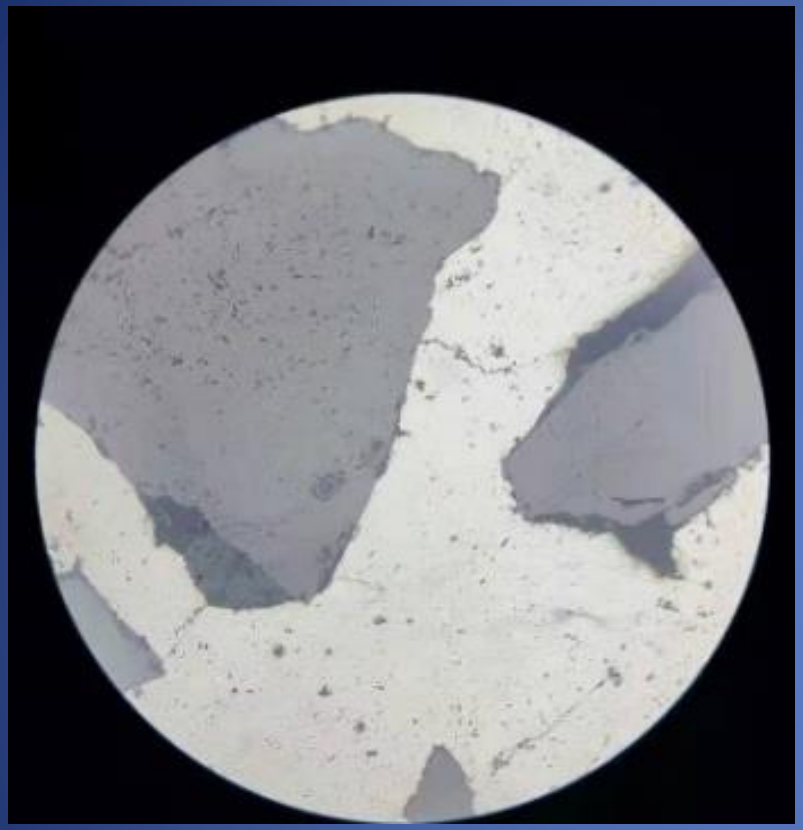
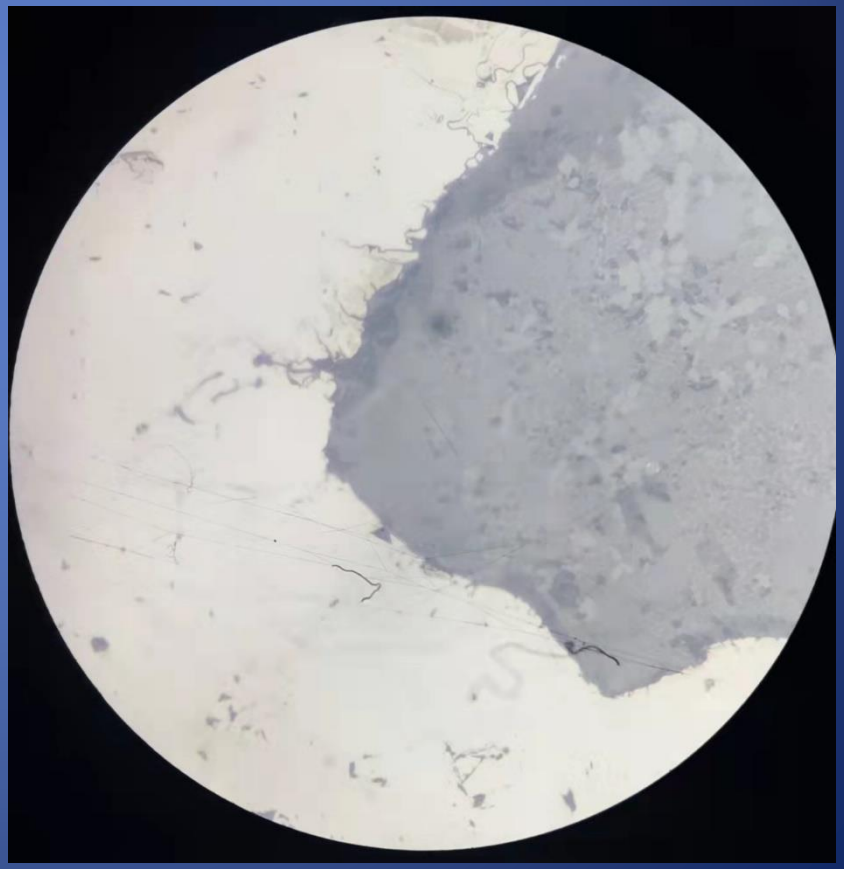
MMC
金属基陶瓷复合铸造产品使用效果
The application effect of metal matrix ceramic insert composite cast products

