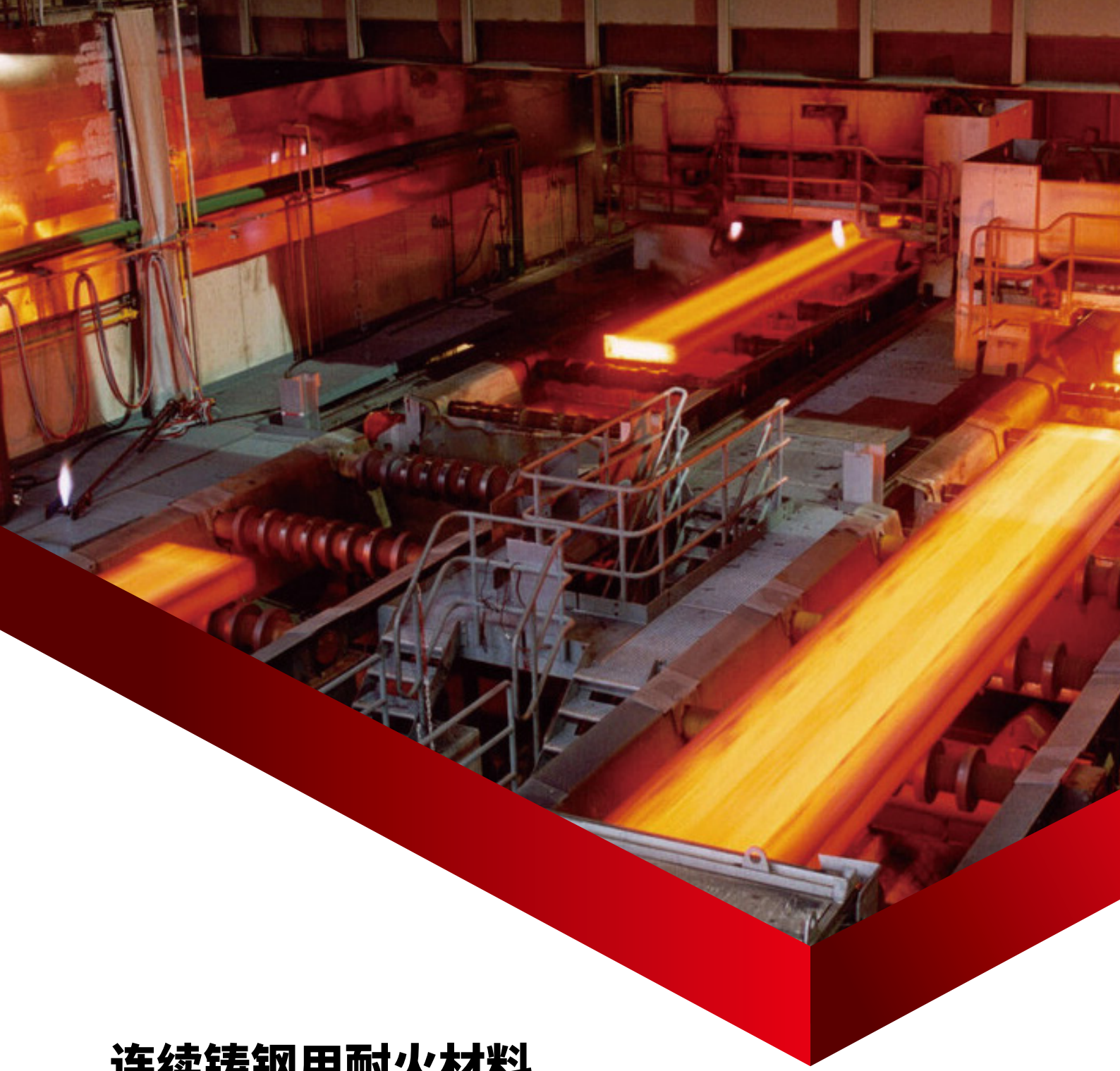


连续铸钢用耐火材料
Refractories for Continuous Casting

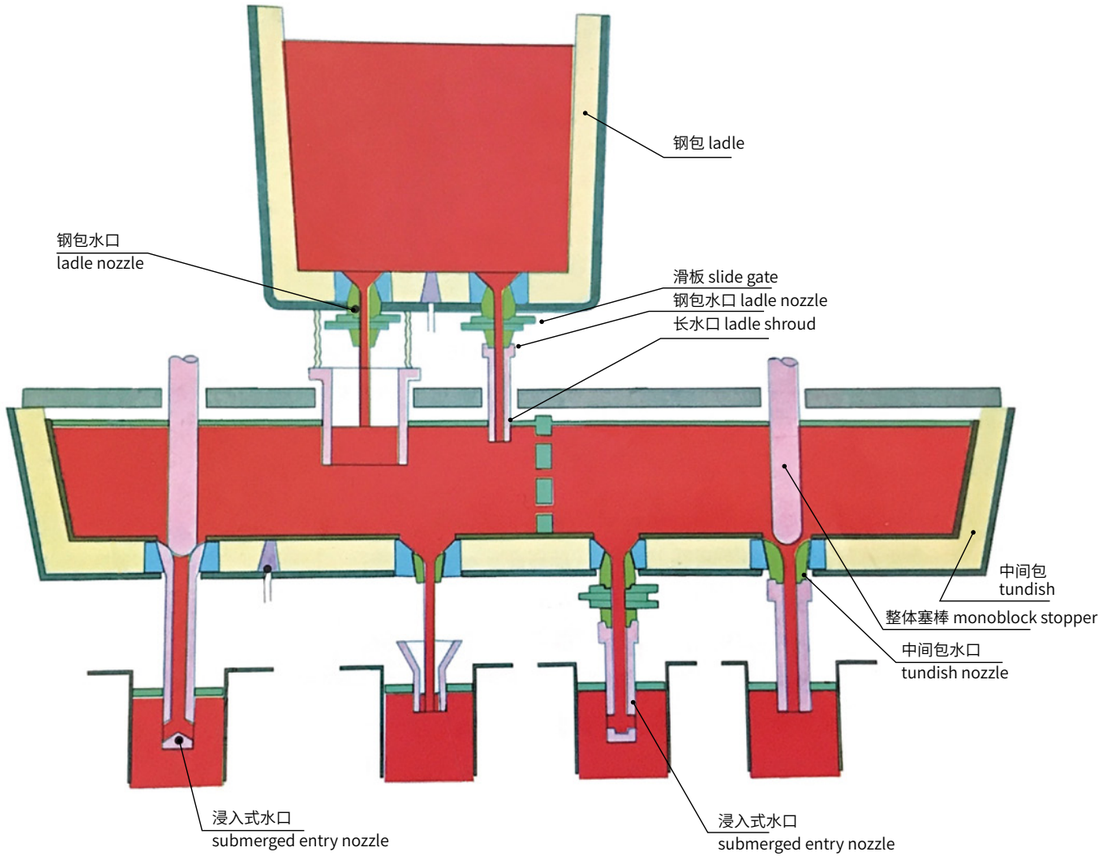
JindeRef 锦德耐火

诸城市锦德耐火材料有限公司

Zhucheng Jinde Refractory Co.,Ltd.

Jinde Refractories

目录 Content



应用图
APPLICATION DRAWING

Company Profile
▶ 公司简介

Zhucheng Jinde Refractory Co.,Ltd. professional specialized in producing AL-C & Zr-C refractories for continuous steel casting system.With more than 20 years technical back ground,adopted advanced cold isostatic pressing technology, we produce high quality monoblock stopper, ladle shroud, tundish nozzle, submerged entry nozzle etc. Our company covers 67600 square meters and located in Zhucheng ,Shandong which near Qingdao port only 50KM.

Our technical team members are with background in metallurgy, machinery etc which have strong ability on new product development. Also, our company was controlled by ISO9001:2015 international quality system and verified by TUV, and equipped with advanced testing machine and methods. We could accept customized product.

