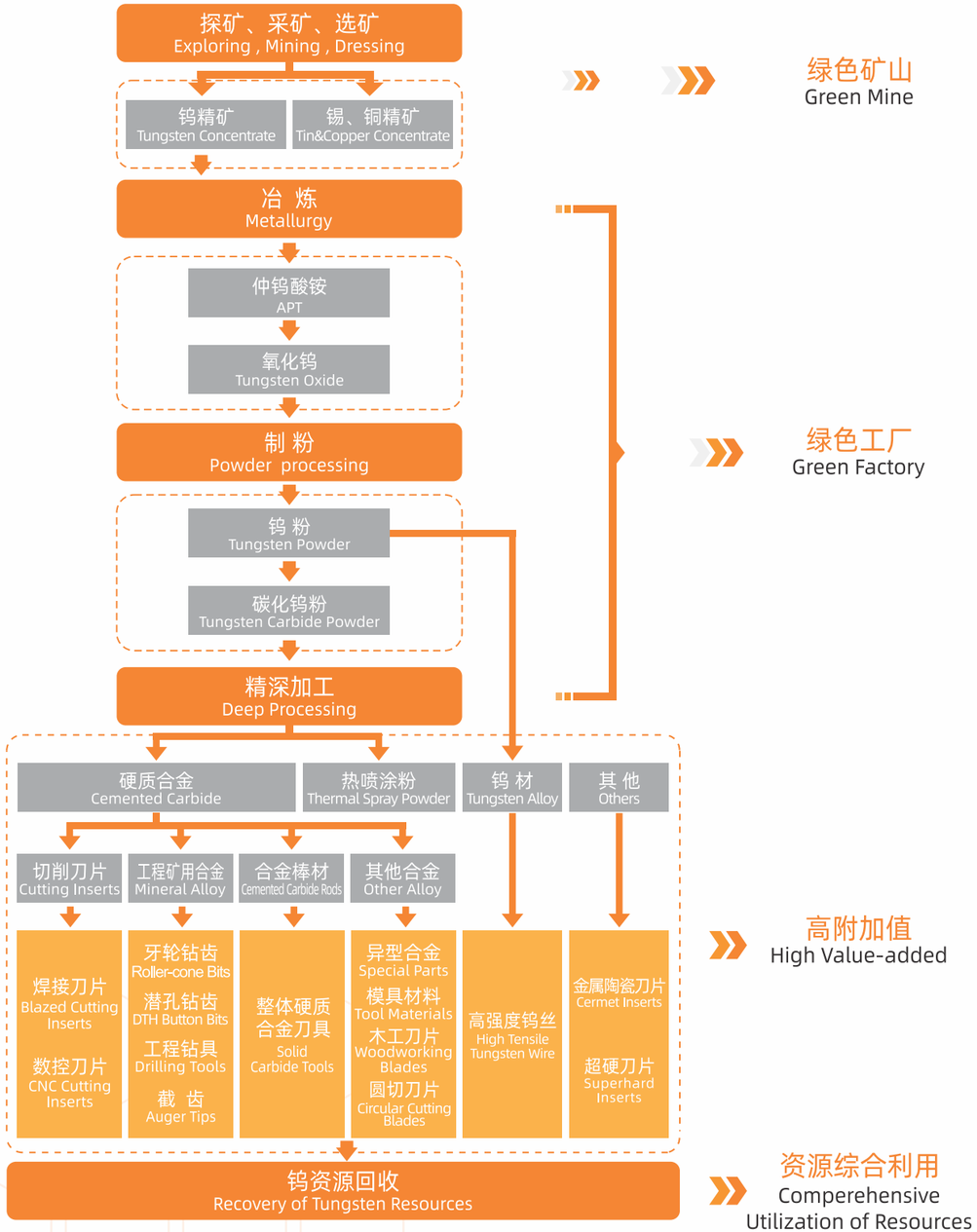
700+ 授权专利
Authorized Patents

50+ 主持和参与制定/修订国家/行业标准
preside over and participate in the formulation of national and industry standards

22 省部级及以上科技奖
provincial and ministerial level and above science and technology awards



完整的钨行业产业链
The Complete Tungsten Industry Chain



硬质合金
Cemented Carbide

硬质合金是以难熔金属硬质化合物(WC、TiC等)和粘结金属(Co、Ni、Fe等）为原料，采用粉末冶金方法制备而成的一种复合材料。硬质合金具有高硬度、高耐磨性、高强度、高弹性模量、低热膨胀系数、高红硬性及化学性质稳定等特点。

Cemented carbide is a composite material produced via powder metallurgy, utilizing raw materials including refractory metal hard compounds (such as WC, TiC) and binding metals (like Co, Ni, Fe). It exhibits characteristics such as high hardness, high wear resistance, high strength, a high modulus of elasticity, a low coefficient of thermal expansion, high red hardness, and stable chemical properties.

