

Shell Fabrication Development for IFE demonstration study

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The power generation by inertial fusion is being expected as one of sustainable zero-emission energy source. Since 2009, we have been developing not only power lasers also targets used for fuel capsules, which fabrication is key-technology for Inertial Fusion Energy (IFE) research.

High accuracy dimension shell with good uniformity make the high efficient implosion, such as more neutron generation, higher ρR , higher pressure and so on, when such shell are irradiated for IFE demonstration. We have been using conventional micro-encapsulation process for shell fabrication, shown as Figure 1, and we improve the shape accuracy in mass production. On the other hand, many IFE researchers require multi-layer capsule for implosion efficiency improvement [1]. We are trying to fabricate double-layer shell by applying micro-encapsulation process. The status of multi-layer shell fabrication development will be presented including the evaluation results of shell shape.

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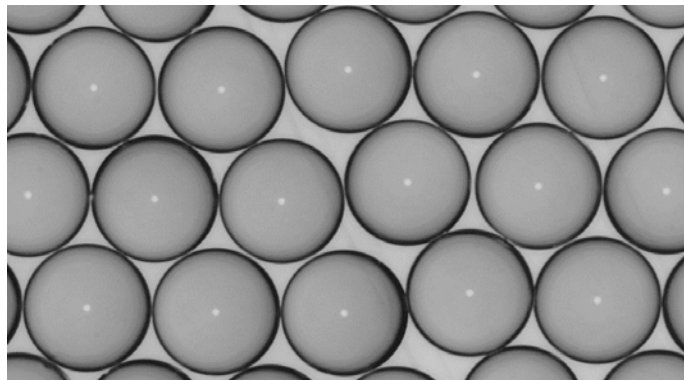


Figure 1: Deuterated poly-styrene shells
(Diameter $508.7 \pm 1.20 \mu\text{m}$ Wall thickness $7.67 \pm 0.08 \mu\text{m}$)

References

- [1] S. P. Regan *et al.* Phys. Rev. Lett. 111, 045001 (2013)