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产品手册

SHANDONG JINCHI

研磨钢球 研磨棒 钢锻 专业制造商



山东金池重工股份有限公司

SHANDONG JINCHI HEAVY INDUSTRY JOINT-STOCK CO.,LTD



COMPANY INTRODUCTION

山东金池重工股份有限公司

公司

简

介

山东金池重工股份有限公司（原：济南金池钢球有限公司），是一家研磨产品制造商。我们的主要产品有耐磨钢球，耐磨钢棒，耐磨钢锻，磨机衬板与法兰。产品生产技术及规格完全符合国际标准，年生产能力 10 万吨以上。

优质的原材料、全自动生产设备、独特的热处理技术以及严格的质量控制体系，这四大优势让我们生产出来的产品冲击性能稳定、耐研磨、磨机综合效率高。

公司有独立的实验室，先进的和精确的实验室设备，以确保每一个生产步骤都按照质量标准进行生产。此外，我们公司已经通过 ISO 9001 质量认证 .OHSAS18001:2007 职业健康安全认证 ,ISO14001: 2004 环境管理体系认证。我们的客户来自世界各地，如：澳大利亚，南非，加纳，韩国，加拿大，美国，芬兰等。并且公司在澳大利亚和秘鲁设有办事处。公司拥有独立的进出口权，一直致力于为客户提供优质的产品。此外，公司拥有完善的售前售后服务体系，致力于为客户提供有竞争力的产品价格，所有这些都为公司赢得了持久的信誉。

山东金池重工股份有限公司期待着与您合作一起开创美好的未来。

Shandong Jinchi Heavy Industry Joint-stock Co.,LTD (original: Jinan Jinchi Steel Ball Co.,Ltd) , Is a professional manufacturer of forging products. The main products of our company are GRINDING MEDIA BALLS, GRINDING RODS, CYLPEBS, MILL LINERS AND STEEL FLANGES, with specifications all reaching international standards and annual production capacity is over 100,000 tons.

High-quality raw materials, advanced full-automatic production line, unique heat treatment technology and strict quality control system, these four major advantages make sure our products have stable impact performance, high wear resistance and high combined efficiency of grinding mill.

The company has an independent laboratory, the advanced and accurate lab equipment, to ensure that each step of the production process is performed in accordance with the quality standards. Moreover, our company has been accredited with ISO9001 Quality Certification, OHSAS18001 Occupational health and safety certification and ISO14001 environmental management system certification. Our clients are from all over the world, such as Australia, South Africa, Ghana, Korea, Canada, USA etc. with two branch offices in Peru and Australia. The company has sole right to handle import and export business, has been striving to provide quality products for clients. In addition, the company also provides reliable service system with favorable product prices. All these gains long term reputation for the company.

Shandong Jinchi Heavy Industry Joint-stock Co.,LTD is looking forward to cooperating with you to create a better future!





Four Major Advantages Stronger and More Wearable

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产品介绍 Product introduction

锻造（热轧）钢球 FORGING(ROLLING) STEEL BALLS



产品执行标准 YB/T091-2005 锻（轧）钢球

Executive standard for the product is YB/T091-2005 forging(rolling)steel balls

锻造钢球化学成分

(Chemical composition of forging steel balls)

