



BOSNAX (THAILAND) CO.,LTD.

บริษัท บอสแนกซ์ (ประเทศไทย) จำกัด

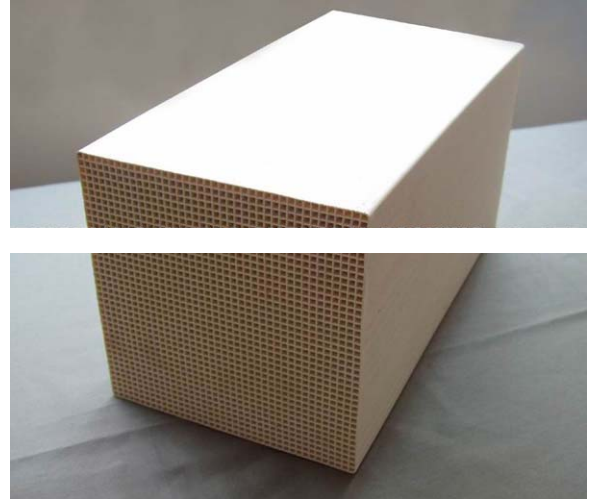
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Honeycomb Ceramics

Brief Introduction

Ceramic honeycombs are a new kind of industrial ceramic product developed in recent years. They have a large surface area, higher air vent rate, good heat functions, stable chemical properties etc. At present, ceramic honeycombs are being used to purify industrial waste gas, automobile emissions, eliminate noise, deal with waste water, to dry air, incineration, used in the manufacture of infrared ray instruments, to filter metal liquids etc. All ceramic honeycombs can be produced in conformance with customer requests.

As heat exchange media, ceramic honeycomb are mainly used in heat recovery unit of RTO's.

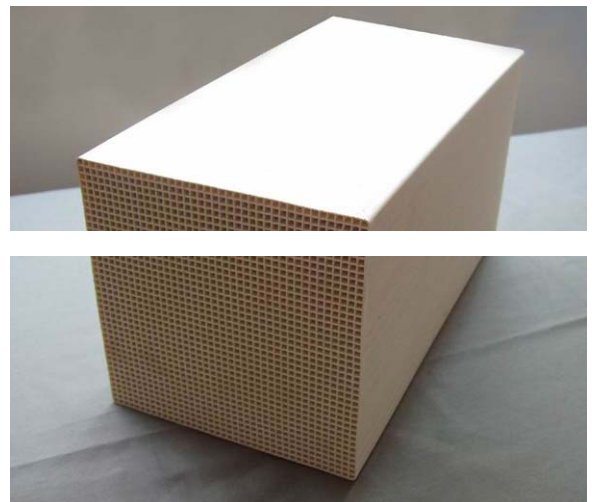


Porous Cordierite Honeycomb Monolith

- **Ceramic honeycomb used for RTO application**

Cordierite is a magnesium alumina silicate material, which has very low linear expansion, low coefficient of thermal expansion and excellent resistance to thermal shock. Cordierite also offers an excellent range of mechanical strength, porosity criteria, and excels in cost-effective extruded and dry-pressed forms.

Cordierite Honeycomb Monoliths are divided into two types: porous type and compact type.



- **Chemical composition**

SiO ₂	Al ₂ O ₃	MgO	Fe ₂ O ₃	Na ₂ O	K ₂ O
48-51%	31-34%	14-16%	<0.5%	<0.5%	<0.5%

- **Physical properties**

Index	Value
Cordierite gross density(g/cm ³)	1.9-2.0
Average linear expansion(20-1000°C) (10 ⁻⁶ /k-1)	<2
Specific heat capacity(KJ/Kg)	830-900
Temperature cycle resistance(K)	300
Max operation Temp.(°C)	1300
Thermal shock resistance(°C)	800
Acid resistance(%)	>99
Alkali resistance(%)	>85
Water absorption(Wt%)	22±5

- **Technical data**

Spec.	Quantity of channels	Wall thickness (mm)	Surface area (m ² /m ³)	Free volume (%)	Average weight (min.) (kg/m ³)
150*150*300	60*60	0.5	1315	70	680
150*150*300	50*50	0.7	1050	58	680
150*150*300	40*40	0.7	883	65	518
150*150*300	25*25	1.0	573	67	502

