



- 公司简介 - Company Profile



山东大和研磨钢球有限公司坐落于山东省济南市明水经济技术开发区，是一家专业生产和销售研磨钢球的企业。公司成立于1998年，注册资金1500万元，占地面积50000多平方米，职工300余人，其中各类专业技术人员近30人。拥有先进的锻球、铸球自动化生产线、全自动热处理生产线，以及标准化的实验室和完善的检测设备，形成了年生产研磨钢球100000吨的能力。

我司主要产品有直径20mm-150mm锻造钢球，直径17mm-130mm高、中、低铬铸造钢球，铸造钢段、磨棒。所生产的的钢球具有硬度高、耐研磨、破碎率低，不失圆等特点。产品广泛应用于矿山、水泥、火电、化工等领域。销售遍及全国30多个省、市、自治区，并出口到东南亚、非洲、南美等不同国家和地区。

公司先后通过了ISO9001质量管理体系认证、ISO14001环境管理体系认证、OHSAS18001职业健康安全管理体系认证。我司致力于为客户提供高质量的产品、竞争力的价格和满意的服务，与海内外用户携手合作，共创未来。

Shandong Dahe Grinding Ball Company Limited is a professional manufacturer and exporter of grinding media in China. It is located in Mingshui economic and technological development zone, Jinan city, Shandong province. Our company was established in 1998, covers an area of 50000 square meters, with \$2.5 million registered capital. There are over 300 employees, including nearly 30 technicians. We have advanced automatic production lines of forged grinding ball and casting grinding ball, full-automatic heat treatment lines, and standardized laboratory with completed testing equipments. The annual output is 100000 metric tons.

Our main products are Forged Grinding Ball with size of Dia. 20mm-150mm, High, Medium and Low Chrome Casting Grinding Ball with size of Dia. 17mm-130mm, as well as Grinding Rod and Casting Cylpebs. The specialties of our grinding ball are high hardness, good wear resistance, no breakage and even wearing. They are widely used in the mines, cement plants, power stations and chemical industries, etc. All the products are sold to more than 30 provinces in China and exported to to Asia, Africa, South America and other countries and regions.

Our company has passed ISO9001 quality management system certificate, ISO14001 environmental management system certificate and OHSAS18001 occupational health and safety management system certificate. We are doing our best to provide our customers with high quality products, competitive price and satisfactory service. And we would like to create a prosperous future together with the friends all over the world.

公司资质 Company Aptitudes

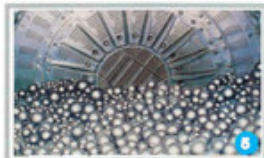
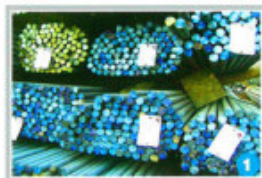




锻造钢球

Forged Steel Grinding Balls

◎锻造钢球生产流程 Manufacturing Process of Forged Balls



锻造钢球工艺特点

●**材质稳定** 锻造钢球所需的原材料—圆钢，全部从国家大型钢厂订购，并且可以对不同研磨钢球材质的特殊要求，进行特殊加工。

●**原材料加热** 我们采用节能型感应棒料加热电炉进行加热，可以保证整块原材料温度均匀并且大大降低原材料损耗，均匀的温度可以保证在热处理过程中硬度的均匀。

●**锻造成型** 采用锻造设备对原材料进行锻打到一定形变量，增加压缩比，从而使研磨球的组织结构更加密实，提高韧性和硬度。

●**热处理** 通过自行研制的水淬火热处理生产线和科学的热处理工艺，使锻造研磨球从表面到芯部的硬度更高并同时具有高韧性，破碎率极低，在各种恶劣的工作环境下保持研磨球的稳定性。

Process Features of Forged Balls

●Material stability

The raw material of forged balls are round steel, ordered from national large-scale steel mills.

We can also provide special processing as per special requirements of different grinding balls materials.