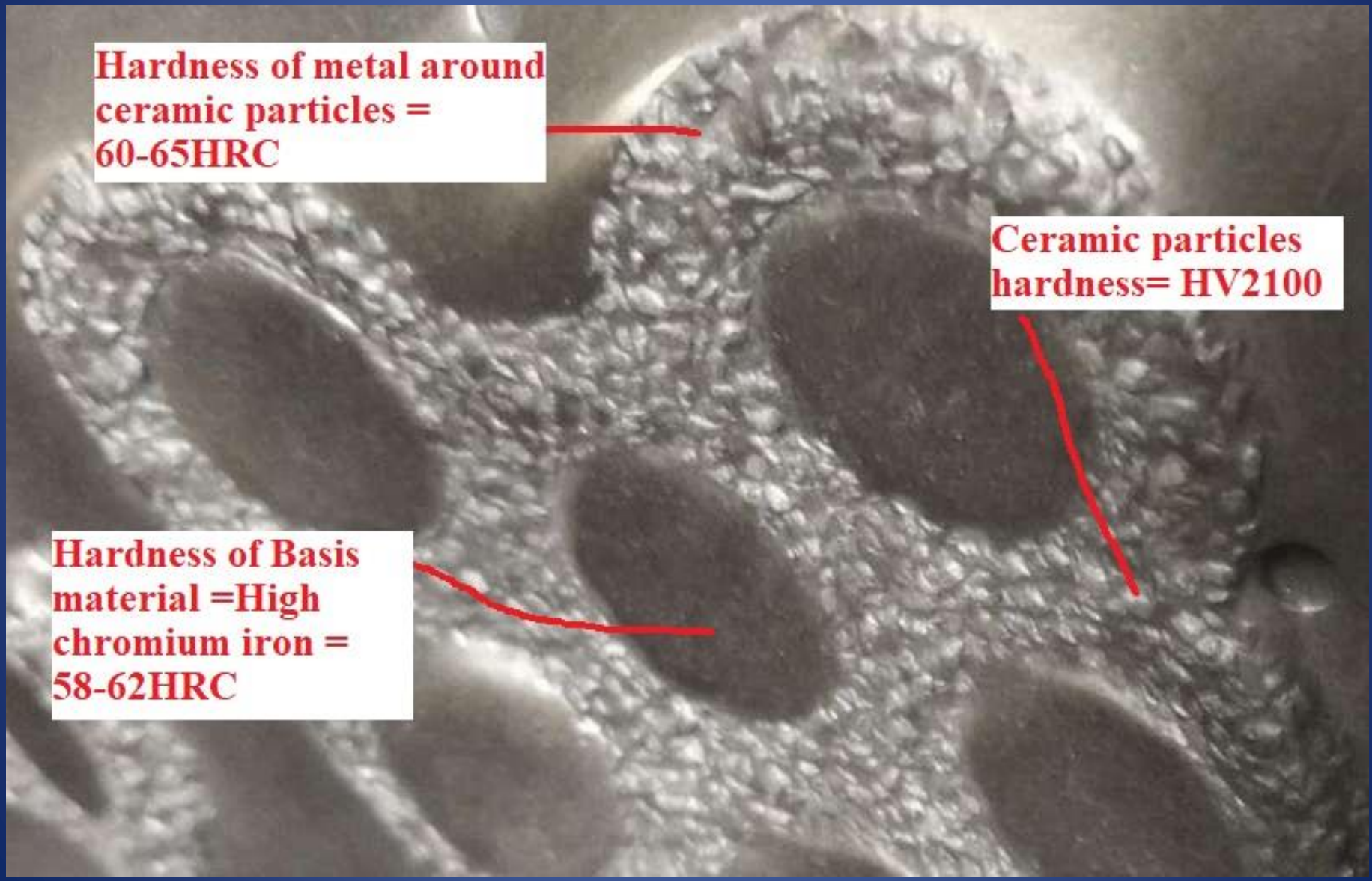


陶瓷与金属界面金相
Ceramics and metal interface metallography





MMC-Cr 高铬铸铁陶瓷复合铸造耐磨材料
High Chromium cast iron matrix ceramic insert casting wear-resistant material



金属陶瓷复合铸造立磨辊套使用效果
Use effect of Metal matrix ceramic insert casting Roller of Vertical Grinding Mill

under normal conditions，The average wear depth of the high-chromium ceramic insert casting Roller and Bimetallic ceramic insert composite（three-phase composite）casting Roller of coal mill is 2-3mm per 1000 hours;

