

	<b>Areas of application</b>	<b>Standard shapes and sizes</b>	<b>Methods of attachment</b>
<b>SC-cast basalt</b>	<p>Protection against strong abrasive wear caused during the transport, preparation, processing, storage of medium to coarse bulk solids. Service temperature up to 350°C.</p> <p><b>e.g.</b> piping, chutes, trenches, chain conveyors, cyclone separators, silos, bunker.</p>	<p>Rectangular tiles, 80 – 300 mm, hex. tiles (width 200), thickness 30-60 mm; Radial tiles, formpieces, formpiece linings, thickness 30 – 40 mm. Compact piping DN 32 – 600 mm, thickness 20 – 30 mm; cylinder 500 mm long, bends radii 400 – 3000 mm</p>	<p>Installation in mortar, bonding with one/two component adhesive, bolting</p>
<b>SC-hard ceramic</b>	<p>Protection against medium-level abrasive wear caused by fine-grain bulk materials. Service temperature up to 500°C.</p> <p><b>e.g.</b> flotations, chutes, trenches, chain conveyors, cyclone separators, silos, hopper, bunker</p>	<p>Standard tiles: 150 x 150 mm; cut tiles: wall thickness 10 – 25 mm. Special sizes possible.</p>	<p>Installation in mortar, bonding with one/two component adhesive</p>
<b>SC-alumina ceramic</b>	<p>Protection against strong abrasive and impact wear caused by any kind of bulk solids. Service temperature up to 1550°C.</p> <p><b>e.g.</b> piping, flotations, chutes, trenches, chain conveyors, cyclone separators, silos, hopper, bunker</p>	<p>Standard tiles, side length 150 – 250 mm, thickness 6- 50 mm, with/without centre hole/threaded bolt, square platelets 20 x 20 and 25 x 25 mm, thickness 3 – 10 mm, hex. platelets width 20 and width 32, thickness 3 – 25 mm, formpieces thickness 5-30 mm, straight cylinder and bend segments, thickness 8 – 25 mm.</p>	<p>Installation in mortar, bonding with one/two component adhesive, bolting, welding</p>
<b>SC-zirconia ceramic</b>	<p>Protection against strong abrasive and impact wear caused by any kind of bulk solids. Service temperature up to 1.000°C.</p> <p><b>e.g.</b> separators, cyclones, piping, silos, hopper</p>	<p>Standard tiles square/rectangular, side length 150 – 500 mm, wall thickness 20 – 100 mm, with/without centre hole, radial tiles, formpieces, straight pipes and bend segments from DN 50 – DN 300 in thickness 17 – 25 mm.</p>	<p>Installation in mortar, bonding with one/two component adhesive, bolting, welding</p>
<b>SC-silicon carbide ceramic</b>	<p>Protection against strong abrasive and impact wear with extreme abrasion and a high service temperature up to 1.700°C as well as frequent temperature fluctuations. For any kind of bulk solids.</p> <p><b>e.g.</b> special piping, pulverized fuel (PF) piping, blower linings, melt chutes, hydrocyclones, nozzles</p>	<p>Standard tiles square/rectangular, wall thickness 10 – 75 mm, in some cases also available in 6 mm thickness; formpieces main sizes 6 mm to 1200 mm, cylinder and bend segments DN 50 – DN 200 in 20 mm wall thickness.</p>	<p>Installation in mortar, bonding with one/two component adhesive, bolting, welding</p>
<b>SC-WearStop®</b>	<p>Protection against abrasive wear with frequent temperature changes, service temperature up to 1200°C. For any type of bulk solids.</p> <p><b>e.g.</b> separators, cyclones, mechanical conveyors, piping</p>	<p>25 kg bags (mortar "M" or castable "C" type) Usual layer thickness ranges between 10 and 60 mm.</p>	<p>Casting, trowelling (mortar or plaster)</p>

# Survey SC-materials – properties

	Physical Properties	Chemical Composition	Chemical Resistance																
<b>SC-cast basalt</b>	Raw density 2,9 - 3,0 g/cm <sup>3</sup> Porosity 0 % Hardness to Mohs ~ 8 Compressive strength 450 - 550 MPa Flexural strength 40 - 50 MPa Coefficient of expansion 6 - 8 x 10 <sup>-6</sup> 1/K Thermal conductivity 1,1 - 1,6 W/mK Max service temperature 300 - 350 °C	<table> <tr> <td>Components</td> <td>Mean Values (Weight %)</td> </tr> <tr> <td>SiO<sub>2</sub></td> <td>46</td> </tr> <tr> <td>Al<sub>2</sub>O<sub>3</sub></td> <td>12</td> </tr> <tr> <td>Fe<sub>2</sub>O<sub>3</sub></td> <td>6</td> </tr> <tr> <td>FeO</td> <td>7</td> </tr> <tr> <td>MgO</td> <td>10</td> </tr> <tr> <td>CaO</td> <td>11</td> </tr> <tr> <td>Others</td> <td>8</td> </tr> </table>	Components	Mean Values (Weight %)	SiO <sub>2</sub>	46	Al <sub>2</sub> O <sub>3</sub>	12	Fe <sub>2</sub> O <sub>3</sub>	6	FeO	7	MgO	10	CaO	11	Others	8	Corrosion resistant; resistant to almost all acids and alkalis (except HF-compounds); usable for moist and chemically aggressive materials and service conditions.