To provide complete solutions for metallurgy industry we have good relationship with customers worldwide. Complete after-sale service to help customers to solve problem helps us always in market with our clients.

Zhucheng Jinde Refreactory Co.,Ltd. is willing to establish long term business relationship with clients worldwide with offering high quality products and service .

诸城市锦德耐火材料有限公司是一家连续铸钢用铝碳铝锆碳耐火材料的专业生产企业并且拥有 20 多年技术背景。采用先进的冷等静压技术生产整体塞棒，长水口，中间包水口，浸入式水口等。工厂位于山东省诸城市枳沟镇开发区内，占地面积 67600 平方米，厂房建筑面积 13000 平方。

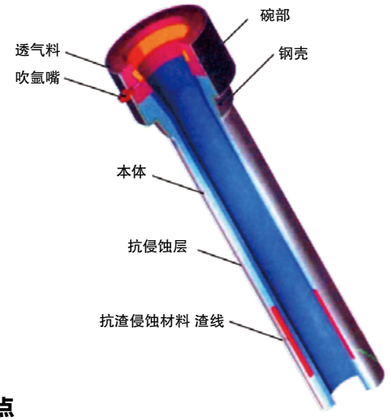
企业技术力量雄厚，拥有冶金、材料科学、机械等多学科的技术队伍，配备先进的生产技术水平和检测手段，ISO9001:2015 国际质量体系和德国莱茵 TUV 认证体系有效覆盖管理和生产，具有很强的新品研发能力。

企业旨在为冶金工业提供整套解决方案。完善的售后服务体系保证了市场的开发，与用户建立良好共赢的合作关系。在服务理念上，企业确立为客户解决问题，为客户创造价值的信念，售后服务流动队与客户长期频繁交流与沟通，深受客户的欢迎。

诸城市锦德耐火材料有限公司愿以“勤奋工作、务实创新”的精神和“具有相当竞争力的产品”与国内外企业建立合作共赢的伙伴关系。

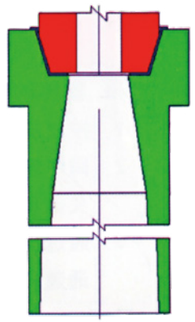
产品 Products

长水口



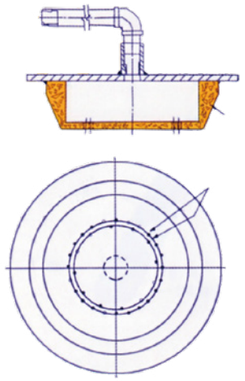
特点

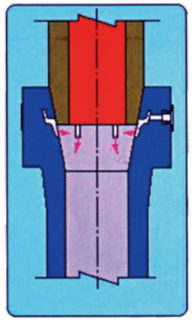
1. 各种不同的吹氩气结构，可根据需求定制
2. 防氧化釉层有效的防止碳结合材料被氧化
3. 标准的铝碳本体材料性能优良，不炸裂，耐侵蚀
4. 标准的锆质材料保证了渣线部位具有优良的耐侵蚀性能
5. 标准的镁质材料保证了渣线部位对 Ca 处理钢具有优良的耐蚀性能
6. 内层无碳材料保证了超低碳钢 硅钢 洁净钢的特殊要求
7. 侵入式开浇长水口对保证钢水质量起到了更关键的作用

