SHANDONG QISHUAI WEAR RESISTANT EQUIPMENT CO., LTD

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Company profile

Shandong Qishuai wear resistant equipment Co., Ltd is specialized in High-performance alloy spraying-welding wear-resistant processing, microcrystalline Zirconia-Corundum wear-resisting lining board and high performance alloy casting of high-tech professional production enterprises. After years of development, the company has gathered considerable technical strength and experience in product development, manufacturing and installation area.

- Quality is our culture
- Professional production team
- 24 hours after sales services
- Wear resistant expert
Team Work

QISHUAI TEAM WORK

- professional production team
- professional sales team
- professional Technical engineers
- After-sales services
PRODUCTS

- High alumina ceramic tiles
- Isostatic pressing alumina ceramic pipe
- Rubber ceramic composite lining plate
- Alumina ceramic rubber composite pulley lagging
- Wear resistant chromium carbide plate
- Wear resistant chromium tube
Alumina Ceramic Tile, Ceramic Plate

The Features of Ceramic tile:

1. High hardness
   Its Rockwell hardness HRA80-90, hardness second only to diamond, and the wear-resistant is far more than wear-resistant steel and stainless steel.

2. Excellent wear resistance
   Equivalent to 266 times than the manganese steel and 171.5 times of the high chromium cast iron. In the same conditions, it can extend the service life at least above ten times.

3. Light weight
   The weight is only half of steels, so can greatly reduce the equipment load.

4. Corrosion resistance
   High-aluminum ceramic inorganic oxides have very stable molecular structure and electrochemical corrosion, so they can resist the erosion of organic solvents such as acids, bases and salts.

5. Stability of heat temperature
   Working temperature of high alumina ceramics can be as high as 1600℃.

6. Smooth surface
   High alumina ceramics have the properties of smooth and adhesion, the roughness is only 1/6 that of steel pipes thus less flow Resistance.
High alumina ceramic tiles

The most popular size as below, also customized any sizes.

- 100*100*20mm (4” * 4” * 3/4”)
- 150*100*25mm (6” * 4” * 1”)
- 150*100*13mm (6” * 4” * 1/2”)
- 150*50*25mm (6” * 2” * 1”)
- 150*100*15mm (6” * 4” * 5/8”)
- 100*75*25mm (4” * 3” * 1”)

The detailed parameters of ceramic brick:

<table>
<thead>
<tr>
<th>Performance index</th>
<th>92series</th>
<th>95series</th>
<th>Performance index</th>
<th>92series</th>
<th>95series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>≥92</td>
<td>≥95</td>
<td>Moh’s Hardness</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>3.63g/m³</td>
<td>3.68g/m³</td>
<td>Rate of Water Absorption (%)</td>
<td>≤0.01</td>
<td>≤0.01</td>
</tr>
<tr>
<td>Bending strength</td>
<td>255</td>
<td>275</td>
<td>Rockwell Hardness (HRA)</td>
<td>≥85</td>
<td>≥85</td>
</tr>
<tr>
<td>Compressive</td>
<td>≥2000</td>
<td>≥2250</td>
<td>Fracture Toughness (MPa)</td>
<td>3.65</td>
<td>3.75</td>
</tr>
<tr>
<td>Strength (MPa)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal expansion</td>
<td>7.2×10⁻⁶m/°C</td>
<td>7.5×10⁻⁶m/°C</td>
<td>Dielectric Strength</td>
<td>10×10⁻⁶</td>
<td>10×10⁻⁶</td>
</tr>
<tr>
<td>coefficient</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal Conductivity</td>
<td>20W/m.K</td>
<td>20W/m.K</td>
<td>Temperature</td>
<td>1600</td>
<td>1600</td>
</tr>
</tbody>
</table>
Alumina Ceramic Products

Plate liner

Pipeling liner

Mosaic

Cylindrical mosaic

Welding liner

Irregular liner
Product Description

92% & 95% alumina ceramic tube is mainly used in wear resistance fields. Usually alumina ceramic tube will be installed with steel tube, and we could supply the finished products as custom drawing.

Product Advantages

1. Molding: Isostatic pressing
2. Wear-Resistance: Approx 10 times stronger than common pipes under same conditions
3. Corrosion resistance: Strong acid or alkali resistant
4. Scouring abrasion resistance: Can bear scouring abrasion by large grain material without damage
5. Good fluidity: Smooth surface ensure the free flow of material without blocking
6. Low maintenance cost: Super wear-resistance reduce the maintenance frequency and also the maintenance cost.
Mineral Processing equipment operates in some of the harshest and remote locations. It is crucial to the Mineral Processing industries that this equipment continues to operate efficiently and its lifecycle is maximised to minimise down time. By appropriately protecting equipment from the extreme wear caused by the high speed and flow rates of ore when processed as a slurry ensures better equipment longevity. Slurry is highly abrasive and can not only cause wear damage to wet processing equipment but also with the inclusion of chemicals and heat, there is constant risk of corrosion and dangerous leakage.

