



## Investigation of SiO<sub>2</sub> thin film uniformity deposited by electron beam and thermal evaporation method

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### Abstract

In this paper, SiO<sub>2</sub> thin film is produced by two methods: at the first method, SiO<sub>2</sub> is directly evaporated by the electron gun and the oxygen gas is injected to compensate for oxygen loss due to dissociation. At the second method, silicon monoxide is evaporated by thermal evaporation and during the evaporation time, the substrate is bombarded by the oxygen ion that is produced by an ion source. The refraction index, the extinction coefficient and the layer thickness are calculated by numerical method of the transmittance and reflectance equations. By the shift in the spectral transmittance, the amount of non-uniformity is calculated. The results show that if the quantity of the current and the ion energy are selected properly, SiO<sub>2</sub> film will not have absorption in the second method. Moreover, SiO<sub>2</sub> film produced by the second method is more uniform than that produced by the first method.

**Keywords:** silicon dioxide, silicon monoxide, uniformity, refractive index

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