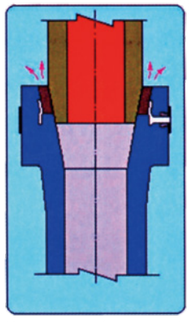


长水口的作用

1. 防止钢水二次氧化而生产非金属夹杂物
2. 减少从钢包到中间包的温降
3. 将钢水从钢包倒入中间包时不会产生钢水飞溅 同时 中间包钢水翻动最小



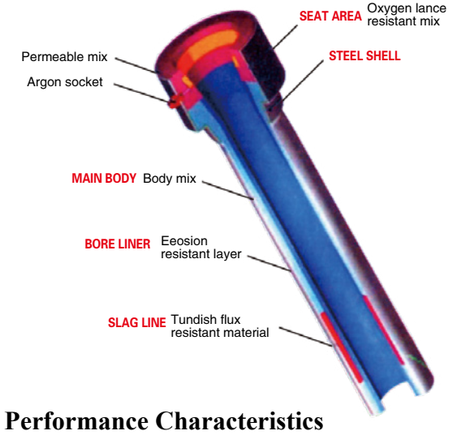




成分

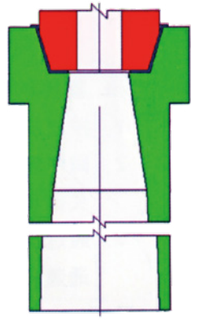
	Al_2O_3%	Fe_2O_3%	SiO_2%	TiO_2%	ZrO_2%	CaO%	MgO%	LOI%	体积密度 g/cm³	显气孔率 %	抗折强度 Mpa	类别
本体	58.78	1.30	10.80	1.59	7			21.28	2.61	16.80	8.1	标准型
锆质渣线					76.2	1.71		15.01	3.65	15.61	5.87	锆质渣线
本体	39.25		21.3		1.2			35.2	2.20	14.67	5.32	重复使用型

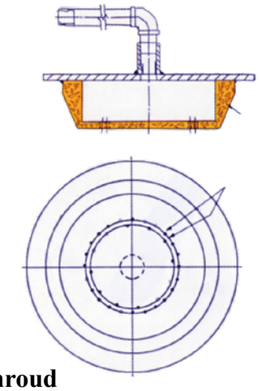
Ladle Shroud



Performance Characteristics

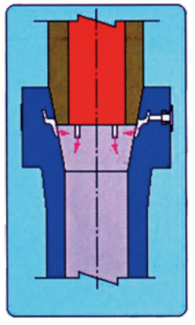
1.We accept customized for different argon blowing design
2.Oxidation resistance layer can prevent Carbon bonded material be oxidated.
3.BZ type AL-C material for body part is with good property which is thermal shock resistance and erosion resistance.
4.BZ type Zr-based material provides good erosion resistance properties for slag line part.
5.BZ type Mg material ensures excellent erosion resistance of slag line to Ca-treated steel.
6.Inner layer with carbon free material guarantee the special requirements of ultra-low carbon steel, silicon steel and clean steel
7.Bell shroud plays an important role in ensuring the quality of molten steel during casting.

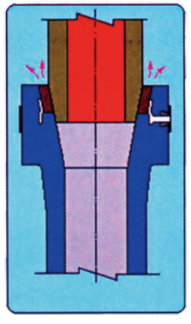




Function of Ladle Shroud

1.Prevent oxidation of molten steel and the formation of non-metalllic inclusion
2.To reduce molten steel temperature loss from ladle to tundish
3.It is preventing molten steel splashing when pouring from ladle to tundish and can make sure the minimum turnover in tundish.





Component

	Al_2O_3%	Fe_2O_3%	SiO_2%	TiO_2%	ZrO_2%	CaO%	MgO%	LOI%	density g/cm³	Porosity %	Fracture Strength Mpa	Type
Body	58.78	1.30	10.80	1.59	7			21.28	2.61	16.80	8.1	BZ Type
Slag line					76.2	1.71		15.01	3.65	15.61	5.87	Slag Line
Body	39.25		21.3		1.2			35.2	2.20	14.67	5.32	Reusable Type

整体塞棒

特点

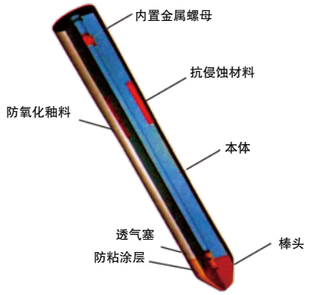
1. 防氧化釉层有效的防止碳结合材料被氧化
2. 标准的铝碳本体材料性能优良不炸裂，耐侵蚀
3. 标准的铝碳棒头材料性能优良，耐侵蚀
4. 加强的尖晶石棒头材料保证了头部能够抵抗最严重的侵蚀
5. 标准的镁碳棒头材料对 Ca 处理钢具有优良的耐侵蚀性能
6. 高标准的锆质材料保证了渣线部位具有优良的耐蚀性能