金池牌号 Brand	材质 Materials	C%	Si%	Mn%	P%	S%	Cr%	Ni%	Cu%	Mo%	A1%
JC-1	B2	0.70-0.85	0.17-0.37	0.70-1.00	≤ 0.035	≤ 0.035	0.50-0.60	≤ 0.20	≤ 0.20	/	0.015-0.050
JC-2	B2-1	0.55-0.70	0.15-0.30	0.65-0.85	≤ 0.020	≤ 0.020	0.70-1.10	≤ 0.20	≤ 0.20	/	0.015-0.050
JC-3	B3	0.58-0.66	1.70-1.90	0.68-0.80	≤ 0.030	≤ 0.030	0.78-0.90	≤ 0.20	≤ 0.20	/	0.015-0.050
JC-4	B4	0.65-0.75	1.20-1.40	0.50-0.70	≤ 0.025	≤ 0.025	0.85-1.00	/	≤ 0.25	/	/
JC-5	B6	0.75-0.90	0.17-0.37	0.8-1.02	≤ 0.035	≤ 0.035	0.88-0.98	≤ 0.25	≤ 0.25	0.06-0.13	0.020-0.047
JC-6	B6-1	0.82-0.90	0.15-0.35	0.90-1.05	≤ 0.020	≤ 0.020	0.88-0.98	≤ 0.25	≤ 0.25	0.06-0.13	0.020-0.047
LC-7	BU	0.95-1.05	0.15-0.35	0.95-1.05	≤ 0.025	≤ 0.025	0.45-0.55	≤ 0.06	≤ 0.15	≤ 0.05	0.020-0.040
JC-8	1090	0.90-1.10	0.17-0.37	0.60-0.90	≤ 0.025	≤ 0.025	≤ 0.025	≤ 0.02	≤ 0.02	/	/
JC-9	42CrMo	0.38-0.45	0.20-0.40	0.50-0.80	≤ 0.035	≤ 0.035	0.90-1.20	/	/	0.15-0.25	/
JC-10	40Cr	0.37-0.45	0.20-0.40	0.50-0.80	≤ 0.035	≤ 0.035	0.80-1.10	/	/	/	/
JC-11	65MN	0.62-0.70	0.17-0.37	0.90-1.20	≤ 0.035	≤ 0.035	≤ 0.25	/	/	/	/
JC-12	60MN	0.57-0.65	0.17-0.37	0.70-1.00	≤ 0.035	≤ 0.035	≤ 0.25	≤ 0.25	/	/	/
JC-13	50MN	0.48-0.56	0.17-0.37	0.70-1.00	≤ 0.035	≤ 0.035	≤ 0.25	≤ 0.25	/	/	/

锻造球技术参数

Specification of forged steel Grinding balls

Nominal diameter 直径	Diameteical Tolerance 直径公差	Weight of single ball in average 单个球重量	Surface hardness 表面硬度	Impact toughness 冲击韧性
(mm)	(mm)	(g)	(HRC)	(j/cm ²)
Φ 20	+2 -1	32	> 60	≥ 12
Φ 25		64		
Φ 30		110		
Φ 40		263		
Φ 50		513		
Φ 60	+3 -2	888		
Φ 70		1410		
Φ 80		2104		
Φ 90		2996		
Φ 100		4110		
Φ 110	+4 -2	5457	> 58	
Φ 120		7102		
Φ 130		9030		
Φ 140		11278		
Φ 150	13871			

生产流程

Production Process

热轧钢球生产流程

PRODUCTION PROCESS OF STEEL BALL

- 1、轧制球磨钢球的原料采用的是各种化学成分的轧制圆钢棒。

2、圆钢棒在轧制前在连续式加热炉中被加热到合适温度。

3、红热状态中的钢胚被送入钢球轧制机后，在 2 个带有特殊螺旋 7L 型的轧辊之间螺旋前进，并被轧制成钢球，每个钢球轧制机每分钟可轧制钢球 60-200 个。

4、轧制成红热状态的钢球立刻进入本厂特别设计的在线热处理设备中进行淬火一回火处理，使钢球获得高而且均匀的硬度。

5、成品钢球具有精确的尺寸及硬度及良好的耐磨性和机械性能。

6、经检验合格后，成品钢球被送往包装车间，包装后发给客户。

1. The materials of the grinding steel balls is different grade round steel bars with various chemical composition.

2. The round bars are heated to a proper temperature in a continuous furnace before rolling.

3. Red hot bar is conveyed into the skew rolling mill, then it rotates forward between two rolls with special spiral 7L. As this process continues, it is gradually rolled into steel balls. A single skew rolling mill can produce 60-200 steel balls per minute.