●Heating of raw material

Adopting energy-efficient induction Bar furnace to heat the raw material. It has two advantages:

A. Ensure uniform temperature of the entire raw material, and then the uniform temperature can ensure even hardness during heat treatment process.

B. Lower raw material consumption

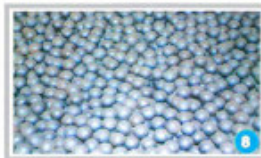
●Forged Forming

The raw materials are forged to a certain deformation by forged equipment, increase compression ratio, so that to dense the structure of wear-resistant ball and improve the toughness and hardness.

●Heat treatment

We're using independently-developed water quenching heat treatment production line and scientific heat treatment process.

Our forging grinding balls have the specialities of higher hardness (from surface to the core), high toughness and low breakage. They can even maintain the stability under various poor working conditions.



◎锻造钢球的技术参数 Technical Parameters of Forged Balls

锻造钢球的分类及化学成分

Type and Chemical Composition of Forged Balls

名称 Name	材质 material	C	Mn	Si	Cr	S	P	Mo & Ni
DAHE-1	45#	0.42-0.50	0.5-1.0	0.17-0.37	≤0.25	≤0.035	≤0.035	Trace
DAHE-2	60Mn	0.57-0.65	0.7-1.0	0.17-0.37	≤0.25	≤0.035	≤0.035	Trace
DAHE-3	65Mn	0.60-0.70	0.9-1.2	0.17-0.37	≤0.25	≤0.035	≤0.035	Trace
DAHE-4	B2	0.75-0.85	0.8-0.9	0.17-0.37	0.5-0.6	≤0.035	≤0.035	Trace
DAHE-5	75SiMn	0.7-0.90	0.7-1.2	0.4-0.8	≤0.25	≤0.03	≤0.03	Trace
DAHE-6	40MnCr	0.45-0.50	0.7-1.2	0.17-0.37	0.9-1.1	≤0.03	≤0.03	Trace

锻造钢球力学性能

Physical Property of Forged Balls

名称 Name	材质 material	冲击值 Impact Test (Ak.J/cm ²)	落球疲劳次数 Endurance test (times)	硬度 Hardness (HRC)				破碎率 Breakage Rate
				Dia.20mm-90mm		Dia.100mm-150mm		
				表面 Surface	芯部 Core	表面 Surface	芯部 Core	
DAHE-1	45#	≥12	≥10000	≥55	≥35	≥50	≥30	<1%
DAHE-2	60Mn	≥13	≥10000	≥60	≥45	≥55	≥40	<1%
DAHE-3	65Mn	≥15	≥12000	≥60	≥45	≥56	≥40	<1%
DAHE-4	B2	≥17	≥12000	≥60	≥55	≥58	≥50	<1%
DAHE-5	75SiMn	≥16	≥12000	≥60	≥50	≥60	≥48	<1%
DAHE-6	40MnCr	≥16	≥12000	≥60	≥50	≥60	≥48	<1%



锻造钢球单重及金相组织

Weight and Microstructure of Forged Balls

直径 (mm) Nominal diameter	公差 (mm) Diametrical Tolerance	钢球单重 (kgs) Approx weight per ball	每吨球个数 Average number per MT	金相组织 Microstructure
25	+1.5, -0.5	0.064	15625	M+B+C (M-马氏体 B-贝氏体 C-碳化物) (M-Martensite B-Bainite C-Carbide)
30	+1.5, -0.5	0.11	9090	
40	+2.0, -1.0	0.26	3846	
50	+2.0, -1.0	0.51	1961	
60	+3.0, -2.0	0.89	1124	
70	+3.0, -2.0	1.4	714	
80	+3.0, -2.0	2.1	476	
90	+3.0, -2.0	3	333	
100	+4.0, -3.0	4.1	244	
110	+4.0, -3.0	5.47	283	
120	+4.0, -3.0	7.1	141	
130	+4.0, -3.0	9.02	111	