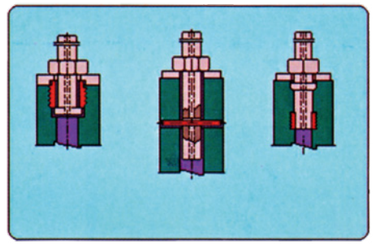
塞棒的作用

1. 控制从中间包到结晶器的钢流
2. 同中间包滑动水口配合使用起到安全关闭和防止浇铸末期卷渣
3. 通过塞棒向钢流通道吹氩气防止通道内由于夹杂物沉积堵塞

塞棒和中间包开浇前的预热制度

1. 室温至 900℃ 升温时间 20 分钟
2. 900℃ 至 1150℃ 升温时间 20 分钟 并在 1150℃ 保温 2.5 小时 然后开浇





成分

	Al_2O_3%	Fe_2O_3%	SiO_2%	TiO_2%	ZrO_2%	CaO%	MgO%	LOI%	体积密度 g/cm^3	显气孔率 %	抗折强度 Mpa	类别
本体	55.42	0.91	16.58	1.41				26.81	2.53	16.81	9.6	标准型
棒头	86.61	0.43	0.77	0.33				11.11	2.85	17.7	6.73	标准型
棒头	71.43	0.91	10.65				12.1	10.95	2.78	16.3	14.5	加强型
渣线					75.10	1.71		15.10	3.78	15.61	6.97	锆质渣线
棒头	15.1		8.95		0.29	1.56	56.8	17.3	2.59	16.7	7.8	钙处理钢用

Customized is acceptable 可接受客户定制

Monoblock Stopper

Performance Characteristics

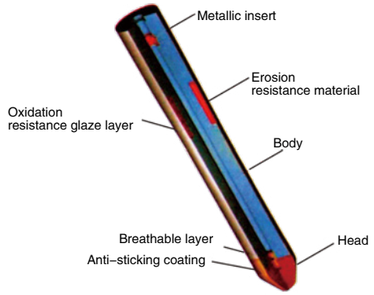
1.Oxidation resistance glaze layer can help to prevent carbon bonded material to be oxidized.
2. Stopper body is BZ type AL-C based material with good properties which is good thermal shock resistance and erosion resistance.
3. Stopper head is BZ type AL-C material with good properties and good anti-erosion property.
4. Stopper head is JQ type spinel material which can resistant to the most severe erosion.
5. Stopper head is BZ type Mg-C material is good erosion resistance properties to Ca-treated steel.
6. Slag line part is GBZ type Zircon material gives excellent erosion resistance properties.

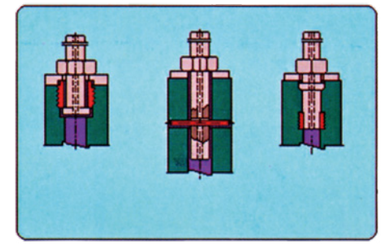
Function of Stopper

1.To control the steel flow from tundish to mold.
2.Work with slide gate as an shut off device and to prevent slag entrapment during casting end.
3.Through stopper to blow Argon to steel channel to prevent block from inclusion deposition.

Preheating method for stopper and tundish before casting

1.It takes 20minites from room tempreture to 900℃
2.From 900℃ to 1150℃ it takes 20minites and holding at 1150℃ for 2.5hours, then casting.





Component

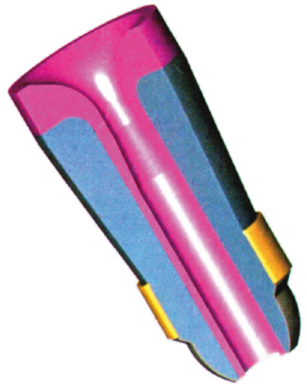
	Al_2O_3%	Fe_2O_3%	SiO_2%	TiO_2%	ZrO_2%	CaO%	MgO%	LOI%	Density g/cm	Porosity %	Fracture Strength Mpa	Type
Body	55.42	0.91	16.58	1.41				26.81	2.53	16.81	9.6	BZ Type
Head	86.61	0.43	0.77	0.33				11.11	2.85	17.7	6.73	BZ Type
Head	71.43	0.91	10.65				12.1	10.95	2.78	16.3	14.5	JQ Type
Slag Line					75.10	1.71		15.10	3.78	15.61	6.97	Slag Line
Head	15.1		8.95		0.29	1.56	56.8	17.3	2.59	16.7	7.8	Ca-treated Steel

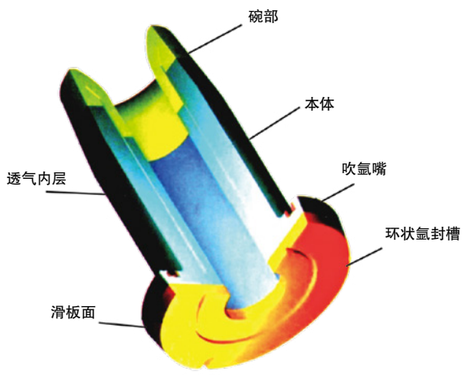
Customized is acceptable 可接受客户定制

中间包水口

特点

1. 标准的铝碳本体材料性能优良不炸裂耐侵蚀
2. 标准的铝碳碗部材料性能优良耐侵蚀
3. 标准的防堵材料能够有效的防止 AL2O3 氧化物的附着 杜绝水口的堵塞
4. 标准的吹氩气结构 能够防止氧气的吸入
5. 底部材质的高耐磨性和精确尺寸确保实现水口快换





成分

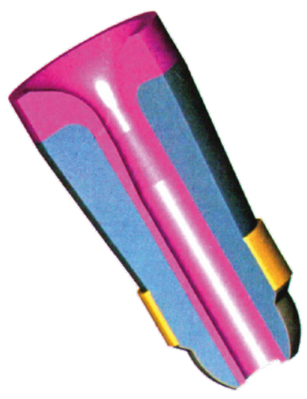
	Al_2O_3 %	Fe_2O_3 %	SiO_2 %	TiO_2 %	ZrO_2 %	CaO %	MgO %	LOI %	体积密度 g/cm^3	显气孔率 %	抗折强度 Mpa	类别
本体	63.15	1.15	6.83	0.87	3.25			24.58	2.54	16.42	8.67	标准型
碗部	86.61	0.43	0.77	0.33				11.11	2.85	17.7	6.73	标准型
碗部	71.43	0.91	10.65				12.1	10.85	2.78	16.3	14.5	加强型
内层	64.1	0.81	12.5		4.94	0.12	0.32	16.52	2.63	22.48	10.28	透气材料

