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CHENGDU TOOL RESEARCH INSTITUTE CO.,LTD

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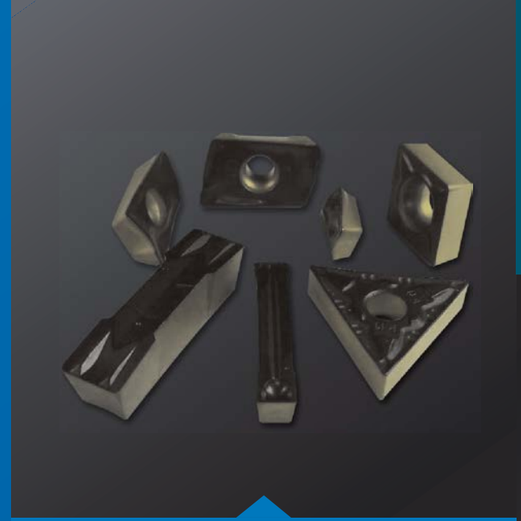


品质源于
1956

求实创新，追求卓越
PRAGMATIC INNOVATION
THE PURSUIT OF EXCELLENCE

化学涂层中心
技术与产品简介

Chemical Coating Center
Technique and Products Introduction

国机集团 成都工具研究所有限公司
CHENGDU TOOL RESEARCH INSTITUTE CO.,LTD

COMPANY PROFILE

公司简介

成都工具研究所有限公司（以下简称“工具所”）1956年创建于北京，是原国家机械工业部直属的我国机械行业唯一的综合性工具科研开发机构，1965年内迁至成都。1998年经国家科技部批准，成为“国家精密工具工程技术研究中心”和“国家工具生产力促进中心”的依托组件单位。1999年转制为科技型企业，进入中国机械工业集团有限公司。

Chengdu Tool Research Institute Co.,Ltd (hereafter CTRI) is founded in 1956 and formally under the direction of China's Machinery Ministry as the sole comprehensive tool researching and scientific developing institution of China's Machinery industry. CTRI moved to Chengdu in 1965. Approved by Ministry of Science and Technology, CTRI became the supporting institution of State Precision Tool Engineering Technology Research Center in 1998. It was later approved into China National Machinery Industry Corporation (SINOMACH) and transformed to a scientific and technological enterprise in 1999.

工具所主要从事精密切削刀具、精密测量仪器和表面改性技术三大类机械产品共性技术研究及其高新技术产品的开发与生产。已形成了以硬质合金石油管螺纹梳刀为主导并逐步发展了轴承刀具、超硬刀具、数控刀具、深孔加工刀具、汽车刀具、型线刀具、配套刀具、齿轮测量仪器、主动量仪、激光干涉仪、工具专机以及PVD、CVD、PCVD涂层技术服务、QPQ盐浴复合处理技术与装备等多种产品并存的产业结构。

CTRI is mainly engaged in precise cutting tools, measuring instruments, surface modified technique and advanced technological products. With the leading development of carbide chasers for oil pipe, CTRI extends products varieties for more industry structures, including bearing inserts, PCD/CBN cutting tools, CNC cutting tools, deep hole machining tools, automobile cutting tools, profile cutting tools, coupling tools, gear tester, in process gauge, calibration laser interferometer, special machines, and PVD, CVD, PCVD coating technical service, QPQ salt bath treatment technology and equipment.

行业地位

Industry Status

成都工具研究所是我国工具行业科研、技术的领头羊、行业归口所，以下组织挂靠在我所：

Chengdu Tool Research Institute is a leading scientific research and technology center in China tool industry. It also works as a supporting institute for the following organizations:

中国机械工业金属切削刀具技术协会
China metal cutting tool Engineering Association
中国机床工具工业协会工具分会
China Machine Tool & Tool Builder's Association Tools Branch
中国仪器仪表学会机械量测试仪器学会
China Instrument and Control Society
国家刀具质量监督监测中心
National Tool Quality Supervision and Monitoring Center
机械工业量具量仪产品质量监督检测中心
Mechanical industrial measuring instrument products Quality Supervision Testing Center
国家进出口商品检验局刀具认可实验室
China Import and Export Commodity Inspection Bureau tool accredited laboratory
国家进出口商品检验局量具量仪认可实验室
China Import and Export Commodity Inspection Bureau measuring instrument for Laboratory Accreditation
科技成果检测鉴定国家级检验机构（刀具）
Scientific and technological achievements identification of national inspection agency (tool)
科技成果检测鉴定部级检验机构（量具量仪）
Science and technology achievements inspection level inspection agency (measuring)
全国刀具标准化技术委员会秘书处
The tool Standardization Technical Committee Secretariat
全国量具量仪标准化技术委员会秘书处
The measuring tool and instrument Standardization Technical Committee Secretariat
ISO/TC 29 （工具）P成员国内归口单位
ISO/TC 29 (tool) P members internally controlled unit
ISO/TC213 （产品的几何和几何技术规范及检验）P成员国内归口单位
ISO/TC213 (geometry and geometry specification and inspection of products) P members internally controlled unit
CNACL 国家认可实验室
CNACL National Laboratory Accreditation
《工具技术》杂志社
Tool Engineering
国家精密工具生产力促进中心
National Precision Tool Productivity Promotion Center
中国机械工业金属切削刀具技术协会
China metal cutting tool Engineering Association
中国机械工程学会生产工程分会切削专业委员会
China Institute of mechanical engineering, production engineering branch, cutting Committee
四川省机械工程学会机加工专业委员会
Sichuan Mechanical Engineering Society Machine processing professional committee

品质源于

1956

科研成果

Scientific Achievements

自成都工具研究所成立以来，主要取得以下科研成果：

Followings are main scientific achievements since the foundation of CIRT :

一、国家发明奖三项：

three National Invention Awards

齿轮整体误差测量新技术 发明二等奖

The second prize in new technology of integrated error measuring gear Invention

单晶金刚石钎焊工艺及焊料 发明二等奖

The second prize in mono-crystalline diamond brazing technology and solder Invention

无锡易磨高性能高速钢 发明三等奖

The third prize in Wuxi easy grinding high speed steel

二、国家科技进步奖八项

Eight "the national science and technology progress awards"

量具刀具产品标准的制定和贯彻 二等奖

The second prize in The formulation and implementation of measuring tool products standard

中模数硬质合金齿轮滚刀 三等奖

The third prize in the module of carbide gear hob

立方氮化硼聚晶机理及其应用 三等奖

The third prize in PCBN mechanism and application

涂层硬质合金刀片成套技术及装备研究 三等奖

The third prize in researching coated carbide inserts integrated technology and equipment

QPQ盐浴复合处理技术及成套设备 二等奖

The second prize in composite treatment technology for QPQ salt bath and complete sets of equipment

机电一体化发展预测与综合分析（合作项目） 三等奖

The third prize in Electromechanical integration development prediction and comprehensive analysis (cooperated projects)

材料动态断裂性能研究及其在典型机械零部件上的应用（合作项目） 三等奖

Research on dynamic fracture properties of materials and its application in the typical mechanical parts on the (cooperated project) the Third prize

机械工业共性数据库（合作项目） 二等奖

The second prize in Machinery industry common database (cooperated projects)

三、省部科技进步奖

The Provincial Department of science and Technology Progress Award

121项（略）

121 items (omission)

人力资源

Human Resources

全所共有职工500余人，其中科技人员320人，有突出贡献的国家级专家3人，享受国家政府津贴26人，省部级专家15人，研究员级高级工程师27人，高级工程师103人，高级会计师、高级经济师10人、中级技术人员140人，硕士研究生14人，大中专生146人，专业涉及机械、金属材料、电子、计算机、机电一体化等专业。

CTRI presently has almost 500 employees, 320 of whom are technical staff, 3 state-level experts with outstanding contribution, 26 recipients of government special allowance, 15 ministerial level experts, 27 professor level senior engineers, 103 senior engineers, 10 senior accountants and senior economists, 140 intermediate technical staff , 14 with master degree, 146 with college diploma and employees are widely involved in machinery, metal materials, electronic, computer, electromechanical integration specialty.