铸造钢球

Casting Iron Grinding Balls

◎ 铸造钢球生产流程 Manufacturing Process of Casting Balls



铸造钢球工艺特点

- **化学成分匹配合理的化学成分**是我公司技术人员不断试验、检测、逐步优化而形成的，具有独特性，各种合金元素最佳的配置，可以使研磨球的硬度和韧性相结合，达到最佳状态。
- **精炼浇注工艺**铸造钢球全部采用中频电炉生产，恒温调质，两次铁水净化处理，有效的保证了材质的纯度和稳定性。
- **温度控制工艺**温度控制是铸造钢球生产中非常重要、复杂的工艺，不同的出炉温度、浇注温度、出模温度及热处理温度，非常敏感的反映在产品质量上，掌握适宜的浇注温度、出模温度，可使产品从液态到固态过渡中达到良好的机体组织状态。
- **藏型工艺**当铁水温度达到1500℃时与模具温度的温差浇注，可以使耐磨球内部组织颗粒细化而更加密实，使碳化物呈放射状排列，在研磨过程中这种碳化物再次嵌入基体，不断形成硬质层，从而使硬度和韧性保持在合理区间，大大提高了研磨球的韧性和硬度。
- **热处理工艺**热处理采用油淬和风淬两套生产线进行热处理，使研磨球烧透、淬透，台式回火炉回火处理达到铸造钢球基体高硬度、韧性好、磨耗低、破碎少、抗磨性能好等特点。

Process Features of Casting Balls

- **Chemical Composition Matching**
The rational chemical composition is gradually optimized and formed by our technical staff after continuous tests. It is unique. The best configuration of various alloying elements can combine the ball's hardness and toughness at their best.
- **Melting and pouring process**
All casting iron balls are produced by intermediate frequency electric furnace. The purity and stability of materials are effectively ensured after uniform temperature conditioning and twice hot metal purification.
- **Temperature Control Process**
The temperature control is an important and complex process during casting iron ball production. Different tapping temperature, pouring temperature, mold temperature and heat treatment temperature are sensitively reflected in the quality of products. It is requested to master the proper pouring temperature, mold temperature, so that can make sure the products achieve a good state of body tissue during the transition from liquid to solid states.
- **Moulding Process**
Pouring when the molten iron temperature reaches 1500 degrees, using the temperature difference between molten iron and the molds. In this way, the ball can achieve internal organization of grain refinement and be more dense. Meanwhile, the Carbide is radially arranged, and such Carbide is embedded in the matrix again during grinding process, forming hard layer continuously. So that the hardness and toughness is maintained to a reasonable range, greatly improving the toughness and hardness of the grinding balls.
- **Heat treatment process**
We have two sets of the heat treatment production line. One is oil quenching, the other is air quenching. So that the grinding balls can be burning through and unquenching through. And the grinding ball has the characters of high hardness, good toughness, low wear rate, low break rate, wear-resistant, etc through tempering.





铸造钢球的技术参数 Technical Parameters of Casting Balls

铸造钢球分类及化学成分
Type and Chemical Composition of Casting Balls

名称 Name	材质 material	C	Si	Cr	Mn	S	P	Mo&Ni	Al&Cu	Micr- structure
DAHE-7	Specialhi-CrI	2.0-2.8	≤1.0	22-32	0.5-2.0	≤0.06	≤0.08	Trace	Trace	M+C
DAHE-8	Specialhi-CrII	2.0-2.8	≤1.0	17-22	0.5-2.0	≤0.06	≤0.08	Trace	Trace	M+C
DAHE-9	Specialhi-CrIII	2.2-3.0	≤1.0	15-17	0.5-2.0	≤0.06	≤0.08	Trace	Trace	M+C
DAHE-10	High-Cr	2.2-3.2	≤1.0	10-14	0.5-1.5	≤0.06	≤0.08	Trace	Trace	M+C
DAHE-11	Medium-Cr	2.1-3.2	≤1.2	5-9	0.5-1.5	≤0.06	≤0.08	Trace	Trace	P+C
DAHE-12	Low-Cr	2.2-3.5	≤1.2	1-3	0.5-1.5	≤0.06	≤0.08	Trace	Trace	P+C