硬质合金晶粒尺寸分类表（ISO4499-2-2020)
Classification of Hardmetal Grain Size (ISO4499-2-2020)

合金类别 Alloy Category	合金WC晶粒尺寸（μm) WC Grain Size (μm)
亚纳米晶/Sub-nano	<0.2
超细晶/Ultrafine	0.2~0.5
亚微米晶/Submicron	0.5~0.8
细晶/Fine	0.8~1.3
中晶/Medium	1.3~2.5
粗晶/Coarse	2.5~6.0
超粗晶/Ultra-coarse	>6.0
特粗晶/Extra coarse	>8.0



亚纳米硬质合金是指WC晶粒尺寸小于0.2μm的硬质合金，它比传统硬质合金同时具有更高的硬度和强度，有效解决了高温合金、钛合金、复合材料、淬硬钢等难加工材料超高速切削的难题，大幅度提高了机械加工效率，是航空航天领域和高端装备制造行业优选的刀具材料。

Sub-nano-Grained Cemented Carbide refers to cemented carbide with a WC grain size of less than 0.2 μm. Compared to conventional cemented carbide, nano-grained cemented carbide exhibits simultaneously higher hardness and strength. It effectively addresses the challenges of ultra-high-speed cutting of difficult-to-machine materials such as superalloys, titanium alloys, composites, and hardened steel, significantly improving machining efficiency. It is the preferred tool material in the aerospace and high-end equipment manufacturing industries.

超粗硬质合金是指WC晶粒尺寸大于6μm的硬质合金，与粗晶硬质合金相比具有更好的韧性、更好的抗热疲劳性、更高的耐磨性。广泛应用于极端工况条件下的高硬采煤、矿山采掘、工程掘进、椎基施工和矿石破碎等行业，产品可靠性大幅度提高。

Ultra-Coarse-Grained Cemented Carbide refers to cemented carbide with a WC grain size greater than 6 μm. Compared to coarse-grained cemented carbide, it offers better toughness, superior thermal fatigue resistance, and higher wear resistance. It is widely used in extreme working conditions such as high-hardness coal mining, mining excavation, tunnel engineering, pile foundation construction, and ore crushing, substantially enhancing product reliability.

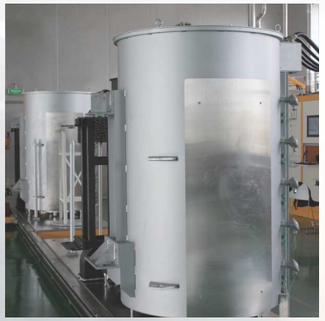
硬质合金生产介绍
Introduction of Cemented Carbide Production

公司在引进国外先进硬质合金生产工艺技术和装备的基础上，持续加大自主研发，形成了具有自主知识产权的核心技术体系；主要产品涵盖球齿、焊接机夹刀片、数控刀片基体、异型、冲压模具、冷镦模等各类硬质合金，年产能1500吨。公司在超细/超粗晶硬质合金、矿用合金等领域具备技术和工艺优势，产品畅销国内外市场。

On the basis of introducing advanced foreign cemented carbide process technology and equipment, the company has continuously strengthened independent R&D and formed a core technology system with independent intellectual property rights. Its main products cover various types of cemented carbide such as buttons, welded indexable inserts, CNC insert blanks, special-shaped parts, stamping dies, and cold heading dies, with an annual production capacity of 1,500 tons. The company has technical and process advantages in ultra-fine/ultra-coarse grain cemented carbide, mining alloys, and other fields, and its products sell well in both domestic and international markets.













生产流程
Product Process

采 矿
Mining

硬质合金主要成分源于钨矿。章源钨业拥有自己的矿山，从开采、选矿开始保证原材料的质量供应，从粉末源头控制和保证产品质量。

Cemented carbide' s primary component is derived from tungsten ore.Zhangyuan Tungsten owns its own mines,ensuring the quality and supply of raw materials from the start of mining and dressing,controlling and guaranteeing product quality from the powder source.



粉末制备
Powder Processing

钨矿经过冶炼工艺演化成碳化钨，最终制备出RTP粉。近三十年冶炼技术研发和积累，可以提供各种牌号规格。

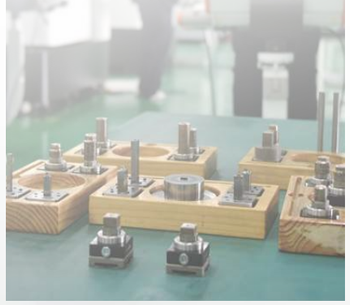
Tungsten ore evolves into tungsten carbide powder through smelting processes, and is ultimately processed into RTP powder. With nearly thirty years of research and development in smelting technology, we can provide various grades and specifications.



模 具
Mold

章源钨业拥有高精度的模具制作设备和经验丰富的团队。可快速定制各种产品的模具。

The company has high-precision mold making equipment and an experienced team and can quickly customize molds for various products.



成 型
Pressing

RTP粉末通过成型工艺压制成毛坯。拥有多种压制成型工艺技术，可以得到各种几何形状的毛坯。

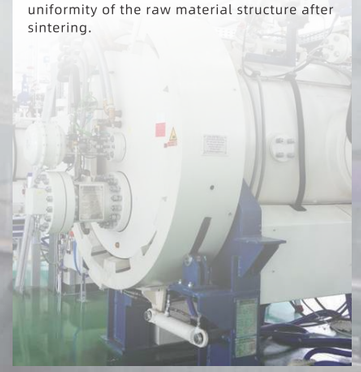
The company has multiple compression molding techniques, various geometric shapes of blanks can be obtained.



