LAYERED RESIST SYSTEM USING TUNABLE AMORPHOUS CARBON FILM AS A BOTTOM LAYER AND METHODS OF FABRICATION THEREOF

ABSTRACT

Disclosed is vapor deposited thick arc layer and method of preparing single and tunable thick bottom layer coatings based on amorphous carbon films. These films can be hydrogenated, fluorinated, nitrogenated carbon films. Such films have the index of refraction and the extinction coefficient tunable from about 1.4 to about 2.1 and from about 0.1 to about 0.6, respectively, at UV and DUV wavelengths, in particular 365, 248 and 193 nm. This makes the films extremely useful to be used as thick bottom layers in a bilayer resist system. The films produced by the present invention can be deposited over device topography with high conformality, and they are etchable by oxygen and/or fluorine ion etch process. Because of these unique properties, these films can be used to form a single or tunable thick bottom layer at UV and DUV wavelengths to produce practically zero reflections at the resist/bottom layer interface.

Fig.2