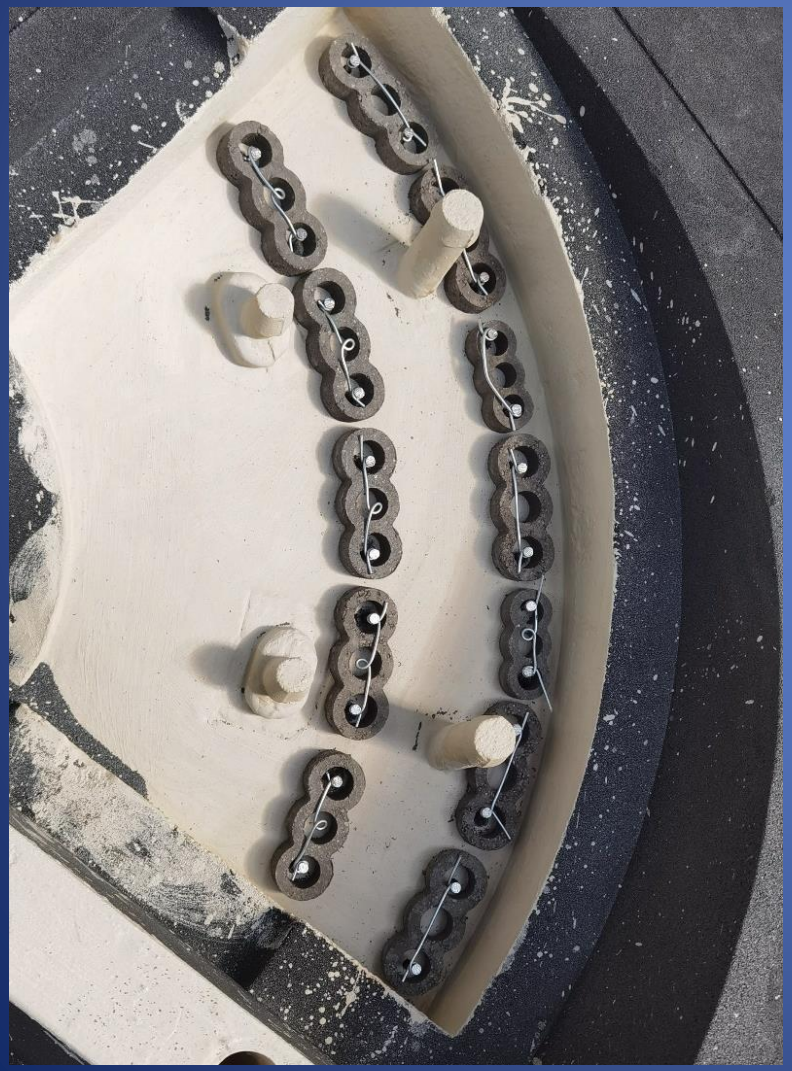
砂铸工艺陶瓷布局及安装
installation and layout of Ceramic core of Sand casting process

DJM通常根据铸造图纸选择陶瓷芯的形状类型和尺寸。我们会根据铸造图纸设计铸造工艺，布置陶瓷，并选择陶瓷芯的类型、尺寸，陶瓷芯使用起来非常简单方便，根据我们设计的铸造工艺将陶瓷芯用钉子或自攻螺钉固定在砂型上即可。

DJM usually selects the shape type and size of the ceramic core according to the casting drawings. We will design the casting process according to the casting drawings, arrange the ceramics, and choose the type and size of the ceramic core. The ceramic core is very simple and convenient to use. According to the casting process designed by us, the ceramic core can be fixed on the sand mold with nails or self-tapping screws.





