P L A S U S

Spectroscopic plasma monitor and
process control systems

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Introducing EMICON SA-HIPIMS System

While reactive high-density plasma processes, like HIPIMS, are more and more adapted in industrial plasma applications, a reliable and stable control technique is crucial for securing deposition parameters in production processes. For example, stabilizing the deposition rate and the layer properties simultaneously over the complete lifetime of the target will make HIPIMS production more effective and competitive regarding product quality and production costs. Especially HIPIMS applications are facing the challenge, that the target erosion modifies the magnetic field strength in front of the target, what in turn has a dramatic impact on peak current and ionization.

The worldwide unique **EMICON SA-HIPIMS** system combines the control techniques based on spectroscopic data and electrical pulse data, which enables the user to control HIPIMS production processes despite long-term drifts such as target erosion or change of chamber conditions.

By combining the measurement of pulse current and pulse voltage with the spectroscopic plasma monitoring technique, the degree of ionization and the reactive gas flow can be controlled independently, thus securing layer density and stoichiometry at the same time. While the spectroscopic data reveals mainly information about the gas composition, the analysis of the pulse shape provides additional information about ion density and reactive operation mode (metallic, transition, poisoned). Both data is evaluated in the EMICON SA-HIPIMS system simultaneously and a combined control algorithm opens the door for establishing a long-term process control for productions lines.