

FABRICATION OF LASER TARGETS TO STUDY THE RAYLEIGH-TAYLOR HYDRODYNAMIC INSTABILITY

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Laser experiments on studying the development of Rayleigh-Taylor hydrodynamic instabilities use multilayer targets in which the interface between a dense layer (load node) and a low-density region (unload node) has pre-applied one-dimensional disturbances, which represent a sinusoid wave with a period of 130 μm and an amplitude from 16 μm to 37 μm . The paper presents a technique to manufacture such load nodes from Anycubic Grey photopolymer resin by replica method. To prevent damage to the light-alloy load node, the technique has been developed to sputter it with molybdenum absorber through magnetron sputtering and then to cover it with polyethylene ablator 1–8 μm thick through resistive evaporation. Roughness of laser target working surfaces was monitored at all stages of manufacturing and did not exceed $R_a < 100\text{ nm}$ and $R_q < 100\text{ nm}$.

Keywords: Rayleigh-Taylor instability, photopolymer, replica, roughness, molybdenum sputtering, polyethylene sputtering.

References

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