

[DOCUMENT] ABSTRACT

Provided is a mask blank that can manufacture a phase shift mask that can enhance phase shift effect to an exposure light of an ArF excimer laser, that can secure an exposure margin, and having a good optical performance.

Provided is a mask blank having a phase shift film on a transparent substrate, the phase shift film contains hafnium, silicon, and oxygen, a ratio of a hafnium content to a total content of hafnium and silicon in the phase shift film by atom% is 0.4 or more, a refractive index n of the phase shift film to a wavelength of an exposure light of an Arf excimer laser is 2.5 or more, and an extinction coefficient k of the phase shift film to a wavelength of the exposure light is 0.30 or less.