HIGH TEMPERATURE METALLIC-CERAMIC
PRODUCTS, COMPONENTS AND SYSTEMS
FOR ELECTRICALLY AND COMBUSTION-HEATED
FURNACES
560 °C – 1800 °C

HEATING | INSULATION | MEASURING
SCHUPP® Ceramics is an established specialist for high temperature technology. Our family-owned company has been developing, producing and marketing high-quality metallic-ceramic solutions for sintering, firing, melting and heat treatment since 1996. Whether in combustion- or electrically heated industrial and laboratory furnaces/kilns, our products, components and systems work reliably at temperatures of 560 °C to 1800 °C.

From approved standard products for high-precision firing process control to individual, custom-made products for electrical heating or thermal insulation – we provide standard and tailor-made solutions for industrial applications, production and research for customers around the world.
Flexibility and determination characterise how we meet our customers’ requirements. Our international team of more than 50 employees are focused on assisting more than 900 customers worldwide. Trust, honesty and the will to make a difference define how we establish and maintain successful partnerships.

In keeping with the principle adding value by valuing others, we cultivate our relationships with customers, production and research partners and employees. Similarly, it is understood that we handle materials and energy as responsibly and sparingly as possible.

These values have guided us since the company was founded in 1996, and we are always striving to live up to them. Your success and your satisfaction provide us with motivation, passion and impetus.

October 2015, SCHUPP®-Crew with our Company Fellow “Sammy”

We are engineers and businessmen, craftsmen and workers. That’s what we stand for!
We develop customised, high temperature systems that successfully integrate into our customers’ thermal processes, which ensures efficiency and reliability. Our engineers and technicians precisely analyse the specific challenges of the application from the beginning of the project. They identify potential for improvement and work to find exactly the right technical and economical solution. For complex requirements, we consciously focus on simple solutions in order to make your work easier and reduce your costs. Our systems, components and products are built with knowledge gained from four decades of high temperature technology and a keen sense of current market development.

**EXPERTISE AND EXPERIENCE**

**IN HIGH TEMPERATURE TECHNOLOGY**

We trust our customers and we want them to trust us. That’s why we rely on fair pricing, as well as cooperative dialogue and clear communication in all directions. Your contact person will answer your questions as quickly as possible thanks to many years of experience in high temperature technology.

**SALES**

**ARE A MATTER OF TRUST**

We will accompany you on your journey. For the successful development of new business areas, our sales engineers will also advise and assist you with practical measures. At the same time, creativity is as much a matter of course as our claim that we will constantly strive to improve for you.

**WE UNDERSTAND OUR CUSTOMERS AND OUR BUSINESS!**

**YOU CAN RELY ON THAT!**

ANDREI LOSCUTOV  
COMMERCIAL DIRECTOR

MANFRED HERWEG  
TECHNICAL DIRECTOR
UltraBoard & UltraVac

Efficient thermal insulation up to 1800 °C

- Up to 1800 °C application temperature
- Low thermal conductivity
- Long service life due to very low shrinkage
- Easy machining (homogeneous structure)
- Standard dimensions for boards: 900 mm x 600 mm
- Thicknesses: 20, 25, 40, 50, 100 mm
- Density: up to 700 kg/m³

UltraBoard and UltraVac insulate electrically heated industrial and laboratory furnaces/kilns up to 1800 °C application temperature. Made of polycrystalline mullite/alumina wool (PCW), these parts are a high-quality alternative to insulation materials made of aluminosilicate wool (ASW), also known as refractory ceramic fibre (RCF). The shot-free quality, minimal shrinkage and dimensional stability of our material guarantee a long service life, making it particularly economical.

BOARDS, CYLINDERS AND SHAPES
MADE OF POLYCRYSTALLINE MULLITE/ALUMINA WOOL (PCW)

- Mullite structure, high-strength
- Shot-free and ceramic fibre-free
- Up to 1600 °C application temperature
- 72 % Al₂O₃ content
- Long service life due to very low shrinkage
- Thicknesses of blankets up to 25 mm
- Densities of blankets: 100 kg/m³ and 130 kg/m³

ITM-Fibermax®

Flexible thermal insulation up to 1600 °C

ITM-Fibermax® is the flexible thermal insulation variant – whether as a raw material in the form of wool and needled blankets. The material is an extremely good substitution for materials containing ceramic fiber.