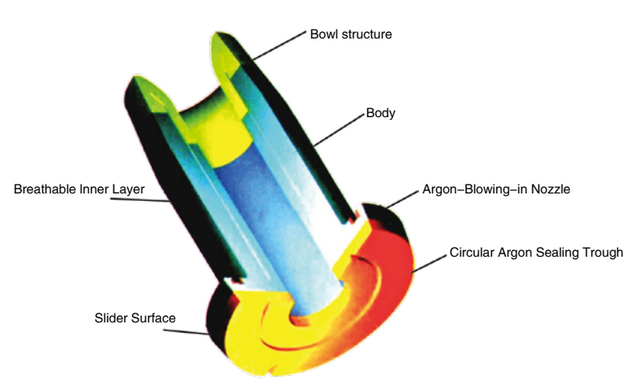
Customized is acceptable 可接受客户定制

Tundish Nozzle

Function of Ladle Shroud

1.BZ type AL-C based material having good erosion resistance and good thermal resitance properties.
2.BZ type AL-C based material for the bowl structure part having high corrosion resistance.
3.BZ type anti-blocking material can prevent Al2O3 adhesion inside of the tundish nozzle which helps prevent nozzle be blocked.
4.BZ type argon blowing design can help prevent Oxygen inhalation.
5.High wearing resistance and actuate dimension used in the bottom materials ensure nozzle to achieve quick change.





Component

	Al_2O_3 %	Fe_2O_3 %	SiO_2 %	TiO_2 %	ZrO_2 %	CaO %	MgO %	LOI %	Density g/cm^3	Porosity %	Fracture Strength Mpa	Type
Body	63.15	1.15	6.83	0.87	3.25			24.58	2.54	16.42	8.67	BZ Type
Bowl Structure	86.61	0.43	0.77	0.33				11.11	2.85	17.7	6.73	BZ Type
Bowl Structure	71.43	0.91	10.65				12.1	10.85	2.78	16.3	14.5	JQ Type
Liner	64.1	0.81	12.5		4.94	0.12	0.32	16.52	2.63	22.48	10.28	Breathable Materials

Customized is acceptable 可接受客户定制

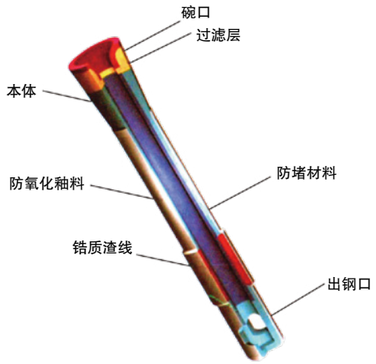
浸入式水口

特点

1. 标准的铝碳本体材料性能优良不炸裂 耐侵蚀
2. 强化的尖晶石碗部材料保证了与塞棒配合控制部位能够抵抗最严重的侵蚀
3. 标准的吹氩气结构能够防止氧化附着
4. 高标准的锆质材料保证了渣线部位具有优良的耐蚀性能 更耐含氟保护渣的侵蚀
5. 内层无碳材料保证了超低碳钢硅钢洁净钢的特殊要求

浸入式水口的作用

1. 水口碗部与塞棒头配合 共同实现精确控流
2. 保护钢水不被二次氧化而影响铸坯体质量
3. 确保结晶器内钢流分布以实现最佳凝固模型



成分

	Al_2O_3 %	Fe_2O_3 %	SiO_2 %	TiO_2 %	ZrO_2 %	CaO %	MgO %	LOI %	体积密度 g/cm^3	显气孔率 %	抗折强度 Mpa	类别
本体	63.15	1.15	6.83	0.87	3.25			24.58	2.54	16.42	8.67	标准型
碗部	86.61	0.43	0.77	0.33				11.11	2.85	17.7	6.73	标准型
碗部	71.43	0.91	10.65				12.1	10.95	2.78	16.3	14.5	加强型
渣线					79.10	1.71		12.01	3.81	13.61	6.97	渣线部位
内层	56.2	0.81	4.06		15.2	0.12		22.5	2.4	16.7	7.2	防堵材料
内层	52.9		13.9				21	2.1	2.51	18.71	6	无碳材料

Customized is acceptable 可接受客户定制

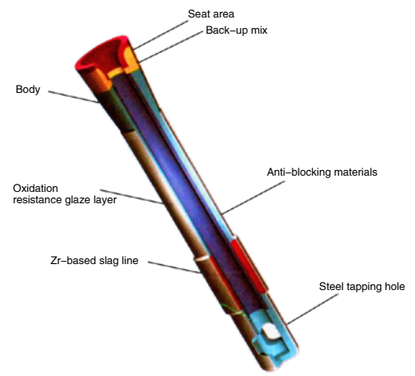
Submerged Entry Nozzle

Performance Characteristics

1.BZ type AL-C based material having good erosion resistance and good thermal resitance properties.
2.JQ type spinel material for bowl part ensures the parts which SEN worked with stoppers can resist the most severe erosion.
3.BZ type argon blowing design help to prevent oxidation adhesion
4.GBZ type Zirconium material ensures excellent corrosion resistance of slag line, and is more 5.resistant to the corrosion of fluorine-containing protective slag
6.Inner layer with carbon free material guarantee the special requirements of ultra-low carbon steel, silicon steel and clean steel

Function of Submerged Entry Nozzle

1. Bowl part of SEN worked with stopper head can guarantees a perfect steel pouring control.
2. Preventing molten steel from re-oxidation and affecting billet quality.
3. Assuring molten steel be well distributed in molds to achieve optimal solidification.