烧 结
Sintering

章源钨业拥有先进的烧结设备，匹配独特的烧结工艺，保证烧结后毛坯组织的致密性和均匀性。

The company has advanced sintering equipment matched with unique sintering processes to ensure the density and uniformity of the raw material structure after sintering.



质量控制
Quality control

任何细微的缺陷都可能严重影响硬质合金的产品性能。完整的产业链优势使得我们能够严格控制所有的生产环节质量，以保证产品性能稳定性和一致性。

Any minor defect can seriously affect the product performance of cemented carbide. The advantage of a complete industrial chain enables us to strictly control the quality of all production processes to ensure product performance stability and consistency.



产品特点
Product Features

ZK
系列牌号
Series Grades

综合性能优良，物理机械性能特别是韧性较高，合金组织结构孔隙度控制在A02B00，用于制作矿山、油田用硬质合金柱齿。

ZK series grades which used for making mining and oil-field drill bits are excellent overall performance with high toughness in physical and mechanical properties, porosity could be controlled in A02B00 in microstructure.

ZJ
系列牌号
Series Grades

采用高温碳化生产的超粗 WC，合金 WC 平均晶粒度可达 6 微米以上，抗疲劳磨损和抗冲击性能优越，合金组织结构孔隙度控制在 A02B00，是制作挖路齿、截齿最理想的材质。

ZJ series grades which used for making cap tips and auger tips are using high temperature produced ultracoarse tungsten carbide powder with average grain size bigger than 6μm, anti-fatigue wear and impact of superior performance, porosity could be controlled in A02B00 in microstructure.

我们可以按照产品相关国家标准和我公司样本生产供货，同时还能根据您指定的加工需求，来图来样，为您量身定制特殊尺寸产品。

产品样本为2026版，您可根据需要选用产品。对您的垂青，我们将用满意的服务和优质的产品予以回报，全力助您打造知名品牌。

We can supply the products according to relevant products national standards and the brochure of our company. Your particular demands will be also satisfied.

This brochure is 2026 edition, you can choose what you need. For your attention, we will reciprocate you with satisfied service and high quality products to help you building for famous brand.

产品索引
Product Index


球形齿 Spherical Buttons


锥形齿 Conical Buttons


抛物线齿 Parabolic Buttons


勺形齿 Spoon Buttons


边楔齿 Eccentric Wedge Buttons


楔形齿 Wedge Buttons


平顶齿 Flattop Buttpns

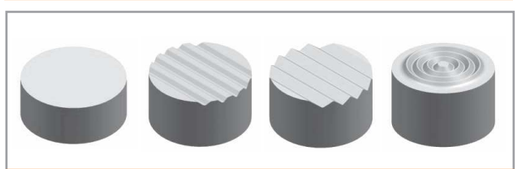

锯形齿Serrated Flat Buttons


挖路齿 Cap Tips


截齿 Auger Tips


截齿 Auger Tips


截齿 Auger Tips


复合片基体 PDC Substrate Tips


煤截片 Coal Flake


大八角 Illicium Majus

主要牌号性能列表
Main Grade Properties

牌 号 Grade	钴含量 Cobalt %	密度Density g/cm³	硬度 Hardness HRA	抗弯强度TRS N/mm²	WC晶粒度 WC Grain Size μm
ZK05H	6.0	14.90	90.5	2600	1.6
ZK05	6.0	14.93	90.2	2600	1.8
ZK6R	6.0	14.90	90.4	2600	1.8
ZK6G	6.0	14.90	90.5	2800	1.6
ZK05C	6.0	14.93	89.8	2700	2.0
ZK05B	6.0	14.92	89.6	2400	2.4
ZK7	7.0	14.82	89.8	2700	2.0
ZK10	8.0	14.72	89.0	2800	2.0
ZK10B	8.0	14.72	88.5	2500	2.4
ZK15	9.5	14.58	88.0	2800	3.0
ZK20	10.0	14.50	87.2	2800	3.0
ZK20D	10.0	14.50	87.8	2800	2.4
ZK20A	10.0	14.50	88.5	2800	2.0
ZK30	11.0	14.40	86.5	3000	3.0
ZK30A	11.0	14.40	88.0	3000	2.0
ZK50	13.0	14.20	86.0	2900	3.0
ZK50A	13.0	14.20	88.4	3000	2.0
ZK60	15.0	14.00	85.5	2900	3.0

