UltraVac™

Permanent Vacuum Head and Performance Longevity

Andor's UltraVac™ vacuum process was designed not only to facilitate deep TE cooling, but also to provide absolute protection of the exposed sensor.

Unless protected, cooled sensors will condense moisture, hydrocarbons and other gas contaminants. Such contaminants are particularly damaging towards the detecting surface of backilluminated sensors.

Exposed to such outgassed contaminants, the Quantum Efficiency of a back-illuminated EMCCD will decline proportionally. Furthermore, the sensor can fail if excessive condensation forms.

It was these compelling reasons that drove Andor to develop permanent vacuum technology more than 15 years ago. Andor have indeed perfected a proprietary Permanent Vacuum Head, essential not only to optimize cooling performance, but also to ensure that the sensor is protected and that this performance is retained year after year. Only Andor have shipped thousands of vacuum systems, enabling us to unequivocally substantiate our longevity claims with real reliability data.

A back-illuminated EMCCD sensor must be housed in a hermetically sealed vacuum head with minimized outgassing, otherwise both cooling performance and the sensor QE itself will degrade.

Benefits of Permanent Vacuum Head:

- Sustained vacuum performance over many years operation - proprietary process to minimize outgassing. Peak QE and cooling will not degrade.
- Benefit from a thoroughly proven solution. More than 15 years of shipping vacuum systems to the field and a negligible failure rate - MTBF (mean time between failure) figure of more than 100 years. No one else can make or substantiate this claim with real data.
- Performance improves because the temperature of the chip can be reduced significantly. Better cooling (down to –100ºC with an enhanced thermoelectric peltier design) translates into substantially lower darkcurrent and fewer blemishes.
- Elimination of condensation and outgassing means that the system can use only a single entrance window, with double antireflection coating – you can believe the QE curve.
- Prevent convection heat transport from the front window which would otherwise lead to condensation on the outside window.

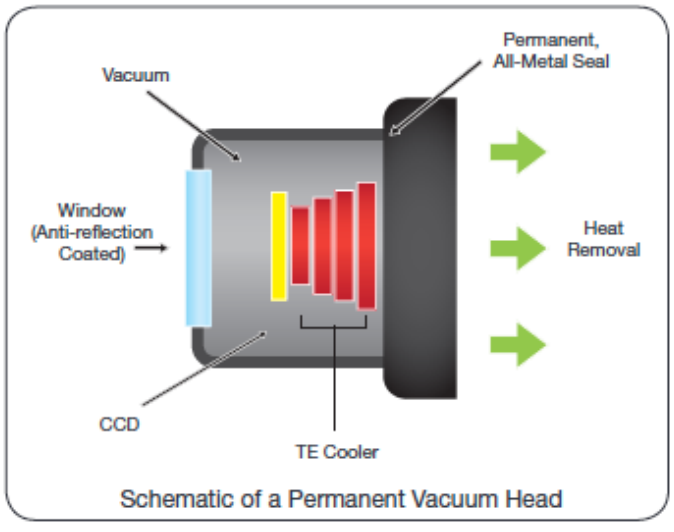

Figure 1