Alumina Bubble Products 氧化铝空心球制品

Alumina hollow balls are made of industrial alumina melted and blown in an electric furnace, and the mineral phase is a-Al_2O_3 microcrystals. With aluminum oxide hollow spheres as the main body, adding appropriate auxiliary raw materials and binders, it can be molded in various ways and sintered to make lightweight high-temperature heat-insulation materials in various shapes with a volume density of 1.1-1.8g/cm³. Alumina bubble products are characterized by a maximum service temperature of up to 1800°C, low thermal conductivity, a bulk density of only about half that of corundum products but times of the mechanical strength of general light products, excellent thermal shock resistance & resistance to various high-temperature atmosphere, and can be directly used as the high-temperature kiln lining. It is an ideal ultra-high temperature lightweight energy-saving material. Zhejiang Trend produces three recipes of alumina bubble products ZAB99, ZAB95 and ZAB90 to meet the needs from different application fields.

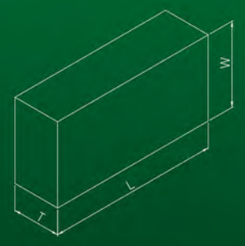
氧化铝空心球是用工业氧化铝在电炉中熔炼吹制而成，矿物相为a-Al_2O_3微晶体。以氧化铝空心球为主体，添加适当的辅助原料和结合剂，可采用多种方式成型、烧结后制成体积密度1.1-1.8g/cm³各种形状的轻质高温隔热材料。氧化铝空心球制品的特点是最高使用温度可达1800℃，导热系数低，体积密度仅为刚玉制品的一半左右但机械强度为一般轻质制品的数倍，抗热震性优异且耐受各种高温气氛，可直接用做高温窑炉内衬，是一种非常理想的超高温轻质节能材料。浙江创导生产三种牌号的氧化铝空心球制品ZAB99、ZAB95和ZAB90，以满足不同应用领域的需求。

Properties 技术性能		Units 单位	Trend's Materials 材料牌号		
			ZAB99	ZAB95	ZAB90
Compositional 物质组成					
Mineralogy 矿物组成			Microcrystalline Corundum 微晶刚玉	Microcrystalline Corundum 微晶刚玉	Microcrystalline Corundum 微晶刚玉
Chemical composition 化学成分	Al_2O_3	%	99	95	90
	SiO_2	%	0.2	3.0	8.2
	Fe_2O_3	%	0.02	0.04	0.18
Mechanical 机械性能					
Bulk density 体积密度		g/cm³	1.4-1.7	1.4-1.6	1.4-1.6
Compressive strength @ RT 常温耐压强度		Mpa	17.0	16.6	10.5
M.O.R. @1250℃ 1250℃时抗折强度		Mpa	8	-	-
Thermal 热学性能					
Thermal shock resistance 热震稳定性		★	★★★★	★★★★	★★★★
Max working temperature 最高工作温度		℃	1800	1800	1700

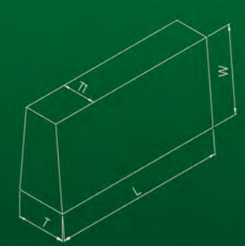
Applications and Main Product Sizes 应用及主要规格尺寸

Trend alumina bubble products are widely used in the following fields: general continuous and intermittent ultra-high temperature kiln lining, kiln car base lining, nitrogen and hydrogen protection kiln lining, electric furnaces with various heating elements, petrochemical Industrial gasification furnaces, carbon black industrial reaction furnaces and metallurgical industrial induction furnaces etc, very significant energy-saving performances are seen.