- **Application**

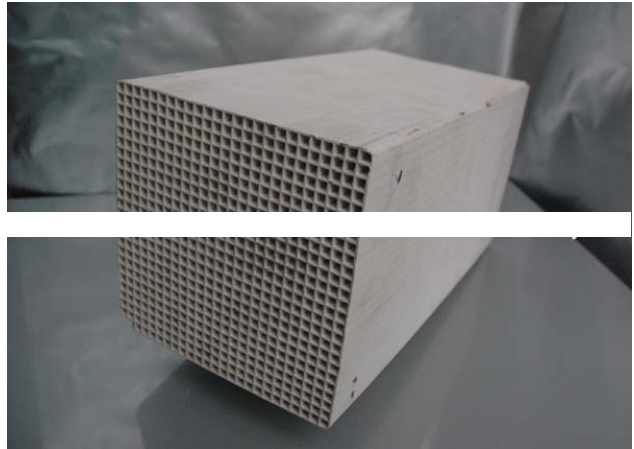
Used in the petroleum chemical engineering, garbage incineration, coating and paints chartered plane, also applied in the industry waster gas and waste water processing etc.

Compact Cordierite Honeycomb Monolith

- **Ceramic honeycomb used for RTO application**

Cordierite is a magnesium alumina silicate material, which has very low linear expansion, low coefficient of thermal expansion and excellent resistance to thermal shock. Cordierite also offers an excellent range of mechanical strength, porosity criteria, and excels in cost-effective extruded and dry-pressed forms.

Cordierite Honeycomb Monoliths are divided into two types: porous type and compact type.



- **Chemical composition**

SiO ₂	Al ₂ O ₃	MgO	Fe ₂ O ₃	Na ₂ O	K ₂ O+CaO
48-50%	37-39%	7-9%	<1%	<1%	<2%

- **Physical properties**

Index	Value
Gross density(g/cm ³)	2.22-2.45
Average linear expansion(20-1000°C) (10-6/k-1)	<3
Specific heat capacity(KJ/Kg)	850-950
Temperature cycle resistance(K)	250
Max operation Temp.(°C)	1300
Acid resistance(%)	>98
Water absorption(Wt%)	<3
Open porosity(%)	<3
Heat conductivity(W/mk)	1.5-2.5
Mean heat storage capacity(Kwh/m ³ k)	0.252

- **Technical data**

Spec.	Quantity of channels	Wall thickness (mm)	Surface area (m ² /m ³)	Free volume (%)	Average weight (min.) (kg/m ³)
150*150*300	60*60	0.5	1278	64	730
150*150*300	50*50	0.7	1050	58	814
150*150*300	40*40	0.7	883	65	720
150*150*300	33*33	1.0	700	59	737
150*150*300	25*25	1.0	573	68	580

- **Thermal efficiency**

Velocity (M/min)	Thermal efficiency			<p style="text-align: center;">Assumptions</p> <p style="text-align: center;">Combustion Temp. :816°C</p> <p style="text-align: center;">Inlet Temp. :20°C</p> <p style="text-align: center;">Section Area:7.5 m²</p> <p style="text-align: center;">Bed height:1200 mm</p> <p style="text-align: center;">Cycle time:180 seconds</p>
	50*50	33*33	25*25	
60	95.4%	92.4%	91.2%	
75	94.6%	91.0%	89.4%	
90	93.9%	89.6%	87.6%	
105	93.2%	88.4%	85.7%	
120	92.6%	87.2%	83.8%	
135	92.0%	86.0%	82.0%	

- **Application**

- **Used in heat storing HTAC to exchange gas and store heat**

- Heat storing honeycomb carrier is also called high temperature incendiary heat storing carrier. It is the key and core part of heat storing HTAC. It has been widely used to all kinds of pushing-steel heating furnace, stepping heating furnace, heat treatment furnace, forging furnace, dissolving furnace, steel wrapping/middle wrapping baking apparatus, soaking pit, radiation tap incendiary apparatus, covering furnace, high temperature hot-blast stove in metallurgical machine building and all kinds of ceramic cellar stove, glass cellar stove in building materials, and all kinds of tap heating stove, splitting stove, other industrial stove cellar, too.