牌 号 Grade	钴含量 Cobalt %	密度Density g/cm³	硬度 Hardness HRA	抗弯强度TRS N/mm²	WC晶粒度 WC Grain Size μm
ZJ6	6.0	14.92	87.5	2200	6.0
ZJ6EC	6.0	14.92	87.0	2000	6.0-8.0
ZJ7EC	7.0	14.82	86.6	2000	6.0-8.0
ZJ10EC	8.0	14.72	85.8	2000	8.0
ZJ10CR	8.0	14.70	85.5	2000	8.0
ZJ10S	8.0	14.72	85.2	2000	8.0-10.0
ZJ10U	8.0	14.72	85.0	2000	10.0-12.0
ZJ15	8.5	14.66	86.0	2000	6.0
ZJ15S	8.5	14.66	85.0	2000	8.0-10.0
ZJ20A	10.0	14.50	86.1	2350	5.0-7.0
ZJ30A	11.0	14.40	86.2	2400	5.0-7.0
ZF30	13.0	14.20	87.5	2400	2.0
ZF60	16.0	13.90	86.0	2500	2.0

矿山采掘用齿概况
Mining Buttons Overview

钻头/齿类别 Drill Bits/ Buttons Type	常用牌号 Common Grade	齿形 Buttons Form	齿形型号代码 Buttons Form Code	适用工况 Applicable Condition
球齿钎头 Buttons Bits	ZK05	球形齿 Spherical Buttons	SQ	适用于极硬F15-F20岩层 Suitable for F15-F20 extra hard rock.
	ZK05	抛物线齿 Parabolic Buttons	SD	适用于中硬F10-F15岩层 Suitable for F10-F15 medium hard rock.
	ZK05	锥形齿 Conical Buttons	SZ	适用于中硬F10-F15岩层 Suitable for F10-F15 medium hard rock.
螺纹钻头 潜孔钻头 Thread Bits/ DTH Drill Bits	ZK05、ZK6R、ZK6G ZK05C、ZK10	球形齿 Spherical Buttons	SQ	适用于极硬F15-F20岩层 Suitable for F15-F20 extra hard rock.
	ZK05、ZK6R、ZK6G ZK05C、ZK10	抛物线齿 Parabolic Buttons	SD	适用于中硬F10-F15岩层 Suitable for F10-F15 medium hard rock.
	ZK05、ZK6R ZK6G、ZK05H	锥形齿 Conical Buttons	SZ	适用于中硬F10-F15岩层 Suitable for F10-F15 medium hard rock.
牙轮钻头 滚齿刀 Tri-Cone Drill Bits/ Hobbing Cutter	ZK20、ZK20D、ZK20A	球形齿 Spherical Buttons	SQ	适用于极硬F15-F20岩层 Suitable for F15-F20 extra hard rock.
	ZK20、ZK20D、ZK20A	抛物线齿 Parabolic Buttons	SD	适用于中硬F10-F15岩层 Suitable for F10-F15 medium hard rock.
	ZK20、ZK20D ZK20A、ZK30、ZK30A	锥形齿 Conical Buttons	SZ	适用于中硬F10-F15岩层 Suitable for F10-F15 medium hard rock.
	ZK30、ZK30A	边楔齿 Eccentric Wedge Buttons	SB	适用于中软、中硬F05-F15岩层 Suitable for F05-F15 medium soft;medium hard rock.
	ZK30、ZK30A、ZK50	楔形齿 Wedge Buttons	SX	适用于中软、中硬F05-F15岩层 Suitable for F05-F15 medium soft;medium hard rock.
	ZK05B、ZK10B	平顶齿 Flattop Buttons	SP	保径齿 Gauge protection buttons
	ZK05B、ZK10B、ZK20A	锯形齿 Zigzag Bbuttons	SG	保径齿，外径精度要求稍低 Gauge protection buttons,outside diameter accuracy requirements are lower.
	ZK20A、ZK30、ZK30A	勺形齿 Spoon Buttons	SS	适用于软岩、中软F03-F10岩层 Suitable for F3-F10 soft and medium soft rock.