M-马氏体;P-珠光体;C-碳化物)(M-Martensite;P-Pearlite;C-Carbide)

铸造钢球力学性能
Physical Property of Casting Balls

名称 Name	材质 Material	冲击值 Impact Test (AKJ/cm)	落球疲 劳次数 Endurance Test (times)	硬度 Hardness (HRC)				破碎率 Breakage Rate
				Dia.17mm-90mm		Dia.100mm-130mm		
				quenching	unquenching	quenching	unquenching	
DAHE-7	Specialhi-CrI	≥4	≥10000	≥60	≥49	≥60	≥48	<1%
DAHE-8	Specialhi-CrII	≥4	≥10000	≥60	≥49	≥60	≥48	<1%
DAHE-9	Specialhi-CrIII	≥4	≥10000	≥60	≥49	≥59	≥48	<1%
DAHE-10	High-Cr	≥3	≥10000	≥60	≥49	≥58	≥48	<1%
DAHE-11	Medium-Cr	≥3	≥8000	-	≥48	-	≥48	<1%
DAHE-12	Low-Cr	≥2	≥8000	-	≥45	-	≥45	<1%

铸造钢球单重
Weight of Casting Balls

直径 (mm) Nominal diameter	公差 (mm) Diametrical Tolerance	钢球单重 (kgs) Approx weight per ball	每吨球个数 Average number per MT
20	+1, -0.5	0.033	30303
25	+1, -0.5	0.064	15625
30	+2.0, -1.0	0.11	9090
40	+2.0, -1.0	0.261	3831
50	+2.0, -1.0	0.510	1961
60	+2.0, -1.0	0.883	1132
70	+3.0, -1.5	1.402	713
80	+3.0, -1.5	2.092	478
90	+3.0, -1.5	2.98	335
100	+3.0, -1.5	4.087	244
110	+3.0, -1.5	5.44	183
120	+3.0, -1.5	7.062	141





磨棒

Grinding Rods

名称 Name	材质 Material	直径 D (mm)	长度 L (m)	化学成分 CHEMICAL COMPOSITION						硬度 HRC
				C	Mn	Si	Cr	P	S	
DAHE-13	60Mn	60-90	3-6	0.57-0.65	0.7-1.0	0.17-0.37	0.25MAX	0.035MAX	0.035MAX	35-45
DAHE-14	B2	60-90	3-6	0.75-0.85	0.8-0.9	0.17-0.37	0.5-0.6	0.035MAX	0.035MAX	45-55



钢段

Grinding Cylpebs

名称 Name	材质 Material	化学成分 CHEMICAL COMPOSITION								硬度 HRC
		C	Mn	Si	Cr	Mo	Cu	P	S	
DAHE-15	Hi-Cr	1.8-3.3	0.3-1.0	0.3-1.2	10-14	≤0.6	≤0.6	≤0.10	≤0.10	55-65
DAHE-16	Low-Cr	2.0-3.3	0.4-1.5	0.5-1.8	0.5-1.5	≤0.6	≤0.6	≤0.15	≤0.15	45-55

规格 SPECIFICATION

Φ16*16	Φ18*18	Φ18*22	Φ20*25	Φ20*30	Φ20*35	Φ22*30
Φ25*25	Φ25*30	Φ25*35	Φ30*35	Φ30*40	Φ35*40	Φ35*45



质量控制

Quality Control



包装形式

Package





研磨钢球

GRINDING MEDIA



山东大和研磨钢球有限公司
SHANDONG DAHE GRINDING BALL COMPANY LIMITED



MANUFACTURER OF GRINDING MEDIA

山东大和研磨钢球有限公司

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