合金钢陶瓷复合板锤/锤头
Alloy Steel Matrix ceramic composite Blow Bar/ Hammer

DJM采用金属陶瓷颗粒为增强相、合金钢为基体金属、利用纳米陶瓷及稀土细化晶粒、提高抗冲击性能、提高金属基体的强度，在耐磨件易磨损部位熔铸增强相-陶瓷颗粒预制体，熔铸过程中基体金属与合金化后的陶瓷颗粒在金属液高温作用下实现冶金结合、从而***获得硬度呈阶梯分布的金属基陶瓷复合层，大幅提高耐磨性能、冲击值可达100J/CM2以上，抗冲击，无断裂风险，塑性变形小，可焊接再加工***，使用寿命是传统产品的1-3倍

DJM uses cermet particles as the reinforcement phase and alloy steel as the matrix metal, and uses Nano Ceramic to improve the strength of the metal matrix of the wear-resistant parts. The reinforcement phase - ceramic particle preform is cast in the wear-resistant lining plate. In the process of melting and casting, the matrix metal and alloyed ceramic particles achieve metallurgical combination under the action of metal liquid at high temperature, so as to obtain the metal base ceramic composite layer ***with a ladder of hardness distribution, which greatly improves the wear resistance, the impact over 100J/CM2、the impact resistance, no fracture risk, the plastic deformation is small, Weldable and reprocessable***、and the service life is 1-3 times that of traditional products



合金钢陶瓷复合板锤/锤头
Alloy Steel Matrix ceramic composite Blow Bar/ Hammer

DJM采用金属陶瓷颗粒为增强相、合金钢为基体金属、利用纳米陶瓷及稀土细化晶粒、提高抗冲击性能、提高金属基体的强度，在耐磨件易磨损部位熔铸增强相-陶瓷颗粒预制体，熔铸过程中基体金属与合金化后的陶瓷颗粒在金属液高温作用下实现冶金结合、从而***获得硬度呈阶梯分布的金属基陶瓷复合层，大幅提高耐磨性能、冲击值可达100J/CM2以上，抗冲击，无断裂风险，塑性变形小，可焊接再加工***，使用寿命是传统产品的1-3倍

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合金钢陶瓷复合铸造自(半)磨机/球磨机衬板

Alloy Steel ceramic insert composite liner of SAG mill / Ball Mill

DJM采用金属陶瓷颗粒为增强相、合金钢为基体金属、利用纳米陶瓷提高耐磨衬板金属基体的强度，在耐磨衬板易磨损部位熔铸增强相-陶瓷颗粒预制体，熔铸过程中基体金属与合金化后的陶瓷颗粒在金属液高温作用下实现冶金结合、从而获得***硬度呈阶梯分布的金属基陶瓷复合层，大幅提高耐磨性能、冲击值超过50J/CM2，抗冲击，无断裂风险，塑性变形小，可焊接再加工***，使用寿命是传统产品的1-3倍

DJM uses cermet particles as the reinforcement phase and alloy steel as the matrix metal, and uses Nano Ceramic to improve the strength of the metal matrix of the wear-resistant lining plate. The reinforcement phase - ceramic particle preform is cast in the wear-resistant lining plate. In the process of melting and casting, the matrix metal and alloyed ceramic particles achieve metallurgical combination under the action of metal liquid at high temperature, so as to obtain the metal base ceramic composite layer ***with a ladder of hardness distribution, which greatly improves the wear resistance, the impact value exceeds 50J/CM2, the impact resistance, no fracture risk, the plastic deformation is small, Weldable and reprocessable***、and the service life is 1-3 times that of traditional products



陶瓷（nm）复合铸造立磨辊套/衬板

MMC – Ceramic(nm)composite casting Vertical Grinding Mill Roller/Liner

DJM采用金属陶瓷颗粒为增强相、高铬铸铁为基体金属、利用纳米陶瓷提高金属基体的冲击韧性及强度，在易磨损部位熔铸增强相-陶瓷颗粒预制体，熔铸过程中基体金属与合金化后的陶瓷颗粒在金属液高温作用下实现冶金结合、从而***获得硬度呈阶梯分布的金属基陶瓷复合层，大幅提高耐磨性能、冲击韧性及强度、***使用寿命是传统产品的1-3倍

DJM uses metal ceramic particles as the reinforcing phase and high-chromium cast iron as the matrix metal. It enhances the impact toughness and strength of the metal matrix with nano-ceramics. In the easily worn parts, the reinforcing phase - ceramic particle preforms are cast in. During the casting process, the matrix metal and the alloyed ceramic particles are metallurgically bonded under the high-temperature action of the molten metal***, thereby obtaining a metal matrix ceramic composite layer with a stepped hardness distribution. This significantly improves the wear resistance, impact toughness and strength***, and the service life is 1-3 times that of traditional products.



