

# 高温耐火材料

## 钢包及中间包产品及解决方案

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**WE ARE YOUR EXPERT IN OVERALL SOLUTIONS  
FOR LADLE AND TUNDISH REFRACTORIES**

**唐山首尔耐火材料有限公司**

**TANGSHAN SOAR REFRACTORY CO., LTD.**



唐山首尔耐火材料有限公司成立于2005 年，坐落于唐山市丰润区。公司占地 48000 平方米，拥有固定资产1 亿元，现有员工400多人，其中专业技术人员20余人，高级工程师、硕士研究生以上学历员工4人。公司是经315全国征信系统平台认定的“AAA级信用单位”、“AAA级重合同守信用单位”；2015年中国耐火材料协会官网《耐材之窗》组织的耐火材料百强评选排名前列；2019年4月，公司被河北省耐火材料行业协会推选为副会长单位。

15年来，公司专注于钢包与中间功能性包耐火材料的研发、生产与经营，并提供相应的技术服务以及整体承包解决方案；企业稳健发展，规模不断扩大，已具备年25万吨的生产能力，同产品领域销售规模居河北省第三位，公司业务遍及国内外，覆盖国内东北、西北、华北、西南、华东各大产钢区域。2018年，公司产品国内市场占有率达到1.9%，省内市场占有率超过20%。2017年实现主营业务收入1.5亿元，2018年销售收入超2亿元，2019年销售收入3亿元，年增长率保持在30%以上。

未来，公司将立足耐火材料行业，依托公司在高温控流系统上的领先优势，完善高新技术研发中心，全力开拓新型材料在耐材上的研究与应用，形成南北二大生产基地，加快兼并重组，进一步增强综合实力。建成一个以高科技为基础、以耐火材料为主业，覆盖钢铁、新型材料、智能装备等领域的企业。力争在2023年完成在主板的上市。



唐山首尔耐火材料有限公司厂区全景图

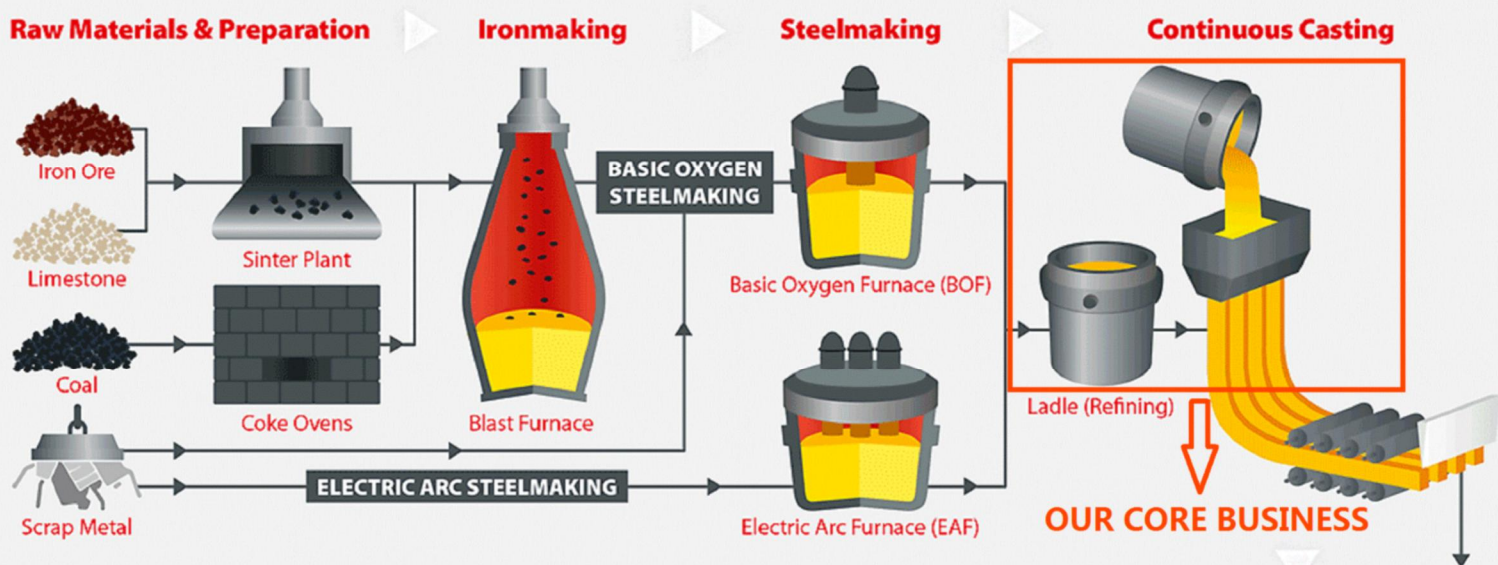
Aerial View of Tangshan Soar Refractory Co., Ltd.



Tangshan Soar Refractory Co., Ltd. was established in 2005 and is located in Fengrun District, Tangshan City - the cradle of the modern Chinese Industry. Our company covers an area of 48,000 qm<sup>2</sup> and has fixed assets of over 15 million US Dollars. There are over four hundred employees in our company. More than twenty of them are professionals and technical personnel. We also have four senior engineers, and four employees with master's degree or above. Our company has been honored as Reliable and Trustworthy Company by 315 National Credit Information System Platform. In 2015, Soar Refractory ranked the top in the top-100 refractory enterprises in the official website of *Refractories Window* - China Refractory Association. In April 2019, our company has been elected as the vice president of Hebei Refractory Industry Association.

Since its establishment 15 years ago, our company has been focusing on the R & D, production and marketing of shaped and unshaped refractories, such as sliding nozzles for high-temperature flow control system and ladle castables. We are able to provide the overall technical services, refractory solutions and products for ladle and tundish as well. Soar Refractory has been developing steadily and it keeps expanding continuously. It has an annual production capacity of 250,000 tons. In these product segments, our sales volume stays at the third place since many years in Hebei Province - the province with the largest steel production volume in China. Our company's business covers the steel production areas in Northeast, Northwest, North, Southwest and East of China and we are active both nationwide and globally. In 2018, the domestic market share of our company's products reached 1.9%, and our market share within the Hebei province exceeded 20%. In 2017, our main business revenue was over 20 million US Dollars. In 2018, our sales revenue reached almost 30 million US Dollars and in 2019 exceeded 40 million US Dollars. Our annual growth rate is keeping above 30% in recent years.

Soar Refractory will keep focusing on the refractory industry. Relying on our leading advantage in high-temperature flow control systems, we will improve the high-tech R&D center, fully explore the research and application of new materials in the refractory field, build two production bases in South and North China, accelerate the merger and reorganization, and further enhance our comprehensive competitiveness. Our new group enterprise will base on the high-tech materials, while refractory still remains as our core field. But our business scope will cover steel, new materials, intelligent equipment and so on. The IPO is expected to be completed in 2023.



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## 钢包镁碳砖

### MgO-C Bricks



for ladle slag lines...

首尔镁碳砖采用高纯度、高致密电熔镁砂及大结晶电熔镁砂、高纯石墨为主要原料，添加特殊添加剂及适量的抗氧化剂，以酚醛树脂、高效粘合剂为结合剂，机压而成。

该产品主要应用于钢包渣线、熔池及包底等工作部位，能显著提高钢包的使用寿命，特别是应用于渣线部位时其使用寿命能明显高出其它耐火材料。该产品具有强度高、抗渣性好、热震稳定性好等优点。可根据冶炼条件、冶炼钢种的不同而选择不同牌号的镁碳砖。

For Soar MgO-C bricks, high-purity and high-density fused magnesite, large crystal fused magnesite, and high-purity graphite are used as the main raw materials. The special additives and the appropriate antioxidants are added. Phenolic resin and high-efficient adhesives are binders. This brick is machine-pressed.

This product is mainly used in working linings such as ladle slag zones, sidewalls and bottoms. It could significantly increase the service life of ladles. Especially when it is applied in slag line, its service life could be significantly higher than that of other refractory materials. The product has the advantages of high strength, good slag resistance and good thermal shock resistance. Different types of MgO-C bricks could be selected according to different smelting conditions and steel grades.