Composite Ceramic Wear Liners can be supplied as standard pads, or cut panels to meet customer drawings and specifications, or can be custom engineered to ensure maximum suitability for your specific application.

Ceramic Wear Panels can also be supplied with steel backing for mechanical fastening onto equipment for quicker and easier replacement.

Qishuai Composite Ceramic Wear Liners last longer, requiring less change-outs, reducing downtime and increasing the productivity of your equipment.
Rubber composite ceramic lining plate

The rubber composite ceramic liner plate have two forms of rubber+ceramic and metal+rubber+ceramic. It is a special ceramic pieces, embedded by vulcanization in the special rubber, composition a square wear-resistant rubber liner, and then by welding or paste fixed to the inner shell of the equipment on the steel plate, to form a strong and buffer anti-wear layer.

**Normal size:**
- 500*500*30
- 500*500*40
- 300*300*25
- 300*400*32
- 188*300*30
- 316*476*60

**Ceramic material data:**

<table>
<thead>
<tr>
<th>Ceramic content</th>
<th>Bulk density</th>
<th>Moh's hardness</th>
<th>Rate of water absorption(%)</th>
<th>Bending strength(M pa)</th>
<th>Fracture toughness(M pa)</th>
<th>Rockwell hardness(HRA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>92% and 95%</td>
<td>3.63g/m³(92%a203)</td>
<td>0</td>
<td>≤0.01</td>
<td>255(92%a203)</td>
<td>3.65(92%a203)</td>
<td>≥85</td>
</tr>
<tr>
<td></td>
<td>3.68g/m³(95%a203)</td>
<td></td>
<td></td>
<td>275(95%a203)</td>
<td>3.75(95%a203)</td>
<td></td>
</tr>
</tbody>
</table>

**Rubber material data:**

<table>
<thead>
<tr>
<th>Tensile strength</th>
<th>Rubber elongation</th>
<th>shore hardness</th>
<th>break permanent deformation</th>
<th>rubber proportion</th>
<th>Main composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>16MPa</td>
<td>450-500%</td>
<td>60±5</td>
<td>30%</td>
<td>1.2</td>
<td>Natural rubber</td>
</tr>
</tbody>
</table>

Note: the rubber species is natural rubber or customized according to your requirements.
Vulcanize the wear-resistant ceramics with dimple on the surface onto the special rubber according to some curtain layout by an advanced hot vulcanization process to get a special wear-resistant composite material, which is then instead of the traditional rubber pasted onto the surface of the pulley to form the ceramic pulley lagging, which means low maintenance and less downtime.
Alumina ceramic rubber composite pulley lagging

Standard Size of ceramic pulley lagging

<table>
<thead>
<tr>
<th>Size</th>
<th>Length (mm)</th>
<th>Width (mm)</th>
<th>Ceramic thickness (mm)</th>
<th>Rubber thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800×500×16mm</td>
<td>800</td>
<td>500</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>800×500×17mm</td>
<td>800</td>
<td>500</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>800×500×18mm</td>
<td>800</td>
<td>500</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>800×500×19mm</td>
<td>800</td>
<td>500</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>800×500×20mm</td>
<td>800</td>
<td>500</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>800×500×21mm</td>
<td>800</td>
<td>500</td>
<td>12</td>
<td>9</td>
</tr>
</tbody>
</table>

Technical details of the rubber and alumina ceramic

<table>
<thead>
<tr>
<th>Item</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alumina Content</td>
<td>≥92%</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>≥3.63g/cm³</td>
</tr>
<tr>
<td>Rockwell Hardness (HRA)</td>
<td>≥90</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>≥850MPa</td>
</tr>
<tr>
<td>KIC Fracture Toughness</td>
<td>≥4.8MPa M1/2</td>
</tr>
<tr>
<td>Bending Strength</td>
<td>≥290MPa</td>
</tr>
<tr>
<td>Thermal Conductivity</td>
<td>20W/m.k</td>
</tr>
<tr>
<td>Coefficient of Thermal Expansion</td>
<td>7.2×10⁻⁶/m·°k</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength</td>
<td>≥27MPa</td>
</tr>
<tr>
<td>Break Extension</td>
<td>≥300%</td>
</tr>
<tr>
<td>Shore Hardness</td>
<td>60-70</td>
</tr>
<tr>
<td>Break Permanent Deformation</td>
<td>≤24%</td>
</tr>
<tr>
<td>Rubber and Ceramic Adhesion</td>
<td>≥3.0MPa</td>
</tr>
<tr>
<td>Temperature</td>
<td>≤100-300°C</td>
</tr>
<tr>
<td>Rubber Aging Life</td>
<td>≥8 year</td>
</tr>
</tbody>
</table>
The features of the alumina ceramic rubber composite pulley lagging