- Heat storing HTAC is a new concept incendiary technology. It combines organically recover smoking gas and remaining heat with efficiently burning and reducing discharging Nox, so it can get the double aims of saving energy ultimately and reducing discharging Nox ultimately. The technology characters as follow:

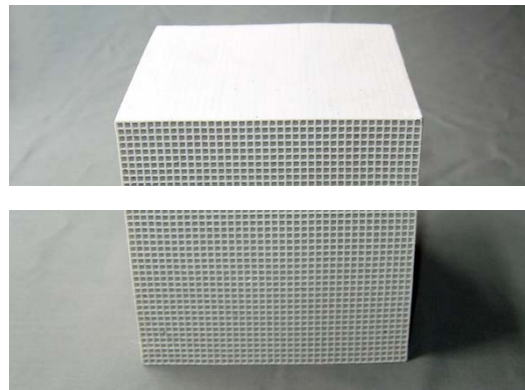
- Smoking gas and remaining heat recovering device is adopted to replace and exchange smoking gas, air and coal gas, so while they pass the heat storing, they can recover ultimately physical heat in high temperature smoking gas and save energy (normally 10%~70%) and improve the efficiency of heat apparatus, and reduce replacing of CO₂ (10%~70%).

- By expanding the area of flame burning (almost to the edge of stove) by poor oxygen burning, it can make the temperature in stove even, so Nox in smoking gas reduced above 40%.

- Because the average temperature in stove is raised and heat conduction is improved, heat apparatus in the same size can improve output above 20% and reduce the cost of apparatus.

- Low calorific value fuel can get high stove temperature with high temperature preheats gas or high temperature preheats gas, so it has expanded the low calorific value fuel use range.

Porcelain Honeycomb Monolith



- Chemical composition**

SiO ₂	Al ₂ O ₃	MgO	Fe ₂ O ₃	Na ₂ O	K ₂ O
<72%	>18%	0.18-0.45%	<1%	<1%	2.7-4.5%

- Physical properties**

Index	Value
Gross density(g/cm ³)	2.3-2.45
Thermal volume(KJ/Kg. °C)	800-900
Thermal shock resistance(°C)	>300
Max operation Temp.(°C)	1100
Acid resistance(%)	>99
Alkali resistance(%)	>85
Water absorption(Wt%)	<0.5%

- **Technical data**

Spec.	Quantity of channels	Wall thickness (mm)	Surface area (m ² /m ³)	Free volume (%)	Packaging density (kg/m ³)	Weight per piece (kg)
150*150*150	60*60	0.5	1315	70	910	3.07
150*150*150	50*50	0.7	1050	58	920	3.11
150*150*150	40*40	0.7	883	65	908	3.07
150*150*150	25*25	1.0	573	67	730	4.93

- **Application**

- **Used in heat storing HTAC to exchange gas and store heat**

- Heat storing honeycomb carrier is also called high temperature incendiary heat storing carrier. It is the key and core part of heat storing HTAC. It has been widely used to all kinds of pushing-steel heating furnace, stepping heating furnace, heat treatment furnace, forging furnace, dissolving furnace, steel wrapping/middle wrapping baking apparatus, soaking pit, radiation tap incendiary apparatus, covering furnace, high temperature hot-blast stove in metallurgical machine building and all kinds of ceramic cellar stove, glass cellar stove in building materials, and all kinds of tap heating stove, splitting stove, other industrial stove cellar, too.

- Heat storing HTAC is a new concept incendiary technology. It combines organically recover smoking gas and remaining heat with efficiently burning and reducing discharging Nox, so it can get the double aims of saving energy ultimately and reducing discharging Nox ultimately. The technology characters as follow:

- Smoking gas and remaining heat recovering device is adopted to replace and exchange smoking gas, air and coal gas, so while they pass the heat storing, they can recover ultimately physical heat in high temperature smoking gas and save energy (normally 10%~70%)and improve the efficiency of heat apparatus, and reduce replacing of CO2 (10%~70%).

- By expanding the area of flame burning (almost to the edge of stove) by poor oxygen burning, it can make the temperature in stove even, so Nox in smoking gas reduced above 40%.

- Because the average temperature in stove is raised and heat conduction is improved, heat apparatus in the same size can improve output above 20% and reduce the cost of apparatus.

- Low calorific value fuel can get high stove temperature with high temperature preheats gas or high temperature preheats gas, so it has expanded the low calorific value fuel use range.