核心竞争力

Competitive Advantages

目前成都工具研究所已在刀具材料、精密复杂成形刀具与数控刀具设计及加工技术、刀具表面强化改性技术与装备、大型精密量仪设计制造、激光测量及光电传感器技术以及计算机软件等技术领域，形成了独特的整体、核心成套技术优势，初步构成了以硬质合金石油管螺纹梳刀、硬质合金精密异形刀具、超硬刀具、刀具表面强化技术及装备、齿轮测量仪、激光测量仪等六项主导产品，包含30多项核心、高新技术产品的产品技术结构，这些产品和技术大都处于国内领先或国际先进水平。

Chengdu Tool Research Institute has formed a completed and unique technical competitive advantages in tool material, precise and complex shaped cutter and NC tool design and processing technology, cutting tool surface modification and strengthening technology and equipment, large-scale design precision instrument manufacturing, laser and photoelectric sensor technology and computer software technology. It initially formed six leading products including carbide treading tools for oil pipe, carbide precision special-shaped inserts, super hard cutting tools, tool surface strengthening technology and equipment, gear measuring instrument, laser measuring instrument. Those products are supported by more than 30 core, high-tech products technology structure and most of these products and technology are leading technologies in the domestic and international advanced level.

质量控制

Quality Control

质量认证：ISO9001:2008
Quality Certification: ISO9001:2008

质量方针：
以技术创新为先导，以质量管理为保证，以持续改进为核心，以顾客满意为目标。
Quality policy:
To make technical innovation as the guide, the quality of management as the guarantee, continuous improvement as the core and take customer satisfaction as the goal.

质量目标：
★ 贯彻ISO9001：2008标准，通过ISO9001：2008质量管理体系认证，并保持体系有效运行。
★ 技术不断创新，每年设计开发新产品或新项目2项以上。
★ 以质量管理为保证，加强过程控制，实施持续改进，产品质量精益求精，确保产品出厂合格率达100%。三年内使主导产品合格率提高到95%以上，成品交检批次合格率达到95%。
★ 以顾客为关注焦点，增进顾客满意，三年内使顾客满意率达98%以上，顾客投诉解决率达到100%。
★ 顾客重大投诉为零，重大质量事故为零，重大设备安全事故为零。
The quality objectives:
★ in carrying out the standard of ISO9001:2008, through the ISO9001:2008 quality management system certification, and keep the system running effectively.
★ technology innovation, design and develop more than 2 new products or new projects each year
★ to guarantee the quality management , strengthen the process control, carry out continuous improvement, refine on product quality, to ensure 100% products manufactured pass rate. Increase leading products pass rate to 95% in three years and the finished product inspection pass rate to 95%.
★ customer focus, improve customer satisfaction, three years to make customer satisfaction rate reaches above 98%, to solve customer complaint rate reached 100%.
★ customer major complaints to zero, a major quality accidents to zero, zero accident of major equipment.

服务管理

Service management

服务宗旨：
全心全意为用户服务

服务承诺：
尽可能满足用户的合理需求

服务标准：
快速、及时、有效，向用户提供一流产品和一流服务

Service Aim : put one's heart and soul into service for the user

Service Commitment: to meet the reasonable needs of users as far as possible

Service standards: rapid, timely, effective, provide first-class products and first-class service to users

企业合作

Business cooperation

・与联合国合作建立中国量仪基地
・与德国klingelnberg公司合作，锥齿轮测量技术出口德国
・广范与国外公司进行技术交流与合作
・与国内大专院校、大型企业进行广范的技术交流与合作
・与英国普法永道咨询公司合作，全面提升企业形象和管理能力

・ cooperation with the United Nations to establish Chinese instrument base
・ cooperation with Klingelnberg (Germany), bevel gear measurement technology exported to Germany
・ technological exchanges and cooperation with foreign companies
・A wide range of cooperation and technological exchanges with colleges, universities and large domestic enterprises
・ cooperation with British consulting company to improve corporate image and management ability

历史及实力

History and Strength

成都工具研究所有限公司化学涂层中心是国内最早瞄准化学涂层工业化应用的机构，1971年开始便进行各种涂层工艺及装备的开发。

The chemical coating center of Chengdu Tool Research Institute Co., LTD. is the earliest domestic institution aimed at chemical coating industrial application.In 1971, CTRI began to do research on variety of coating processing and coating equipment.

