北京金煤创业科技股份有限公司
BeiJing JinMei Entrepreneur Co., Ltd.

合金钢陶瓷复合铸造立磨辊套/衬板

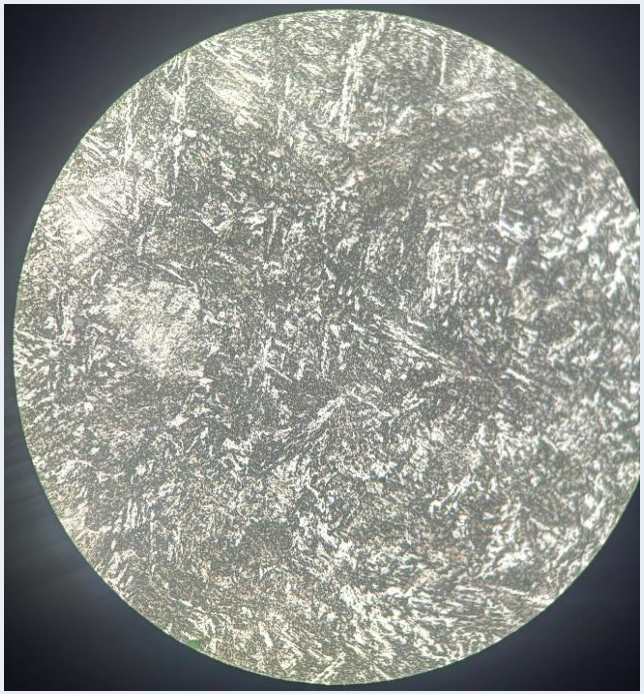
MMC – Alloy Steel Ceramic composite casting Vertical Grinding Mill Roller/Liner

DJM采用金属陶瓷颗粒为增强相、合金钢为基体金属、利用纳米陶瓷提高金属基体的强度，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

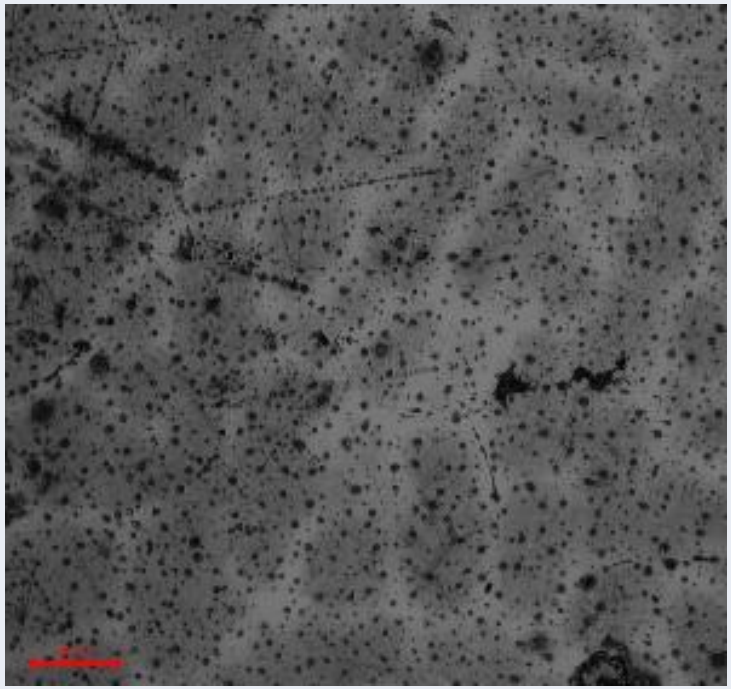
DJM uses Ceramic particles as the reinforcement phase and alloy steel as the matrix metal, and uses Nano Ceramic to improve the strength of the metal matrix of the wear-resistant wearparts. The reinforcement phase - ceramic particle preform is cast in the wear-resistant wearparts. In the process of melting 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

合金钢陶瓷（nm）复合合金钢机械性能对比
Comparison of mechanical properties of ceramic (nm) composite alloy steel

