

Design and Fabrication of Targets for Proton Focus Cone Fast Ignition Experiments*

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The fast ignition concept is a proposed method to reach fusion by two separate processes. The task of the first process is the compression of fuel and the second is the ignition of the compressed fuel by a rapid and directed energy deposition. One delivery method of this energy can be in the form of focused proton beams and this type of fast ignition target will be discussed here. The target designs consisted of gold and plastic cones with a curved proton generating surface (aluminum) within the cone and very close to the tip. The challenges of the given target specifications led to a new cone design that consisted of a cone base and cone tip made in two pieces with the proton generating surface sandwiched between the two. The fabrication of these targets consisted of several steps and processes that included making PAMS shell mandrels, sputter coating deposition, electroplating, precision machining, chemical etching, and target assembly.

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