Components	Mean Values (Weight %)																		
SiO <sub>2</sub>	46																		
Al <sub>2</sub> O <sub>3</sub>	12																		
Fe <sub>2</sub> O <sub>3</sub>	6																		
FeO	7																		
MgO	10																		
CaO	11																		
Others	8																		
<b>SC-hard ceramic</b>	Raw density 2,4 - 2,5 g/cm <sup>3</sup> Porosity 0 - 2 % Hardness to Mohs 6 - 7 Compressive strength 300 - 400 MPa Flexural strength 40 - 60 MPa Coefficient of expansion 5 x 10 <sup>-6</sup> 1/K Thermal conductivity 1,6 W/mK Max service temperature 500 °C	<table> <tr> <td>Components</td> <td>Mean Values (Weight %)</td> </tr> <tr> <td>SiO<sub>2</sub></td> <td>72</td> </tr> <tr> <td>Al<sub>2</sub>O<sub>3</sub></td> <td>20</td> </tr> <tr> <td>Fe<sub>2</sub>O<sub>3</sub></td> <td>1,5</td> </tr> <tr> <td>K<sub>2</sub>O</td> <td>4</td> </tr> <tr> <td>Others</td> <td>2,5</td> </tr> </table>	Components	Mean Values (Weight %)	SiO <sub>2</sub>	72	Al <sub>2</sub> O <sub>3</sub>	20	Fe <sub>2</sub> O <sub>3</sub>	1,5	K <sub>2</sub> O	4	Others	2,5	Corrosion resistant; resistant to almost all acids and alkalis (except HF-compounds); usable for moist and chemically aggressive materials and service conditions.				
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Others	2,5																		
<b>SC-alumina ceramic</b>	Raw density 3,4 - 3,65 g/cm <sup>3</sup> Porosity 0 Hardness to Mohs ~ 9 Compressive strength > 3000 MPa Flexural strength 240 - > 300 MPa Coefficient of expansion 6 - 8 x 10 <sup>-6</sup> 1/K Thermal conductivity 20 - 22 W/mK Max service temperature 1.550 °C	<table> <tr> <td>Components</td> <td>Mean Values (Weight %)</td> </tr> <tr> <td>Al<sub>2</sub>O<sub>3</sub></td> <td>&gt; 92</td> </tr> <tr> <td>SiO<sub>2</sub></td> <td>2,5</td> </tr> <tr> <td>CaO</td> <td>2,3</td> </tr> <tr> <td>MgO</td> <td>2,8</td> </tr> <tr> <td>Fe<sub>2</sub>O<sub>3</sub></td> <td>0,06</td> </tr> <tr> <td>Na<sub>2</sub>O</td> <td>0,03</td> </tr> <tr> <td>K<sub>2</sub>O</td> <td>0,01</td> </tr> </table>	Components	Mean Values (Weight %)	Al <sub>2</sub> O <sub>3</sub>	> 92	SiO <sub>2</sub>	2,5	CaO	2,3	MgO	2,8	Fe <sub>2</sub> O <sub>3</sub>	0,06	Na <sub>2</sub> O	0,03	K <sub>2</sub> O	0,01	Good resistance to acids except HF-compounds. Limited resistance to alkaline solutions (loss of the bonding sections).