The average wear depth of the high-chromium ceramic insert casting Roller and Bimetallic ceramic insert composite（three-phase composite）casting Roller of Raw mill is 4-6mm per 1000 hours;

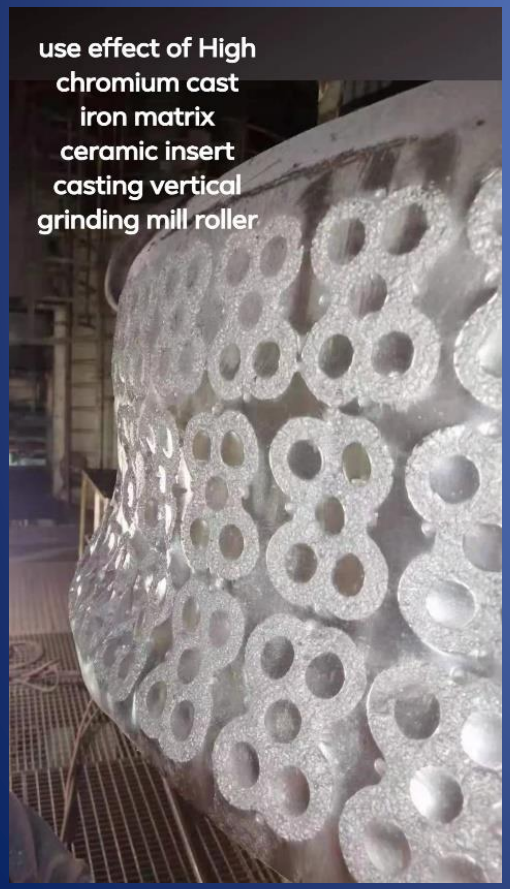
The average wear depth of the high-chromium ceramic insert casting Liner of coal mill is 1-2mm per 1000 hours;

Bimetallic ceramic insert composite（three-phase composite）casting Roller is recommended when the weight of a single piece exceeds 3000kg

在正常情况下，磨煤机高铬陶瓷复合铸造辊套和双金属陶瓷复合(三相复合)铸造辊套的平均磨损深度为2 ~ 3mm / 1000小时;原料磨高铬陶瓷复合铸造辊和双金属陶瓷复合(三相复合)铸造辊套每1000小时的平均磨损深度为4 ~ 6mm;

磨煤机高铬陶瓷复合衬套每1000小时平均磨损深度为1 ~ 2mm;