The light, shot- and ceramic fibre-free material is particularly suitable for temperatures above 1250 °C as well as applications that require a chemical resistance.

POLYCRYSTALLINE MULLITE/ALUMINA WOOL AND NEEDLED BLANKETS

Blankets needled on both sides are an indispensable component in module production. They have an alumina content of 72 %. We offer densities of 100 kg/m³ and 130 kg/m³.
MolyTec combines intermetallic molybdenum disilicide (MoSi$_2$) heating elements and polycrystalline mullite/alumina wool (PCW) shaped insulation parts to make turn-key heating systems for sophisticated areas like production, research and development environments. MolyTec is fully compatible with all technically comparable heating systems and can be integrated into almost any type of furnace system.

We also manufacture complete furnace sets of PCW insulation boards up to 1800 °C application temperature as an economical alternative for the re-lining of existing furnaces and for the production of new systems. In addition to the furnace lining, we also offer the appropriate electric heating elements (MoSi$_2$) upon request – all from one source.

Development, planning and installation of both versions is always carried out at our company’s premises. We draw upon our many years’ experience in high temperature technology and in a wide range of application industries to find a solution that is both technically optimised and cost-efficient. This is how we also quickly develop and implement special solutions with individual dimensions and structures to meet your requirements.

### CUSTOMISED ELECTRIC HEATING SYSTEMS AND FURNACE LININGS

- Combination of MolyCom® and UltraBoard/UltraVac
- Up to 1550 °C application temperature (depending on geometry)
- Complete furnace linings as customised production according your requirements
- Our service: consulting, conception, heat transfer calculation, construction and installation

UltraVac
Insulation boards, cylinders and shapes for your furnace lining up to 1800 °C

UltraVac
Whether industrial standard, high-purity demands or special resistance to oxidation – SCHUPP® Ceramics makes high temperature technology to suit your specific requirements.

**MolyCom®-Ultra 1700, 1800 and 1850**

**INDUSTRIAL STANDARD**

**MolyCom®-Hyper 1800, 1800SC1) and 1800AP2)**

**HIGH PURITY**

MolyCom®-Hyper 1800 is the solution for particularly high purity demands: Trace elements are reduced to a minimum (1/10 compared to competitor). MolyCom®-Hyper 1800 and 1800SC allow sintering of zirconia without discolouration, also above 1600 °C. MolyCom®-Hyper 1800AP is a special type of element, one that is resistant to oxidation from 200 °C to 700 °C.

Intemetallc Molybdenum Disilicide heating Elements (MoSi₂)

Whether industrial standard, high-purity demands or special resistance to oxidation – SCHUPP® Ceramics makes high temperature technology to suit your specific requirements. MolyCom®-Ultra 1700, 1800 and 1850 are particularly durable and conform to industrial standards. The heating elements form a self-healing protective layer of pure quartz.

MolyCom®-Hyper 1800 is the solution for particularly high purity demands: Trace elements are reduced to a minimum (1/10 compared to competitor). All heating elements are also fully compatible with other comparable manufacturers’ elements. We create complex heating element geometries and offer all kinds of required accessories, such as holders or connecting bands.
Process Temperature Control Rings PTCR
Universal, precise control of thermal processes from 560 °C up to 1750 °C

- 7 ring-types in a temperature range from 560 °C to 1750 °C
- Ensuring a reliable, outstanding and regular quality level
- Reducing of your quality assurance efforts
- Precise measuring results +/- 3 °C or better
- Easy handling and cost-efficient

CERAMIC MEASURING RINGS FOR DOCUMENTING SINTERING, FIRING AND HEAT TREATMENT PROCESSES

Process temperature control rings PTCR make a decisive contribution to controlling and therefore to the quality of thermal processes. Thanks to their special ceramic material properties, they determine the heat input up to 1750 °C more precisely than conventional measurement methods. This enables precise furnace settings. The measuring rings are placed anywhere in the furnace and they precisely register the total amount of radiation, convection and contact heat transferred to them. The degree of contraction is almost linear over the complete operating range of the PTCR, providing a practical measure of the accumulated heat during continuous or batch processes. We offer a web-based application to simplify the work with PTCR and the documentation of thermal processes – PTCR WEB APP. We provide digital micrometers with custom-fit receptacles for the rings and USB interfaces for data transfer.

