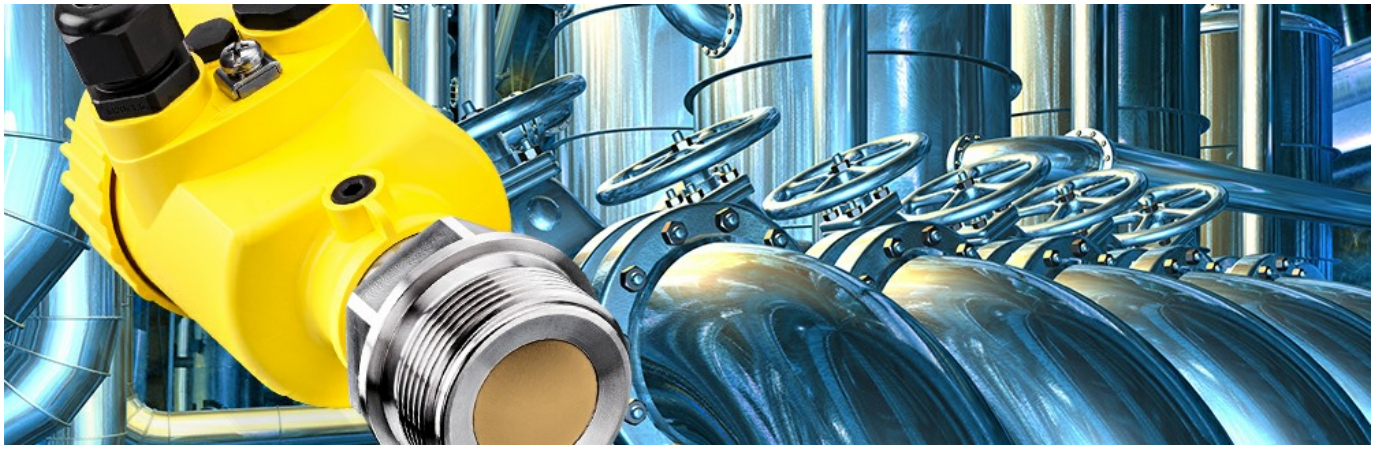


7 good reasons for using pressure transmitters with ceramic measuring cell

The temperature shock-resistant ceramic CERTEC® measuring cell offers new application possibilities.

Due to its accuracy and high reliability, **pressure measurement technology** in the process industry is one of the most versatile and robust measuring principles applied for pressure and level. It demonstrates its capabilities especially when things get difficult: in chemically aggressive media, in hygienic or hazardous areas, in applications with rapid temperature changes, heavy condensation or extreme pressures and temperatures.

Temperature or thermal shock resistance is a recurring issue for many **pressure transmitters** with ceramic measuring cells, but not for VEGA's CERTEC® measuring cell − its special compensation capability provides an effective antidote to this particular vulnerability. An additional temperature sensor circuit on the rear of the diaphragm can detect even the slightest change in temperature and has thus solved this problem. This temperature value can even be used as a second output. But the ceramic-capacitive CERTEC® measuring cell, manufactured from special sapphire ceramic, can do much more: it is one of the most robust and resilient pressure measuring cells ever made.

In short: When the loads are enormous and the demands on the measuring cell are high, there are 7 good reasons for using pressure transmitters with ceramic measuring cells.

1. Abrasion resistant

In aggressive process environments, metallic measuring cells can readily fail through a variety of stresses such as abrasion, impacts, friction, corrosion and high temperatures take their toll. However, it is a different story with measuring cells made with CERTEC® ceramic, which are exceptionally hard and abrasion resistant: 10 times harder than stainless steel.
From demanding production techniques, like slurry containing metallic debris or sand-laden media: whenever superior resistance to chemicals or extreme temperatures or pressures is expected from the deployed measurement technology, CERTEC® ceramic is the only choice, as it handles these conditions with ease.
Even strong cleaning agents or mechanical cleaning with a brush have no effect on the measuring cell.

2. Minimal drift = high long-term stability

Pressure transmitters with ceramic CERTEC® measuring cell deliver reliable measuring results as they are virtually drift-free. When it comes to long-term stability, they far outperform metallic measuring cells.

Drift is a phenomenon that slowly creeps into pressure measuring systems. In pressure transmitters with metallic measuring cells, so-called long-term drift is a common occurrence, due to ageing of the material. The thin metal diaphragm fatigues after a certain period of use and no longer returns exactly to the original zero point – and starts to 'drift' farther away over time. The user then has to carry out a drift compensation in the form of a recalibration.

Ceramic CERTEC® measuring cells, on the other hand, operate practically drift free. The hardness and limited but precise flexibility and range of motion of the ceramic material means that they exhibit virtually no material fatigue or drift. For that reason, the self-monitoring ceramic measuring cells lengthen the recalibration cycles considerably.

3. Oil free

Ceramic measuring cells are dry measuring cells that operate without oil as a pressure transmitting medium. This distinguishes them from metallic measuring cells, where the pressure reaches the sensor element indirectly, transferred by internal oil. If oil is involved, there is always a potential danger that it could enter the process unnoticed, for example due to a rupture in a membrane. With corresponding consequences for the end products. Because the risk of contamination is ever-present in closed, pressurized manufacturing processes, oil-free sensors are being used more and more. Also, oil-filled measuring systems in combination with high temperatures are less suitable for vacuum applications.

Pressure transmitters with ceramic CERTEC® measuring cell are designed to avoid such risks entirely. Here, pressure acts directly on the sensing diaphragm, so there is no need for transmission oil. This technology thus fulfils the demand for oil-free processes, and completely eliminates the risk of entire batches getting contaminated. Also when it comes to zero point shift, users are always on the safe side: where there is no oil, no air can get trapped in the system, which can cause drift.