F60/5铸态 / 热处理 As-cast F60/5 / Heat Treated		F60/5纳米陶瓷复合铸态 / 热处理 F60/5 Ceramic Particle Composite as-Cast / Heat-Treated
851Mpa / 1145MPa	Tensile Rm： Mpa	713Mpa / 1080Mpa
273Mpa / MPa	Yield Re： Mpa	246Mpa / Mpa
45J/CM2 / 80J/cm2	Impact： Kw2	36J/CM2 / 68J/cm2
40HRC / 53HRC	Hardness： HRC	50HRC / 55HRC



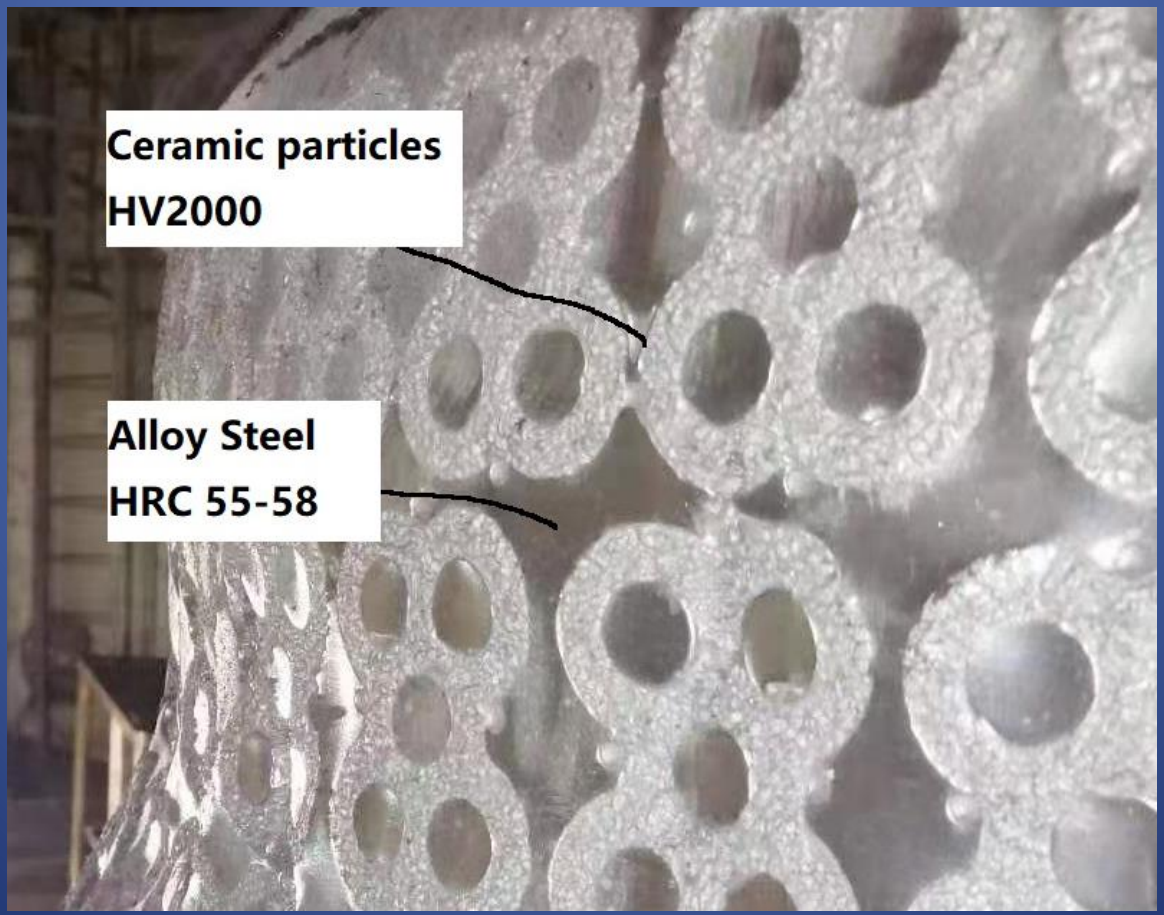
C:0.45-0.55
Al： 0.2
Ce：0.3
Cr:5--6.5
Mo:0.3-0.5
Ni:<0.5%
Mn：<0.8
Si：<0.5
S: < 0.3
P: < 0.35



合金钢陶瓷复合铸造立磨辊套
Roller of Alloy Steel Ceramic composite casting

DJM采用金属陶瓷颗粒为增强相、合金钢为基体金属、利用纳米陶瓷提高金属基体的强度，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 Ceramic 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 wearparts. The reinforcement phase - ceramic particle preform is cast in the wear-resistant wearparts. 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