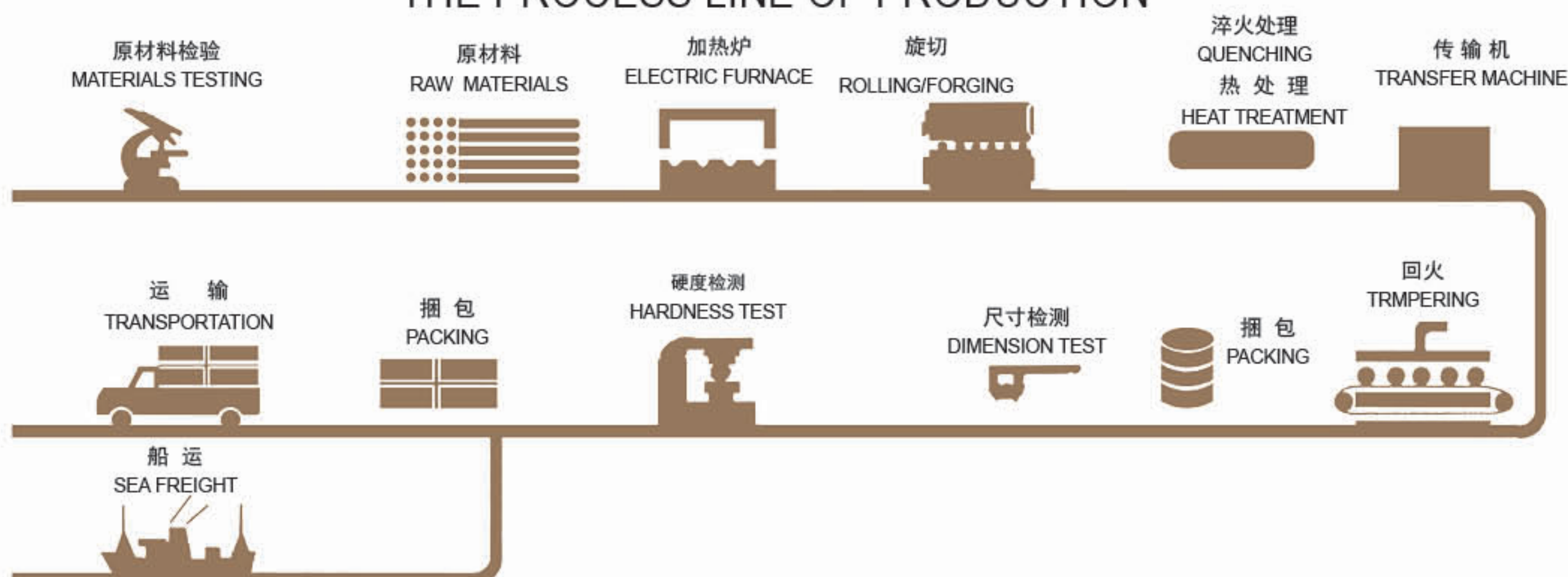
4.The red hot steel balls are transported directly to the online heat treatment equipment, which is specially designed for quenching and tempering. This makes sure steel balls can obtain high and uniform hardness.

5.Finished steel balls are characterized with precise size,uniform hardness, good wear resistance and mechanical properties.

6.The products passed inspection are transported to the packaging workshop and then delivered to customers after packed.

制造工艺流程图

THE PROCESS LINE OF PRODUCTION



产品性能 Product performance	锻造钢球 Forged/rolling grinding balls	硬度均匀	Uniform hardness
		不破碎	Unbreakable
		耐研磨	High wear resistance
		冲击值高	High impact value
		磨机综合效率高 High combined efficiency of grinding mill	

产品介绍 Product introduction

铸造磨球 CASTING BALLS



高铬铸铁球、低铬铸铁球 High chrome casting iron balls, Low chrome casting iron balls
 产品执行标准：GB/T17445-2009 铸造磨球 Executive standard of product GB/T17445-2009 Casting balls

