

ABSTRACT

Provided are a phase shift mask blank that can sufficiently suppress the formation of haze on a phase shift film surface (on a phase mask), a phase shift mask having reduced haze defects, a method for manufacturing the phase shift mask, and a method for modifying the phase shift mask by electron beam modification etching. A phase shift mask blank (10) according to an embodiment of the present invention is a phase shift mask blank used for producing a phase shift mask to which exposure light having a wavelength of 200 nm or less is applied, the phase shift mask blank including: a transparent substrate (11); a phase shift film (14) formed on the transparent substrate (11); and a light shielding film (15) formed on the phase shift film (14), in which the phase shift film (14) is a multi-layer phase shift film in which a plurality of the phase layers (12) and a plurality of the protective layers (13) are alternately deposited, and a modification etching rate during electron beam modification of the protective layer (13) is higher than a modification etching rate of the phase layer (12).

FIG. 1