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	渣线砖 Ladle Slag Line Bricks
MgO, % ≥	72
C, % ≥	14
显气孔率 / Apparent Porosity, % ≤	4
体积密度 / Bulk Density, g/cm <sup>3</sup> ≥	2.95
常温耐压强度 / Cold Crushing Strength, MPa ≥	35

\* 产品也可根据客户需求定制 / Tailored Solutions on Request



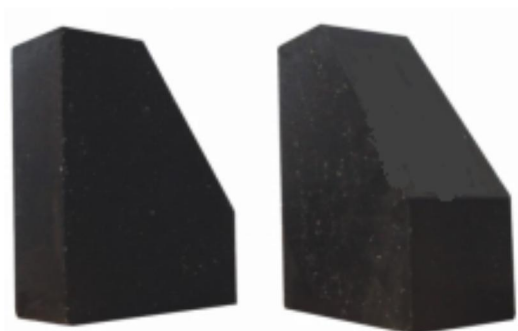
## 钢包铝镁碳砖

Al<sub>2</sub>O<sub>3</sub>-MgO-C Bricks

## 钢包镁铝碳砖

MgO-Al<sub>2</sub>O<sub>3</sub>-C Bricks

首尔铝镁碳砖和镁铝碳砖采用特级铝矾土及镁砂、刚玉为骨料，配以合理的基质组成，以酚醛树脂及特殊高强粘合剂为结合剂，机压成型。此产品具有抗侵蚀、抗剥落、强度高、残余膨胀适中等特点，广泛适用于钢包包底和包壁等部位。



Soar Al<sub>2</sub>O<sub>3</sub>-MgO-C bricks and MgO-Al<sub>2</sub>O<sub>3</sub>-C bricks are made of special grade bauxite, magnesite and corundum as aggregates. With an appropriate matrix composition, phenolic resin and special high-strength adhesives are binders.

The bricks are machine-pressed and they have the characteristics of corrosion resistance, anti-stripping, high strength and moderate residual expansion rate. It is widely used in ladle bottom and ladle sidewall.

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

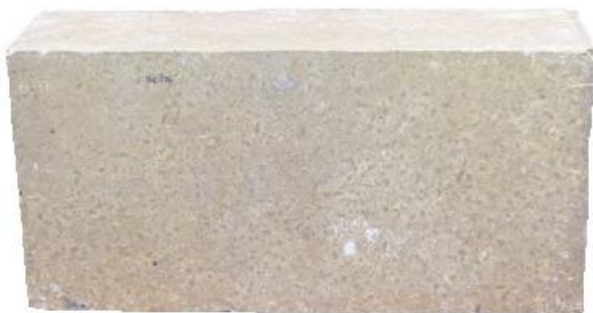
项目 / Item	铝镁碳砖 Al <sub>2</sub> O <sub>3</sub> -MgO-C Brick	镁铝碳砖 MgO-Al <sub>2</sub> O <sub>3</sub> -C Brick
Al <sub>2</sub> O <sub>3</sub> , % ≥	55	-
MgO, % ≥	-	45
Al <sub>2</sub> O <sub>3</sub> +MgO, % ≥	72	-
MgO+Al <sub>2</sub> O <sub>3</sub> , % ≥	-	75
C, % ≥	5	5
显气孔率 / Porosity, % ≤	7.0	5.5
体积密度 / Bulk Density, g/cm <sup>3</sup> ≥	2.90	2.90
常温耐压强度 / Cold Crushing Strength, MPa ≥	50	40

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

## 铝镁尖晶石砖

## Alumina Magnesia Spinel Bricks

首尔铝镁尖晶石砖以板状刚玉和尖晶石为原料，采用特种环保型结合剂，经机压而成，广泛应用于无碳钢包包壁和包底，减少了对冶炼洁净钢种的污染。



Soar alumina magnesia spinel brick is made of tabular corundum and spinel. The special environmental protection binder is adopted and this brick is machine-pressed. It is widely used in the carbon-free ladle sidewall and bottom to reduce the pollution on smelting clean steel.

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	数据 / Data
Al <sub>2</sub> O <sub>3</sub> , % ≥	90
MgO, % ≥	6
线变化 / Linear Change Rate, %	-0.3 - +0.5

\* 产品也可根据客户需求定制 / Tailored Solutions on Request



## 钢包镁钙砖 MgO-CaO Bricks



镁钙砖以特种含钙材料为原料，以特种树脂为结合剂，经加入特殊防水剂及特殊处理工艺制成。此产品主要应用于精炼钢包，能在使用过程中吸附钢水中的非金属夹杂物并达到净化钢水的目的。

MgO-CaO bricks are made of special calcium-containing materials. The special resin is a binder. The special waterproofing agent is added and this brick is produced through a special treatment process. This product is mainly used in refining ladle to absorb non-metallic inclusions in molten steel and achieve the purpose of purifying molten steel.

## 理化性能指标 / PHYSICAL AND CHEMICAL

项目 / Item	数据 / Data
CaO, % ≥	18 / 28 / 38 / 48
MgO + CaO, % ≥	92
*ΣSAF, % ≤	3.0
显气孔率 / Porosity, % ≤	15.0
体积密度, g/cm <sup>3</sup> ≥	2.90
常温耐压强度 / Cold Crushing Strength, MPa ≥	60
0.2 MPa荷重软化开始温度 / Refractories Under Load (RUL), T <sub>0.6</sub> /°C ≥	1650
*ΣSAF = SiO <sub>2</sub> % + Al <sub>2</sub> O <sub>3</sub> % + Fe <sub>2</sub> O <sub>3</sub> %	

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

## 钢包镁铬砖

### MgO-Cr<sub>2</sub>O<sub>3</sub> Bricks



镁铬砖由铬矿石和镁砂组成的复合碱性耐火材料，通过不同的结合方式压制成型，经高温或超高温烧成而得，具有优良的抗渣性、高温强度、抗冲蚀性和抗疲劳性。适用于AOD精炼炉，DH、RH脱气装置，VOD精炼包衬，有色冶炼炉衬及水泥窑内衬材料。

MgO-Cr<sub>2</sub>O<sub>3</sub> brick is a composite basic refractory material composed of chrome ore and magnesia.

It is compressed into shapes through different combinations and is burned at high or ultra-high temperature. It has excellent slag resistance, high-temperature strength, corrosion resistance and fatigue resistance. It is suitable for AOD refining furnace, DH, RH degasser, VOD refining furnace lining, non-ferrous smelting fur-

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	普通 Normal	直接结合 Directly- combined	再结合 Recombined	半再结合 Semi- recombined
MgO, % ≥	50	58	50	50
Cr <sub>2</sub> O <sub>3</sub> , % ≥	8	6	20	20
显气孔率 / Porosity, % ≤	22	18	17	16
常温耐压强度 / Cold Crushing Strength, MPa ≥	25	40	40	35
荷重软化温度/Refractories Under Load (RUL), °C ( 0.2MPa, T <sub>0.6</sub> )	1530	1650	1700	1700

\* 产品也可根据客户需求定制 / Tailored Solutions on Request



## 预制无碳砖

### Prefabricated Carbon-free Bricks



首尔公司开发的刚玉质及刚玉尖晶石质无碳砖

预制件及机压成型制品，具有高温体积稳定、耐侵蚀、抗热震性好等优点，有效减少炼钢过程中的增碳现象，用于低碳钢系列钢包上。

The corundum-based pre-formed shape developed by Soar Company is a carbon-free brick made of special bonding agent and through machine-pressed molding. It has the advantages of high-temperature stability, corrosion resistance and thermal shock resistance, which effectively reduce carbon increase in the steelmaking process.

So it is used on mild steel ladles.

Ladle Linings

钢包砖系列

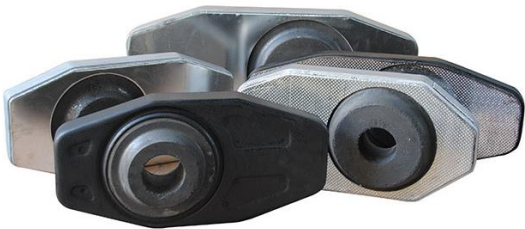
## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

名称/ Item		数据 / Data
Al <sub>2</sub> O <sub>3</sub> +MgO, % ≥		92
体积密度 / Bulk Density, g/cm <sup>3</sup> ≥		3.10
耐压强度	110°C x 24h	50
Crushing Strength, Mpa ≥	1550°C x 3h	90
永久线变化	1550°C x 3h	0 ~ +0.5
Permanent Linear Change (PLC)		

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

烧成滑板

Burned Slide Gate Plates



首尔烧成滑板经过中温或高温烧成工艺，具有强度高、抗冲刷、热震稳定性好、体积稳定性好等特点，是大中型钢包的首选材料。首尔烧成滑板分为铝碳质、铝锆碳质、镁尖晶石质，可满足不同钢种的需要。

Soar burned slide gate plate is burned at medium temperature or high temperature.

It has the characteristics of high strength, corrosion resistance, good thermal shock stability and good volume stability. It is the preferred material for large and medium-sized ladles.