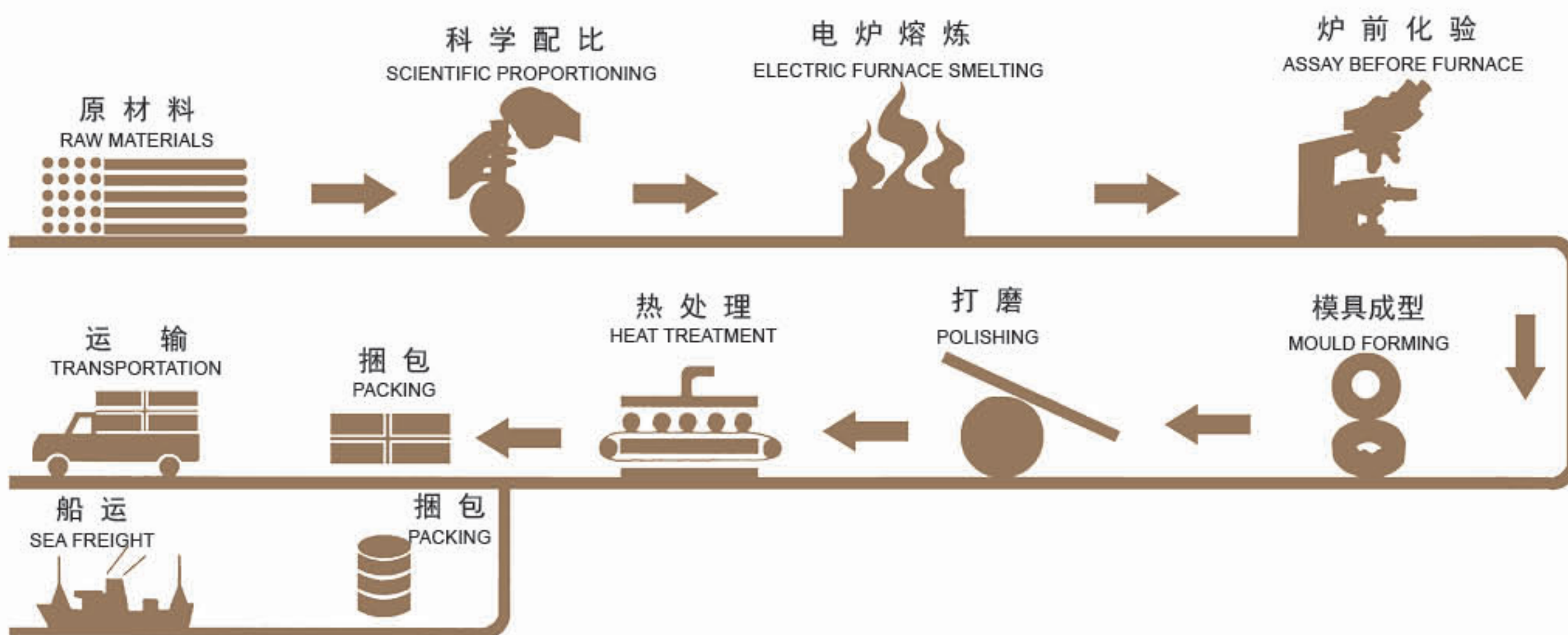
Item		Chemical Composition(%)								
		C	Si	Mn	Cr	P	S	Mo	Cu	Ni
High chrome cast grinding balls 高铬合金铸球	ZQCr12	2.0-3.0	0.3-1.2	0.2-1.0	11-13	≤ 0.10	≤ 0.10	0-1.0	0-1.0	0-1.5
	ZQCr15	2.0-3.0	0.3-1.2	0.2-1.0	14-17	≤ 0.10	≤ 0.10	0-1.0	0-1.0	0-1.5
	ZQCr20	2.0-2.8	0.3-1.0	0.2-1.0	18-22	≤ 0.10	≤ 0.08	0-2.0	0-1.0	0-1.5
	ZQCr26	2.0-2.8	0.3-1.0	0.2-1.0	22-28	≤ 0.10	≤ 0.08	0-2.5	0-2.0	0-1.5
Middle chrome cast grinding balls 中铬合金铸球	ZQCr7	2.0-3.2	0.3-1.5	0.2-1.0	6.0-10	≤ 0.10	≤ 0.08	0-1.0	0-0.8	0-1.5
Low chrome cast grinding balls 低铬合金铸球	ZQCr2	2.0-3.6	0.3-1.5	0.2-1.0	1.0-3.0	≤ 0.10	≤ 0.08	0-1.0	0-0.8	--
Bainite ductile cast grinding balls 贝氏体合金铸球	ZQsi3	3.2-3.8	2.0-3.5	2.0-3.0	--	≤ 0.10	≤ 0.08	--	--	--