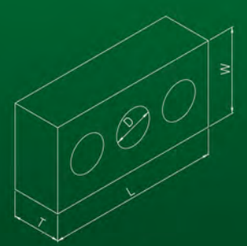
创导氧化铝空心球制品广泛应用于下述领域：一般的连续式和间歇式超高温窑炉内衬、窑车台衬，氮气、氢气保护窑炉内衬，各种发热体的电炉，石化工业气化炉，炭黑工业反应炉及冶金工业感应电炉等，具有非常显著的节能效果。



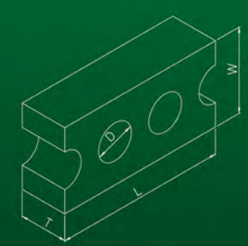
T12. 01. 2000-2002



T12. 01. 2003-2005



T12. 01. 2006-2007



T12. 01. 2006-2007

Drawing No. 产品图号	L,mm	W,mm	T,mm	T1,mm	D,mm
T12.01.2000.001	230	114	65		
T12.01.2001.001	265	132	65		
T12.01.2002.001	172	114	65		
T12.01.2003.001	218	120	69	64.5	
T12.01.2003.002	110	120	69	64.5	
T12.01.2003.003	195	120	69	64.5	
T12.01.2004.001	218	130	110	35	
T12.01.2005.001	230	114	73	68	
T12.01.2005.002	240	114	73	68	
T12.01.2005.003	140	114	73	68	
T12.01.2006.001	200	132	65		70
T12.01.2007.001	236	110	114		50

* Other shapes and sizes can be produced according to customer needs.
* 其它形状和尺寸按需求生产。

Corundum-Mullite Products 刚玉-莫来石制品

Trend corundum-mullite products are advanced refractory products, made of sintered corundum or fused corundum, sintered mullite or fused mullite and a-Al2O3 as the main raw materials, supplemented with sintering aids and binders, and sintered at high temperature. Corundum and mullite are the main crystal phases. The products have good high temperature strength, high temperature creep resistance, thermal shock resistance and corrosion resistance. Trend mainly has five recipes of corundum-mullite products, each with its own emphasis on high-temperature performance, to meet the needs from various industries and multi-scenario applications.

创导刚玉-莫来石制品是以烧结刚玉或电熔刚玉、烧结莫来石或电熔莫来石及a-Al2O3等为主要原料，再辅以烧结助剂和结合剂，通过高温烧结而成的高级耐火材料制品，其主晶相为刚玉和莫来石。此类制品具有较好的高温强度、抗高温蠕变性、抗热震性和抗侵蚀性。创导主要有五种牌号的刚玉-莫来石制品，在高温性能方面各有侧重，以满足各行业、多场景应用。

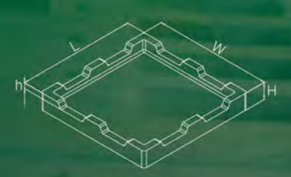
Properties 技术性能		Units 单位	Trend's Materials 材料牌号				
			ZCM95	ZCM90	ZCM85	ZCM80	ZCM75
Compositional 物质组成							
Mineralogy 矿物组成			Corundum Mullite 刚玉 莫来石	Corundum Mullite 刚玉 莫来石	Corundum Mullite 刚玉 莫来石	Corundum Mullite 刚玉 莫来石	Mullite 莫来石
Chemical composition 化学成分	Al_2O_3	%	95	90	85	80	75
	SiO_2	%	3.0	8.5	12.5	18.7	23.0
	MgO	%	0.25	0.35	0.50	0.50	0.20
Mechanical 机械性能							
Bulk density 体积密度		g/cm^3	3.2	3.2	3.0	2.9	2.7
Apparent porosity 显气孔率		%	16	17	18	18	17
Compressive strength@RT 常温耐压强度		Mpa	132	132	113	100	90
Thermal 热学性能							
Refractoriness under load 荷重软化温度T2 @0.2Mpa		℃	1700	1700	1650	1620	1700
Thermal shock resistance 热震稳定性		★	★★★	★★★	★★★★	★★★★	★★★★
Max working temperature 最高工作温度		℃	1750	1700	1650	1600	1750

Applications and Main Product Sizes 应用及主要规格尺寸

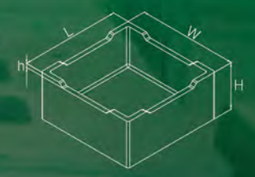
Corundum-mullite products of various shapes can be produced by various molding methods such as semi-dry pressing, vibration pressing, plastic hand making, and casting. Trend corundum-mullite products are widely used in electronic ceramics such as varistors, thermistors, ceramic capacitors, electric vacuum tubes, ceramic substrates, pusher plates and saggars for magnetic material kilns; kiln furniture such as pusher plates and saggars used in calcination kilns for battery materials such as lithium cobalt oxide and lithium iron phosphate; pusher plates and saggars and other kiln furniture materials for kilns that require protective atmospheres (hydrogen, nitrogen, etc.) for calcining zirconia and rare earths; they are also widely used in industrial microwave ovens, kiln furniture, kiln linings, and furnace linings of high-temperature molybdenum wire furnaces (powder metallurgy, battery negative electrode materials, LED phosphors).