单件重量超过3000kg时，推荐使用双金属陶瓷复合(三相复合)铸造辊套





立磨衬板使用实例
the use of examples-Mill Liner

- 物料=4500大卡煤（HGI=60）
- 进料粒度= 30-50mm
- 磨损形式=高应力碾碎式磨粒磨损（grinding abrasion）
- 使用者及设备=燃煤热电厂ZGM95G立磨碾底衬板
- 高铬陶瓷复合衬板使用寿命=12000-20000小时 每千小时磨耗=1-2mm
- 水泥生料使用寿命= 每千小时磨耗=2-3mm







金属基陶瓷复合立磨辊套
Roller of High Cr Cast Iron+ZTA Ceramic particles

Material	Cr26 辊套 / Cr26 Roller			Roller of Cr26 + Ceramic	
	使用寿命/service life	产量/output		使用寿命/service life	产量/output
石英砂 silica sand	2000小时（个3月）	3000-4000吨/每套辊套		10个月以上 8000小时	12000吨/每套辊套
锂矿	2000-3000小时	3000-4000吨/每套辊套		8000小时以上	
煤/coal	6000-8000小时			18000小时以上	
水泥生料 cement raw material	4000-6000小时			12000小时以上	



陶瓷复合雷蒙磨-磨辊-磨环使用寿命
The service life of Ceramic insert Raymond mill-Ring-roller

Material： Clay + ceramic brick
the service life of conventional Ring-roller（Mn13）is 600hour
the service life of high manganese steel ceramic inset Raymond mill-Ring-roller is 1150hour
the service life of high chromium ceramic inset Raymond mill-Ring-roller is 1900hour.

物料: 粘土+陶瓷砖
传统环辊(Mn13)的使用寿命为600小时
高锰钢陶瓷复合雷蒙磨环辊使用寿命为1150小时
高铬陶瓷复合雷蒙磨环辊使用寿命为1900小时







陶瓷复合雷蒙磨-磨辊-磨环使用寿命
The service life of Ceramic insert Raymond mill-Ring-roller



MMC-M 马氏体钢陶瓷复合耐磨材料

MMC-M (Martensite steel matrix ceramic Insert casting Wearparts）



陶瓷金属复合铸造球磨机衬板使用效果

using effect of Metal ceramic insert composite casting Ball mill liner



陶瓷金属复合球磨机衬板使用效果
using effect of Metal ceramic insert composite Ball mill liner

Cermet composite ball mill liner life comparison table					
material	use conditions	High manganese steel liner life		Ceramic composite liner life	note
coal	Coal-fired thermal	24 months		96 months	
Raw material (limest	cement plant	7-8 months		24 months	
iron ore	concentrating mill	4-6 months		18 months	
aluminium ore	sintering	7-8 months		24 months	
copper ore	concentrating mill	4-6 months		18 months	
gold ore	concentrating mill	4-6 months		18 months	









金属陶瓷复合铸造自(半)磨机衬板
Metal ceramic insert composite shell liner of SAG mill

Cermet composite SAG mill liner life comparison table

material	use condition	Alloy steel liner life		Ceramic composite liner life	note
iron ore	concentrating mill	4-6 months		12 months	
copper ore	concentrating mill	4-6 months		12 months	
gold ore	concentrating mill	4-6 months		12 months	



陶瓷金属复合铸造磨机衬板使用效果

using effect of Metal ceramic insert composite casting mill liner



陶瓷金属复合铸造磨机衬板使用效果

using effect of Metal ceramic insert composite casting mill liner



MMC-金属陶瓷复合铸造半自磨机溜槽衬板使用效果
Use effect Of Metal ceramic insert composite Chute Liner of SAG Mill

材质/Material	Cr27溜槽衬板 The service life of Cr27 Chute Liner	Cr27陶瓷复合溜槽衬板 The service life of Cr27+Ceramic Chute Liner	备注/Note
铜矿 Copper ore	4-6个月/ 4-6 months	12个月以上 / over 12 months	
金矿 Gold ore	4-6个月/ 4-6 months	12个月以上 / over 12 months	