高铬铸球参数 (High Chrome Ball Parameter)

Nominal diameter 直径 (mm)	Weight of single ball in average(g) 单个球重量	Quantity/ MT 个数 / 吨	Surface hardness 表面硬度 (HRC)	Endurance impact test(Times) 落球冲击疲劳寿命 (次数)
Φ 15	13.8	72549	>60	>10000
Φ 17	20.1	49838		>10000
Φ 20	32.7	30607		>10000
Φ 25	64	15671		>10000
Φ 30	110	9069		>10000
Φ 40	261	3826		>10000
Φ 50	510	1959		>10000
Φ 60	882	1134		>10000
Φ 70	1401	714		>10000
Φ 80	2091	478		>10000
Φ 90	2977	336	>58	>10000
Φ 100	4084	245		>8000
Φ 120	7057	142		>8000
Φ 130	8740	115		>8000

生产流程

制造工艺流程图



Product performance

Casting balls

球表面与球心硬度均匀
Uniformity of hardness from
surface to core

高铬铸锻参数 (High Chrome Cylpebs Parameter)

Nominal diameter 直径 (mm)	Weight of single cylpebs in average 单个锻的重量 (g)	Quantity /MT 个数 / 吨	Surface hardness 表面硬度 (HRC)	Endurance impact test(Times) 落球冲击疲劳寿命 (次数)
Φ 35*40	300.2	3331	>60	>8000
Φ 30*45	193	5182		>8000
Φ 25*30	114.9	8706		>10000
Φ 20*25	61.3	16324		>10000
Φ 18*20	39.7	25191		>10000
Φ 16*18	28.2	35424		>10000
Φ 14*16	19.2	52052		>10000
Φ 12*14	12.4	80970		>10000
Φ 10*12	7.4	136030		>10000
Φ 8*10	2	510112		>10000

产品介绍 Product introduction

研磨棒（钢锻） Grinding Rods(Grinding Cylpebs)



钢锻技术参数 (Specification of Grinding Cylpebs)

公称直径 mmX 长度 mm Size	直径允许偏差, mm Dia Tolerance	圆度, % Out Of Round	长度允许偏差, mm Length Tolerance
Φ20 × 25	+1.2/-1.0	≤ 5	+1.5/-1.5
Φ25 × 30	+1.5/-1.5	≤ 5	+2.0/-2.0
Φ30 × 35	+1.5/-1.5	≤ 5	+2.0/-2.0
Φ30 × 40	+1.5/-1.5	≤ 5	+2.0/-2.0
Φ35 × 40	+2.0/-2.0	≤ 5	+2.5/-2.5
Φ35 × 45	+2.0/-2.0	≤ 5	+2.5/-2.5
Φ40 × 50	+2.0/-2.0	≤ 5	+2.5/-2.5
Φ45 × 55	+2.0/-2.0	≤ 5	+2.5/-2.5

研磨棒技术参数 (Specification of Grinding Rods)

公称直径 Diameter mm	长度 Length (mm)	直径公差 Dia Tolerance mm	长度公差 Length Tolerance mm	表面硬度 Surface Hardness HRC
Φ30-Φ120	3000-6000	+1.5	+25	45-55