合金钢陶瓷复合铸造立磨配件

Alloy ceramic composite casting vertical grinding mill spare parts

DJM采用金属陶瓷颗粒为增强相、合金钢为基体金属、利用纳米陶瓷提高金属基体的强度，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

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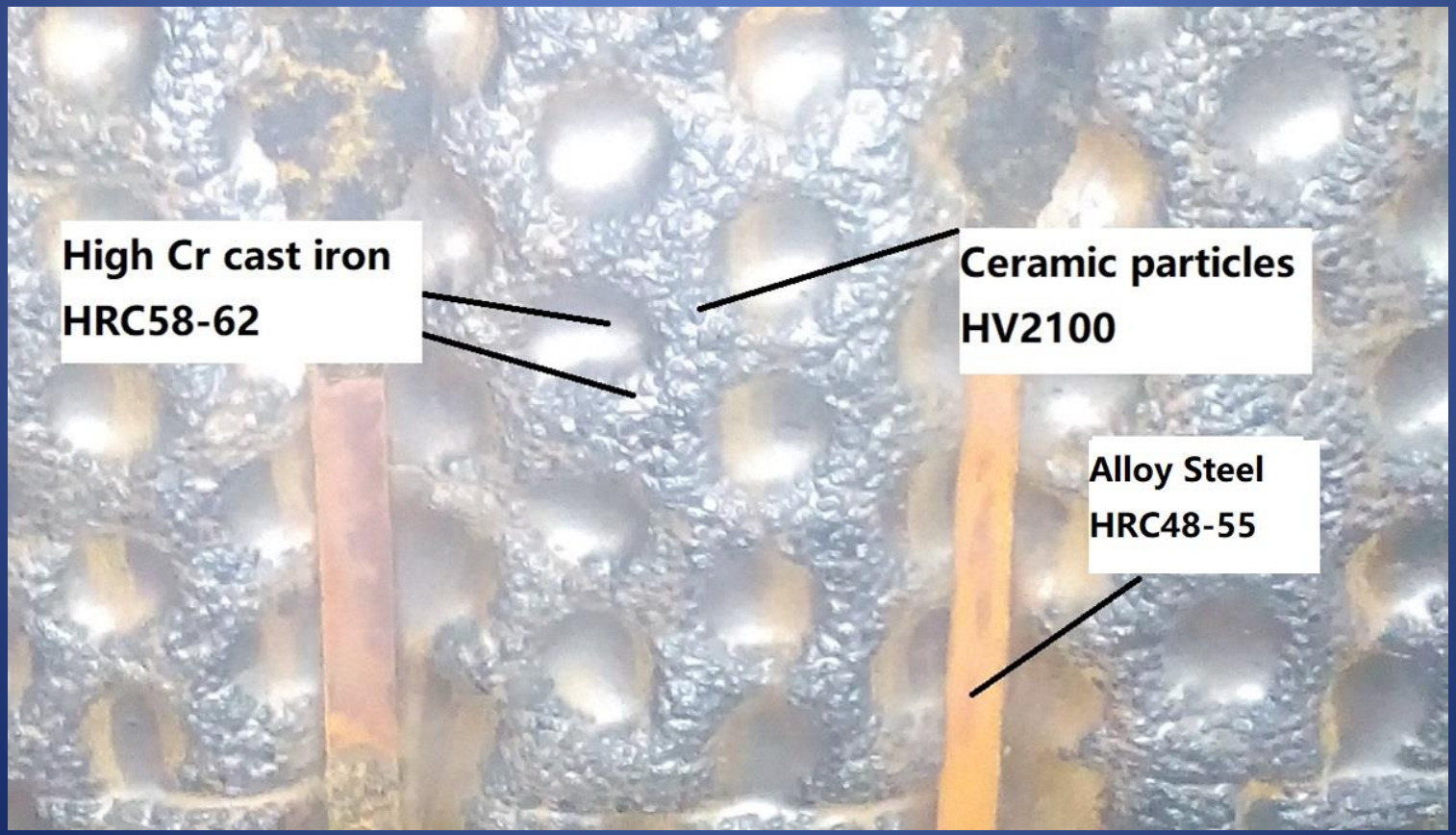