陶瓷（nm）复合铸造立磨辊套/衬板

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陶瓷复合立式螺旋搅拌磨机(塔磨机)螺旋衬板

ceramic insert spiral liner of Vertical spiral agitating mill (towermill, VTM)

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DJM uses metal ceramic particles as the reinforcing phase and high-chromium cast iron as the matrix metal. It enhances the impact toughness and strength of the metal matrix with nano-ceramics. In the easily worn parts, the reinforcing phase - ceramic particle preforms are cast in. During the casting process, the matrix metal and the alloyed ceramic particles are metallurgically bonded under the high-temperature action of the molten metal***, thereby obtaining a metal matrix ceramic composite layer with a stepped hardness distribution. This significantly improves the wear resistance, impact toughness and strength***, and the service life is 1-3 times that of traditional products.



MMC-Mn 高锰钢陶瓷复合耐磨材料

MMC-Mn （High Manganese Steel Ceramic Insert casting wearparts）

即在高锰钢为基材的金属部件易磨损部位熔铸增强相-陶瓷颗粒.通过陶瓷颗粒与铸造合金的冶金结合来实现金属陶瓷复合并形成金属陶瓷复合层; 陶瓷颗粒与金属的冶金结合是通过金属液体的热量来实现的; 陶瓷颗粒与基体金属形成金属陶瓷复合层的硬度呈阶梯分布: 在浇铸工程中利用复合陶瓷材料中的合金元素细化高锰钢晶粒，提高高锰钢基体性能，充分发挥高锰钢的加工硬化特点，减少塑性变形，提高低冲击耐磨能力； 结合陶瓷材料的高耐磨特性，提高工作面的抗磨性能，从而获得即耐磨且抗冲击的耐磨材料。高锰钢陶瓷复合材料的寿命大幅度提高。

That is, the reinforcement phase - ceramic particles are fused and cast in the easily worn parts of metal parts with high manganese steel as the base material. The metal ceramic composite layer is formed by the metallurgical combination of ceramic particles and casting alloy. The metallurgical bonding of ceramic particles with metal is realized by the heat of metal liquid. The hardness of ceramic-ceramic composite layer formed by ceramic particles and matrix metal shows a step distribution. In the casting engineering, alloy elements in composite ceramic materials are used to refine the grain of high-manganese steel, improve the matrix properties of high manganese steel, give full play to the work-hardening characteristics of high-manganese steel, reduce plastic deformation, and improve the low-impact wear resistance. Combined with the high wear resistance of the ceramic material, the wear resistance of the working surface is improved, so that the wear-resistant and impact-resistant material is obtained. The life of high manganese steel ceramic composite is greatly improved.

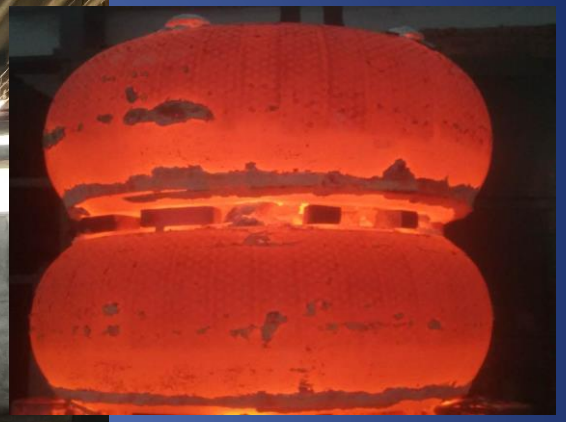


陶瓷复合耐磨产品-热处理
Ceramic insert castings - Heat treatment

陶瓷复合产品的热处理适用于基材材质的常规热处理工艺，但升温曲线/降温曲线要根据DJM的技术要求做适当调整
The heat treatment of ceramic composite products is suitable for the conventional heat treatment process of substrate materials, but the temperature rise curve/cooling curve should be adjusted according to the technical requirements of DJM