Soar burned slide gate plates are divided into  $\text{Al}_2\text{O}_3$ -C-based,  $\text{Al}_2\text{O}_3$ - $\text{ZrO}_2$ -C-based, MgO-spinel-based ones, to meet the requirements of different steel grades.

理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item		$\text{Al}_2\text{O}_3$ -C-based	$\text{Al}_2\text{O}_3$ -C-ZrO <sub>2</sub> -based	MgO-Al <sub>2</sub> O <sub>3</sub> -C-based
Al <sub>2</sub> O <sub>3</sub> , %, ≥		70	70	-
Al <sub>2</sub> O <sub>3</sub> +MgO, %, ≥		-	-	80
C, %, ≥		2	3	3
ZrO <sub>2</sub> , %, ≥		-	4	-
常温耐压强度, MPa, ≥	不浸渍 unimpregnated	80	80	80
Cold Crushing Strength, MPa, ≥	浸渍 pitch-impregnated	80	100	90
显气孔率, % ≤	不浸渍 unimpregnated	10	10	10
Apparent Porosity, % ≤	浸渍 pitch-impregnated	5	5	5
体积密度, g/cm <sup>3</sup> , ≥	不浸渍 unimpregnated	2.9	2.95	2.9
Bulk Density, g/cm <sup>3</sup> , ≥	浸渍 pitch-impregnated	2.92	2.97	2.92



## 不烧滑板

### Unburned Slide Gate Plates



首尔公司开发的刚玉质及刚玉尖晶石质无碳砖预制件及机压成型制品，具有高温体积稳定、耐侵蚀、抗热震性好优点，有效减少炼钢过程中的增碳现象，用于低碳钢系列钢包上。

The main materials of the Soar unburned slide gate plate are  $\text{Al}_2\text{O}_3$ -C-based,  $\text{Al}_2\text{O}_3$ -MgO-based and  $\text{ZrO}_2$ -containing series. Special binder and antioxidant are adopted. It has the advantages of high strength, corrosion resistance and erosion resistance. Its costs war low and it does not pollute the environment. It is an environmental-friendly product and is proved to be the first choice for medium and small-sized ladles.

Flow Control Products

钢包控流系列

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	铝碳材质 $\text{Al}_2\text{O}_3$ -C based Material	镁碳材质 MgO-C based Material
$\text{Al}_2\text{O}_3$ , % $\geq$	90	-
MgO, % $\geq$	-	85
C, % $\geq$	2.00	3.5
体积密度 / Bulk Density, $\text{g/cm}^3 \geq$	3.00	2.95
常温耐压强度 / Cold Crushing Strength, MPa $\geq$	100	80
显气孔率 / Apparent Porosity, % $\leq$	12	10

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

钢包上水口

Inner Nozzles



对于钢厂来说，上水口的使用寿命对钢包包龄及滑动水口系列产品的消耗都有一定的影响。根据上述情况，首尔采用合理原料配合和合理颗粒级配，使产品具有良好的热震稳定性、优异的抗氧化性、抗侵蚀性和抗冲刷性能，达到长使用寿命的特点。

For steel mills, the service life of nozzles has a profound effect on the service life of ladle and the consumption of sliding nozzle products. According to the above facts, Soar Refractory adopts suitable raw materials and appropriate particle size distribution to make the products have good thermal shock stability, excellent oxidation resistance, corrosion resistance and erosion resistance, and achieve the characteristics of long service life.

理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	铝镁碳材质 Al <sub>2</sub> O <sub>3</sub> -MgO-C based Material	铝镁碳材质 Al <sub>2</sub> O <sub>3</sub> -C based Material
Al <sub>2</sub> O <sub>3</sub> + MgO, % ≥	80	-
Al <sub>2</sub> O <sub>3</sub> , % ≥	15	90
C, % ≥	5	2
体积密度 / Bulk Density, g/cm <sup>3</sup> ≥	2.98	3.00
显气孔率 / Porosity, % ≤	7	7

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

## 钢包机压下水口

### Pressed Collector Nozzles



采用刚玉、高铝矾土、鳞片石墨、抗氧化剂、酚醛树脂等研制生产的钢包下水口具有热震稳定性优良、强度高、抗冲刷能力强、不易断裂等特点。

The pressed collector nozzle developed and produced with corundum, high alumina bauxite, flake graphite, anti-oxidants and phenolic resin has the characteristics of excellent thermal shock stability, high strength, strong erosion resistance and cracking resistance.

钢包控流系列  
Flow Control Products

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 Item	铝碳材质 Al <sub>2</sub> O <sub>3</sub> -C based Material
Al <sub>2</sub> O <sub>3</sub> , % ≥	75
C, % ≥	5
体积密度 / Bulk Density, g/cm <sup>3</sup> ≥	2.90
显气孔率 / Porosity, % ≤	10

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

浇注下水口

Pouring Collector Nozzles



采用刚玉等高纯原料，配以特殊的添加剂，经过精细的加工生产工艺，浇注而成。浇注下水口具有热震稳定性优良、抗冲刷能力强、耐侵蚀、强度高、不氧化等特点。主要应用于大型钢包上。

They are made of high-purity raw materials such as corundum and special additives. It is poured through fine processing and producing techniques. This pouring nozzle has the characteristics of excellent thermal shock stability, strong erosion resistance, corrosion resistance, high strength and non-oxidation. It is mainly used in large-sized ladles.

理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	数据 / Data
MgO+Al <sub>2</sub> O <sub>3</sub> , % ≥	90
常温耐压强度 / Cold Crushing Strength, MPa ≥	45
体积密度 / Bulk Density, g/cm <sup>3</sup> ≥	3.15
显气孔率 / Apparent Porosity, % ≤	20

\* 产品也可根据客户需求定制 / Tailored Solutions on Request



## 浇注座砖

### Pouring Well Blocks



首尔浇注座砖采用刚玉、尖晶石等原料，通过科学的原料配制及合理的颗粒级配、精湛的生产工艺加工而成。本产品具有优异的结构稳定性、抗冲刷、耐侵蚀、热震稳定性好和使用寿命长等优点，适合各类型的精炼钢包使用。

Soar pouring well block is made of corundum, spinel and other raw materials. It is processed through scientific raw material preparation, appropriate particle gradation and exquisite production technology. This product has the advantages of excellent structural stability, erosion resistance, corrosion resistance, good thermal shock stability and long service life. It is suitable to be used in various types of refining ladle.

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	数据 / Data
Al <sub>2</sub> O <sub>3</sub> , % ≥	90
CaO, ≤	2
线变化 / Linear Change Rate, %	-0.3 - +0.5

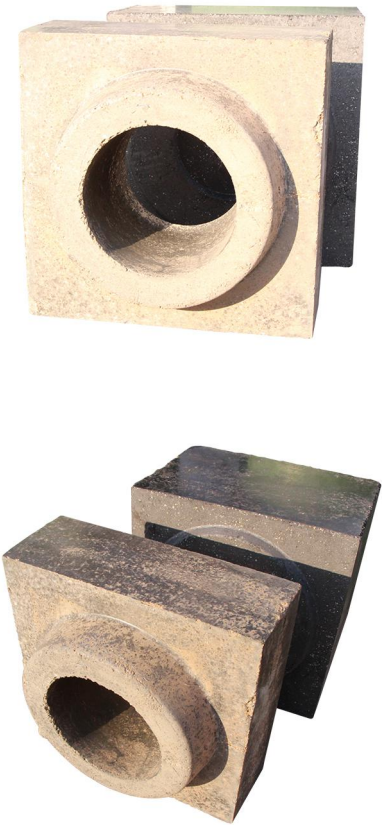
\* 产品也可根据客户需求定制 / Tailored Solutions on Request

机压水口座砖

Pressed Well Blocks

首尔机压水口座砖采用优质原材料，机压而成，具有结构稳定、抗冲刷、耐侵蚀、热震稳定性好和使用寿命长等优点。

Soar pressed well block is machine-pressed and made of high-quality raw materials. It has the advantages of stable structure, erosion resistance, corrosion resistance, good thermal shock stability and long service life.



