



Technical Note: 10000003

Use of Maxtek Sensor Heads in a Sputtering Environment

INFICON Maxtek Thickness Monitors, Controllers and Sensor Heads are suitable for use in most sputtering systems. Only normal precautions need be taken in installing the Quartz Crystal Sensor Head. The Head should normally be water-cooled and care should be taken that the Head receives a representative sample of the deposited material. In addition care should be taken that the installation of the Sensor Head does not disrupt any electrical fields or otherwise disturb the normal material deposition pattern.

The Sensor Head must be grounded and hence it is not suitable for use in bias sputtering where the Head must be installed at some RF potential above ground.

Because the sputtering process is very noisy electrically, it is important to ground the Monitor/Controller itself, as well as the Sensor Head, to the base plate or housing of the sputtering chamber. Use a wide ground strap to obtain low impedance at RF frequencies. Normal diameter wires have relatively high impedance at RF frequencies and may allow a significant voltage to develop between the Monitor/Controller and the system. This voltage is unlikely to cause any damage or shock hazard but may result in an erratic thickness display.

Some manufacturers sell special sputtering sensors heads with built in magnets but these are only beneficial for the older parallel plate RF sputtering systems. INFICON Maxtek Sensor Heads are perfectly suitable for all modern sputtering processes which utilize a Magnetron or other type of source where the plasma is controlled and constrained.

These old parallel plate RF sputtering systems result in a flux of high-energy electrons which impinge on the sensor head and can cause significant temperature related thickness errors if the crystal's temperature change during deposition is significant. The sputtering sensor head's built in magnet helps to divert these hot electrons and thereby reduces the overall heating effect. It should be pointed out that standard sensor heads can provide accurate results in these types of sputtering systems if the crystal is allowed to cool after the deposition and the process adjusted based on this "cool" thickness reading.

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