High-performance ceramics – High-tech with unrivalled properties

By implementing oxide ceramic sensors, KROHNE is using a technically superior material for electromagnetic flowmeters (EMF) and pressure measuring devices that is permanently resistant to corrosive and abrasive media. Additionally, ceramic is immune to temperature shocks and absolutely safe against gas discharge and leaks – all in all a unique combination for high-performance applications in all industrial sectors.

Flow and pressure measuring devices with ceramic liner

**OPTIFLUX 5000**
EMF with CERMET electrodes offer excellent long-term stability and accuracy for high-grade aggressive and abrasive media. Used by leading metrological institutes as a reference device.

**OPTIFLUX 7000**
EMF with capacitive electrodes that do not come in contact with the media are designed for applications that use adhering media and liquids with low conductivity levels. Stable measurements even in noisy applications.

**BATCHFLUX 5500**
EMF for volumetric filling systems

**OPTIBAR PC 5060**
Pressure transmitter with highly overload-proof ceramic membrane for pressure and level measurement.

**OPTIBAR LC 1010**
Submersible level probe for continuous level measurement.
• High-resistance to abrasion
• Suited for pastes and sludges with very high solid content
• The helium leakage rate of ceramic including electrodes is less than $10^{-7} \text{ (hPa} \times \text{ l/s)}$, this means “gas-tight”
• Vacuum-resistant up to 0 hPa
• High mechanical strength and form stability
• 0 % porosity (important for aggressive outgassing or toxic media)
• Excellent surface quality and very low roughness (Ra $<$ 0.8/μm)
• Oxide ceramic is very resistant to acids and lyes. (Nitric acid and nitrohydrochloric acid or even hot concentrated hydrochloric acid cannot damage the oxide ceramic)
• Adherence to the pressure equipment directive (DGLR)
• Long service life especially compared to plastic liners with abrasive wear
• Fully vacuum-resistant
• High resistance to temperature shocks up to 120 K
• Very high burst pressure/overload resistance

• 1 MPa = 1 N/mm²

Flowmeters

<table>
<thead>
<tr>
<th>Flowmeter</th>
<th>Size / DN</th>
<th>Ceramic Electrode / Electrode integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPTIFLUX 5000</td>
<td>Flange 25...150</td>
<td>CERMET, sintered-in</td>
</tr>
<tr>
<td>OPTIFLUX 5000</td>
<td>Sandwich 25...150</td>
<td>CERMET, sintered-in</td>
</tr>
<tr>
<td>BATCHFLUX 7000</td>
<td>Sandwich 25...150</td>
<td>Capacitive, on ceramic tube</td>
</tr>
<tr>
<td>OPTIFLUX 7000</td>
<td>Sandwich 15...50</td>
<td>Capacitive, on ceramic tube</td>
</tr>
</tbody>
</table>

Sapphire: 99.94 % Al₂O₃ ceramic
Bending strength = 630 MPa*, E-module = 406 GPa

FRIALIT® FZM, MgO-partially stabilised ZrO₂, Bending strength = 500 MPa*, E-module = 200 GPa

Special features of flowmeters with ceramic liner

• Oxide ceramic is very resistant to acids and lyes. Nitric acid and nitrohydrochloric acid or even hot concentrated hydrochloric acid cannot damage the oxide ceramic
• Adherence to the pressure equipment directive (DIN/EN)
• Long service life especially compared to plastic liners with abrasive wear
• Full vacuum-resistant
• High resistance to temperature shocks up to 120 K
• Very high burst pressure/overload resistance

Pressure transmitter

<table>
<thead>
<tr>
<th>Pressure transmitter</th>
<th>OPTIBAR PC 5600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>0.025...100 bar</td>
</tr>
<tr>
<td>Reference accuracy</td>
<td>&lt;0.05 to 0.2 % of UFV</td>
</tr>
<tr>
<td>Process temperature</td>
<td>-40...+120°C</td>
</tr>
<tr>
<td>Process connections</td>
<td>Thread of more than M16 ASME-range, EN, DIN, JIS, from DN15 to DN40, G27, G37, Duplex, PVD</td>
</tr>
<tr>
<td>Approvals</td>
<td>Ex d, Ex ia, SIL2/3, ATEX/IECEx Ex ia I G, drinking water approvals (KTW, ACS)</td>
</tr>
</tbody>
</table>

Special features of the pressure measuring devices with ceramic diaphragm

• Suitable for pressure applications of up to 100 bar and 150 °C
• Overload-proof up to 200 times the nominal measurement range
• 100 % hydrogen resistance
• 100 % diaphragm breakage detection
• In the event of diaphragm breakage this is detected by the sensor electronics
• Ten times harder than stainless steel
• Absolutely vacuum-tight

Contact

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