



## Application Note: Electron Beam Secondary Electron Management

Unfortunately there is no guarantee for eliminated “secondary electron“ penetration of substrate. This is caused by simple physics. However Telemark has developed ways to significantly reduce electron damage by design of the Telemark electron beam source.

It needs to be noted the system design considerations can also improve the occurrence of electron damage.

One advantage is Telemark's strong magnetic field extending to the rear of the source and the longer the source, the better. Telemark multi-pocket sources are better in this respect.

The other beneficial measure is the angle of incidence of the electron beam as close to normal (90°) as possible at the pocket. Telemark has continually improved magnetic design and beam geometry. Telemark's current configuration has significantly improved the impingement angle of the beam to the pocket. It provides 90° arrival and continuation to the bottom of the pocket.

Throw distance is another measure. Obviously the farther away the substrate is from the source the lesser the chance for “secondary electrons” to reach the substrate.

- Rate and emission current (power density of incoming beam) are a factor.
- High Voltage is also a factor when considering secondary electron management. A lower high voltage (7kV to 8kV for instance, still acceptable for most metals, preferable for dielectrics anyway) produces “slower” electrons.