Components	Mean Values (Weight %)																		
Al <sub>2</sub> O <sub>3</sub>	> 92																		
SiO <sub>2</sub>	2,5																		
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Na <sub>2</sub> O	0,03																		
K <sub>2</sub> O	0,01																		
<b>SC-zirconia ceramic</b>	Raw density 3,4 - 3,5 g/cm <sup>3</sup> Porosity ca. 3% Hardness to Mohs ~ 9 Compressive strength 400 MPa Flexural strength 60 MPa Coefficient of expansion 6,5- 7 x 10 <sup>-6</sup> 1/K Thermal conductivity 4,2 - 7 W/mK Max service temperature 1.000 °C	<table> <tr> <td>Components</td> <td>Mean Values (Weight %)</td> </tr> <tr> <td>ZrO<sub>2</sub></td> <td>32 - 33</td> </tr> <tr> <td>Al<sub>2</sub>O<sub>3</sub></td> <td>50 - 51</td> </tr> <tr> <td>SiO<sub>2</sub></td> <td>14 - 16</td> </tr> <tr> <td>Others</td> <td>balance</td> </tr> </table>	Components	Mean Values (Weight %)	ZrO <sub>2</sub>	32 - 33	Al <sub>2</sub> O <sub>3</sub>	50 - 51	SiO <sub>2</sub>	14 - 16	Others	balance	Good resistance to acids except HF-compounds. Limited resistance to alkaline solutions (loss of the bonding sections).						
Components	Mean Values (Weight %)																		
ZrO <sub>2</sub>	32 - 33																		
Al <sub>2</sub> O <sub>3</sub>	50 - 51																		
SiO <sub>2</sub>	14 - 16																		
Others	balance																		
<b>SC-silicon carbide ceramic</b>	Raw density 2,7 - 3,15 g/cm <sup>3</sup> Porosity 0 - 16 % Compressive strength 1000 - 3500 MPa Flexural strength 100 - 410 MPa Coefficient of expansion 2,8 - 5,0 x 10 <sup>-6</sup> 1/K Max service temperature 1.350 - 1.700 °C	<table> <tr> <td>Components</td> <td>Mean Values (Weight %)</td> </tr> <tr> <td>SiC</td> <td>74 - 99,9</td> </tr> <tr> <td>SiO<sub>2</sub></td> <td>0 - 17</td> </tr> <tr> <td>Si Metall</td> <td>0 - 25</td> </tr> <tr> <td>Al<sub>2</sub>O<sub>3</sub></td> <td>0 - 10</td> </tr> <tr> <td>Others</td> <td>0,1 - 3</td> </tr> </table>	Components	Mean Values (Weight %)	SiC	74 - 99,9	SiO <sub>2</sub>	0 - 17	Si Metall	0 - 25	Al <sub>2</sub> O <sub>3</sub>	0 - 10	Others	0,1 - 3	Very good corrosion resistance, high resistance to acids (except nitric acid), some limitations to extremely high alkaline concentrations.				
Components	Mean Values (Weight %)																		
SiC	74 - 99,9																		
SiO <sub>2</sub>	0 - 17																		
Si Metall	0 - 25																		
Al <sub>2</sub> O <sub>3</sub>	0 - 10																		
Others	0,1 - 3																		
<b>SC-WearStop®</b>	Raw density 2,8 - 2,9 g/cm <sup>3</sup> Hardness to Mohs 7 - 8 max. particle size 3 - 4 mm Compressive strength 190 - 225 MPa Flexural strength 25 - 30 MPa Coefficient of expansion 1,0 x 10 <sup>-5</sup> 1/K Thermal conductivity 1,5 W/mK Max service temperature 350 - 400 °C HT-qualities up to 1200 °C	<table> <tr> <td>Components</td> <td>Mean Values (Weight %)</td> </tr> <tr> <td>CaO</td> <td>17 - 20</td> </tr> <tr> <td>Al<sub>2</sub>O<sub>3</sub> + TiO<sub>2</sub></td> <td>50 - 70</td> </tr> <tr> <td>SiO<sub>2</sub></td> <td>11 - 25</td> </tr> <tr> <td>Others</td> <td>2 - 5</td> </tr> </table>	Components	Mean Values (Weight %)	CaO	17 - 20	Al <sub>2</sub> O <sub>3</sub> + TiO <sub>2</sub>	50 - 70	SiO <sub>2</sub>	11 - 25	Others	2 - 5	Wear Resistance: DIN 52 108 Böhme disc: 1,5 - 4,0 cm <sup>3</sup> /50 cm <sup>2</sup> ASTM C-704 - 94 (however, blast angle at 30°): 3,9 - 4,7 cm <sup>3</sup>						
Components	Mean Values (Weight %)																		
CaO	17 - 20																		
Al <sub>2</sub> O <sub>3</sub> + TiO <sub>2</sub>	50 - 70																		
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