双金属陶瓷复合（三相复合）立磨辊套
Bimetallic ceramic insert composite（three-phase composite）casting Roller
Alloy Steel + High Chrome Iron + Ceramic particles

DJM采用合金钢为基体金属、利用纳米陶瓷提高金属基体的强度，在易磨损部位镶铸增强相-陶瓷颗粒复合高铬预制体，熔铸过程中基体金属与陶瓷高铬预制体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 alloy steel as the base metal and enhances the strength of the metallic matrix with nano-ceramics. Reinforcing phases—ceramic particles—are embedded into a composite high-chromium preform at wear-prone areas. During the melting and casting process, the base metal and the ceramic high-chromium preform achieve metallurgical bonding under high-temperature molten metal conditions, resulting in a metal-ceramic composite layer with a graded hardness distribution. This significantly improves wear resistance, with impact values exceeding 50 J/cm², offering excellent impact resistance without risk of fracture, minimal plastic deformation, weldability for reprocessing, and a service life 1 to 3 times longer than conventional products.



双金属陶瓷复合（三相复合）立磨辊套

Bimetallic ceramic insert composite（three-phase composite）casting Roller

Alloy Steel + High Chrome Iron + Ceramic particles



DJM-Magotteaux-VEGA-金属陶瓷复合技术对比
Technical Comparison of DJM-Magotteaux-VEGA

Manufacturer	Technique	Product	application	technical feature	Process advantages	Process flaws	Thickness of the ceramic layer	Guaranteed lifespan	Per thousand hours of wear and tear
马克托 Magotteaux	XWIN	Vertical grinding roller, liner, Blow Bar, sand making machine blade / anvil	Power plant,cement, building materials,mines	XWIN （Ceramic + High Cr Iron One casting - infiltration composite）	The process is demanding, but the operation is relatively easy and the product has a good appearance.	The process is demanding,The production of large-scale cast-infiltration composite parts is very, the ceramic layer is prone to extensive peeling off.	Roll=45-50 mm Liner=40-45 mm	The service life is jointly borne by the ceramic layer and the high-chromium layer. 80% of the service life is borne by the ceramic layer.	
印度 VEGA	duo-xwin	Standby grinding roller, liner plate	Power plant, cement, building materials, mines	duo-xwin （Ceramic + high-Cr iron + GGG insert casting, two casting - Sintering）	It is made of multiple composite plug-in ductile iron, ensuring toughness while maintaining a low overall fracture probability.	The process is complicated and the appearance has some flaws, hardness of the GGG is slightly lower.	Roll=45-50 mm Liner=40-45 mm	The lifespan commitment is fully borne by the ceramic layer.	
金煤科技 DJM	DJM-CZ	Vertical grinding roller,liner, guide plate,Blow Bar,Hammer,concrete equipment blade/blade/liner	Power plant, steel plant, cement factory,mining, construction waste recycling and treatment	DJM-CZ （Ceramic + High Cr Iron One casting , - Sintering-melting composite）	The process is demanding, The ceramic is metallurgically bonded to the base material. There are no gaps between each phase and no defects such as shrinkage porosity	The process is complex	Roll=45-50 mm Liner=40-45 mm	The service life is jointly borne by the ceramic layer and the high-chromium layer. 80% of the service life is borne by the ceramic layer.	
金煤科技 DJM	DJM-MZ	Vertical grinding roller, liner, Blow Bar, Hammer, BallMill liner, Teeth…	Power plant, steel plant, cement factory,mining, construction waste recycling and treatment	DJM-MZ （Ceramic + Alloy steel One casting , - Sintering-melting composite）	The process has high requirements. The ceramic is metallurgically bonded to the base material. There are no gaps between each phase and no defects such as shrinkage porosity. The product is wear-resistant and impact-resistant.	The process is complex, and the surface hardness of the product is slightly lower.	Roll=45-50 mm Liner=40-45 mm	The service life is jointly borne by the ceramic layer and the Alloy layer. 80% of the service life is borne by the ceramic layer.	

DJM-Magotteaux-VEGA-金属陶瓷复合技术对比
Technical Comparison of DJM-Magotteaux-VEGA





谢谢！
Thanks！

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