



## Product Information

### QSense® QSX 309 Aluminium oxide

The QSense sensors are developed and produced to provide you with stable, reliable and reproducible data. Full performance is ensured through extensive quality controls and guaranteed for one-time use according to the recommendations.

#### Sensor specifications

Description	Aluminium oxide sensor
Top coating material	Aluminium oxide (Al <sub>2</sub> O <sub>3</sub> ) <sup>A</sup>
Surface roughness	< 2 nm RMS <sup>B</sup>
Maximum temperature <sup>C</sup>	150 °C
Pre-cleaning of sensor	A new sensor might be contaminated with hydrocarbons and dust. Pre-cleaning the surface will give more reproducible QCM-D results.
Protocol light	For light cleaning, step 2 - 4 below can be used.
Protocol thorough <sup>D, E, F</sup>	<ol style="list-style-type: none"> <li>1. Sonicate the sensor surfaces in 99% ethanol for 15 minutes.</li> <li>2. Rinse with milliQ water.</li> <li>3. Dry with nitrogen gas.</li> <li>4. UV/ozone treat for 10 minutes (see UVO treatment).</li> </ol>
Usage	QSense sensors are intended for one-time use only.
Shelf Life	Stable at least 12 months from package date in unopened package, see expiry date on package.
Storage	Store in a cool, dry place out of light.
Chemical compatibility	Do not expose to strong acids and bases. Stay within pH 4-9 to avoid corrosion. <sup>G</sup> There is no guarantee that the coating will be stable under all experimental conditions.

Specifications may be subject to change without notice.

A - The chemical composition was confirmed by XPS.

B - Ref. AFM.

C - Sensor oscillates/works at 150 °C in air. Temperatures above 150 °C have not been tested. Note that ambient environment may influence coating behavior. Theoretically, the quartz and the Au coating withstand temperatures up to 573 °C where the quartz undergoes a phase transition altering its piezoelectric properties. The adhesion layers, the electrode and coating materials will migrate with time, and the migration rate is affected by temperature and time.

D - The suggested pre-cleaning protocols for the sensors are not harmful to the sensor coatings themselves. If the protocols are used for cleaning the sensor after a measurement, note that there is no guarantee that materials adsorbed onto the coatings are removed.

E - K. D. Kwon et al, Environ. Sci. Technol. 40 (2006) p27739

F - Please see QSense "Instrument care and sensor pre-cleaning" for more info.

G - <http://www.aluminiumdesign.net>

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