检测仪器和设备

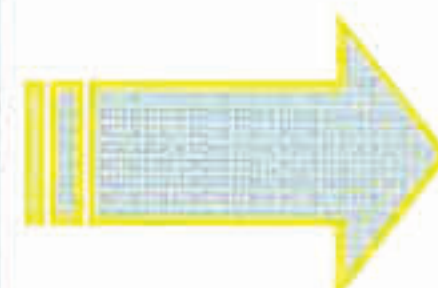
DETECTION INSTRUMENTS AND EQUIPMENT



8 米高度落球试验机
Dropping Test Machine(8m)



线切割机
Wire Cutting Machine



切片检测内部质量
Internal Quality Examination



冲击试验机
Impact tester



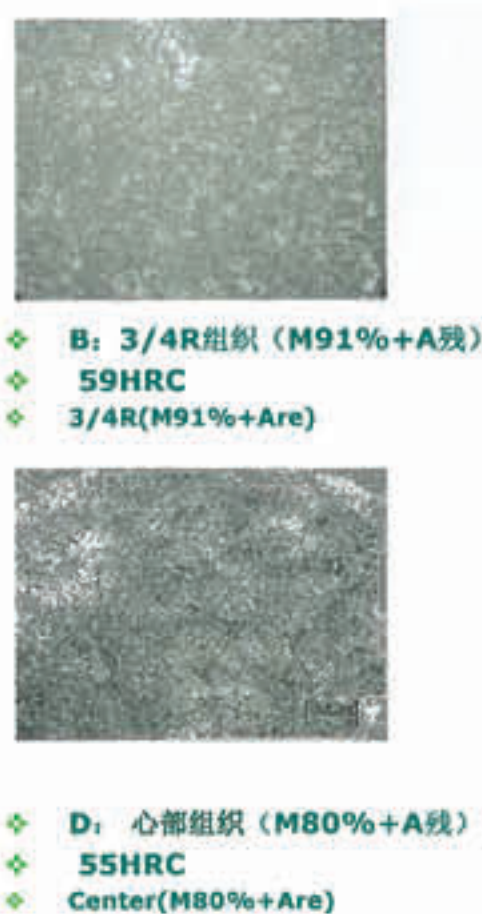
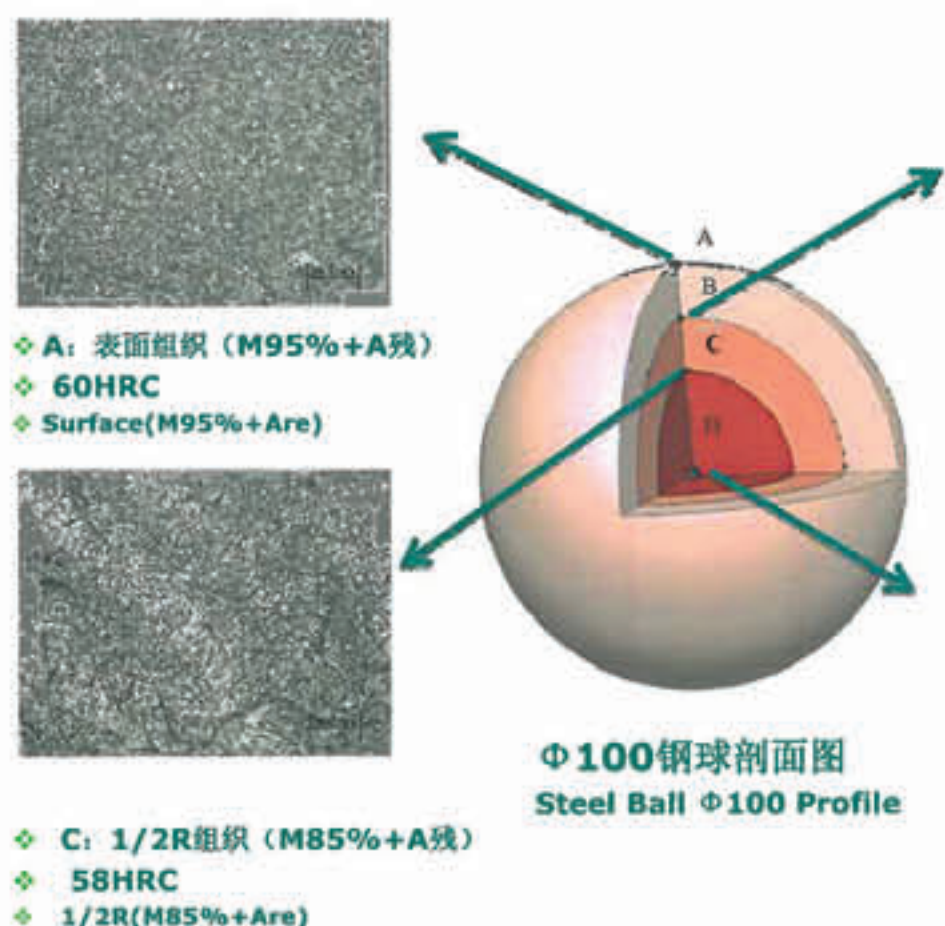
金相检测分析
Metallographic
examination analysis