中心目前共有员工13人，其中教授级高工1人，高级工程师3人，工程师5人，拥有化学涂层设备（CVD）2台，物理化学涂层设备（PCVD）2台，除一台全自动CVD设备从瑞士引进外，其余设备均为独立开发，是国内目前唯一一家可同时提供CVD、PCVD涂层技术支持、涂层开发的中心。

At present, there are 13 employees working in center, including 1 professor senior engineer,3 senior engineers and 5 engineers. As well as there are 2 CVD units and 2 PCVD units. All units are independent development except 1 automatic CVD unit imported from Swiss. Coating center is currently the only professional center which can provide both technical support and development of CVD and PCVD coating in China.

中心同时配套有干式、湿式喷砂机4台、全自动清洗机2台及扫描电镜、X射线衍射仪、金相显微镜、球磨仪及划痕仪等涂层检测设备。可稳定提供具有优异性能的TiN、TiC、HT-TiCN、纳米MT-TiCN、细晶粒 α -Al_2O_3、κ - Al_2O_3、类金刚石涂层（DLC）等单层及多层复合涂层产品，可广泛适用于机械、石油、航天、船舶、军工等领域。近年来，中心先后承担、参与多项国家、省、部级重大科研项目，取得了多项成果，且多项重大成果填补了国家空白并达到国际先进水平。

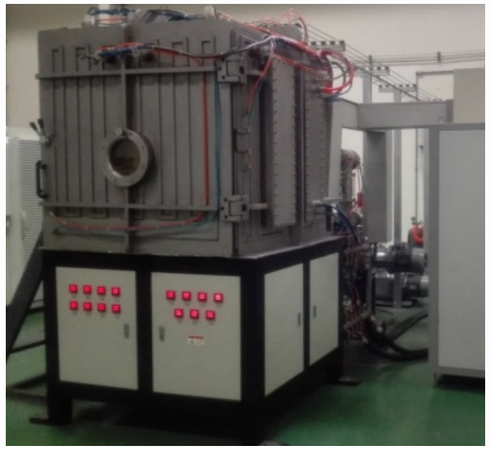
Center at the same time supporting 4 dry and wet sand blasting machines, 2 automatic cleaning machines,scanning electron microscope（ SEM）, X-ray diffractometer, Metalloscope, ball milling machine, scratch tester and other coating testing Equipment. Chemical coating center provides inserts with stable performance and excellent coating, namely TiN, TiC, HT - TiCN, nano MT - TiCN, fine grained α -Al_2O_3, k-Al_2O_3, diamond-like coating (DLC) , monolayer and multilayer composite coating. Products can be widely used in machinery, petroleum, aerospace, shipbuilding, military project and other fields. In recent years, the center has undertaken a number of national, provincial and ministerial major scientific research projects.Many achievements have been made in research on coating and several of them fill the national gaps and reach the international advanced level.