Features of non-stick rubber sheet:
1. Synthetic rubber
2. Electrostatic prevention
3. Flame resistant
4. Exceptionally high abrasion resistance and modulus
5. Exceptional grip
6. Exceptional wear resistance
7. Will not prematurely harden
8. Bonding layer
9. Press cured using high temperature and pressure
The bimetallic (meaning two types of metals) product starts with standard steel base plate that is then fused or overlaid with chromium carbide. Chromium carbide metallurgically bonds to the steel’s surface to form a protective and durable surface that will not separate from the base metal. Chromium carbide overlay steel plate is extremely hard, resistant to both wear and impact, and withstands high temperatures.

WEAR PLATE AFTER HARDFACING:
1- Thickness tolerances : -0/+1 mm
2- Physical properties : resistant to abrasion and erosion till 800°C.
3- Flatness tolerances : max. 3 mm/1000 mm.
4- Dimensions of the standard plates : customized
5- Application: high hardness and abrasion
Wear resistant chromium carbide plate

<table>
<thead>
<tr>
<th><strong>Product Name</strong></th>
<th>China made high chrome carbide overlay Wear liner plate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material</strong></td>
<td>High chromium carbide overlay plate</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>3+3.6+4.8+6+10+10, 12+12, etc. Or as your requirement.</td>
</tr>
<tr>
<td><strong>Hardness</strong></td>
<td>50-65 HRC</td>
</tr>
<tr>
<td><strong>Surface Treatment</strong></td>
<td>Hardfacing , cladding ,coated.</td>
</tr>
<tr>
<td><strong>Technique</strong></td>
<td>Hardfacing Advanced submerged arc welding / open arch welding technology</td>
</tr>
</tbody>
</table>
| **Chemical Composition** | C : 4.0-6.0%  
Cr : 24-45%  
Mn : 1.0-5%  |
| **Base Plate**   | Q235 / Q345                                          |
| **Plate Size**   | Length: 3000mm  
Width: 600-1500mm  
Size van be customized |
| **Feature**      | High wear resistance  
12-20 times higher than common plate  
5-10 times than low alloy steel plate  
2-3 times than high chromium cast iron plate |
| **Delivery time**| 7 days for sample  
25 days for production |
| **Packaging details** | Steel frame or as required package |
| **Application**  | Mining, Steel, Cement, Power, Port, etc.             |
Chromium Carbide Overlay (CCO) Steel Pipe is chromium carbide overlay on the inside diameter of the standard wall pipe.

Wear resistant chrome pipe is composed of the wear base material and the wear layer, the wear layer is generally accounts for 1/3 or 2/3 of total thickness; The wear layer and the base material is combined through metallurgy, so that the wear layer can’t fall off, and can bear stronger impact.
Wear resistant chromium tube

Wear Resistant Alloy Tube
The features of chrome carbide overlay steel pipe:
1-preferable wearlessness
2-superior heat resistant performance
3-Excellent machining performance
4-Superior cost performance effect

Chemical composition:

<table>
<thead>
<tr>
<th></th>
<th>Cr</th>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>others</th>
<th>Hardness</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-30%</td>
<td>4%-5%</td>
<td>0.5%-1.5%</td>
<td>0.5%-2.5%</td>
<td>Less than 2%</td>
<td>58-62HRC</td>
<td></td>
</tr>
</tbody>
</table>

Hardfacing layer information:

<table>
<thead>
<tr>
<th>Hardness</th>
<th>HARDNESS TOLERANCES</th>
<th>Thickness tolerances</th>
<th>Weld pool</th>
<th>Welding direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-62HRC</td>
<td>-0/+1.5 HRC</td>
<td>-0/+1 mm</td>
<td>2mm</td>
<td>Lengthways of the plate</td>
</tr>
</tbody>
</table>
The advantage of CCO pipe:

1-In the inner or external wall of general steel pipe, with wear resistant pipe welding machine directly clad wear resistant layer of high carbon high chromium. Compared with manual welding, automatic welding will not have wear resisting layer off phenomenon, improve the service life of wear resistant pipe.
2-Can be cut, formed and welded
3-Cost effective
4-Increased wear life of piping systems
5-Minimise downtime
6-Reduce maintenance and operational costs
7-Weld overlay can be applied to two sides for added strength and durability
8-Increase production
OUR CUSTOMERS

North America

European

China

Africa

South America

Australia
PRODUCTS APPLICATION

Iron and Steel Smelting Industry

Thermal Power Industry

Coal Mining Industry

Machinery Manufacturing Industry

Water Pump Industry

Petrochemical Industry
WORMLY WELCOME TO VISIT US!

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