陶瓷板锤消失模铸造
Lost foam casting process for ceramic insert blow bar

DJM通常根据铸造图纸选择陶瓷芯的形状类型和尺寸。我们会根据铸造图纸设计铸造工艺，布置陶瓷，并选择陶瓷芯的类型、尺寸，陶瓷芯使用起来非常简单方便，根据我们设计的铸造工艺将陶瓷芯用钉子、胶水固定在泡沫型上然后上涂料、烘干即可埋箱浇铸。

DJM usually selects the shape type and size of the ceramic core according to the casting drawings. We will design the casting process according to the casting drawings, arrange the ceramics, and choose the type and size of the ceramic core. The ceramic core is very simple and convenient to use. According to the casting process designed by us, the ceramic core is fixed on the foam type with nails and glue, and then coated and Dry can be buried box casting



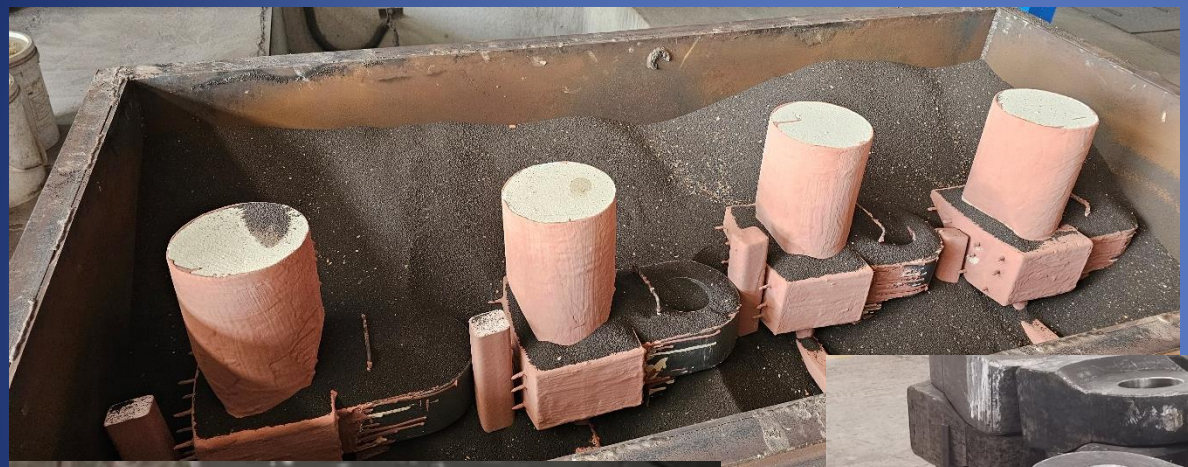




锤头消失模铸造工艺陶瓷布局及安装
installation and layout of Ceramic core of Lost foam casting process for Hammer

DJM通常根据铸造图纸选择陶瓷芯的形状类型和尺寸。我们会根据铸造图纸设计铸造工艺，布置陶瓷，并选择陶瓷芯的类型、尺寸，陶瓷芯使用起来非常简单方便，根据我们设计的铸造工艺将陶瓷芯用钉子、胶水固定在泡沫型上然后上涂料、烘干即可埋箱浇铸。

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合金钢陶瓷（nm）复合铸造耐磨衬板
Alloy steel Ceramic (nm) composite castings wear resistant Liner

DJM采用金属陶瓷颗粒为增强相、合金钢为基体金属、利用纳米陶瓷提高耐磨衬板金属基体的强度，在耐磨衬板易磨损部位熔铸增强相-陶瓷颗粒预制体，熔铸过程中基体金属与合金化后的陶瓷颗粒在金属液高温作用下实现冶金结合、从而获得***硬度呈阶梯分布的金属基陶瓷复合层，大幅提高耐磨性能、冲击值超过50J/CM2，抗冲击，无断裂风险，塑性变形小，可焊接再加工***，使用寿命是传统产品的1-3倍