涂层设备
Coating Units

进口全自动CVD涂层设备
Imported Automatic CVD Coating Unit

自主研发CVD涂层设备
Self - Developed CVD Coating Unit

自主研发PCVD设备
Self - Developed PCVD Coating Unit



自主研发全自动PCVD设备
Self - Developed Automatic CVD Coating Unit

涂层前后处理设备
Coating Pre and Post Treatment Equipment

进口全自动清洗机 Imported Automatic Washing Machine

国产全自动清洗机 Domestic Automatic Washing Machine

干、湿喷砂机 Wet and Dry Sand Blasting Machine

涂层质量检测设备

Coating Quality Testing Equipment

检测中心

Testing Center

进口金相显微镜

Imported Metalloscope

进口自动抛光机

Imported Polishing Machine

国产划痕仪

Domestic Scratch Tester

国产X射线衍射仪

Domestic X-Ray Diffractometer

体视显微镜

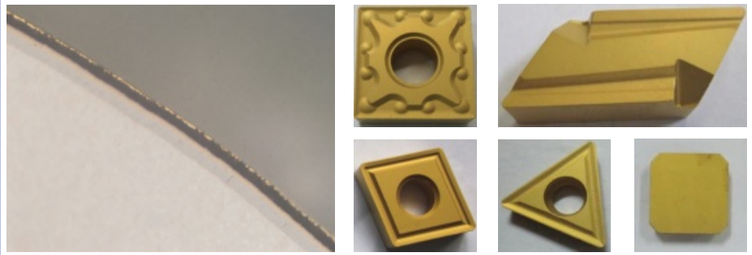
Stereoscopic Microscope

产品

Products

G1涂层：MT-TiCN（3um）+ α-Al_2O_3（3um）+ TiN（1um）

G1 coating：MT-TiCN（3um）+ α-Al_2O_3（3um）+ TiN（1um）

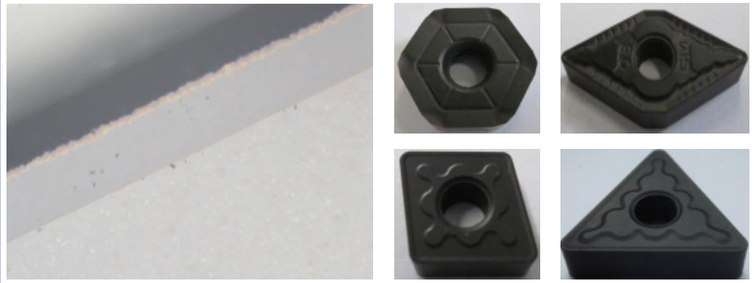


通过CVD方法制备的外表为黄色的通用涂层。通过改良的过渡层设计和α-Al_2O_3工艺控制，保证了极其优异的膜基结合强度和耐磨损性能，通过匹配合适的基体材料及后处理工艺可广泛应用于钢、不锈钢、铸铁的粗、半精及精加工，首选加工钢件。

By CVD method, G1 is a general coating with yellow appearance .Through improvement of the transition layer design and controlling of α-Al_2O_3, it ensures excellent coating bonding strength and wear resistance. By matching the appropriate base material and post-treatment process can be widely used in rough processing, sem-finish processing and finish processing of cast iron, steel and stainless steel. The steel work-piece is preferred.

