

Abstract Submitted
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Probe Diagnostics in Commercial Plasma Reactors VALERY
GODYAK, RF Plasma Consulting, VLADIMIR NAGORNY, Plasma Dynamics,
DONGSOO LEE, Mattson Technology Inc — The commercial plasma reactors are
not designed for plasma diagnostics and attempts to implement methods and appa-
ratus proved in the laboratory plasma experiments are in many cases frustrating.
There are three major problems in implementing of meaningful probe diagnostics in
commercial plasma reactors. They are: a) large frequency spectrum with significant
amplitudes of the plasma rf potential corresponding to source and bias fundamen-
tal frequencies and their harmonics; b) contamination of the probe surface with a
low conductive layer of the reaction products; and c) too high impedance between
the plasma and grounded chamber due to the chamber contamination or/and an
artificial protective coating. Analysis of these problems and attempts of their reso-
lution are discussed in this presentation. Experimental measurements with different
commercial probes, based on electron and ion currents of the probe characteristic,
performed in commercial rf plasma processing chambers filled with both noble and
molecular processing gases are presented and discussed here. Feasibility of different
kinds of probe diagnostics (based on ion and electron saturation currents, as well one
based on the second derivative of the probe current) in commercial plasma reactors
is discussed and some recommendation are given for meaningful probe diagnostics
in such devices.

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