DJM uses cermet particles as the reinforcement phase and alloy steel as the matrix metal, and uses Nano Ceramic to improve the strength of the metal matrix of the wear-resistant lining plate. The reinforcement phase - ceramic particle preform is cast in the wear-resistant lining plate. In the process of melting and casting, the matrix metal and alloyed ceramic particles achieve metallurgical combination under the action of metal liquid at high temperature, so as to obtain the metal base ceramic composite layer ***with a ladder of hardness distribution, which greatly improves the wear resistance, the impact value exceeds 50J/CM2, the impact resistance, no fracture risk, the plastic deformation is small, Weldable and reprocessable***、and the service life is 1-3 times that of traditional products





消失模铸造工艺高铬陶瓷复合辊套的陶瓷布局及安装

installation and layout of Ceramic core for high Chrome cast iron ceramic insert casting Roller of Lost foam casting process









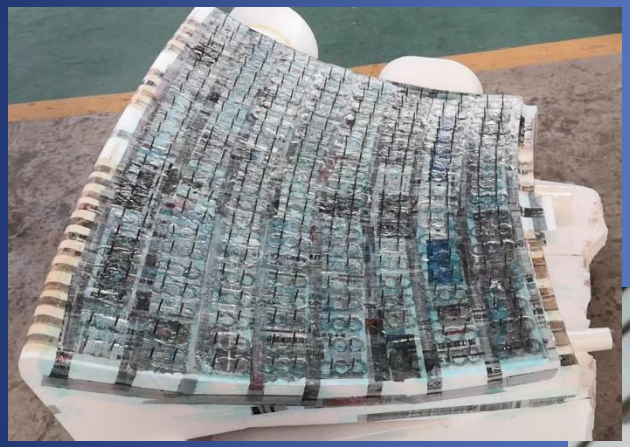




消失模铸造工艺高铬陶瓷复合碾底衬板的陶瓷布局及安装
installation and layout of Ceramic core for high Chrome cast iron ceramic insert casting Liner of Lost foam casting process











陶瓷（nm）复合铸造预热器耐热钢挂片
Heat-resistant steel Ceramic(nm) composite castings Preheater liner

耐热钢基陶瓷复合铸造预热器挂片，利用增强相（陶瓷）微粒形成纳米晶核、细化晶粒、净化钢液、脱硫脱氧、增强相微粒均匀弥散于本体形成硬质相***大幅提高耐热钢的屈服强度、耐磨性能、高温强度、耐腐蚀性能***；充分发挥增强相的耐热抗氧化耐磨性能从而满足恶劣工况条件下的耐热抗氧化耐磨要求

The heat-resistant steel-based ceramic composite casting preheater liner utilizes the micro-particles of the reinforcing phase (ceramic) to form nanocrystalline nuclei, refine grains, purify the molten steel, desulfurize and deoxidize, and evenly disperse the reinforcing phase micro-particles in the matrix to form a hard phase, ***significantly enhancing the yield strength, wear resistance, high-temperature strength, and corrosion resistance of the heat-resistant steel. It fully exploits the heat resistance, oxidation resistance***, and wear resistance of the reinforcing phase to meet the requirements of heat resistance, oxidation resistance, and wear resistance under harsh working conditions.





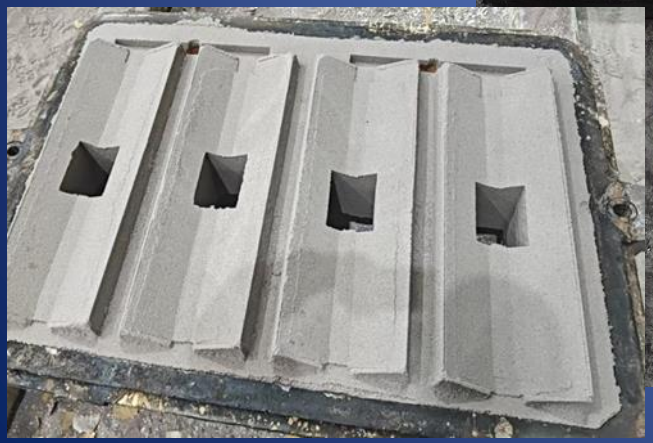
陶瓷（nm）复合铸造耐热钢侧导板
side guide plate　Cr28Ni48W5+ Ceramic（nm)