Component

	Al_2O_3 %	Fe_2O_3 %	SiO_2 %	TiO_2 %	ZrO_2 %	CaO %	MgO %	LOI %	Density g/cm^3	Porosity %	Fracture Strength Mpa	Type
Body	63.15	1.15	6.83	0.87	3.25			24.58	2.54	16.42	8.67	BZ Type
Bowl Structure	86.61	0.43	0.77	0.33				11.11	2.85	17.7	6.73	BZ Type
Bowl Structure	71.43	0.91	10.65				12.1	10.95	2.78	16.3	14.5	JQ Type
Slag Line					79.10	1.71		12.01	3.81	13.61	6.97	Slag Line
Liner	56.2	0.81	4.06		15.2	0.12		22.5	2.4	16.7	7.2	Anti-blocking Materials
Liner	52.9		13.9				21	2.1	2.51	18.71	6	Non-carbon Materials

Customized is acceptable 可接受客户定制

薄板坯水口

薄板坯连铸连轧工艺复杂 结晶器异形 水口的形状受到如下制约

1. 水口壁厚受到结晶器宽度的限制
2. 高拉速下 >5m/min , 低粘度和低熔点的结晶器保护渣加速水口的侵蚀
3. 高纯材料的使用需要更好的防氧化保护
4. 复杂的水口设计 使其对热震更加敏感

应用低温烘烤技术生产的薄板坯水口 广泛应用于 ASP BSP CSP 铸机系统 确保不炸裂 避免因水口炸裂造成停机事故的发生

成分

	Al_2O_3 %	Fe_2O_3 %	SiO_2 %	TiO_2 %	ZrO_2 %	CaO %	MgO %	LOI %	体积密度 g/cm^3	显气孔率 %	抗折强度 Mpa	类别
本体	63.15	1.15	6.83	0.87	3.25			24.58	2.54	16.42	8.67	标准型
碗部	86.61	0.43	0.77	0.33				11.11	2.85	17.7	6.73	标准型
碗部	71.43	0.91	10.65				12.1	10.95	2.78	16.3	14.5	加强型
渣线					79.10	1.71		12.01	3.81	13.61	6.97	渣线部位
内层	56.2	0.81	4.06		15.2	0.12	0.32	22.5	2.4	16.7	7.2	防堵材料
内层	52.9		13.9			0.07	21	2.1	2.51	18.71	6	无碳材料
碗部	15.1		8.95		0.29	1.56	56.8	17.3	2.59	16.7	7.8	钙处理钢用

Customized is acceptable 可接受客户定制

Submerged Entry Nozzle for Thin Slab Casting

The SES shape was limited by followings as complicated process of thin slab casting and special moulds:
1.Wall thickness of the nozzle is limited by the mold width.
2.It accelaretes the erosion of nozzle by mold fluxes which low viscosity and low melting points a high cast speed((>5m/min)
3.It requires better anti-oxidation protection if high pure material was applied
4.Complicated design makes the nozzle easily affected by thermal shock.

SES for thin slab casting produced by low tempreture baking technology is widely applied in ASP, BSP, CSP casting system which has good thermal shock resistance and could eliminate shutdown accident caused by SEN explosion

Component

	Al_2O_3 %	Fe_2O_3 %	SiO_2 %	TiO_2 %	ZrO_2 %	CaO %	MgO %	LOI %	Density g/cm^3	Porosity %	Fracture Strength Mpa	Type
Body	63.15	1.15	6.83	0.87	3.25			24.58	2.54	16.42	8.67	BZ Type
Bowl structure	86.61	0.43	0.77	0.33				11.11	2.85	17.7	6.73	BZ Type
Bowl structure	71.43	0.91	10.65				12.1	10.95	2.78	16.3	14.5	JQ Type
Slag line					79.10	1.71		12.01	3.81	13.61	6.97	Slag line
Liner	56.2	0.81	4.06		15.2	0.12	0.32	22.5	2.4	16.7	7.2	Anti-blocking Materials
Liner	52.9		13.9			0.07	21	2.1	2.51	18.71	6	Non-carbon Materials
Bowl structure	15.1		8.95		0.29	1.56	56.8	17.3	2.59	16.7	7.8	Ca-treated steel

Customized is acceptable 可接受客户定制

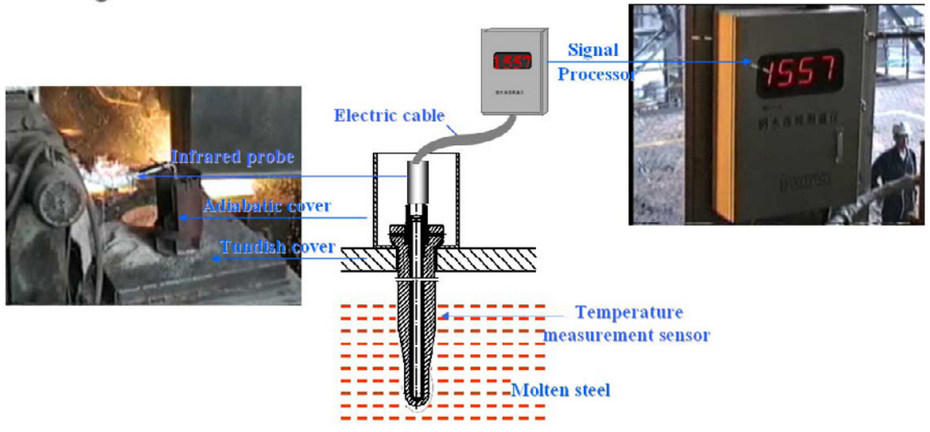
连续铸钢用热电偶保护套
Thermocouple protective sheath for continuous steel casting

