

The CEA sol-gel technology for coating on glass

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The French Commission for Atomic Energy is currently involved in the construction of a 2 MJ/500TW (351-nm) pulsed laser devoted to Inertial Confinement Fusion. This megajoule-class laser will be the largest laser system ever built in the world, with 240 beams and almost 10,000 m² in coated area required. Because of the low cost compared to vacuum deposition techniques, the sol-gel process has been selected for 95% of laser optical coated area. The high optical and laser damage threshold performances allow to use such a technology to antireflective-coat various optical components and also to prepare multilayer highly reflective coatings for deformable mirrors. Due to their ability to ensure appropriate deposited optical thickness, room-temperature deposition techniques such as dip-, spin- or laminar-flow-coating have been optimized for laser coating production. Using this know-how, the CEA has developed sol-gel antireflective coatings for numerous applications such as for CRTs and shielding windows. The low temperature process enables fragile or tempered large-size glass substrate coating, including easy-clean or scratch-resistance properties.