CERAMIC ADHESIVE FOR HIGH TEMPERATURE APPLICATIONS MADE OF POLYCRYSTALLINE MULLITE/ALUMINA WOOL (PCW)

SCHUPP® Ceramics offers a reliable solution for connecting high temperature parts as well: FiberPlast C 1800 D permits reliable bonding or coating of ceramic fibre-based materials - such as insulation boards.

The single-component adhesive ready for use is particularly easy to process and will hold reliably and permanently at application temperatures up to 1750 °C. The plastic adhesive is made of polycrystalline mullite/alumina wool (PCW) with added inorganic binders and specifically coordinated additives.

We will gladly develop special high temperature masses, such as adhesives or coatings, together with you to suit your requirements.

FiberPlast C 1800 D
Permanent adhesion at highest temperatures up to 1750 °C

- Bonded or coated ceramic fibre-based parts
- For permanently safe connections
- Application temperatures up to 1750 °C
- Single-component adhesive ready for use and easy to process
- Made of polycrystalline mullite/alumina wool (PCW)
- Also for repairs and maintenance work
We want to help your company succeed, this is how we measure the value of our work. This is why we have developed a comprehensive quality management system that is reflected in the high standard of all of our systems, components and products.

We are committed to this quality: From the beginning to the end of the production chain, everyone in the team always strives to optimise the results from development to practical implementation. This is the standard that we set for ourselves and for the close cooperation with our production partners and the RWTH Aachen University at our location.

FOR YOUR SUCCESS, WE BELIEVE IT’S WORTH THE EFFORT!

The reliable integration of our systems, components and products into your supply chain is important to us. This is why we offer customised, simple logistics solutions across every single step of the process. Together with our international partners we always strive for more than punctual delivery.

With professional inventory management, clear delivery procedures and safety packaging, we ensure the success of our customers’ production, particularly in dynamic and complex markets.

LOGISTICS IS MORE THAN JUST TRANSPORTATION

WE CONTROL, STORE, PACKAGE AND SORT THINGS OUT FOR YOU!
**MolyCom®-Ultra 1700, 1800 & 1850**

<table>
<thead>
<tr>
<th>INDUSTRIAL STANDARD</th>
<th>MolyCom®-Ultra 1700</th>
<th>MolyCom®-Ultra 1800</th>
<th>MolyCom®-Ultra 1850</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density [kg/dm³]</td>
<td>5.8</td>
<td>5.8</td>
<td>6.5</td>
</tr>
<tr>
<td>Bending strength at 20 °C [N/mm²]</td>
<td>350 – 450</td>
<td>350 – 450</td>
<td>350 – 450</td>
</tr>
<tr>
<td>Porosity [%]</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Max. element temperature (under air) [°C]</td>
<td>1700</td>
<td>1780</td>
<td>1820</td>
</tr>
<tr>
<td>Max. furnace/kiln temperature (under air) [°C]</td>
<td>1550</td>
<td>1650</td>
<td>1750</td>
</tr>
</tbody>
</table>

**MolyCom®-Hyper 1800 / -Hyper 1800SC / -Hyper 1800AP**

<table>
<thead>
<tr>
<th>HIGH PURITY</th>
<th>MolyCom®-Hyper 1800</th>
<th>MolyCom®-Hyper 1800SC</th>
<th>MolyCom®-Hyper 1800AP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density [kg/dm³]</td>
<td>5.7</td>
<td>5.7</td>
<td>5.7</td>
</tr>
<tr>
<td>Bending strength at 20 °C [N/mm²]</td>
<td>350 – 450</td>
<td>350 – 450</td>
<td>350 – 450</td>
</tr>
<tr>
<td>Porosity [%]</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Max. element temperature (under air) [°C]</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
</tr>
<tr>
<td>Max. furnace/kiln temperature (under air) [°C]</td>
<td>1750</td>
<td>1750</td>
<td>1750</td>
</tr>
</tbody>
</table>