金属基纳米陶瓷复合铸造技术操作简单、实用性强，无须对现有工艺做过多调整，只需将陶瓷微粒膏体涂敷于铸型表面烘干后即可浇铸成型，不影响后期机加工/热处理。广泛应用于耐热钢、高锰钢、合金钢等耐磨耐热材料；适用于水玻璃砂铸、树脂砂铸造、消失模铸造、离心铸造等工艺，适用产品包括：耐热钢挂片/蓖条/辊套/铸管、合金钢顶头/斗齿/锤头/轧辊/辊套、高锰钢齿板/轧臼壁、高铬渣浆泵叶轮/护板/蜗壳、等

The metal-based nano-ceramic composite casting technology is simple to operate and highly practical. It does not require excessive adjustments to the existing process. Just apply the ceramic particle paste to the surface of the mold, dry it, and then it can be cast into shape, without affecting the subsequent machining/heat treatment. It is widely applied to wear-resistant and heat-resistant materials such as heat-resistant steel, high manganese steel and alloy steel. It is applicable to processes such as sodium silicate sand casting, resin sand casting, lost foam casting, and centrifugal casting. The applicable products include: heat-resistant steel hanging plates/grates/roller sleeves/cast pipes, alloy steel top heads/bucket teeth/hammer heads/rolls/roller sleeves, high manganese steel tooth plates/mill walls, high chromium slurry pump impellers/guard plates/volutes, etc





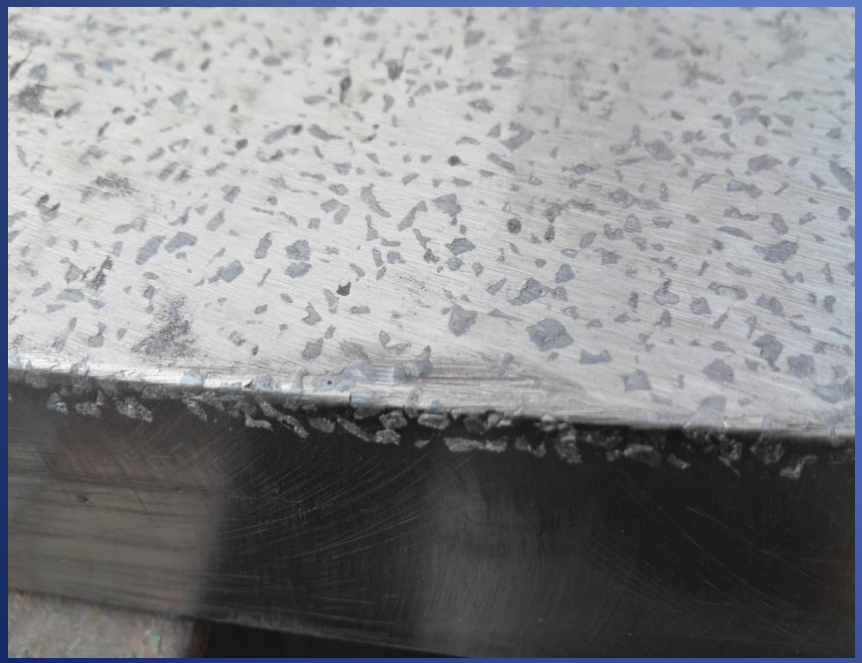




金属基纳米陶瓷复合铸造可焊接耐磨板
Metal Matrix ceramic(nm) composite casting Liner
（weldability wear-resistant plate)

可焊接耐磨条/板是一种以合金钢为基材的陶瓷复合耐磨材料，即在合金钢材料表面熔铸陶瓷颗粒形成陶瓷金属复合材料层，这层复合层的耐磨性能可达高Cr材料的1-3倍，同时这一复合层的厚度可制成达到原备件厚度的1/3，并可根据原磨损曲线有针对性的制作，因选用合金钢为基材，从而使合金钢底座具有很好的焊接性能，又可以承担高冲击强度。陶瓷的硬度提供了最大限度的耐磨性，同时，合金钢底座能吸收高冲击强度，产品易于使用，适用火焰气割，砂轮锯，剪切，水割，等离子等多种切割方式切割，焊接到曲面内外轮廓表面上，无需对其进行预热或后续加热处理; 体积小，便于运输，不需要过多的焊接时间，是理想的小区域磨损修复耐磨材料; 我们能为客户提供个性化定做。

