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0.5MJ Targets for an IFE Fusion Test Facility K.N. LAFORTUNE, L.J. PERKINS, P. BEDROSSIAN, Lawrence Livermore National Laboratory, R. BETTI, LLE/University of Rochester, A. SCHMITT, S. OBENSCHAIN, Naval Research Laboratory — There has been much recent progress in the development of both the source and targets for laser-driven, inertial confinement fusion (ICF). The next step to apply this approach to inertial fusion energy (IFE) is to build a facility that has all the required components of a reactor and demonstrates the reliability and robustness. The Fusion Test Facility proposed by NRL is one such facility [S.Obenschain, Bull. APS v50, 2005]. The cost, complexity and scale of any fusion test facility are driven by the energy required for the fusion target. As the laser-target physics has become better understood, target geometries that require less drive energy have been found. Using conventional hotspot ignition, rad-hydro-burn simulations using HYDRA of low-drive-energy, direct-drive reactor targets requiring just 0.5 MJ of drive energy to achieve gain of 10's are being studied. 1-D scoping studies have been performed to outline the source requirements. Good agreement with comprehensive, time-dependent 1-D simulations in LASNEX has been obtained for integral quantities such as gain, yield and ignition margins. The robustness of the small targets has been explored with 2-D stability studies. Shock ignition of similar targets could be employed to achieve yet higher gains with similar drive energies.

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