MMC-金属陶瓷复合铸造半自磨机溜槽衬板使用效果
Use effect Of Metal ceramic insert composite Chute Liner of SAG Mill



MMC-金属陶瓷复合铸造塔磨机螺旋衬板使用效果
Use effect Of Metal ceramic insert composite Spiral Liner of Tower Mill

材质/Material	Cr27螺旋衬板 The service life of Cr27 Spiral Liner	Cr27陶瓷复合螺旋衬板 The service life of Cr27+Ceramic Spiral Liner	备注/Note
铜矿 Copper ore	4-6个月/ 4-6 months	12个月以上 / over 12 months	
金矿 Gold ore	4-6个月/ 4-6 months	12个月以上 / over 12 months	







MMC-金属陶瓷复合铸造塔磨机螺旋衬板使用效果

Use effect Of Metal ceramic insert composite Spiral Liner of Tower Mill



金属陶瓷复合铸造板锤使用效果
Use effect of Metal matrix ceramic insert casting composite Blow bar

under normal conditions，
the service life of the F60/5 + ceramic is more than 1 times of that of the common marteniste steel （F60/5）

the service life of the Cr27Mo + ceramic is more than 1 times of that of the common high-chromium
the service life of the Cr27Mo + ceramic is more than 1-2 times of that of the common marteniste steel
the service life of the Cr27Mo + ceramic is more than 2-3 times of that of the common high manganese steel

under normal conditions
Unit Feed size; over 500mm. selected high manganese steel + ceramic
Unit Feed size; max 550mm selected marteniste steel + ceramic
Unit Feed size; Max 350mm selected High Cr + ceramic
The type of material is uncertain, Materials contain metals, such as construction waste： selected marteniste steel + ceramic





金属陶瓷复合铸造板锤使用效果
Use effect of Metal matrix ceramic insert casting composite Blow bar



金属陶瓷复合铸造锤头使用效果
Use effect of Metal matrix ceramic insert casting composite Hammer

under normal conditions，the service life of high manganese steel ceramic insert casting hammer is more than 1 times of that of conventional Mn13 hammer

the marteniste steel ceramic insert casting hammer is more than 1-2 times of that of conventional Mn13 hammer

Bimetallic ceramic insert hammer is more than 2 -3 times of that of conventional Mn13 hammer