*Depending on furnace size and type: |Hyper - Super Clean / AP - Anti Pest

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**UltraBoard & UltraVac**

<table>
<thead>
<tr>
<th>Type</th>
<th>1500/300</th>
<th>1600/400</th>
<th>1650/400</th>
<th>1750/400</th>
<th>1750/400P</th>
<th>1750/400PS</th>
<th>1850/400</th>
<th>1850/500</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO₂ [%]</td>
<td>37</td>
<td>35</td>
<td>33</td>
<td>28</td>
<td>22</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Al₂O₃ [%]</td>
<td>63</td>
<td>65</td>
<td>67</td>
<td>72</td>
<td>78</td>
<td>85</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>Classification temperature [°C]</td>
<td>1500</td>
<td>1600</td>
<td>1650</td>
<td>1750</td>
<td>1750</td>
<td>1750</td>
<td>1850</td>
<td>1850</td>
</tr>
<tr>
<td>Max. furnace/kiln temperature [°C]</td>
<td>1420</td>
<td>1480</td>
<td>1600</td>
<td>1700</td>
<td>1700</td>
<td>1700</td>
<td>1800</td>
<td>1800</td>
</tr>
<tr>
<td>Density [kg/m³]</td>
<td>300</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Thermal conductivity [W/mK]</td>
<td>0.20</td>
<td>0.22</td>
<td>0.28</td>
<td>0.29</td>
<td>0.24</td>
<td>0.33</td>
<td>0.54</td>
<td>0.58</td>
</tr>
<tr>
<td>Linear shrinkage [%]</td>
<td>1.2 (1100 °C)</td>
<td>0.5 (1200 °C)</td>
<td>0.2 (1400 °C)</td>
<td>0.2 (1400 °C)</td>
<td>0.0 (1400 °C)</td>
<td>0.7 (1500 °C)</td>
<td>0.5 (1500 °C)</td>
<td>0.2 (1400 °C)</td>
</tr>
</tbody>
</table>

**ITM-Fibermax® Bulk Wool & Needled Blankets**

<table>
<thead>
<tr>
<th>Type</th>
<th>Al₂O₃ [%]</th>
<th>Density [kg/m³]</th>
<th>Thermal conductivity [W/mK]</th>
<th>Thickness [mm]</th>
<th>Sizes [mm]</th>
<th>Type of packaging</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk Wool 1600</td>
<td>72</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10 kg bag of wool</td>
<td>Unchopped/ chopped</td>
</tr>
<tr>
<td>Blanket 1600/100</td>
<td>72</td>
<td>100</td>
<td>0.42 (600 °C)</td>
<td>12.5</td>
<td>25</td>
<td>610 x 7200</td>
<td>Roll needled</td>
</tr>
<tr>
<td>Blanket 1600/130</td>
<td>72</td>
<td>130</td>
<td>0.36 (600 °C)</td>
<td>12.5</td>
<td>25</td>
<td>610 x 7200</td>
<td>Roll needled</td>
</tr>
</tbody>
</table>

**Process Temperature Control Rings PTCR**

<table>
<thead>
<tr>
<th>Type</th>
<th>Temperature range [°C]</th>
<th>Color</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTCR-ZTH</td>
<td>560 – 660</td>
<td>blue</td>
<td>Ø Outer: 20 mm</td>
</tr>
<tr>
<td>PTCR-UTH</td>
<td>660 – 900</td>
<td>yellow</td>
<td>Ø Outer: 10 mm</td>
</tr>
<tr>
<td>PTCR-ETH</td>
<td>850 – 1100</td>
<td>pale green</td>
<td>Standard height: 7 mm</td>
</tr>
<tr>
<td>PTCR-LTH</td>
<td>970 – 1250</td>
<td>pink</td>
<td>Special height: 1.5 mm</td>
</tr>
<tr>
<td>PTCR-SHT</td>
<td>1130 – 1450</td>
<td>green</td>
<td></td>
</tr>
<tr>
<td>PTCR-MTH</td>
<td>1340 – 1520</td>
<td>yellow</td>
<td></td>
</tr>
<tr>
<td>PTCR-HTH</td>
<td>1450 – 1750</td>
<td>white</td>
<td></td>
</tr>
</tbody>
</table>

**FiberPlast C 1800 D**

<table>
<thead>
<tr>
<th>Type</th>
<th>Al₂O₃ [%]</th>
<th>Density [kg/m³]</th>
<th>Type of packaging</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>FiberPlast C 1800 D</td>
<td>80</td>
<td>1400 (wet)</td>
<td>1 kg, other packaging available on request</td>
<td>Ready to use, wet moldable for adhesive bonding, repair &amp; maintenance</td>
</tr>
</tbody>
</table>

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**MolyTec Heating Systems**

A combination of MolyCom®-Ultra or -Hyper with UltraBoard or UltraVac are produced and adjusted on customer request. Possible geometries: panels, cylinders/tubes. The systems are suitable for application temperatures up to 1550 °C (depending on geometry).
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Neuhausstraße 4-10
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