Weldable wear-resistant strip/plate is a kind of ceramic composite wear-resistant material based on alloy steel, that is, cast ceramic particles on the surface of alloy steel material to form ceramic metal composite material layer, the wear resistance of this layer of composite layer can reach 3-4 times that of high Cr material, and the thickness of this composite layer can be made to reach 1/3 of the thickness of the original spare part. And can be made according to the original wear curve, because the selection of alloy steel as the base material, so that the alloy steel base has good welding performance, but also can bear high impact strength. The hardness of the ceramic provides maximum wear resistance. At the same time, the alloy steel base can absorb high impact strength, and the product is easy to use. It is suitable for flame gas cutting, grinding wheel sawing, shear, water cutting, plasma and other cutting methods, and is welded to the internal and external contours of the curved surface without preheating or subsequent heating treatment. Small size, easy to transport, does not require too much welding time, is the ideal small area wear repair wear-resistant materials; We can provide customers with personalized customization.





合金钢陶瓷(nm)复合铸造斗齿/铲齿
Excavator teeth / Shovel teeth of F40/3 Ceramic(nm) composite casting

合金钢基陶瓷复合铸造铲齿，利用增强相（陶瓷）微粒形成纳米晶核、细化晶粒、净化钢液、脱硫脱氧、增强相微粒均匀弥散于本体形成硬质相***大幅提高合金钢的硬度/冲击韧性、耐磨性能、高温强度；冲击值超过50J/CM2，抗冲击，无断裂风险，塑性变形小，可焊接再加工***，使用寿命是传统产品的1倍以上

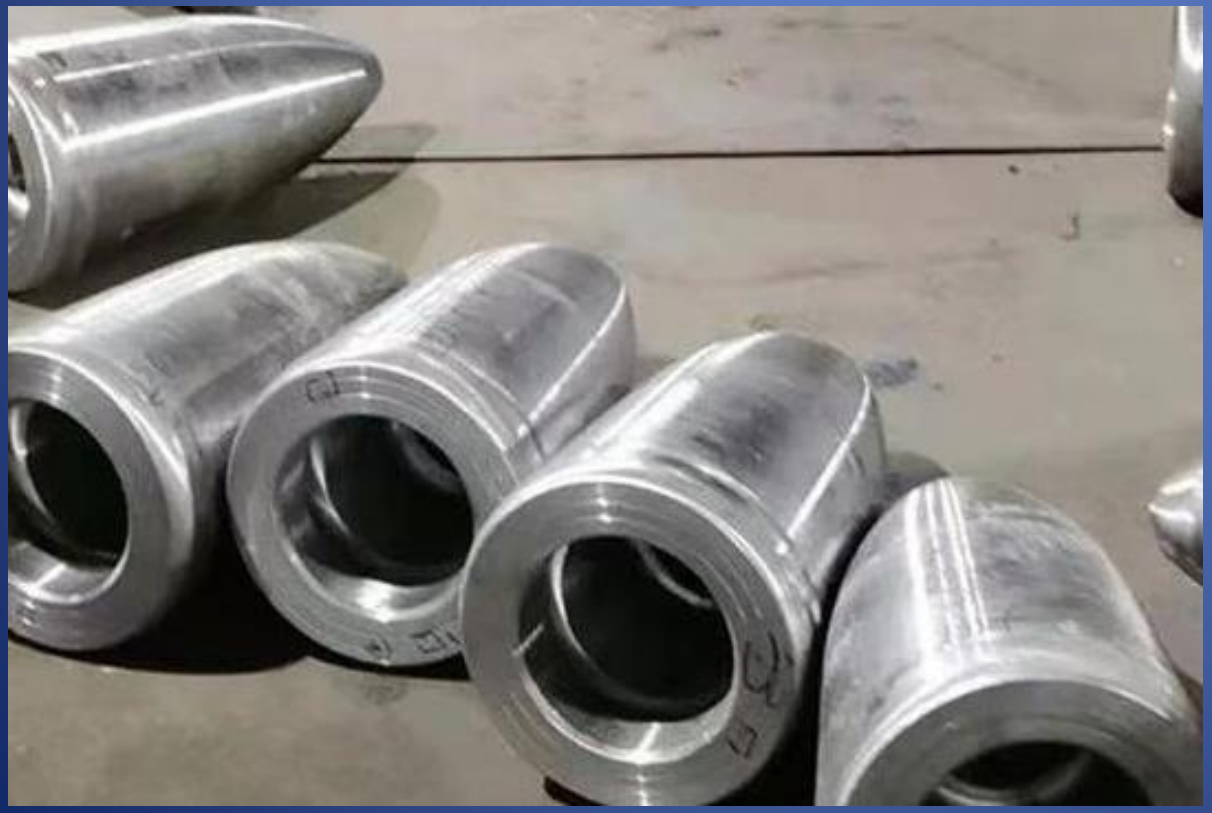
Alloy steel-based ceramic composite casting shovel teeth, by using the micro-particles of the reinforcing phase (ceramic) to form nanocrystalline nuclei, refine the grains, purify the molten steel, desulfurize and deoxidize, and evenly disperse the reinforcing phase micro-particles in the matrix to form a hard phase, ***significantly enhance the hardness/impact toughness, wear resistance, and high-temperature strength of the alloy steel; the impact value exceeds 50J/CM2, it is resistant to impact, has no risk of fracture, has small plastic deformation, is weldable and reprocessable,*** and its service life is more than twice that of traditional products.