G2涂层：MT-TiCN（5um）+ α-Al_2O_3（5um）

G2 coating：MT-TiCN（5um）+ α-Al_2O_3（5um）

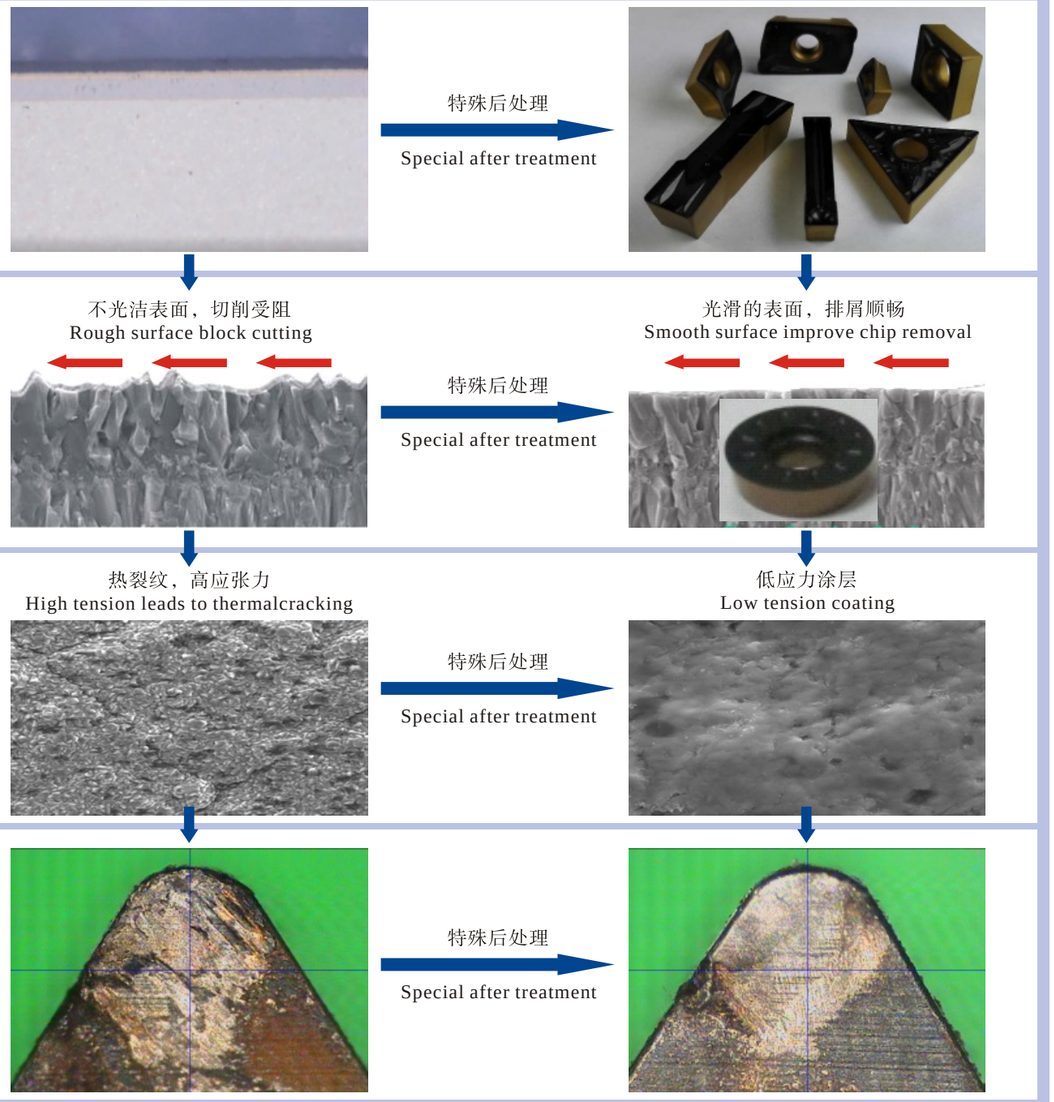


通过CVD方法制备的外表为纯黑色。加厚的α-Al_2O_3设计，提高了涂层在稳定加工过程中的耐磨损性能，同时通过改良的过渡层设计和α-Al_2O_3工艺控制，又保证了极其优异的膜基结合强度，保证了涂层不会过早的剥落而失效，通过匹配合适的基体材料及后处理工艺特别适合铸铁的加工，同时也可用于钢件的半精加工及精加工。另外还可以应用于硬质合金喷嘴、模具、冲头等防腐、耐磨领域。

By CVD method, G2 is pure black appearance.Thickening of the α - Al2O3 improves the wear resistance of the coating in the stable process performance. At the same time, through modifying the transition layer and controlling of α -Al2O3, it ensures excellent coating bonding strength as well as the coating will not premature spalling failure. By matching the appropriate base material and post-treatment process, it is suitable especially for cast iron processing as well as it can be used to semi-finishing and finish machining of steel parts. G2 coating applies in areas of the anti-corrosive and wear-resisting, such as the carbide nozzle, die, punch etc.

G3涂层：MT-TiCN（3um）+ α-Al_2O_3（3um）

G3 coating：MT-TiCN（3um）+ α-Al_2O_3（3um）



通过CVD方法制备的外表为双色的通用涂层。通过改良的过渡层设计和α-Al_2O_3工艺控制，保证了极其优异的膜基结合强度和耐磨损性能，辅之以特殊的后处理工艺，改善涂层内部应力状态，减少裂纹，使表面更光滑，排屑更流畅，通过匹配合适的基体材料，可广泛应用于钢、不锈钢、铸铁的粗、半精及精加工，首选加工钢件。

By CVD method, G3 is double color appearance. Through improving of the transition layer and controlling of α-Al_2O_3, it ensures coating bonding strength and wear resistance. By matching the appropriate base material and post-treatment process, it is improved internal stress state which reduce the crack, improve surface smoothness and chip removal. It can be widely applied in rough processing, semi-finish processing and finish processing of cast iron,steel and stainless steel. The steel work-piece is preferred.