矿山采掘用齿常用牌号性能及应用
Mining Buttons Common Grades,Properties and Applications

牌 号 Grade	钴含量 Cobalt %	密度 Density g/cm³	硬度 Hardness HRA	抗弯强度 TRS N/mm²	Wc晶粒度 WC Grain Size μm	牌号应用特点 Grade Application Characteristics
ZK05H	6.0	14.90	90.7	2600	1.6	具有良好的耐磨性，适用于进齿效率高的潜孔钻头、螺纹钻头；中软、中硬岩层 Excellent abrasive resistance,suitable for high drilling efficiency DTH drill bits;thread bits for medium soft and medium hard rock.
ZK05	6.0	14.93	90.2	2600	1.8	高耐磨性和高韧性，具备广泛适应性，适用各种球齿钎头、潜孔钻头、螺纹钻头； 中硬岩层 High toughness and abrasive resistance,with a wide range of adaptability.Suitable for all kinds of button bits; DTH drill bits; thread bits for medium hard rock.
ZK6R	6.0	14.90	90.4	2600	1.8	优化牌号，高耐磨性和高韧性，适用高风压潜孔钻头、螺纹钻头；中硬岩层 Optimized grade,High toughness and abrasive resistance,suitable for all kinds of high pneumatic DTH drill bits for medium hard rock.
ZK05C	6.0	14.93	90.0	2700	2.0	高韧性和耐磨性，适用各种螺纹钻头和潜孔钻头；中硬岩层 High toughness and abrasive resistance, suitable for all kinds of thread bits and DTH drill bits for medium hard rock.
ZK7	7.0	14.82	89.8	2700	2.0	韧性优异，适用各种螺纹钻头和潜孔钻头；复杂中硬岩层 Excellent toughness, suitable for all kinds of thread bits and DTH drill bits for medium hard rock.
ZK10	8.0	14.72	89.0	2800	2.0	韧性优异，适用各种螺纹钻头和潜孔钻头，适合焊接工艺；复杂中硬岩层 Excellent toughness, suitable for all kinds of thread bits and DTH drill bits for welding procedure;medium hard rock.
ZK20	10.0	14.50	87.2	2800	3.0	韧性优异，适用各种牙轮钻头、滚齿刀头；中硬岩层 Excellent toughness,suitable for all kinds of Tri-cone drill bits and hobbing cutter for medium hard rock.
ZK30	11.0	14.40	86.5	3000	3.0	韧性优于ZK20，适用各种牙轮钻头、滚齿刀头；中硬岩层 Toughness better than ZK20,suitable for all kinds of Tri-cone drill bits and hobbing cutter for medium hard rock.
ZK05B	6.0	14.92	89.6	2400	2.4	高耐磨性，多用于保径齿 High abrasive resistance,it is mainly used for gauge protection buttons.
ZK10B	8.0	14.72	88.5	2500	2.4	高耐磨性，多用于保径齿，及部分牙轮钻头 High abrasive resistance,it is mainly used for gauge protection buttons and Tri-cone drill bits.
ZK20D	10.0	14.50	87.8	2800	2.4	耐磨性优于ZK20，适用各种牙轮钻头、滚齿刀头；中硬岩层 Abrasive resistance better than ZK20,suitable for all kinds of Tri-cone drill bits and hobbing cutter for medium hard rock.
ZK20A	10.0	14.50	88.5	2800	2.0	耐磨性优于ZK20D，适用各种牙轮钻头、滚齿刀头；中硬岩层 Abrasive resistance better than ZK20D, suitable for all kinds of Tri-cone drill bits and hobbing cutter for medium hard rock.
ZK30A	11.0	14.40	88.0	3000	2.0	耐磨性优于ZK30，适用各种牙轮钻头、滚齿刀头；中硬岩层 Abrasive resistance better than ZK30,suitable for all kinds of Tri-cone drill bits and hobbing cutter for medium hard rock.
ZK50	13.0	14.20	86.0	2900	3.0	韧性优于ZK30，适用各种牙轮钻头、滚齿刀头；中软、中硬岩层 Toughness better than ZK30,suitable for all kinds of Tri-cone drill bits and hobbing cutter for medium soft 、medium hard rock.

工程建设用齿概况
Engineering Construction Buttons Overview

钻头/齿类别 Drill Bits/ Buttons Type	常用牌号 Common Grade	齿形 Buttons Form	齿形型号代码 Buttons Form Code	适用工况 Applicable Condition
路面铣刨截齿 Pavement Planing Auger Tips	ZJ6、J6EC、ZJ6EC	帽状挖路齿 Cap Tips	SW	适用于沥青路面 Suitable for asphalt pavement.
	ZK05B、ZJ6	铣刨柱齿 Planing Buttons	SJ/SZ	适用于水泥路面 Suitable for cement pavement.
旋挖截齿 Rotary Drilling Auger Tips	ZJ10EC、ZJ10CR、ZJ10S	柱状截齿 Columnar Auger Tips	SJ	适用于高强度、恶劣工况工程旋挖 Suitable for high strength rotary drilling and harsh working conditions.
	ZJ10EC、ZJ10CR、ZJ10S	异型截齿（蘑菇状、缩腰类） Special Auger Tips (mushroom-shaped/ waisted type)	SJ	适用于中强度、次恶劣工况工程旋挖 Suitable for medium strength rotary drilling and harsh working conditions.
掘进截齿 Tunnelling Auger Tips	ZJ10EC、ZJ10CR ZJ10S、ZJ15S	柱状截齿 Columnar Auger Tips	SJ	适用于高强度、恶劣工况工程掘进 Suitable for high strength tunnelling and harsh working conditions.
	ZJ10EC、ZJ10CR ZJ10S、ZJ15S	异型截齿（蘑菇状、缩腰类） Special Auger Tips (mushroom-shaped/ waisted type)	SJ	适用于中强度、次恶劣工况工程掘进 Suitable for medium strength tunnelling and harsh working conditions.



