

ABSTRACT

MASK BLANK, METHOD FOR MANUFACTURING TRANSFER MASK, AND
METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

A light shielding film 2 made up of a material containing one or more elements selected from silicon and tantalum and a hard mask film 3 made up of a material containing chrome, oxygen, and carbon are laminated on a translucent substrate 1. The hard mask film 3 is a single layer film having a composition gradient portion with increased oxygen content on the surface and on the neighboring region. The maximum peak for N1s in a narrow scan spectrum obtained via X-ray photoelectron spectroscopy analysis is the lower limit of detection or less. The portions excluding the composition gradient portion of the hard mask film 3 have a 50 atom% or more chrome content, and the maximum peak for Cr2p in a narrow scan spectrum obtained via X-ray photoelectron spectroscopy analysis has a binding energy of 574 eV or less.

FIG. 1