4. Compatibility for many process media

Two main options are available for measurement applications in highly corrosive processes: special materials, which are often very expensive, or ceramics. Measuring cells made of CERTEC® ceramic resist interaction with the process media very reliably. In contrast to metallic measuring cells, they exhibit significantly increased chemical resistance to many aggressive liquids and gases. They are therefore compatible with the majority of process media. Unlike metal, ceramics are ideal for a wide variety of applications: from salt water to highly acidic liquids. Expensive alternatives, such as measuring cells coated with tantalum, are only needed for really extreme situations.

5. High overload resistance

Ceramic measuring cells easily handle extreme load changes, achieving up to 200 times the overload resistance of metallic cells. This is mainly due to the design of the transmitter. A typical measuring cell consists of a diaphragm and a ceramic body. If extremely high pressure is applied, the ceramic diaphragm simply stops against the larger base body. The result is an outstanding overload capacity.

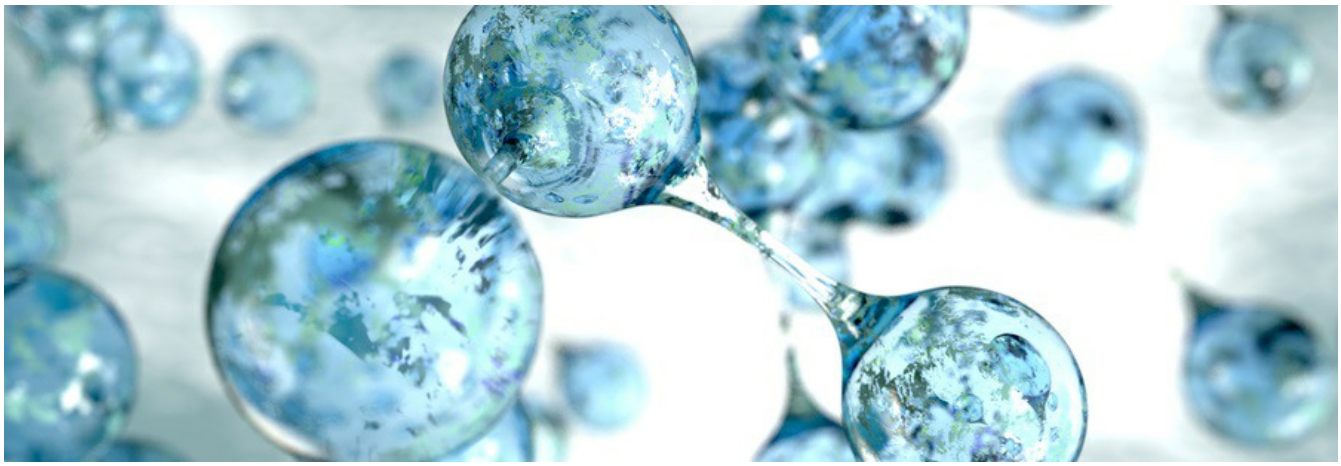
6. Small measuring ranges

With ceramic cells, even very small pressure changes of only a few millibars are reliably detected.

In the case of metallic diaphragm cells, a special oil is needed as a transmission medium for the internal sensor to detect pressure changes. This functional principle is the same whether the measuring ranges are large or small (only a few millibars). This means that, especially with very small measuring ranges, a correspondingly large diaphragm is needed to reliably detect the minute pressure change.

Ceramic CERTEC® measuring cells do not have this problem: they can easily handle small measuring ranges and since they do not require transmission oil, they are extremely compact and can be mounted with small process fittings.

7. No hydrogen diffusion



Due to its small atomic size, hydrogen can even totally permeate metal. And the thinner the diaphragm, the faster it happens. If hydrogen diffuses into and through the diaphragm, it reacts with the transmission oil behind the metallic diaphragm. This results in hydrogen deposits that lead to permanent changes in measurement performance.

The situation is completely different with ceramic measuring cells: even hydrogen cannot diffuse through them and negatively influence their service life. Their superiority in terms of hydrogen permeability can thus be added to the list of advantages of ceramic measuring cells.

Conclusion

Ever since VEGA has been offering with its versatile and highly capable VEGABAR pressure transmitter a ceramic measuring cell, that withstands thermal shock and has superior overload resistance, the arguments for using metallic measuring cells as standard have become fewer and fewer. Because even in hygienic applications – normally the domain of flush-mounted, metallic diaphragms – the innovative CERTEC® ceramic has a lot to offer: highly chemically resistant, it withstands extreme temperatures and is so robust that even solid, abrasive particles in liquids cannot harm it.

Ceramic pressure transmitters are made of one of the world's most stable, resistant materials and come with 7 convincing arguments for their use: abrasion-resistant, virtually drift-free, no filling oil, compatible with many process media, long-term stability, overload-resistant, suitable for very small measuring ranges and, last but not least, superior in terms of hydrogen permeability. In any case, they open up countless ideal areas of application for users.

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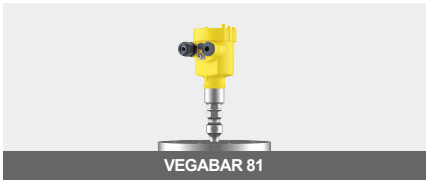
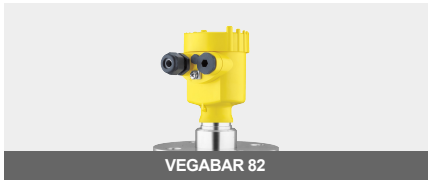
Products


VEGABAR 81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VEGABAR 83


VEGABAR 86


VEGABAR 87

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