潜孔钻机
DTH Drill



旋挖钻机
Rotary Drilling Rig

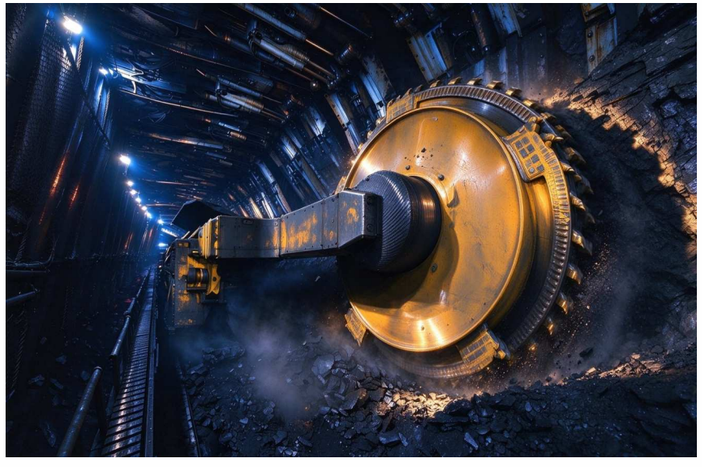


工程建设用齿常用牌号性能及应用
Engineering Construction Buttons Common Grades,Properties and Applications

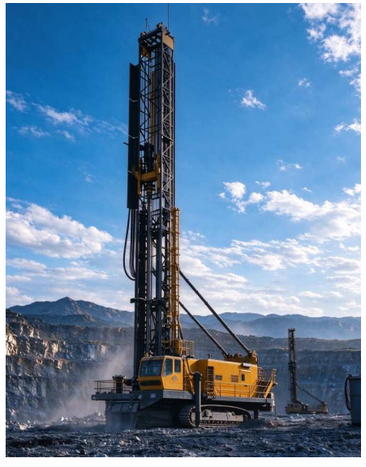
牌 号 Grade	钴含量 Cobalt %	密度 Density g/cm³	硬度 Hardness HRA	抗弯强度 TRS N/mm²	Wc晶粒度 WC Grain Size μm	牌号应用特点 Grade Application Characteristics
ZK05B	6.0	14.92	89.6	2400	2.4	高耐磨性和韧性，适用水泥路面拉毛、铣刨 High wear resistance and toughness suitable for cement pavement planing conditions.
ZJ6	6.0	14.92	87.5	2200	6.0	高韧性和耐磨性，适用沥青路面铣刨 High wear resistance and toughness suitable for asphalt pavement planing conditions.
ZJ6EC	6.0	14.92	87.0	2000	6.0-8.0	韧性优于ZJ6，高韧性和耐磨性，适用沥青路面铣刨及部分快速旋挖 Toughness better than ZJ6,High wear resistance and toughness suitable for asphalt pavement planing and fast rotary drilling conditions.
ZJ7EC	7.0	14.82	86.6	2000	6.0-8.0	优异的抗冲击韧性和抗热疲劳性，适用各种旋挖钻头和掘进钻头；复杂中硬岩层 Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of rotary drill bits and tunnelling bits for medium hard rock.
ZJ10EC	8.0	14.72	85.8	2000	8.0	韧性优于ZJ7EC，优异的抗冲击韧性和抗热疲劳性，适用各种旋挖钻头和掘进钻头；复杂中硬岩层 Toughness better than ZJ7EC,Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of rotary drill bits and tunnelling bits for medium hard rock.
ZJ10CR	8.0	14.70	85.5	2000	8.0	优异的抗冲击韧性和抗热疲劳性，适用各种旋挖钻头和掘进钻头；复杂中硬岩层 Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of rotary drill bits and tunnelling bits for medium hard rock.
ZJ10S	8.0	14.72	85.2	2000	8.0-10.0	韧性优于ZJ10EC,优异的抗冲击韧性和抗热疲劳性，适用各种旋挖钻头和掘进钻头；复杂中硬岩层 Toughness better than ZJ10EC,Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of rotary drill bits and tunnelling bits for medium hard rock.
ZJ10U	8.0	14.72	85.0	2000	10.0-12.0	韧性优于ZJ10S,优异的抗冲击韧性和抗热疲劳性，适用各种旋挖钻头和掘进钻头；高硬岩层 Toughness better than ZJ10S,Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of rotary drill bits and tunnelling bits for extra hard rock.
ZJ15	8.5	14.66	86.0	2000	6.0	优异的抗冲击韧性和抗热疲劳性，适用各种旋挖钻头和掘进钻头；复杂中硬岩层 Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of rotary drill bits and tunnelling bits for medium hard rock.
ZJ15S	8.5	14.66	85.0	2000	8.0-10.0	韧性优于ZJ15,优异的抗冲击韧性和抗热疲劳性，适用各种旋挖钻头和掘进钻头；高硬岩层 Toughness better than ZJ15,Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of rotary drill bits and tunnelling bits for extra hard rock.
ZJ20A	10.0	14.50	86.1	2350	5.0-7.0	优异的抗冲击韧性和抗热疲劳性，适用各种旋挖钻头和掘进钻头；复杂中软岩层 Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of rotary drill bits and tunnelling bits for medium soft rock.
ZJ30A	11.0	14.40	86.2	2400	5.0-7.0	优异的抗冲击韧性和抗热疲劳性，适用各种旋挖钻头和掘进钻头；复杂中软岩层 Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of rotary drill bits and tunnelling bits for medium soft rock.