可以采用多种成型方式如半干法压制、振动压制、可塑法捣打、注浆等制作各种形状的刚玉-莫来石制品。创导刚玉-莫来石制品广泛应用于电子陶瓷如压敏电阻、热敏电阻、陶瓷电容器，电真空管，陶瓷基片、磁性材料窑炉的推板和匣钵；应用于电池材料钴酸锂、磷酸铁锂等煅烧窑炉的推板、匣钵等窑具；应用于煅烧氧化锆、煅烧稀土等需保护气氛（氢气、氮气等）窑炉的推板、匣钵等窑具材料；还广泛应用于工业微波炉、高温钼丝炉（粉末冶金、电池负极材料、LED荧光粉）的窑具、窑衬、炉胆等。

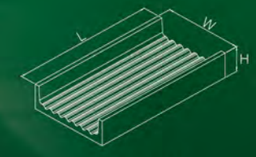
T07. 02. 0202



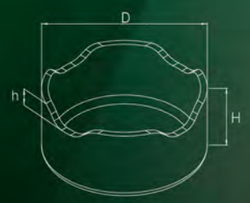
T07. 02. 0203



T07. 02. 0204

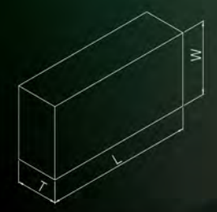


T07. 03. 0019



T07. 01. 0054

Drawing No. 产品图号	L,mm	W,mm	H,mm	h,mm
T07.02.0202.001	250	125	27.5	5
T07.02.0203.001	210	210	30	10
T07.02.0204.001	260	260	120	10
T07.03.0019.001	136	45	250	-
T07.01.0054.001	直径Diameter=250		115	20



T10. 12. 0001-0006

Drawing No. 产品图号	L,mm	W,mm	T,mm
T10.12.0001.001	172	114	65
T10.12.0002.001	230	114	65
T10.12.0003.001	230	230	65
T10.12.0004.001	340	340	45
T10.12.0005.001	345	114	65
T10.12.0006.001	400	500	65

* Other shapes and sizes can be produced according to customer needs.
* 其它形状和尺寸按需求生产。

Zirconium-Mullite Products 锆莫来石制品

Introduce zirconia into mullite material by sintering method or electric fusion method, and further improve the thermal shock resistance and corrosion resistance of mullite through mechanisms such as ZrO_2 or promoting sintering of mullite, or toughening mullite, or improving the structure of mullite etc, so as to obtain fused or sintered zircon mullite products. The sintered zirconium-mullite products produced by our company are high-grade refractory materials made of industrial alumina and zircon concentrate as raw materials via introducing ZrO_2 into the mullite matrix through reaction and sintering. They have good normal & high temperature strength, good wear resistance, high load softening temperature, good thermal shock stability and strong corrosion resistance.

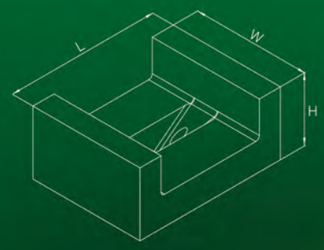
以烧结法或电熔法将氧化锆引入到莫来石材料中，通过ZrO_2或促进莫来石的烧结、或对莫来石增韧、或改善莫来石的结构等机理进一步提高莫来石的抗热震性、耐侵蚀性能等，从而得到电熔或烧结锆莫来石制品。本公司生产的烧结锆莫来石制品，是采用工业氧化铝和锆英石精矿为原料，通过反应与烧结将ZrO_2引入到莫来石基质中而制成的高级耐火材料，具有较高的常温和高温强度、良好的耐磨性、荷载软化温度高、热震稳定性好且抗侵蚀能力强。