钢包控流系列

Flow Control Products

理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	体积密度 Bulk Density, g/cm <sup>3</sup> ≥	显气孔率 Apparent Porosity, % ≤
刚玉质 Corundum-based Well Blocks	3.0	8
铝碳质 Al <sub>2</sub> O <sub>3</sub> -C based Well Blocks	2.90	10
高铝质 High Alumina Well Blocks	2.8	12

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

钢包底吹氩狭缝式透气砖

Purging Plugs



首尔钢包底吹氩透气砖是采用高纯、高密、高强度材料和MAS基质优化体系制成的铬刚玉质辐射状直通狭缝式透气砖。该系列产品具有结构稳定、透气量范围广、气体流量易于调节、吹成率高、抗冲刷、耐侵蚀和使用寿命长等特点。

首尔钢包底吹氩透气砖采用高技术特种原料，以传统狭缝作为气体通道、以高性能浇注料作外围材料的全新高性能复合透气砖。该系列产品具有更高的吹成率和使用寿命。

Soar Refractory applies MAS Matrix optimization system and uses high-purity, high-density, high-strength material in producing this spokewise Cr<sub>2</sub>O<sub>3</sub>-corundum-based directional slit purging plugs. They have the special features of structural stability, excellent air permeability, adjustable air volume, high blowing capacity, high erosion and corrosion resistance, long service life.

This type of purge plugs is a new composite product using high-tech special raw material and is coated by castables with high performance. The air passes through conventional slits. This series of product have even higher blowing capacity and longer service life.

理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	铬刚玉	刚玉尖晶石	刚玉尖晶石	铬刚玉莫来石
Al <sub>2</sub> O <sub>3</sub> +MgO+Cr <sub>2</sub> O <sub>3</sub> , % ≥	80			85
Al <sub>2</sub> O <sub>3</sub> +MgO, % ≥	92			92
Al <sub>2</sub> O <sub>3</sub> +Cr <sub>2</sub> O <sub>3</sub> , % ≥	20			20
体积密度 / Bulk Density, g/cm <sup>3</sup> ≥	-			-
常温耐压强度 / Cold Crushing Strength, MPa ≥	1680			1680

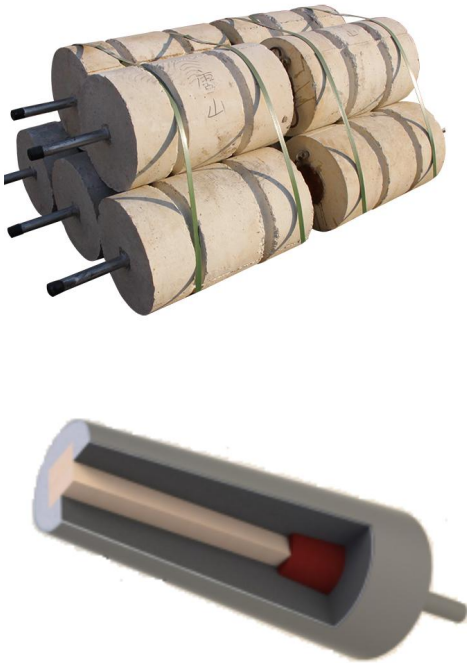
\* 产品也可根据客户需求定制 / Tailored Solutions on Request

钢包底吹氩弥散式透气砖

Porous Purging Plugs

具有较高的工作可靠性、安全性和经济性。在满足精炼方式多样化条件下，保证较高通气率，是直通孔、狭缝式透气砖都无法比拟的。

Porous purging plugs are more reliable at working, safer and more economical. When realizing a variety of methods for steel refining, high ventilation rate has to be guaranteed. This is far beyond what directional slit purging plugs could do.



钢包控流系列  
Flow Control Products

理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	T-80	T-85
Al <sub>2</sub> O <sub>3</sub> , % ≥	80	85
Al <sub>2</sub> O <sub>3</sub> +Cr <sub>2</sub> O <sub>3</sub> +MgO, % ≥	92	92
显气孔率 / Apparent Porosity, % ≤	20	20
常温耐压强度 / Cold Crushing Strength, MPa ≥	-	-
0.2MPa 荷重软化温度 Refractories Under Load (RUL), °C	1680	1680

\* 产品也可根据客户需求定制 / Tailored Solutions on Request



## 钢包引流沙

### Ladle Filler Sand



钢包引流沙以石英砂和高品位铬矿砂、锆英石等为主原料，并加入一定量的添加剂混合制成，可按钢包精炼的具体状况进行不同牌号的选择。

该系列产品具有不上浮、不过烧结、自开率高、操作简便和使用安全等优点。

Ladle filler sand is made of arenaceous quartz and high-grade chromite ore, zircon as the main raw materials. It is mixed with a certain number of additives.

Different grades could be selected according to the specific conditions of ladle refining.

This series of products have the advantages of non-floating, non-sintering, high opening rate, simple installment and safety application.

Castable Refractories

钢包控流系列

## 化学指标 / CHEMICAL PROPERTIES

项目 / Item	铬质 Cr <sub>2</sub> O <sub>3</sub> -based	锆质 ZrO <sub>2</sub> -based
Al <sub>2</sub> O <sub>3</sub> , %	8.82 - 28.55	5.04-7.5
MgO, %	4.55 - 10.01	3.18 - 4.55
SiO <sub>2</sub> , %	12.09 - 49.46	23.08 - 34.4
CaO, %	0.15 - 0.23	0.1 - 0.15
Cr <sub>2</sub> O <sub>3</sub> , %	23.05 - 32.27	16.1 - 23.05
Fe <sub>2</sub> O <sub>3</sub> , %	13.5 - 18.92	9.45 - 13.5
ZrO <sub>2</sub> , %	-	20.1 - 33.6
TiO <sub>2</sub> , %	0.17 - 0.26	0.09
C, %	≤ 3	≤ 3

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

## 胶泥饼

### Al<sub>2</sub>O<sub>3</sub>-C Briquette



该产品采用高纯原料，经特殊工序制成的产品，该产品可直接使用，操作简单，铺展性好、塑性好、粘结强度高、耐侵蚀等优点。是连接滑动水口结合部位的优质产品。

Through special procedure, this product is made of high-purity raw materials. This product could be applied directly. It has the advantages of simple handling, excellent spreadability, good briquettability, high bonding strength, and corrosion resistance. It is a high-quality product that connects the joint parts of sliding nozzles.

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	数据 / Data
Al <sub>2</sub> O <sub>3</sub> , % ≥	58
自由碳 / Free C, % ≥	3.5
厚度 / Thickness , mm	按客户要求 / on request
孔径 / Aperture , mm	按客户要求 / on request

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

## 自流浇注料

### Self-flow Castables



自流浇注料是刚玉、尖晶石、超细粉等，配以合适的结合剂和减水剂及外加剂，使泥料在自身重力的作用下，不经振动即能排气、流平，从而实现致密化的产品。

该产品具有合理的凝固硬化时间；省工省力、快捷方便；且强度高、寿命长、耐高温、热震稳定性良好，抗侵蚀、耐冲刷。

此产品应用广泛，适合于钢包包底及座砖周围、电炉顶填缝；莫来石自流料、高铝自流料适用于钢包、中包永久衬及水冷管包扎和加热炉炉顶、炉墙，此外自流料也可采用机械化施工。

The self-flow castable is made of corundum, spinel and ultra-fine powder and is matched with suitable binders, water-reducing agents and admixtures. Under its self-weight, it could be degassed and leveled without vibration so as to become compact. The product has an appropriate setting and hardening time. It saves labor and effort. Its handling easy and convenient and it has high strength, long service life, high-temperature resistance, good thermal shock stability, corrosion resistance and erosion resistance. This product is widely applied. It is suitable for filling the ladle bottoms, around the well blocks, and the EAF roof. Mullite self-flow material and high-alumina self-flow material are suitable for ladle and tundish permanent linings, sealing up water-cooling tubes, roof and sidewall of heating furnace. In addition, self-flow materials could also be applied in mechanized construction.

Castable Refractories

钢包浇注料系列

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item		A-90	AM-95
Al <sub>2</sub> O <sub>3</sub> , %, ≥		90	-
Al <sub>2</sub> O <sub>3</sub> +MgO, %, ≥		-	90
体积密度 / Bulk Density, g/cm <sup>3</sup> , ≥	Dried at 110°C x 24h 烘后	2.85	2.85
常温耐压强度, MPa, ≥	Dried at 110°C x 24h 烘后	30	30
Cold Crushing Strength, MPa, ≥	Fired at 1500°C x 3h 烧后	90	70
常温抗折强度, MPa, ≥	Dried at 110°C x 24h 烘后	4	5
Cold Strength, MPa, ≥	Fired at 1500°C x 3h 烧后	12	12
自流量 / Spreading Diameter, mm		170-210 (S)	200-220 (V)

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

钢包矾土低水泥浇注料

钢包矾土浇注料

钢包刚玉浇注料

钢包铝镁浇注料

钢包尖晶石浇注料

Al<sub>2</sub>O<sub>3</sub>-based low-cement Castable

Alumina-based Castable

Corundum Castable

Alumina-Magnesia Castable

Alumina Spinel Castable

首尔采用超微粉技术、优良结合剂和高效外加剂，依据耐火材料的基础理论及多年的研发、使用经验，根据钢厂的现场使用状况和操作条件，科学制定适宜的方案，精密调配粒度组成，合理选择结合剂和外加剂配制而成。

首尔生产的钢包浇注料具有强度高、抗热震性能好、耐侵蚀和体积稳定性好等特点，广泛适用于普通钢包、精炼钢包和电炉钢包的工作衬等。

Based on the fundamental theories of refractory materials and the R & D experience for many years, Soar Refractory adopts ultra-fine powder technology to combine excellent binders and high-efficiency admixtures. stability. It is widely applied in working linings of BOF ladles, EAF ladles and refining ladles.