煤炭开采用齿概况
Coal Mining Buttons Overview

钻头/齿类别 Drill Bits/ Buttons Type	常用牌号 Common Grade	齿形 Buttons Form	齿形型号代码 Buttons Form Code	适用工况 Applicable Condition
煤炭截齿 Coal Auger Tips	ZK10、ZK20	煤截片 Coal Slice	M	适用于软岩掘进 Suitable for soft rock tunnelling.
	ZJ7EC、ZJ10EC ZJ10CR、ZJ10S ZJ15、ZJ20A	柱状截齿 Columnar Auger Tips	SJ	适用于中硬F10-F15岩层 Suitable for F10-F15 medium hard rock.
	ZJ7EC、ZJ10EC ZJ10CR、ZJ10S ZJ15、ZJ20A	异型截齿 (蘑菇状、缩腰类) Special Auger Tips (mushroom-shaped/ waisted type)	SJ	适用于中软F05-F10岩层 Suitable for F05-F10 medium soft rock.



采煤机
Coal Shearer



牙轮钻机
Rotary Blast Hole Drill

煤炭开采用齿常用牌号性能及应用
Coal Mining Buttons Common Grades,Properties and Applications

牌 号 Grade	钴含量 Cobalt %	密度 Density g/cm³	硬度 Hardness HRA	抗弯强度 TRS N/mm²	Wc晶粒度 WC Grain Size μm	牌号应用特点 Grade Application Characteristics
ZK10	8.0	14.72	89.0	2800	2.0	适用煤截片 Suitable for coal slice.
ZK20	10.0	14.50	87.2	2800	3.0	适用煤截片 Suitable for coal slice.
ZJ7EC	7.0	14.82	86.6	2000	6.0-8.0	耐磨性优于ZJ10EC，优异的抗冲击韧性和抗热疲劳性，适用各种煤矿开采和巷道掘进 Abrasive resistance better than ZJ10EC,Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of coal mining and drivage.
ZJ10EC	8.0	14.72	85.8	2000	8.0	优异的抗冲击韧性和抗热疲劳性，适用各种煤矿开采和巷道掘进 Excellent impact toughness and thermal fatigue resistance, suitable for all kinds of coal mining and drivage.
ZJ10CR	8.0	14.70	85.5	2000	8.0	优异的抗冲击韧性和抗热疲劳性，适用各种煤矿开采和巷道掘进 Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of coal mining and drivage.
ZJ10S	8.0	14.72	85.2	2000	8.0-10.0	韧性优于ZJ10CR，优异的抗冲击韧性和抗热疲劳性，适用各种煤矿开采和巷道掘进 Toughness better than ZJ10CR,Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of coal mining and drivage.
ZJ15	8.5	14.66	86.0	2000	6.0	优异的抗冲击韧性和抗热疲劳性，适用各种煤矿开采和巷道掘进 Excellent impact toughness and thermal fatigue resistance,suitable for all kinds of coal mining and drivage.
ZJ20A	10.0	14.50	86.1	2350	5.0-7.0	韧性优于ZJ15，适用各种煤矿开采和巷道掘进 Toughness better than ZJ15,suitable for all kinds of coal mining and drivage.

油气钻探概况
Oil & Gas Drilling Buttons Overview

钻头/齿类别 Drill Bits/ Buttons Type	常用牌号 Common Grade	齿形 Buttons Form	齿形型号代码 Buttons Form Code	适用工况 Applicable Condition
牙轮钻头/潜孔锤 Tri-Cone Drill Bits/ DTH Hammer	ZK10、ZK20A、ZK20D	球形齿 Spherical Buttons	SQ	适用于极硬F15-F20岩层 Suitable for F15-F20 extra hard rock.
	ZK15、ZK20A ZK20D、ZK30A、ZK50A	锥形齿 Conical Buttons	SZ	适用于中硬F10-F15岩层 Suitable for F10-F15 medium hard rock.
	ZK20、ZK20D、ZK30	边楔齿 Eccentric Wedge Buttons	SB	适用于中软、中硬F05-F15岩层 Suitable for F05-F15 medium soft and medium hard rock.
	ZK20D、ZK30A、ZK50A	楔形齿 Wedge Buttons	SX	适用于中软、中硬F05-F15岩层 Suitable for F05-F15 medium soft and medium hard rock.
	ZK05B、ZK10B	平顶齿 FlattopTips	SP	保径齿 Gauge protection buttons
	ZK05B、ZK10B	锯形齿 Zigzag Buttons	SG	保径齿，外径精度要求稍低 Gauge protection buttons,outside diameter accuracy requirements are lower.
	ZK30、ZK50、ZK50A	勺形齿 Spoon Buttons	SS	适用于软岩、中软F03-F10岩层 Suitable for F03-F10 soft and medium soft rock.
	ZF30、ZF60	金刚石复合齿基体 PDC	YF、SF	适用于中硬、极硬F10-F20岩层 Suitable for F10-F20 medium hard and extra hard rock.
取芯钻头 Coring Bits	ZK05B、ZK10B、ZK20	大八角 Illicium Majus	T	勘探取芯用齿 Exploration coring buttons

油气钻探用齿常用牌号性能及应用
Oil & Gas Drilling Buttons Common Grades,Properties and Applications

