The Innovative Material for New Dimensions

PERLUCOR® Transparent Ceramics
Transparent, durable and hard-wearing – wherever it counts

Transparent Ceramics PERLUCOR® is opening up completely new areas of application. A material for the extremes: everywhere where conventional glasses, special glasses and protective glasses reach their limits, PERLUCOR® displays greater strength. The material combines transparency with the extraordinary qualities of high-performance ceramic. With excellent properties, the optically perfected high-performance ceramic offers superior qualities for transparent extreme applications, for example, in the areas of

ARCHITECTURE
SCANNERS & DISPLAYS
INDUSTRY
OPTICS & SENSORS
JEWELLERY & DESIGN

Let yourself be inspired by this innovative material: for a multitude of new application possibilities.
SCRATCH-PROOF
HARD
CHEMICALLY RESISTANT
TEMPERATURE-RESISTANT
TRANSPARENT
BRILLIANT
Think beyond borders. Combine functionality with aesthetics in modern architecture. Transparent Ceramics PERLUCOR® is opening up new perspectives and possibilities. It surpasses the conventional borders of durability and remains abrasion-resistant, non-slip, break-proof and transparent. Perfect for applications in architecture, such as sky-walks, stair-ways, glass flooring and lighting systems – when it comes to unclouded vision, the greatest stability and lasting robustness.
Longer-lasting visibility for data collection

Scanners and modern displays for data collection and processing must consistently withstand high mechanical loads and constantly maintain optimal transparency. To enable data to be collected and processed fast, safely and without error. No problem with PERLUCOR®: its extreme robustness and its resistance to scratches, shocks, wear, chemicals and breakage provide long-lasting protection. At airport check-ins, or in fingerprint or hand scanners, for example. Also in scanners in production, logistics or at supermarket check-outs, in document scanners and touchscreen displays.
Clearer view
on raw processes

When splinters start flying, acids or alkalis start splashing and glass starts melting, this is the time for PERLUCOR®. The high-performance ceramic provides tremendous opportunities for areas of visionary and efficient utilisation in all conceivable and inconceivable extreme applications in industry. Where other protective glasses reach their limits, or become scratched, obscured or opaque, PERLUCOR® retains clear transparency for a more secure monitoring of processes: for example, in production, in high-temperature areas, in furnace windows, inspection glasses and spin windows. So that you have a permanently unimpaired view of what’s going on. Whatever happens.
Monitor and control safely

The miniaturisation of optics and sensor systems and their lasting protection in demanding applications require innovative materials. PERLUCOR®, with its high refractive index of 1.72, enables optical lenses and other optical elements to be miniaturised. In this way, large magnification is achieved with small components. PERLUCOR® is predestined for cameras, sensor and surveillance systems for vehicles on land, water or in the air as well as for other applications, such as infrared sensors, on account of its optical qualities. For visibly greater security.
Create exclusive values

High quality design – delicate yet robust in form. With PERLUCOR® the beauty of luxury watches, glasses, eyeglasses, jewellery, smartphones and many designer products come into brilliant effect. The scratch- and wear-resistant, break-proof transparent ceramic is three to four times harder and firmer than glass. It even makes complex geometries possible, such as watch casings. It protects valuables and opens up completely new possibilities in design through its colourability. A special distinction was given to the material with the first translucent 5 euro collector’s coin “The Earth” by the Bank of Latvia.
Qualities for success in the future

Exploit potential with strength and transparency
CeramTec has created a transparent ceramic, which fulfils a high requirements profile – for completely new and almost universal areas of application. PERLUCOR®: a mechanically, chemically, thermally and optically perfected solution for transparent extreme applications. Its qualities are clearly superior to conventional glasses, special glasses and protective glasses.

Mechanical durability
PERLUCOR® displays extreme hardness and great bending strength: this is three to four times as high as with conventional glasses. Degree of hardness 9 on the Mohs scale is only exceeded by diamond or ruby. Hence, the transparent ceramic is resistant to mechanical strain, scratches and particularly suitable for extreme conditions of wear.

High transparency and temperature resistance
Through its high degree of transparency – optical value of > 87% relative transparency (> 80% IT), also with wavelengths of up to 6 µm – PERLUCOR® opens up new areas of application, where conventional glass reaches its limits. Also, in the field of optics, for example: for windows in the infrared applications as well as for the protection of pyrometers and for use with infrared sensors of any kind. The extraordinary thermal capacity of PERLUCOR® makes high-temperature applications up to 1,600°C possible.

Chemical durability
Because of its high purity and binding strength on an atomic basis, PERLUCOR® is resistant to highly concentrated acids and alkalis. Its application (e.g. in process monitoring) does not cause any product contaminations.

High refractive index
Its high refractive index of 1.72 enables high magnification in compact construction and hence a miniaturisation of optical lenses and other optical elements. PERLUCOR® is isotropic and, in contrast to sapphire glass, does not display a double refraction, i.e., birefringence.

The next generation of transparency
Whatever extreme or special application you require a highly efficient transparent ceramics solution for – just get in touch with us. We will develop the innovative and ideal solution for you. To enable you to successfully reach your objective.

Scratchproof  Hard  Temperature resistant  Chemically resistant  Transparent  Brilliant

<table>
<thead>
<tr>
<th></th>
<th>Glass</th>
<th>Glass Ceramics</th>
<th>PERLUCOR®</th>
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</thead>
<tbody>
<tr>
<td>Transparency [%]</td>
<td>&gt;95</td>
<td>90</td>
<td>&gt;85</td>
</tr>
<tr>
<td>Thermal conductivity [W/mK]</td>
<td>1–2</td>
<td>1–2</td>
<td>15</td>
</tr>
<tr>
<td>Temperature of application [°C]</td>
<td>500–700</td>
<td>600–800</td>
<td>1600</td>
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<tr>
<td>Hardness [HV1]</td>
<td>3–6</td>
<td>4–7</td>
<td>14</td>
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<tr>
<td>Bending strength [MPa]</td>
<td>20–40</td>
<td>40–60</td>
<td>300–350</td>
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<tr>
<td>Youngs modulus [GPa]</td>
<td>70</td>
<td>90</td>
<td>280</td>
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<tr>
<td>Ultrasonic velocity [m/s]</td>
<td>5000</td>
<td>5000</td>
<td>10000</td>
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<tr>
<td>Transmission [µm]</td>
<td>0.3 – 2.5</td>
<td>0.4 – 2.5</td>
<td>0.25 – 6.0</td>
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<tr>
<td>Dielectric constant</td>
<td>5 – 7</td>
<td>5 – 7</td>
<td>8 – 9</td>
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</tbody>
</table>
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The measured values mentioned before were determined for test samples and are applicable as standard values. The values were determined on the basis of DIN/DIN-VDE standards and if these were not available, on the basis of CeramTec standards. The values indicated must not be transferred to arbitrary formats, components or parts featuring different surface qualities. They do not constitute a guarantee for certain properties. We expressly reserve the right to make technical changes.