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WO 03/025993 A1

(54) Title: PLASMA CURING PROCESS FOR POROUS LOW-K MATERIALS

(57) Abstract: Low dielectric constant porous materials with improved elastic modulus and film hardness. The process of making such porous materials involves providing a porous dielectric material and plasma curing the porous dielectric material to produce a plasma cured porous dielectric material. Plasma curing of the porous dielectric material yields a material with improved modulus and hardness, but with a higher dielectric constant. The improvement in elastic modulus is typically greater than or about 100 %, and more typically greater than or about 200 %. The improvement in film hardness is typically greater than or about 50 %. The porous dielectric material is plasma cured for a time between about 15 and about 120 seconds at a temperature less than about 350 °C. The plasma cured porous dielectric material can optionally be post-plasma treated. The post-plasma treatment of the plasma cured porous dielectric material reduces the dielectric constant of the material while maintaining an improved elastic modulus and film hardness as compared to the plasma cured porous dielectric material. The post-plasma treated, plasma cured porous dielectric material has a dielectric constant between about 1.1 and about 3.5 and an improved elastic modulus and film hardness.