牌号 Grade	钴含量 Cobalt %	密度 Density g/cm³	硬度 Hardness HRA	抗弯强度 TRS N/mm²	WC晶粒度 WC Grain Size μm	牌号应用特点 Grade Application Characteristics
ZK05B	6.0	14.92	89.6	2400	2.4	高耐磨性，多用于保径齿，大八角 High wear resistance, it is mainly used for gauge protection buttons and illicium majus.
ZK10B	8.0	14.72	88.5	2500	2.4	高耐磨性，多用于保径齿，大八角，及部分牙轮钻头 High wear resistance, it is mainly used for gauge protection buttons; illicium majus and Tri-cone drill bits.
ZK20	10.0	14.50	87.2	2800	3.0	韧性优异，适用各种牙轮钻头；中硬岩层 Excellent toughness,suitable for all kinds of Tri-cone drill bits for medium hard rock.
ZK30	11.0	14.40	86.5	3000	3.0	韧性优于ZK20，适用各种牙轮钻头，中硬岩层 Toughness better than ZK20,suitable for all kinds of Tri-cone drill bits for medium hard rock.
ZK20D	10.0	14.50	87.8	2800	2.4	耐磨性优于ZK20，适用各种牙轮钻头；中硬岩层 Toughness better than ZK20,suitable for all kinds of Tri-cone drill bits for medium hard rock.
ZK20A	10.0	14.50	88.5	2800	2.0	耐磨性优于ZK20D，适用各种牙轮钻头；中硬岩层 Toughness better than ZK20D,suitable for all kinds of Tri-cone drill bits for medium hard rock.
ZK30A	11.0	14.40	88.0	3000	2.0	耐磨性优于ZK30，适用各种牙轮钻头；中硬岩层 Toughness better than ZK30,suitable for all kinds of Tri-cone drill bits for medium hard rock.
ZK50	13.0	14.20	86.0	2900	3.0	韧性优于ZK30，适用各种牙轮钻头；中软、中硬岩层 Toughness better than ZK30,suitable for all kinds of Tri-cone drill bits for medium soft;medium hard rock.
ZK50A	13.0	14.20	88.4	3000	2.0	耐磨性优于ZK50，适用各种牙轮钻头；中软、中硬岩层 Toughness better than ZK50, suitable for all kinds of Tri-cone drill bits for medium soft;medium hard rock.

硬质合金柱齿型号表示规则
Cemented Carbide Buttons Naming Rules

Y	Z	14	20	A – E	15	Q
1	2	3	4	5 6	7	8

1. 系列类型：

Y 标准精度硬质合金柱齿系列 Indicates standard buttons series

S 非标异形柱齿 Indicates specail buttons series

2. 柱齿头部形状：

Q 球形 Spherical
Z 锥形 Conical
D 抛物线形 Parabolic
P 平顶形 Flattop
X 楔形 Wedge
B 边楔形 Eccentric Wedge
S 勺形 Spoon
F 复合片 Flat-bottom tips
W 挖路齿 Cap tips
J 截煤齿 Auger tips

3. 表示柱齿直径，单位为：mm；Y 系列只取两位整数，S 系列可保留一位小数，不足两位时前面添“0”补足两位。
The diameter of the button in mm. Only 2 integer are taken for Y series , 1 integer for S series (If the diameter is only one integer, then it is preceded by zero).

4. 表示柱齿高度，单位为：mm；只取两位整数，不足两位时前面添“0”补足两位。
The height of the button in mm. Only 2 integers are taken. (If the diameter is only one integer, then it is preceded by zero).

5. 表示柱齿特殊头部结构，标准头部结构此位缺省。Special button top and it is omitted here if the top is standard.

6. 表示柱齿底部倒角的角度。The angle of chamfer at the bottom of the button.

7. 表示柱齿底部倒角的高度，数字为高度（mm）的 10 倍，不足两位时前面添“0”补足两位。
The height of chamfer at the bottom, it is 10 times of the height in mm. If it is less than 2 integers, then it is preceded by zero.

8. 表示柱齿底部容气孔情况。It indicates air pocket structure at the bottom.

Q 球形孔 Spherical hole

Z 锥形孔，无容气孔时此位缺省。Conical hole, it is omitted if there is no air pocket.

D、H尺寸公差标准 Tolerance Standards of D and H

直径（D）Diameter		高度（H）Height	
公称尺寸 Nominal size	允许偏差 Tolerance	公称尺寸 Nominal size	允许偏差 Tolerance
≤10	±0.10	≤11	±0.10
		11～18	±0.15
>10	±0.15	18～25	±0.15
		>25	±0.20
“G”系列精磨柱齿 Grinded buttons			
≤14	±0.005	同毛坯柱齿 Same with blank	
>14	±0.01	同毛坯柱齿 Same with blank	

利用资源
BENEFIT FROM RESOURCES

依靠科技
RELIANCE ON TECHNOLOGIES

以人为本
DEVOTION TO HUMANITY

诚信至上
TOP WITH TRUST

安全 • 和谐 • 高效 • 创新
SAFE • HARMONIOUS • EFFICIENT • INNOVATIVE

MEMO