According to the on-site using and operating conditions of the steel plants, we scientifically formulate the appropriate plans and precisely adjust the particle size composition. These products are formulated through appropriate selection of binding agent and admixture.

The ladle castables produced by Soar Refractory has the characteristics of high strength, good thermal shock resistance, corrosion resistance and good volume





## 钢包喷补料 Gunning Mixes



钢包喷补料选用刚玉、优质镁砂、尖晶石等原料，添加独特的结合剂、外加剂配制而成。该系列产品具有附着性好、强度高、回弹率低、易烧结、耐冲刷、抗侵蚀等特点，是钢包渣线及其它易损部位冷、热态修补的理想材料。

The ladle gunning mixes is made of corundum, high-quality magnesia, spinel and other raw materials. Unique binders and additives are applied.

This series of products has the characteristics of good adhesion, high strength, low rebounding rate, easy sintering, excellent erosion resistance and corrosion resistance. They are ideal materials for cold and hot repair of slag lines and other vulnerable parts of ladles.

钢包浇注料系列  
Castable Refractories

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	数据 / Data
Al <sub>2</sub> O <sub>3</sub> , %, ≥	80
MgO, %, ≥	2
CaO, %, ≤	2

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

优质耐火泥浆

High Quality Refractory Mortar



耐火泥浆主要有镁质、刚玉质、高铝质等，该系列产品具有操作简单，铺展性好、塑性好、易涂抹、粘结强度高、耐侵蚀等特点，适用于冶金等行业。

Refractory mortar mainly includes chrome-corundum-based, high alumina-based, etc. This series of products have the characteristics of simple handling, good spreadability, good plasticity, easy smearing, high bonding strength, and corrosion resistance. They are suitable for metallurgy and the other industries.

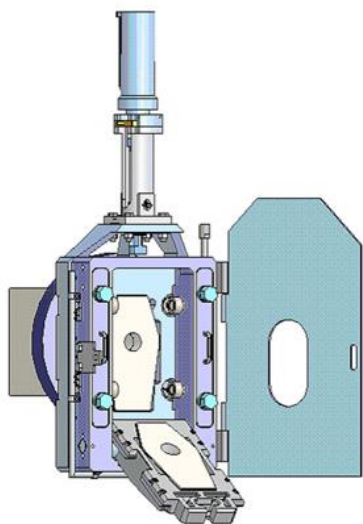
理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item		MgO-based	MgO-Al <sub>2</sub> O <sub>3</sub> -based
MgO, %, ≥		91	70
Al <sub>2</sub> O <sub>3</sub> , %, ≥		-	8 - 20 / 5 - 10
粘接时间 / Bonding time, min		1 - 3	1 - 3
常温抗折粘接强度, MPa, ≥ Flexural Bonding Strength at room temperature, MPa, ≥	Dried at 110℃ 干燥后	1.5	1.5
	Fired at 1500 °C x 3h 烧后	3.0	3.0
加热永久线变化率, % Heating permanent linear rate	Fired at 1500 °C x 3h 烧后	-4 - +1	-4 - +1
粒度 / Granularity, %	< 1.0 mm	100	100
	> 0.5 mm	2	2
	< 0.075 mm	60	60

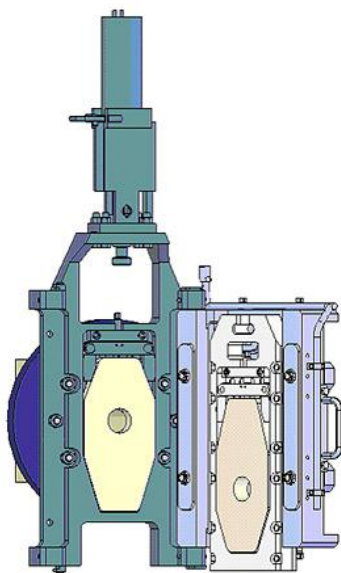
\* 产品也可根据客户需求定制 / Tailored Solutions on Request

## 滑动机构系列

### Ladle Slide Gate Systems



A型 / Type A



B型 / Type B

滑动水口机构由底座、框架、滑动小车，弹性元件组成，机构的滑动小车可以在框架内往复滑动，两滑板面通过弹性组件建立恒定、均匀的面压。

滑动水口机构具有结构紧凑，技术先进，具有较高的安全性和可靠性能，可大大提高耐材制品的使用寿命，实现多连滑操作。使用中具有操作灵活、装卸便利、工人容易掌握的特点。

此产品具有310、359、410、501型，根据钢厂的具体情况、钢包大小、浇钢时间等选用合适的类型。

The ladle slide gate system is composed of a base, a framework, a sliding trolley, and elastic elements. The sliding trolley of the mechanism could slide back and forth within the framework. The two slide surfaces could create a fixed and symmetric pressure through the elastic components.

The slide gate mechanism has a compact structure, advanced technology, high safety and reliability, which could greatly increase the service life of refractory products and realize multiple continuous slides. In use, it has the characteristics of flexible operation, convenient loading and unloading, and easy handling for workers.

Features:

This product has models of 310, 359, 410, and 501. The appropriate type is selected according to the specific conditions of steel plants, ladle size and required time for steel casting.

公司成立之初，就把科技作为企业发展的内生动力，提出“创新科技、领航未来”的发展理念。公司先后与武汉科技大学等高校建立校企合作关系，引进具有研究生学历、高工职称等专业技术人员多人。公司自主研发了多项业内领先的高温耐材制品，不仅在产品配方和品质方面实现了大幅提升，而且使生产工艺在绿色、可持续的发展道路上又向前迈进了一大步。

产品质量是企业立身之本，公司充分认识到质量对企业发展的重大意义。公司自2007年通过ISO9000 质量体系认证起，连年一次审核通过。2019年公司产品经国家耐火材料质量监督检验中心、中冶耐火材料检测中心检测，所有指标均符合国家标准，多项指标大幅优于国家标准。



At the very beginning in the company's history, to innovate technology continuously has already become the endogenous driving force of the company's development. We made "innovating technology and leading in the future" to our motto. Our company has successively established the college-enterprise partnerships with the universities such as Wuhan University of Science and Technology, and has introduced many professionals and technical personnel with postgraduate qualifications and senior engineer qualifications. Our company has developed a number of industry-leading high-temperature refractory products independently, which could not only achieve substantial improvements in product formulation and quality, but the production process has also realised a great improvement in green and sustainable development.

Product quality is the foundation of an enterprise. Soar Refractory realised the importance of quality to enterprise development clearly. Since being ISO9000-certified in 2007, our company has passed the reviews every year. When our company's products have been tested both by National Refractory Quality Supervision and Inspection Center and by China Metallurgical Refractory Testing Center in 2019, all the indicators met the national standards and many of them even outperformed those of the national standards significantly.



**我们的服务**  
**OUR SERVICE**



钢包热修

Hot Repair of Steel Ladles



钢包冷修

Hot Repair of Steel Ladles

钢包整体承包

Overall Contract for Ladle Refractories



中间包整体承包

Overall Contract for Tundish Refractories



中间包上水口

Tundish Upper Nozzles



中间包上水口使用时镶嵌于中间包底部的座砖内，可与塞棒配合起到控制钢水流量的作用。首尔中间包上水口具有耐冲刷性能好、热震稳定性好、抗侵蚀、防堵塞等特点，配合我公司生产的整体塞棒，可明显提高中间包连铸炉数。

Tundish nozzles are embedded in the seating blocks of tundish bottom. It could work with stopper rods to control the flow of molten steel. Soar tundish upper nozzle features good erosion resistance, good thermal shock stability, corrosion resistance and anti-clogging. With the stopper rods produced by our company, it could significantly increase the continuous casting amounts.