Properties 技术性能		Units 单位	Trend's Materials 材料牌号		
			ZZR10	ZZR16	ZZR20
Compositional 物质组成					
Mineralogy 矿物组成			Mullite Baddeleyite 莫来石 斜锆石	Mullite Baddeleyite 莫来石 斜锆石	Mullite Baddeleyite 莫来石 斜锆石
Chemical composition 化学成分	Al_2O_3	%	72.0	55.0	70.0
	SiO_2	%	15.0	28.0	10.0
	ZrO_2	%	11.0	16.0	19.5
Mechanical 机械性能					
Bulk density 体积密度		g/cm^3	3.00	2.85	3.15
Compressive strength @ RT 常温耐压强度		Mpa	100	80	100
M.O.R. @1250℃ 1250℃时抗折强度		Mpa	-	-	13
Thermal 热学性能					
Thermal shock resistance 热震稳定性		★	★★★	★★★	★★
Max working temperature 最高工作温度		℃	1650	1600	1650

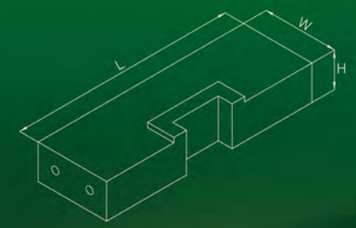
Applications and Main Product Sizes 应用及主要规格尺寸

Trend zirconium-mullite products adopt semi-dry pressing, vibration pressing, hand making and other molding processes, and can be made into conventional shapes and various special-shaped products. They are widely used in key parts of glass melting furnaces such as the roof, furnace bottom, lip bricks, regenerator partition walls, etc., pouring steel slide plates in the iron and steel industry, sizing nozzles and long nozzles in continuous casting ladles, and easily eroded parts in the chemical industry.

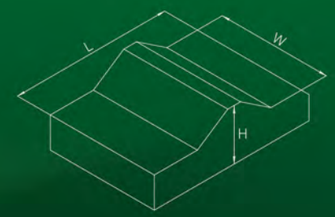
创导锆莫来石制品采用半干法压制、振动压制、捣打等成型工艺，可制成常规形状及各种特异型制品，广泛应用于玻璃熔窑的关键部位如碹顶、炉底、唇砖、蓄热室隔墙等，钢铁工业的浇钢滑板、连铸包的定径水口及长水口等以及化工行业的易侵蚀部位。



T10.14.0001

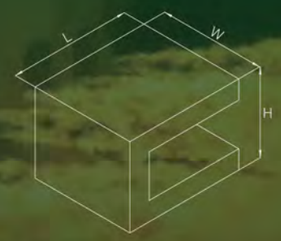


T10.14.0002

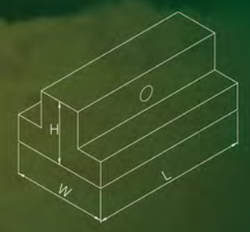


T10.14.0003

T10.14.0004



T10.14.0005



T10.14.0006

Drawing No. 产品图号	L,mm	W,mm	H,mm
T10.14.0001.001	800	610	360
T10.14.0002.001	900	300	170
T10.14.0003.001	610	410	200
T10.14.0004.001	300	300	135
T10.14.0005.001	310	270	225
T10.14.0006.001	300	180	220

* Other shapes and sizes can be produced according to customer needs.
* 其它形状和尺寸按需求生产。

Sintered AZS Products 烧结AZS制品

Trend sintered AZS products are dense refrctory made of fused zirconia corundum as the main raw material, and the main crystal phases are corundum, baddeleyite and mullite, processed by high temperature re-sintering, which have good thermal shock resistance, excellent glass erosion performance and anti-alkali steam erosion performance. They are mainly used for bottom bricks, checker bricks for regenerators, forehearth bricks and upper structures of working pools, etc for soda-lime glass, electric vacuum glass, lead glass and instrument glass furnace, as well as lining bricks for cement and various enamel rotary kiln (furnace), etc. At the same time, we also provide supplementary AZS castable, ramming materials and mortar.