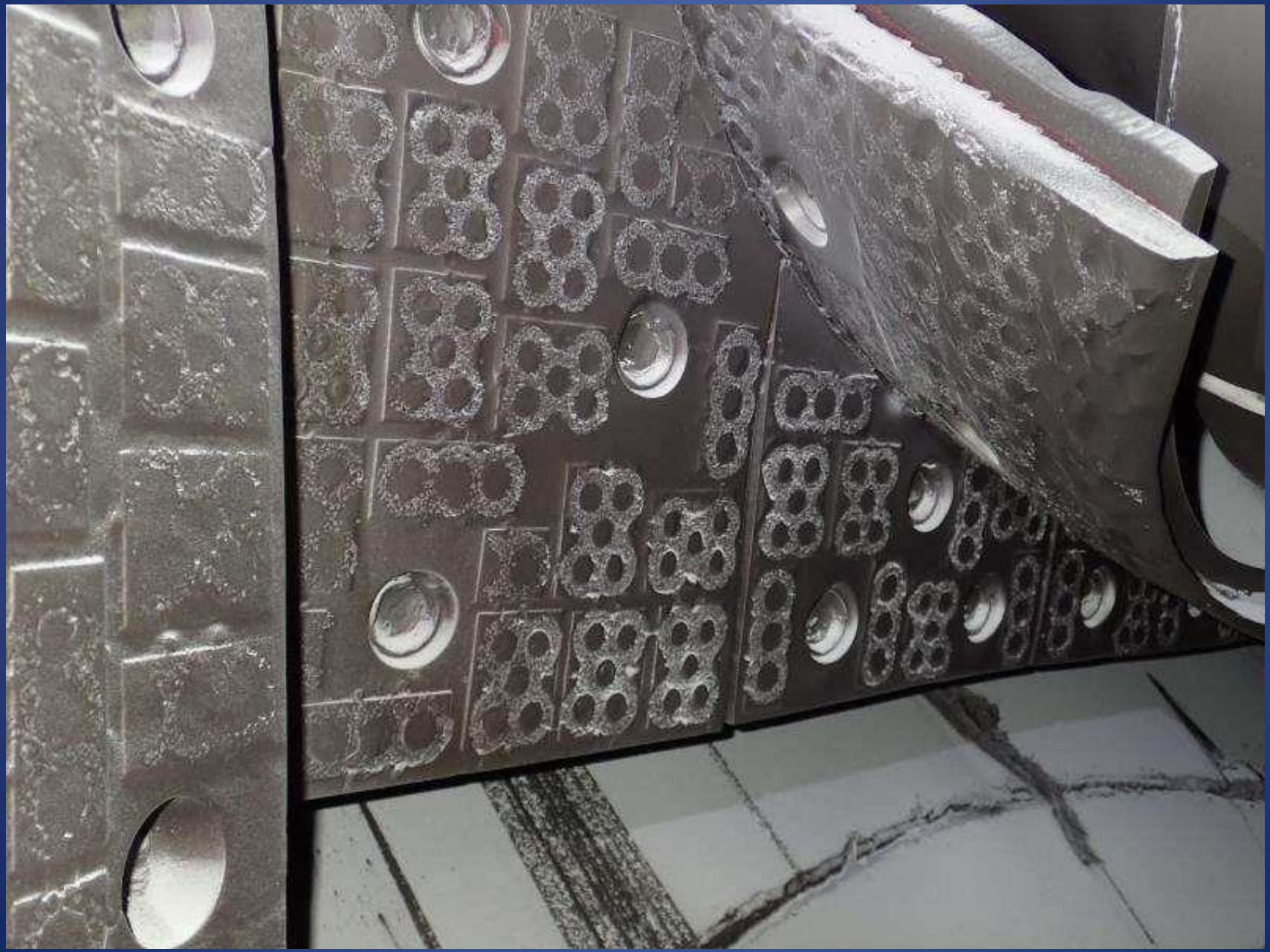
正常情况下，高锰钢陶瓷嵌套铸造锤的使用寿命是常规Mn13锤的1倍以上

马氏体钢陶瓷复合铸造锤是常规Mn13锤的1-2倍以上

双金属陶瓷复合锤是传统Mn13锤的2 -3倍以上



陶瓷复合铸造衬板
Ceramic insert casting Liner



高锰钢陶瓷复合轧臼壁使用效果
Use effect Of High Manganese Steel Ceramic Insert Mantle / Bowl Liner

Material		Mn18Cr2 service life		Mn18Cr2 + Ceramic service life	note
Iron ore	HP500	25days		Over 55days	
Granite	CH660	350-400hour		Over 800hour	
Copper ore	HP4	500-600hour		Over1000hour	
Gold ore	HP300	16days		Over35days	





高锰钢陶瓷复合齿板使用效果
Use effect Of High Manganese Steel Ceramic Insert Jaw Plate

材质/Material	Mn18Cr2齿板 The service life of Mn18Cr2 Jaw Plate	Mn18Cr2+陶瓷复合齿板 The service life of Mn18Cr2+Ceramic Jaw Plate	备注/Note
铁矿石-莫氏硬度6.5 Iron Ore, Mohs hardness 6.5	7-9days	Over 17days	
铜矿渣 Copper slag	22-25days	Over 50days	
金矿 Gold ore	90-100days	Over 180days	







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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