理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	铝碳质本体 Al <sub>2</sub> O <sub>3</sub> -based Outer Body	锆芯 ZrO <sub>2</sub> -Insert
Al <sub>2</sub> O <sub>3</sub> , % ≥	74	-
C, % ≥	5	-
ZrO <sub>2</sub> , % ≥	-	93.5
显气孔率 / Apparent Porosity, % ≤	10	10
体积密度 / Bulk Density, g/cm <sup>3</sup> ≥	2.8	5.0
耐压强度 / Cold Crushing Strength, Mpa ≥	60	65

\* 产品也可根据客户需求定制 / Tailored Solutions on Request



## 定径水口

## Metering Nozzles



首尔定径水口主要为镶嵌形式快换式定径水口，水口内芯的主成分为氧化锆，具有耐火度高、热震稳定性好、抗侵蚀、耐冲刷、扩径小、寿命长等特点。快换式定径水口借助于快换机构系统，可在中包的一个浇次中更换多个下水口，以配合长寿命中间包内衬使用。

Soar metering nozzle is mainly an inlaid quick-change metering nozzle. The main component of this nozzle core is zirconium, which has the characteristics of high refractoriness, good thermal shock stability, erosion resistance, corrosion resistance, small diameter expansion and long service life. With

the help of quick-change system, multiple metering nozzle could be used along with the long service life tundish linings and multiple nozzles could be replaced in one casting process.

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	铝碳质本体 Al <sub>2</sub> O <sub>3</sub> -based Outer Body	锆芯 ZrO <sub>2</sub> -Insert
Al <sub>2</sub> O <sub>3</sub> , % ≥	74	-
C, % ≥	5	-
ZrO <sub>2</sub> , % ≥	-	93.5
显气孔率 / Apparent Porosity, % ≤	10	16
体积密度 / Bulk Density, g/cm <sup>3</sup> ≥	2.7	4.5
耐压强度 / Cold Crushing Strength, Mpa ≥	60	65

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

中包滑板

Tundish Slide Gate Plates

首尔中包滑板具有体密高、耐磨损、抗侵蚀、热震稳定性好、寿命长等特点，是大中型中间包连铸的首选材料，可满足浇铸不同钢种的需要。



Soar tundish slide gate plate has the characteristics of such as high density, wear resistance, corrosion resistance, good thermal shock stability, long service life. It is the preferred material for continuous casting of large and medium-sized tundishes and could meet the needs of casting different steel grades.

理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item		Al <sub>2</sub> O <sub>3</sub> -C-based	Al <sub>2</sub> O <sub>3</sub> -C-ZrO <sub>2</sub> -based	MgO-Al <sub>2</sub> O <sub>3</sub> -C-based
Al <sub>2</sub> O <sub>3</sub> , %, ≥		70	70	-
Al <sub>2</sub> O <sub>3</sub> +MgO, %, ≥		-	-	80
C, %, ≥		2	3	3
ZrO <sub>2</sub> , %, ≥		-	4	-
常温耐压强度, MPa, ≥  Cold Crushing Strength, MPa, ≥	不浸渍 unimpregnated	80	80	80
	浸渍 pitch-impregnated	80	100	90
显气孔率, % ≤  Apparent Porosity, % ≤	不浸渍 unimpregnated	10	10	10
	浸渍 pitch-impregnated	5	5	5
体积密度, g/cm <sup>3</sup> , ≥  Bulk Density, g/cm <sup>3</sup> , ≥	不浸渍 unimpregnated	2.9	2.95	2.9
	浸渍 pitch-impregnated	2.92	2.97	2.92

## 长水口

## Ladle Shrouds



长水口是连接大包与中间包的耐火材料，长水口具有稳定钢液流动状态、防止钢液氧化、防止钢液的飞溅等功能。首尔高中档长水口具有抗热震性能好，抗钢水冲刷能力强，抗渣性好等优点。

Ladle shrouds are the connecting refractory between ladles and tundishes. They have the functions as stabilizing the molten steel streams, preventing molten steel from oxidizing and from splashing, etc. The premium and mid-range ladle shrouds of Soar Refractory feature excellent thermal shock resistance and wear resistance, outstanding resistance against erosion and slag.

## 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	指标 / Index						
	C <sub>45</sub>	C <sub>40</sub>	C <sub>35</sub>	Z <sub>70</sub>	Z <sub>65</sub>	Z <sub>55</sub>	M
Al <sub>2</sub> O <sub>3</sub> , %, ≥	45	40	35	-	-	-	-
F.C, %, ≥	20	25	30	12	15	18	15
ZrO <sub>2</sub> , %, ≥	-	-	-	70	65	55	-
MgO, %, ≥	-	-	-	-	-	-	58
显气孔率 / Apparent Porosity, %, ≤	19.0	19.0	20.0	21.0	21.0	22.0	18.0
体积密度 / Bulk Density, g/cm <sup>3</sup> , ≥	2.18	2.16	2.13	3.50	3.44	3.20	2.45
常温耐压强度 / Cold Crushing Strength, MPa, ≥	19.0	19.0	18.0	-	-	-	-
常温抗折强度, Modulus of Rupture, MPa, ≥	5.5	5.5	4.5	-	-	-	-
热震测试 (1100℃水冷), 次/	5	5	5	5	5	5	5
Thermal Shock Tests (1100 °C), times, ≥							

C — 长水口 / Ladle Shrouds

Z — 复合部位锆碳质 / ZrO<sub>2</sub>-C-based compound part

M — 复合部位镁碳质 / MgO-C-based compound part

\* 产品也可根据客户需求定制 /

Tailored Solutions on Request



## 浸入式水口

### Immersion Nozzles



主要是保护钢液从中间包流入结晶器时不被环境空气

二次氧化和防止钢水飞溅，改善注流在结晶器内的流动状态和热流分布，稳定连铸操作，防止铸坯表面缺陷的作用。首尔浸入式水口以其抗冲刷性好、防堵塞、长寿命、低事故率等优异性能，深得用户青睐。

Immersion nozzles (also submerged entry nozzles, SEN) protect steel fluid from being oxidized and splashing when the liquid steel flows from tundish into crystallizer.

They improve the flowing pattern of steel fluid and the distribution of the heat flow in the crystallizer as well. Casting operation could be stabilized and also defect surface of casting blanks could be minimized. Soar customers appreciate this series of product very much because of its outstanding performance as excellent erosion resistance, anti-clogging, long service life and low accident rate, etc.

### 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	指标 / Index							
	R <sub>50</sub>	R <sub>45</sub>	R <sub>40</sub>	R <sub>35</sub>	Z <sub>70</sub>	Z <sub>65</sub>	Z <sub>55</sub>	M
Al <sub>2</sub> O <sub>3</sub> , %, ≥	50	45	40	35	-	-	-	-
F.C, %, ≥	18	20	22	25	12	15	18	15
ZrO <sub>2</sub> , %, ≥	-	-	-	-	70	65	55	-
MgO, %, ≥	-	-	-	-	-	-	-	58
显气孔率 / Apparent Porosity, %, ≤	19.0	19.0	19.0	19.0	21.0	21.0	22.0	18.0
体积密度 / Bulk Density, g/cm <sup>3</sup> , ≥	2.36	2.28	2.25	2.18	3.50	3.44	3.20	2.45
常温耐压强度 / Cold Crushing Strength, MPa, ≥	19.0	19.0	19.0	18.0	-	-	-	-
常温抗折强度, Modulus of Rupture, MPa, ≥	5.5	5.5	5.0	4.0	-	-	-	-
热震测试 (1100℃水冷), 次/	5	5	5	5	5	5	5	5
Thermal Shock Tests (1100 °C), times, ≥								

R — 浸入式水口 / Immersion Nozzles

Z — 复合部位锆碳质 / ZrO<sub>2</sub>-C-based compound part

M — 复合部位镁碳质 / MgO-C-based compound part

\* 产品也可根据客户需求定制 /

Tailored Solutions on Request

整体塞棒

Tundish Stopper Rods



整体塞棒使用时安装于中间包内，用于控制钢液从中间包至结晶器的流量。首尔整体塞棒分为铝碳质和镁碳质，适用于浇铸不同的钢种；通过数模为客户设计的各种棒头分别适用于大方坯、小方坯，矩形坯、圆坯，大板坯、薄板坯等连铸。该产品具有良好的抗冲刷性能、抗侵蚀性能；浇铸过程中控流稳定，浇铸完成后关闭严密等优点。

Tundish stopper rods are applied within the tundish and control the steel flow from tundish into crystallizer. Soar Refractory provides Al<sub>2</sub>O<sub>3</sub>-C-based and MgO-C-based stopper rods according to casting steel grades. Different designs of stopper rods are available for bloom caster, billet caster, rectangular billet caster, round billet caster, slab caster and thin slab caster, depending on customer demands. They distinguish themselves for their excellent erosion and corrosion resistance, steady flow-control while casting and tight closure after casting, etc..