特点

1. 实现了中间包内钢水温度的连续测量
2. 实现中间包预热温度的连续测量
3. 提高测量的稳定性和可靠性
4. 操作简单方便
5. 连续测温的成本接近热电偶测温的成本

Performance Characteristics:

1. Realize the continuous temperature measurement of molten steel in tundish.
2. Realize the continuous measurement of tundish preheating temperature.
3. Improve the stability and reliability of measurement.
4. Simple and convenient operation.
5. Cost of continuous temperature measurement is close to that of thermocouple temperature measurement.



意义

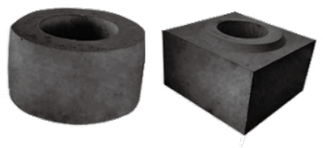
1. 使用该产品可实现连续准确的温度测量 从而为连铸机速度闭环实时控制 模具调整和二冷区冷却强度的实时控制提供了温度检测保障极大地提高了连铸机产量 稳定了产品质量
2. 通过对中间包内温度的精确连续测量 及时掌握温度变化趋势 减少了中间包的冒口和堵塞
3. 准确连续测温 掌握温度变化规律 可降低钢液过热程度
4. 必要时对中间包的烘烤温度进行监控 有利于中间包的浇铸和使用寿命的延长
5. 操作方便 劳动强度明显降低通过对钢水进行连续测温可以提高生产效率提高质量降低材料消耗 稳定生产工艺 因此 钢水连续测温具有重要的意义和多方面的效益

Significance

1. Continuous and accurate temperature measurement could be achieved by using the product. Thus providing guaranteed temperature detection for the close-loop real-time control of casting speed, the mold adjustment and cooling intensity in secondary cooling zone, which help greatly to improve the continuous caster output and stabilize the product quality.
2. Through the accurate and continuous temperature measurement in tundish, the temperature varying trend could be received in time, thus reducing the breakouts and clogging.
3. Superheat degree of molten steel could be reduced owing to the accurate continuous temperature measurement and mastered temperature varying regularity.
4. Monitor the baked temperature of tundish if necessary, which benefits casting and prolonging of tundish service life.
5. Convenient operation can lessen labor intensity obviously.The production could be raised, quality be increased, material consumption be decreased and the producing process be stabilized with continuous temperature measurement for molten steel. So continuous temperature measurement for molten steel is of great significance and benefits in different aspects.