陶瓷（nm）复合铸造合金钢穿孔顶头
Seamless pipe perforated head 20CrNi4+ Ceramic（nm）

- 金属基纳米陶瓷（nm）复合铸造技术操作简单、实用性强，无须对现有工艺做过多调整，只需将陶瓷微粒膏体涂敷于铸型表面烘干后即可浇铸成型，不影响后期机加工/热处理。广泛应用于耐热钢、高锰钢、合金钢等耐磨耐热材料；适用于水玻璃砂铸、树脂砂铸造、消失模铸造、离心铸造等工艺，适用产品包括：耐热钢挂片/蓖条/辊套/铸管、合金钢顶头/斗齿/锤头/轧辊/辊套、高锰钢齿板/轧臼壁、高铬渣浆泵叶轮/护板/蜗壳、等
- The metal-based nano-ceramic (nm) composite casting technology is simple to operate and highly practical. It does not require excessive adjustments to the existing process. Just apply the ceramic particle paste to the surface of the mold, dry it, and then it can be cast into shape, without affecting the subsequent machining/heat treatment. It is widely applied to wear-resistant and heat-resistant materials such as heat-resistant steel, high manganese steel and alloy steel. It is applicable to processes such as sodium silicate sand casting, resin sand casting, lost foam casting, and centrifugal casting. The applicable products include: heat-resistant steel hanging plates/grates/roller sleeves/cast pipes, alloy steel top heads/bucket teeth/hammer heads/rolls/roller sleeves, high manganese steel tooth plates/mill walls, high chromium slurry pump impellers/guard plates/volutes, etc





陶瓷复合耐磨产品包装/颜色
Packaging / Color of ceramic insert casting wearparts

铁托包装，每托重量小于2吨，铸造毛坯表面涂防锈漆，加工表面涂防锈清漆

Packing with iron pallet (each weight is less than 2 tons)/ Raw casting surface coating anti-rust paint, processing surface coating anti-rust varnish

高铬陶瓷复合铸造耐磨材料（MMC-Cr）

High chrome cast iron ceramic insert composite wear-resistant castings



合金钢陶瓷复合铸造耐磨耐冲击材料（MMC-M）

Alloy steel ceramic insert composite wear-resistant castings



高锰钢陶瓷复合铸造耐磨材料（MMC-Mn）

High manganese ceramic insert composite wear-resistant castings



耐热钢陶瓷复合耐热抗磨材料（MMC-HT）

Heat resistant steel Ceramic insert Wear/Heat-resistant castings



双金属陶瓷复合（三相复合）铸造耐磨材料（MMC-B）

Bimetallic ceramic insert composite（three-phase composite）wear-resistant castings





谢谢！
Thanks！

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