创导烧结AZS制品是以电熔锆刚玉为主要原料，通过高温再烧结而制成的主晶相为刚玉、斜锆石和莫来石的致密耐火制品，具有良好的抗热震性和优异的抗玻璃侵蚀能力、抗碱蒸汽侵蚀能力，主要用于钠钙玻璃、电真空玻璃、铅玻璃和仪器玻璃熔窑的池炉铺底砖、蓄热室格子砖、料道砖和工作池上部结构等，以及水泥和各种瓷釉回转窑（炉）内衬砖等。同时还提供配套的AZS浇注料、捣打料和火泥。

Properties 技术性能		Units 单位	Trend's Materials 材料牌号	
			AZS-30	AZS-20
Compositional 物质组成				
Mineralogy 矿物组成			Corundum Baddeleyite 刚玉、斜锆石	Corundum Baddeleyite 刚玉、斜锆石
Chemical composition 化学成分	Al_2O_3	%	48-50	46-50
	SiO_2	%	17-19	28-30
	ZrO_2	%	30-32	19-22
Mechanical 机械性能				
Bulk density 体积密度		g/cm^3	3.00	2.65
Compressive strength @ RT 常温耐压强度		Mpa	100	80
Thermal 热学性能				
Refractoriness under load 荷重软化点 $T_{0.5}$		C	1630	1560
Thermal shock resistance 热震稳定性		★	★★★	★★★
抗玻璃侵蚀性能 Corrosion resistance to melted glass		★	★★★★	★★★

* The shapes and sizes can be produced according to customer needs.
* 产品形状和尺寸按需求生产。

Zircon Products 锆英石制品

Trend zircon products are made of zircon concentrate as the main raw material, supplemented with refractory clay and organic binder, and are formed by pressing and sintered in a high-temperature kiln. The main crystal phase is zircon, which has good thermal shock performance and excellent erosion resistance. Trend mainly produces two recipes of zircon products: high-density zircon bricks (DZS) and aggregate type zircon bricks (PZS). DZS is mainly used in the parts of the melting furnace that are in direct contact with molten glass: pool wall bricks, pool bottom pavement bricks, feed port bricks and wire drawing port bricks; PZS adopts isostatic prefabricated aggregate process and is widely used in the upper structures of glass fiber, sodium calcium of glass, leaded glass and electric vacuum glass melting furnace: isolation brick (transition brick), ascending brick, vent brick, parapet brick, thermocouple and observation hole brick, etc, it is also used for pool floor tiles and sub-floor tiles, etc. Trend also provides supplementary zircon castable, ramming materials and mortar.

创导锆英石制品是以锆英石精矿为主要原料，辅以耐火粘土和有机结合剂，通过压制成型后在高温窑炉中烧结而成，主晶相为锆英石，具有良好的热震稳定性和优异的抗侵蚀能力。创导主要生产两种牌号的锆英石制品：高致密锆砖（DZS）和骨料型锆砖（PZS）。DZS主要用于与玻璃熔液直接接触的熔窑部位：池壁砖、池底铺面砖、加料口砖和拉丝口砖；PZS采用等静压预制骨料制程，广泛应用于玻璃纤维、钠钙玻璃、含铅玻璃和电真空玻璃熔窑的上部结构：隔离砖（过渡砖）、上升道砖、喷火口砖、胸墙砖、热电偶和观测孔砖等，同时也经常用做池底铺面砖和亚层铺底砖等。创导还提供配套的锆英石浇注料、捣打料和火泥。

Properties 技术性能	Units 单位	Trend's Materials 材料牌号	
		DZS	PZS
Compositional 物质组成			
Mineralogy 矿物组成		Zircon 锆英石	Zircon 锆英石
ZrO_2 Content ZrO_2含量	%	65	65
Mechanical 机械性能			
Bulk density 体积密度	g/cm^3	3.9-4.1	3.8
Apparent porosity 显气孔率	%	6-8	18
Compressive strength@RT 常温耐压强度	Mpa	400	100
Thermal 热学性能			
Refractoriness under load 荷重软化点 $T_{0.5}$	C	1680	1700
Thermal shock resistance 热震稳定性	★	★★	★★★

* The shapes and sizes can be produced according to customer needs.
* 产品形状和尺寸按需求生产。