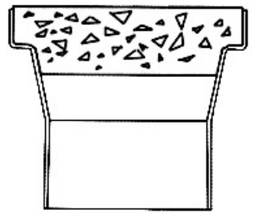
其他产品 Other Product

钢包水口 滑板
Ladle Nozzle,Slide Gate Plate



座砖
Well Block

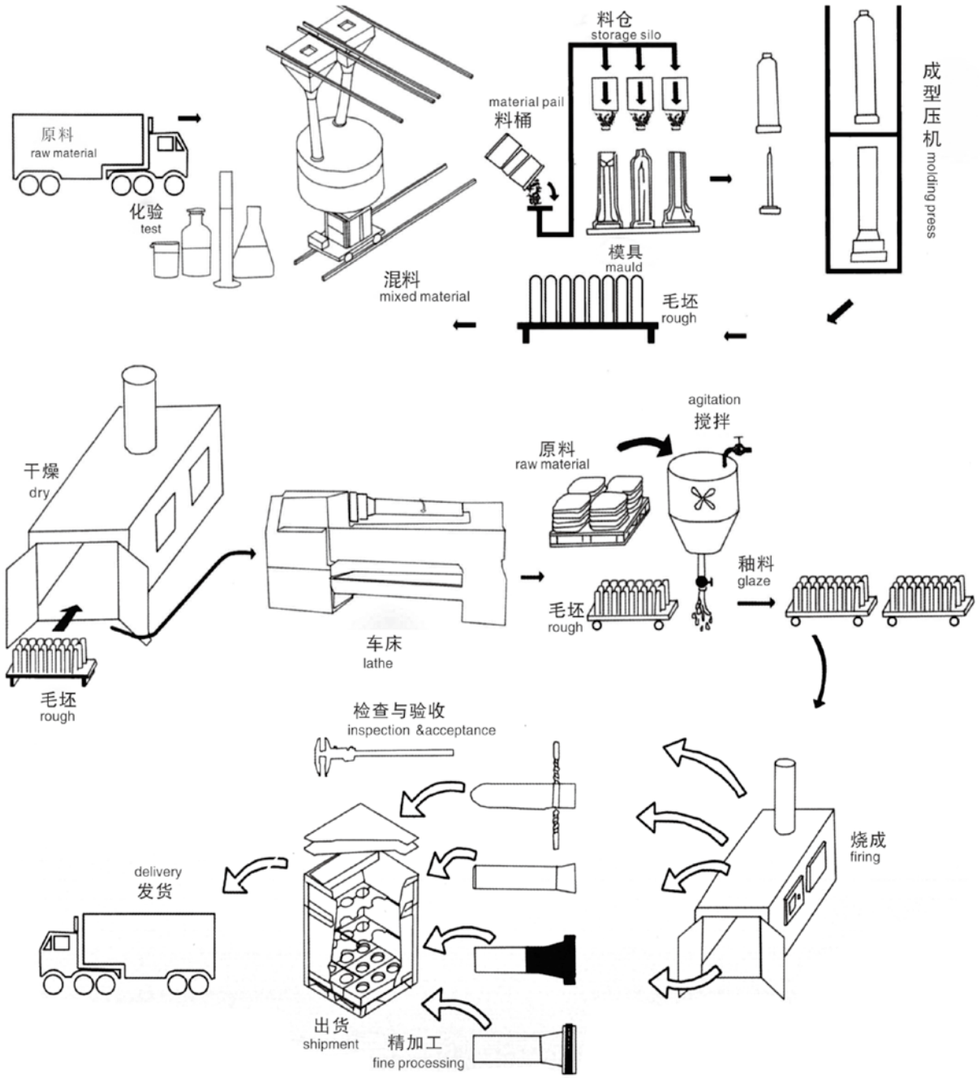
锆质水口
Zirconia Nozzle

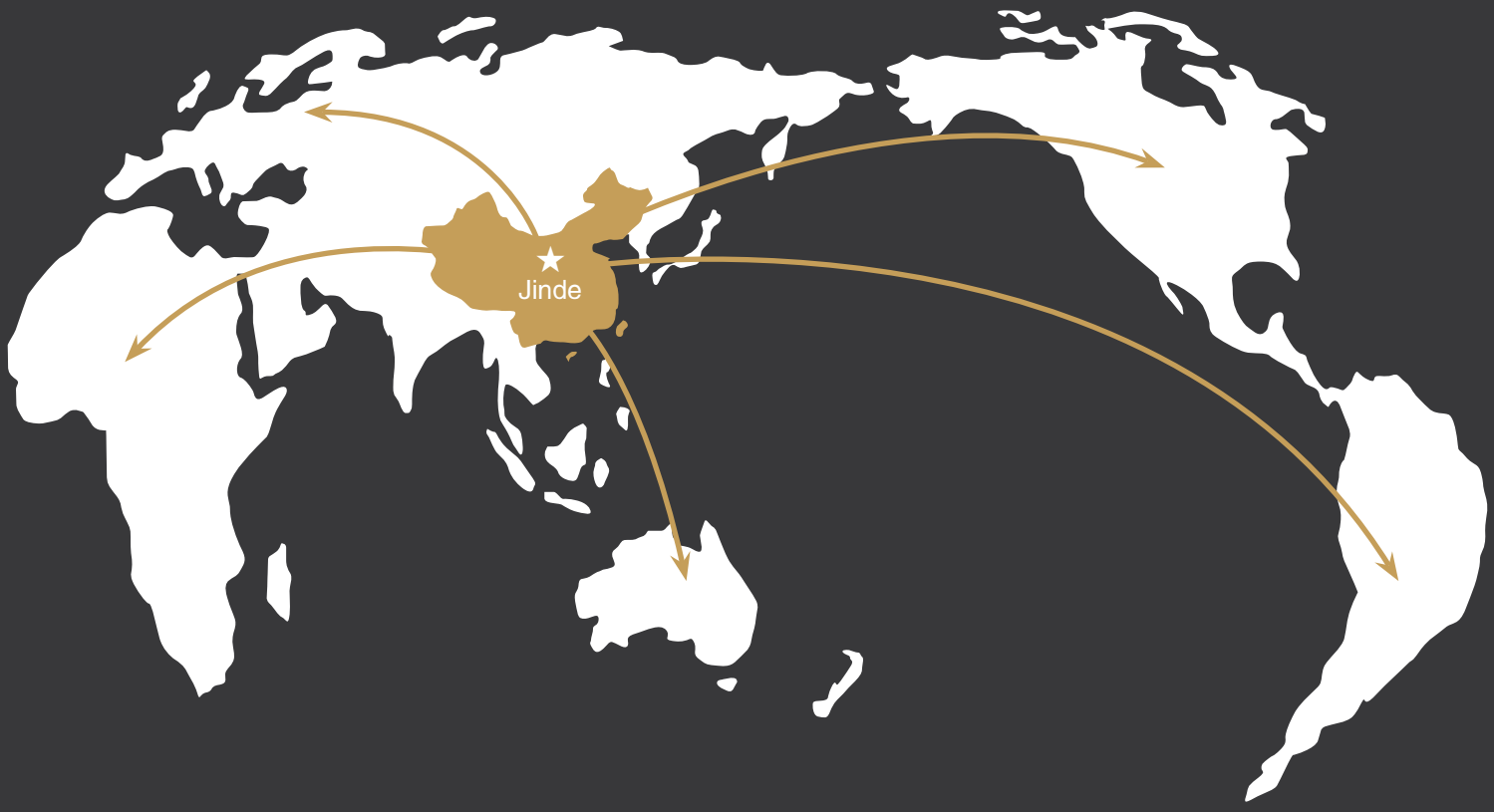


盲板
Blind Flange

水口用铁壳
Metal Shell for Nozzle

工艺流程 & 质量控制
Process Flow & Quality Control





GLOBAL SUPPLIER OF REFRACTORIES

JindeRef
锦德耐火

国内热线
诸城市锦德耐火材料有限公司
地址：山东省诸城市枳沟镇乔庄工业园区
电话：+86 15863260899
邮箱：jindenaihuo@163.com
网址：www.jindenh.com

Overseas Hotline
Zhucheng Jinde Refractory Co.,Ltd
Add：ZhiGou town Zhucheng Weifang city Shandong,China
Tel：+86 15753661791
Email：info@jinduncrucible.com
jindexport@163.com
Web：www.jdrefractories.com
https://zcjinde.en.alibaba.com