洛氏硬度计
Test Instrument For Hardness



光谱仪用于检测化学成份
Spectrometer Is Used To Detect
Chemical Composition

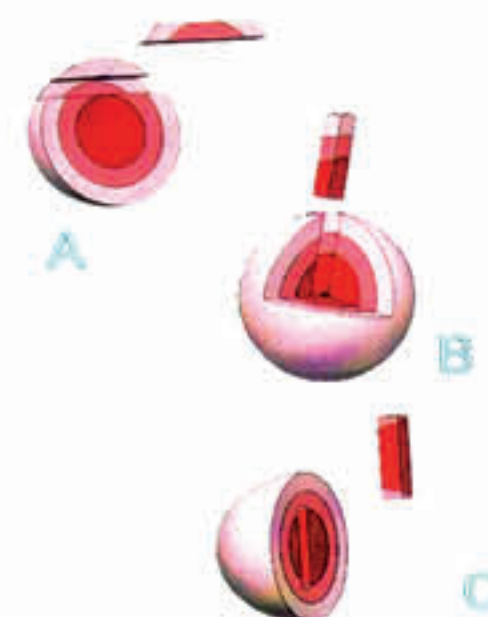


钢球冲击功的技术指标和取样方法，以 Φ125mm 为例，见下图：
The technology of steel ball impact energy index and sampling methods,for example, Φ125mm,see below:

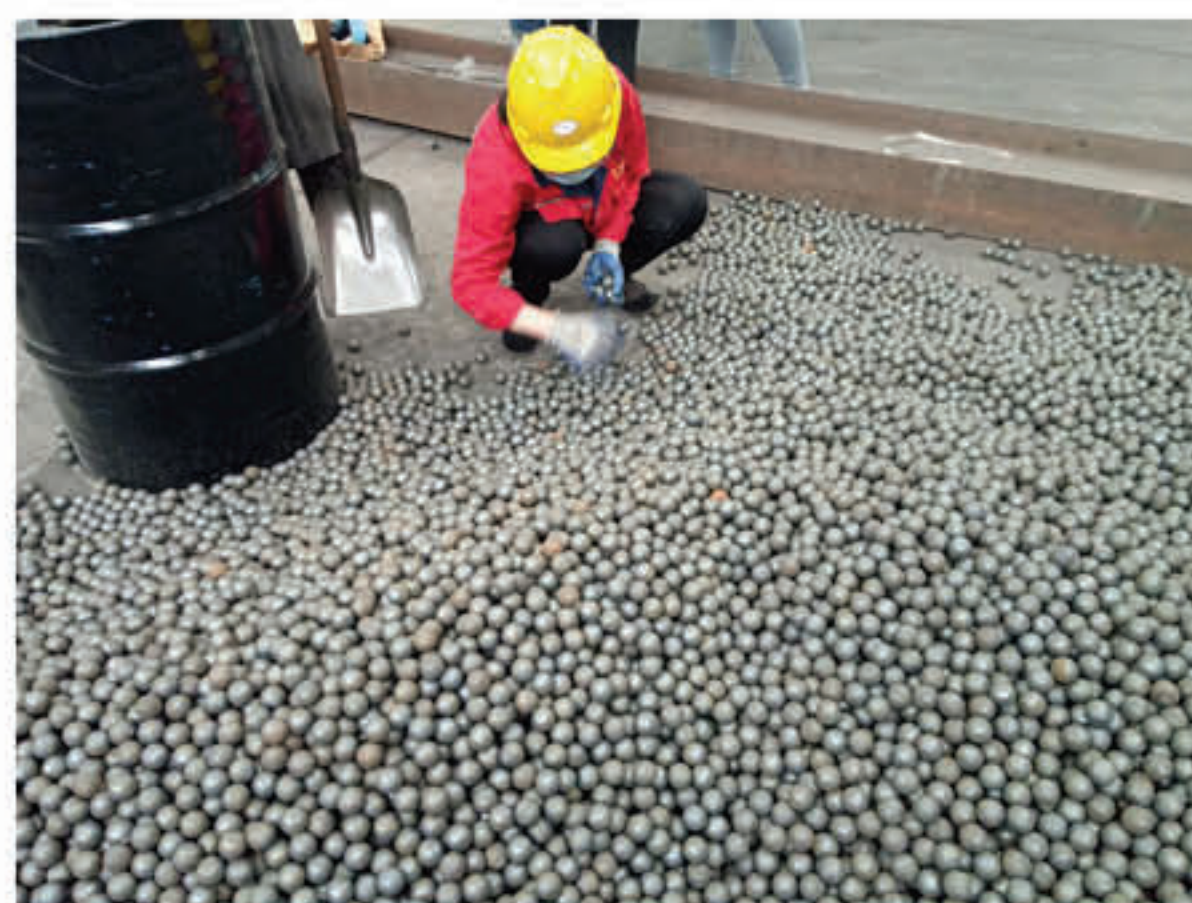
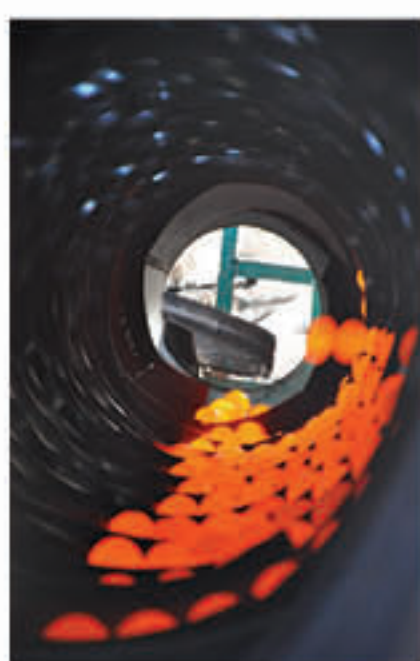
按右边 A、B、C 三种方式提取试样。
检测冲击功如下: (extract specimen
in 3 ways A/B/C

Φ100钢球
A: 14J/cm²
B: 16J/cm²
C: 18J/cm²

Φ125钢球
A: 14J/cm²
B: 18J/cm²
C: 18J/cm²



生产能力和设备 Production Capacity & Equipment



包装和交货 Packing and Delivery

- (1) Container bag: Dia20mm-150mm 1000kg/Container Bag
- (2) Steel Drums: Dia20mm-80mm 900kg/Drum: Dia90mm-150mm 850kgs/Drum;
- (3) Steel Drum on Pallet or Bag on Pallet



应用领域

APPLICATION FIELDS

水泥建材、矿山冶选、电厂磨煤、化工、机械等行业。

Industries of cement building material, metallurgical selection in mine, grinding coal in power plant, chemical industry and machinery, etc.

