

Poster-Session

Case study on reactive sputtering of optical coatings: Effect of bipolar pulsing, unipolar pulsing and the new dynamic reverse pulsing power delivery modes

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In this work, we address the specific demands of the glass/optical coatings industry for sputter deposition of insulating films - high deposition rate, control of heat load on substrate and reduction of arcing events – from the perspective of power delivery. Powering magnetrons for reactive sputtering processes can be achieved by different power delivery configurations. Largely used are bipolar pulsing (symmetric sine wave/square wave) and unipolar pulsing (asymmetric duty cycle and/or discharge voltage) against an explicit anode. A combination of these two modes is possible wherein the power load is halved on each magnetron, known as the dynamic reverse pulsing, and has shown promising results. Based on the specific requirement of the coating, one configuration might outperform the rest. In this poster we present a comparison of these power delivery modes and their influence on the properties of typically used optical coating materials such as SiO_2 , Si_3N_4 and TiO_2 .