理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	指标 / Index						
	S <sub>60</sub>	S <sub>55</sub>	S <sub>45</sub>	Z <sub>70</sub>	Z <sub>65</sub>	Z <sub>55</sub>	M
Al <sub>2</sub> O <sub>3</sub> , %, ≥	60	55	45	-	-	-	-
F.C, %, ≥	10	15	20	12	15	18	15
ZrO <sub>2</sub> , %, ≥	-	-	-	70	65	55	-
MgO, %, ≥	-	-	-	-	-	-	58
显气孔率 / Apparent Porosity, %, ≤	18.0	19.0	19.0	21.0	21.0	22.0	18.0
体积密度 / Bulk Density, g/cm <sup>3</sup> , ≥	2.60	2.44	2.36	3.50	3.44	3.20	2.45
常温耐压强度 / Cold Crushing Strength, MPa, ≥	23.0	22.0	20.0	-	-	-	-
常温抗折强度, Modulus of Rupture, MPa, ≥	5.0	5.0	4.0	-	-	-	-
热震测试 ( 1100℃水冷 ), 次/	5	5	5	5	5	5	5
Thermal Shock Tests (1100 °C), times, ≥							

S — 整体塞棒 / Tundish Stopper Rods

Z — 复合部位锆碳质 / ZrO<sub>2</sub>-C-based compound part

M — 复合部位镁碳质 / MgO-C-based compound part

\* 产品也可根据客户需求定制 /

Tailored Solutions on Request

高铝火泥

刚玉火泥

铬质火泥

High Alumina Fireclay

Corundum Fireclay

Cr<sub>2</sub>O<sub>3</sub>-based Fireclay

该系列产品具有操作简单，铺展性好、塑性好、易涂抹、粘结强度高、耐侵蚀、等优点。

This series of products have the advantages of simple handling, good spreadability, good plasticity, easy smearing, high bonding strength, corrosion resistance, etc.



高铝火泥  
High Alumina Fireclay



刚玉火泥  
Corundum Fireclay



铬质火泥  
Cr<sub>2</sub>O<sub>3</sub>-based Fireclay

中间包控流系列

Tundish Flow Stabilizers

理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	刚玉火泥 Corundum Fireclay	高铝火泥 High Alumina Fireclay	铬质火泥 Cr <sub>2</sub> O <sub>3</sub> -based Fireclay
Al <sub>2</sub> O <sub>3</sub> , % ≥	90	80	70
Cr <sub>2</sub> O <sub>3</sub> , % ≥			2

\* 产品也可根据客户需求定制 / Tailored Solutions on Request

**挡渣板 Slag Dam****冲击板 Impact Pad****稳流器 Stabilizer****护墙板 Protection Pad****拐角护板 Corner Guard****水口座砖 Seating Block**

在中间包内设计安放挡渣板可以改变钢液在中间包内的湍流状态，降低钢水流动速度，促使钢液中有杂质的上浮，增强中间包净化钢液的功能性作用；冲击板和护墙板可有效保证中间包使用过程中的安全性并可显著提高其使用寿命。首尔研制的挡渣板、冲击板、稳流器、护墙板、拐角护板和水口座砖系列产品具有抗渣性能好，稳定性好，热态强度高，使用寿命长等特点。

该系列产品主要分为镁铝尖晶石碳质、镁碳质、铝镁系列等，可根据用户方的冶炼工艺，使用时间和冶炼钢种等不同要求对上述产品进行合理搭配。

The slag dam designed and placed in tundish could change the flow status, reduce the flow speed of molten steel, promote the floating up of impurities in molten steel and enhance the functionality of tundish to purify the molten steel. Impact pad and protection pad could effectively ensure the safety of tundish and could significantly increase its service life. The series of slag dam, impact pad, stabilizer, protection pad, corner guards and seating block developed by Soar Refractory have the characteristics of excellent slag resistance, good stability, high thermal strength and long service life.

This series of products are mainly divided into  $\text{MgO-Al}_2\text{O}_3$ -spinel-C-based,  $\text{MgO-C}$ -based,  $\text{Al}_2\text{O}_3\text{-MgO}$ -based ones. The above products could be suitably matched according to the different requirements of user's smelting process, using time and smelting steel grade.



挡渣板 / Slag Dam



冲击板 / Impact Pad



稳流器 / Stabilizer



水口座砖 / Seating Block



## 中间包干式料

### Tundish Dry Ramming Mixes



中间包干式料是中间包工作衬用主要材料，该产品依据最紧密堆积原理设计颗粒级配，选用优质镁砂或镁橄榄砂为主要原料，应用环保结合剂技术研制而成。

该产品为干法成型，施工快捷，操作方便，施工后体积稳定，可以有效地减少中间包工作层材料对钢水的污染。

首尔研制的中间包干式料系列产品可做到满足12小时到72小时的使用寿命的要求。

The tundish dry ramming mixes is the main material for tundish linings. This product is conceived according to the powder packing theory to design particle distribution. High-quality magnesia or forsterite is selected as the main raw material. It is developed applying the environmental protection binder technology.

This product has the characteristics of dry forming, quick construction, easy handling, and stable volume after construction. It could effectively reduce the pollution of tundish working lining material on molten steel.

The tundish dry ramming mixes developed by Soar Refractory could meet the requirement for a service life of 12 hours to 72 hours.

### 理化性能指标 / PHYSICAL AND CHEMICAL PROPERTIES

项目 / Item	数据 / Data
MgO, %, ≥	55或90 / 55 or 90

\* 产品也可根据客户需求定制 / Tailored Solutions on Request



## 中间包涂抹料

### Tundish Daub

与传统使用绝热板做为中间包内衬相比，中间包涂抹料具有施工简单，使用寿命长，抗渣侵蚀性能优异，使用后易解体和不污染钢水等特点。

中间包涂抹料是选用优质镁砂、镁钙砂、橄榄石等为主要原料，通过采用合理的颗粒级配、结合剂、增塑剂、减水剂和防爆剂等精心研制而成。

首尔研制的中间包系列涂料可满足人工涂抹和机械化喷涂等不同施工方式需要。

Compared with the traditional thermal insulation shield as tundish lining, the tundish daub has the characteristics of simple construction, long service life, excellent resistance to slag corrosion, easy disintegration after use and no pollution on molten steel.

The tundish daub is made of high-quality magnesia, dead burned high-calcium magnesite, olivine, etc. It is developed with appropriate particle gradation, binder, plasticizer, water-reducing agent and explosion-proof agent.

The tundish series daub developed by Soar Refractory could meet the requirements of different construction methods such as manual painting and mechanized spraying.

## 永久衬浇注料

### Refractory Castables

### for Tundish Permanent Lining

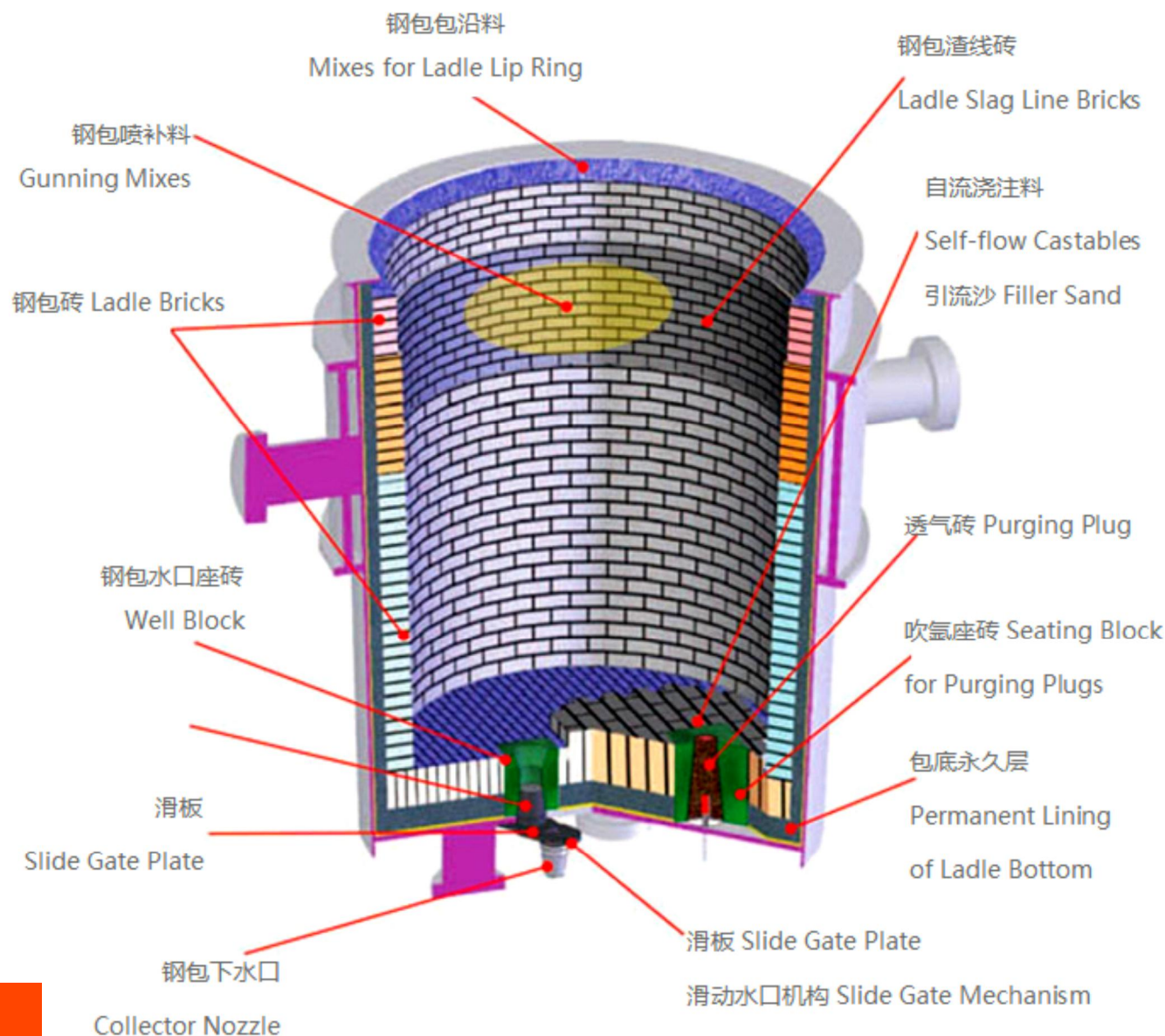
该系列永久衬浇注料是采用合理颗粒级配、合适的原料品种、加入适量的超微粉和高效添加剂制成的低水泥高强度浇注料。该系列浇注料具有体积

