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Progress in indirect drive fast ignition capsule design for the National Ignition Facility DANIEL CLARK, PETER AMENDT, BARBARA LASINSKI, DONALD MEEKER, HENRY SHAY, MAX TABAK, RICHARD TOWN, Lawrence Livermore National Laboratory — We describe our ongoing work in developing indirect drive Fast Ignition (FI) target designs to be fielded on the National Ignition Facility. Previous efforts [Bull. Am. Phys. Soc. 53, 52 (2008)] focused on capsule designs using deuterium-tritium fuel and doped beryllium ablators. In keeping with the need to diagnose electron beam heating of the assembled fuel at low beam energies, these target designs have evolved into non-cryogenic surrogate targets using silver-doped, deuterated plastic "fuel" layers and plastic ablators. Two designs are described in detail, one using a single shock pulse shape followed by a quasi-isentropic compression and a second using a more conventional four-shock pulse shape. The control of pre-heating of the reentrant gold cone in FI targets is particularly problematic in the hard x-ray environment of indirect drive, and a variety of shell dopant materials are investigated in these designs to mitigate the pre-heat. Finally, the reliability of these target designs in assembling the required fuel areal density is assessed in the face of expected target and radiation drive uncertainties using a series of statistical scans including all expected 1-D sources of error.

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