

SEMI-CONDUCTOR INDUSTRY
Temperature sensors for the semi-
conductor production

Consultation . Solution. Innovation.



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Temperature sensors for the semi-conductor production

THERMOCOUPLES AND RESISTANCE THERMOMETERS FOR PROCESS AND QUALITY ASSURANCE

Microprocessors or semiconductor chips accompany us every day and everywhere - from the coffee machine to the industrial server. Temperature sensors are required throughout the entire semiconductor manufacturing process: from wafer production through doping to final metallization and packaging. TEMPCO Sensors measuring technology is precisely tailored to the specific manufacturing conditions of the semiconductor industry. Our expertise lies in the use of special materials and material combinations that make the most sensitive applications possible. These include the use of quartz glass and the combination with ceramics, for example for quartz, sapphire and silicon protective tubes.

Pressure-and vacuum-tight thermocouples, high-temperature thermocouples and corrosion-resistant sensors for etching processes are also among the specialist areas of TEMPCO Sensors our Factory operates a class 5 clean rooms specially for the semiconductor industry. This means we can ensure that the highest quality requirements are met.

No matter what the process is,
our experts are the right contact!

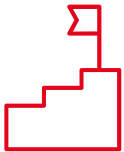
- ✓ Cleanrooms class 5
- ✓ Acid-resistant sensors for etching processes
- ✓ Pressure and vacuum tight sensors
- ✓ Quartz glass blowers available at any time
- ✓ Sensors with extremely short response times





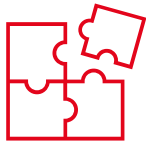
INCREASED CHIP YIELD THANKS TO PROFILE TEMPERATURE MEASUREMENT

The quality assurance of the manufacturing processes is crucial for the yield of chips in the semiconductor industry. Miniature thermocouples are necessary for wafer coating, which ensure a uniform coating at temperatures of 700 °C. The challenge is to accompany the processes with as many sensors as possible, but not to influence them. TEMPCO member of the Rössel group has developed a test wafer for this purpose that can be equipped with almost any number of sensors and can also be used in a vacuum.



THE CHALLENGE

Coating processes on the wafer take place at a temperature of up to 700 °C. For temperature monitoring, sheathed thermocouples with a diameter of less than 0.5 mm must therefore be used. If possible, the process parameters should be recorded on the product (wafer) to be coated and correlated with the measured values in the system. The particular challenge lies in the temporary mechanical attachment of the thermocouples to the wafer for removal during the calibration process.



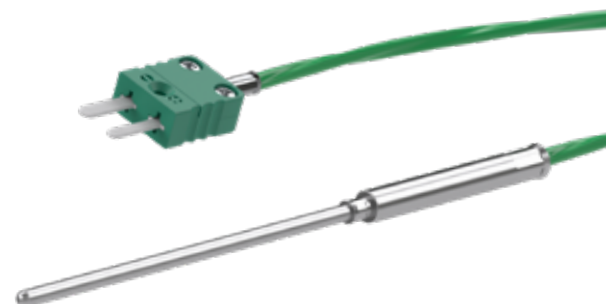
THE SOLUTION

TEMPCO Sensors member of the Rössel group developed a test wafer for the customer to which almost any number of sheathed thermocouples can be temporarily attached. Instead of adhesives, the same material is used to attach the thermocouples as for the wafer to be coated. This has three advantages: the adhesive-free application allows use in a vacuum, direct transfer to the process is possible and the sensors can be removed without damage using a suitable procedure and can thus be recalibrated and reused.



THE INNOVATION

The profile temperature measurement with the test wafer from results in the highest accuracy of the process measurement values, reproducible and reliable. This collection of system-specific experience enabled coating processes to be optimized with pinpoint precision. Because they can be removed without damage, the sensors from TEMPCO Sensors can be recalibrated and reused and used in other coating processes after special cleaning procedures. This protects the environment and resources.





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WE OFFER SOLUTIONS FOR

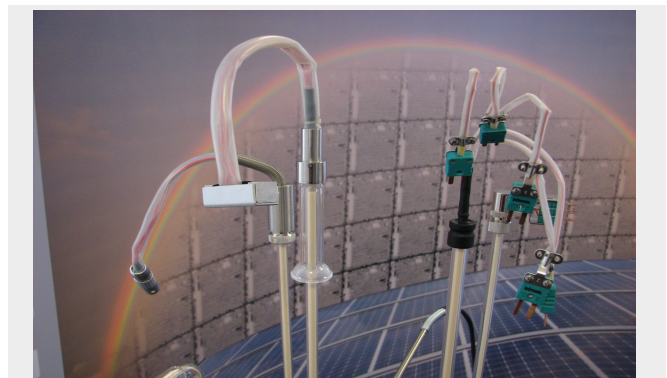
+ ETCHING PROCESSES

+ CVD AND PVD COATING PROCESSES

+ DOPING SYSTEMS

+ CRYSTAL GROWING PROCESS (CZOCHEWSKI PROCESS)

+ PACKAGING PROCESS (BACKEND PROCESS)



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Tempco :/Rössel

As a certified manufacturer of temperature measurement technology for industry and research, we meet the highest manufacturing standards. With internationally recognized approvals and calibrations, we offer quality you can rely on worldwide.



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