稳定性好、强度高、保温性好等优点，适用于钢包、中间包等永久层部位使用。

This series of permanent linings are low-cement and high-strength castables made with appropriate particle gradation, suitable raw materials, and appropriate amounts of ultra-fine powder and high-efficiency additive. This series of castable have the advantages of good volume stability, high strength, good heat preservation, etc. It is suitable for ladle and tundish permanent linings.

## 钢包整体承包

### Steel Ladle Refractory Solutions

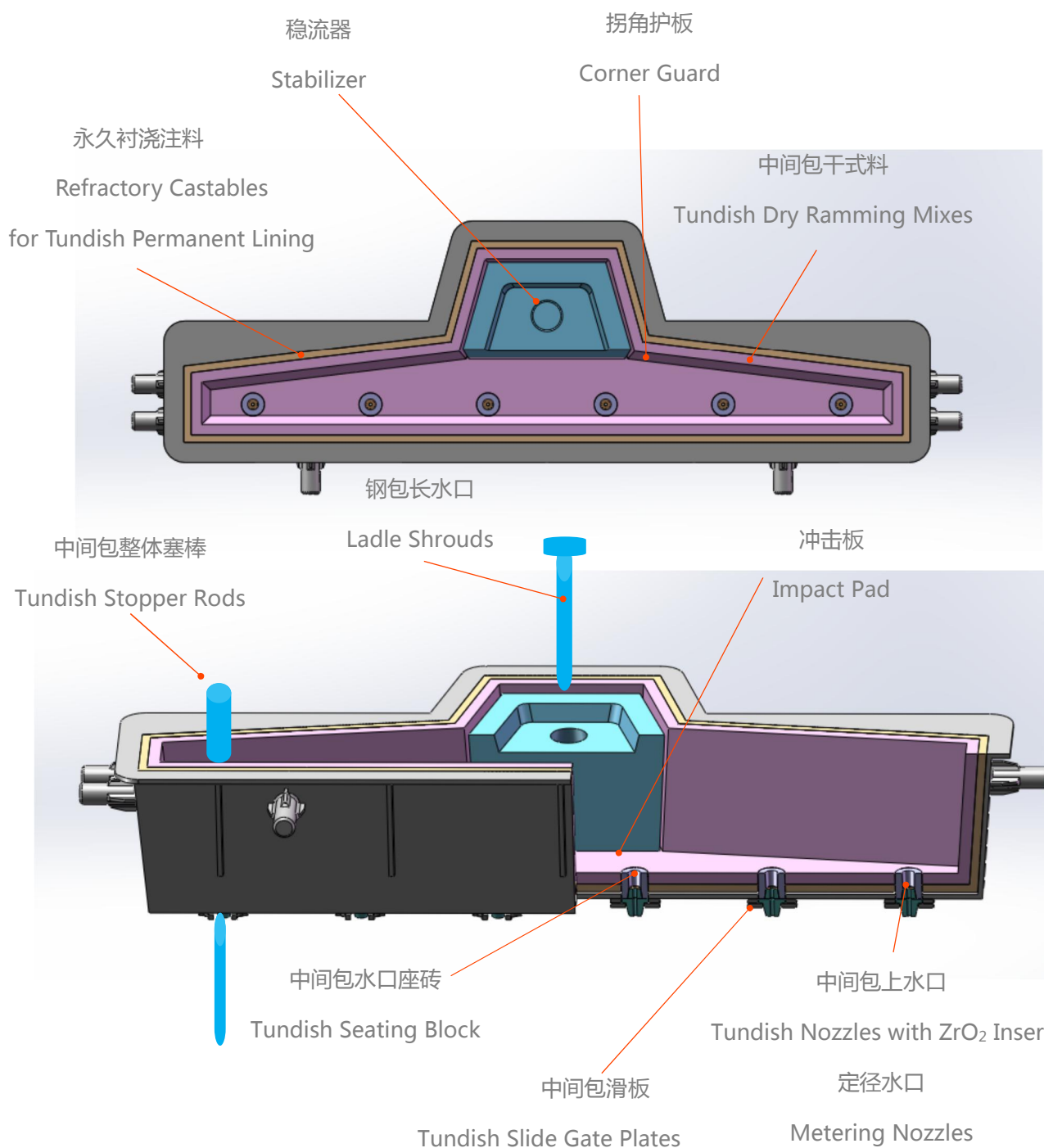


首尔耐材将利用本司丰富的钢包整体承包的专业知识与经验，结合客户的需求和要求，为客户量身定制从设计到施工、从维护到维修的全方位钢包耐火材料整体方案，选用和供应最适合的材质和产品。

Based on our abundant expertise and experience in overall contracts of ladle refractories for over a decade, Soar Refractory is able to provide custom-made overall solutions in this field, from planning to construction, from maintenance to service. We could offer the most professional and economical materials and products to our customers.

## 中间包整体承包

### Tundish Refractory Solutions



首尔耐材将利用本司丰富的中间包整体承包的专业知识与经验，结合客户的需求和要求，为客户量身定制从设计到施工、从维护到维修的全方位中间包耐火材料整体方案，选用和供应最适合的材质和产品。

Based on our abundant expertise and experience in overall contracts of tundish refractories for over a decade, Soar Refractory is able to provide custom-made overall solutions in this field, from planning to construction, from maintenance to service. We could offer the most professional and economical materials and products to our customers.

在全球化程度不断深入、世界经济形势与格局变化加快的大背景下，首尔耐材将立足于耐火材料行业，依托公司在高温耐材控流系统上的领先优势，完善高新技术研发中心，全力开拓新型材料在耐材上的研究与应用，形成南北二大生产基地，加快兼并重组，进一步增强综合实力。建成一个以高科技为基础、以耐火材料为主业，覆盖钢铁、新型材料、智能装备等领域的新型现代企业。

扎实的专业基础、周密而又灵活的战略部署，赋予了首尔人足够的信心和勇气，去迎接新时代带给我们的机会与挑战！



While the globalization is intensifying continuously and the economic circumstances are changing fundamentally, Soar Refractory will remain focused on the refractory industry. Relying on our advantages in the flow-control systems, we are going to improve our R&D-capability and to dedicate to research applications of new materials in the refractory sector. Establishment of two production bases is expected in South and North China. In the future, the reorganized Soar Refractory will become a modernized High Tech enterprise covering fields as steel, new materials and smart equipment, besides refractory as its core business.

The solid expertise and professionalism, careful but also flexible strategic deployment, all of these give us sufficient confidence and courage to face the challenges and opportunities coming in the new era.



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本产品图册可在我公司网站上下载。

我们也愿意随时为您提供更多、更新的公司以及产品信息

欢迎联系我们！

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