G4涂层：TiN、TiC、TiCN多层复合涂层（厚度视工件而定）

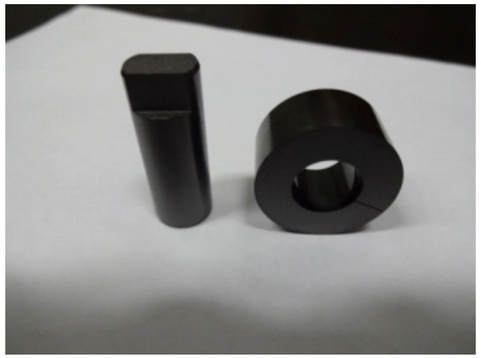
G4 coating：TiN、TiC、TiCN

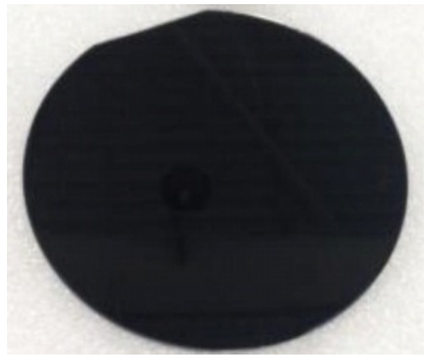
通过CVD方法制备的外表为黄色的多层复合涂层。通过合理的涂层组合，使其成为具有优异膜基结合强度、韧性高、耐磨性好的高性能涂层，匹配以合适的基体材料特别适合钢件的重载切屑，同时也可应用于模具等耐磨领域。

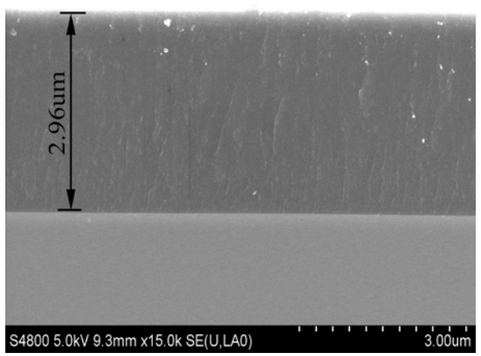
By CVD method, G4 is yellow multilayer. Through reasonable coating combination, it ensures coating bonding strength, high toughness and good wear resistance of high performance coating. Matching with the appropriate base material and post-treatment process, it especially suits heavy cutting of steel work piece and dies area.

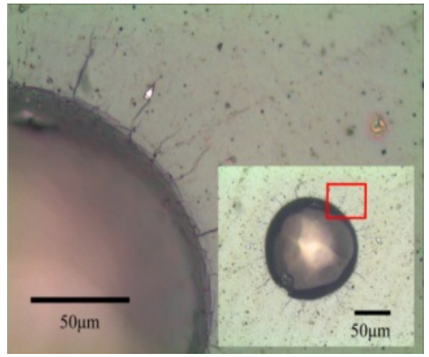
品质源于
1956

G5涂层：类金刚石涂层（DLC）
G5 coating：DLC coating









采用PCVD方法制备的涂层，通过不同的工艺控制，可以形成不同结构、不同厚度、不同硬度、不同颜色、应用于不同领域的涂层，涂层表面及其光滑，结合力及耐腐蚀性能优异，可广泛应用于汽车、航天、机械、医学等减磨、防腐领域。

By PCVD method, G5 is complicate coating which depends on different technical control to present different structure, different thickness, different hardness and different color, and also it applies in different area. It is extremely smooth coating contained with outstanding bonding force and corrosion resistance. It is widely applied in automobile area, aerospace area, machinery area and medical area etc.

G6涂层：PCVD-TiN
G6 coating：PCVD-TiN

PCVD方法制备的单层TiN涂层，厚度2-4um，外表为光亮的金黄色，适合钢件中低速轻载精加工、滚刀及装饰镀。

By PCVD method, G6 is golden monolayer coating and the thickness is 2-4 um.It suits hobbing coating, decoration coating, and mid and low speed underloading finish processing etc.

经营理念
Business Philosophy

精 品 高 效　　诚 信 共 赢

Quality and Efficiency, Integrity and Win-win

工作作风
Working Style

天下大事必作于细，古往今来必成于实

the world in the event, it is necessary to fine, throughout history, it is necessary to success in the reality.

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