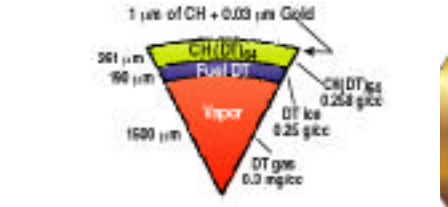
TARGET FABRICATION, INJECTION, AND TRACKING ARE APPROACHED IN AN INTEGRATED FASHION

- **Interrelationships Dictate an Integrated Approach (GA/LANL Working Together)**
- **Two Classes of High-Gain Targets:**
  - **Radiation preheated direct drive design for laser fusion**
  - **Close-coupled indirect drive distributed radiator design for heavy ion fusion**
- **Status of Target Fabrication:**



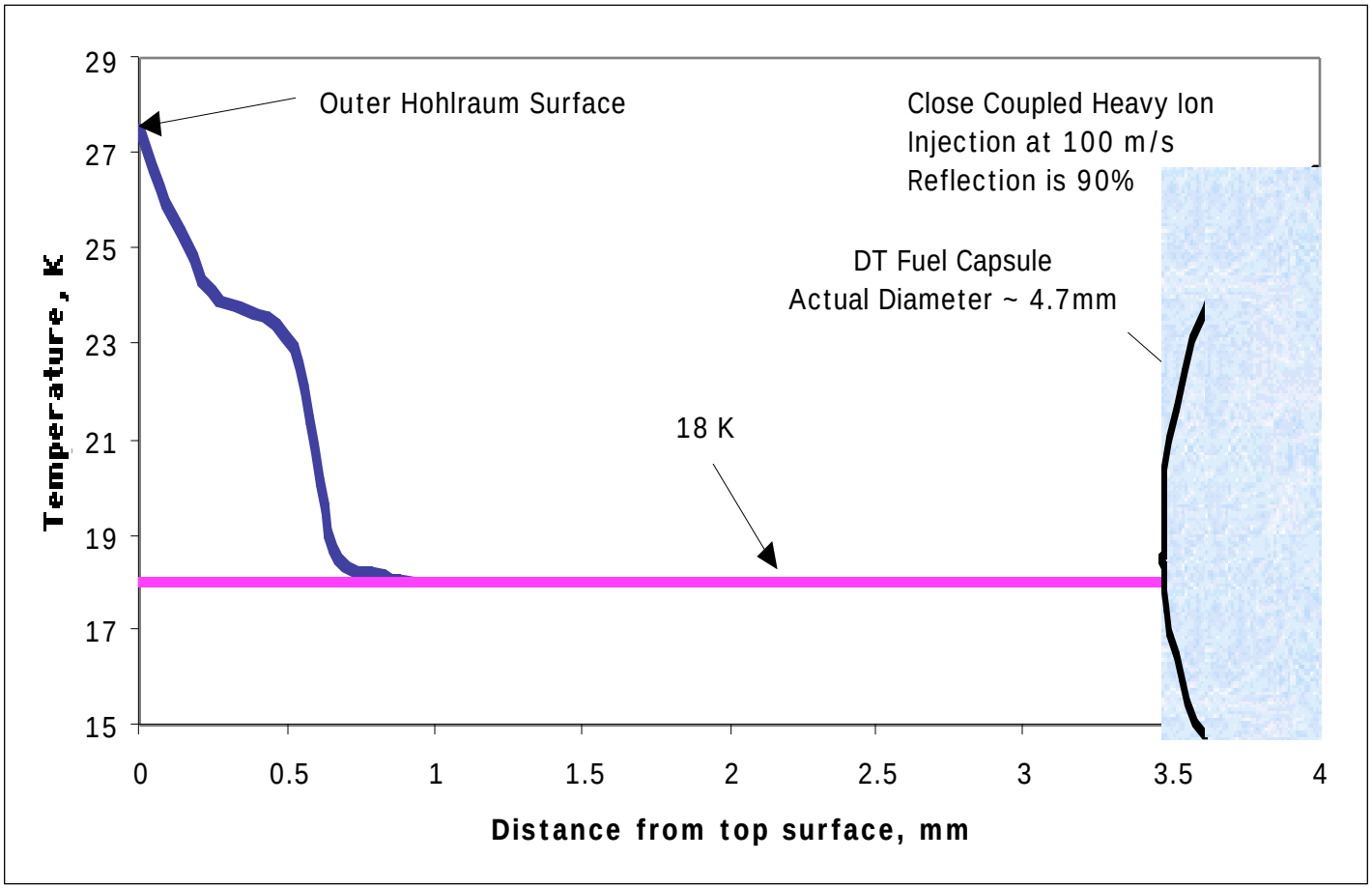
RADIATION PREHEAT TARGET FOR IFE (NRL)


INDIRECT DRIVE TARGET FOR IFE (LLNL)

Direct Drive	Indirect Drive
Builds on demonstrated technologies - Foam shell by microencapsulation - Seal coat by interfacial polycondensation - Gold overcoat by physical vapor deposition - DT filling by permeation at room temperature - Fuel layer formation by cryogenic native β-layering or IR-enhanced layering **Basic feasibility of processes demonstrated in US and Japanese programs**	**Multiple low-density metal foams and metal-doped organic foams require significant development** - Evaluate use of higher density, more localized absorber/radiators - Determine processes for producing materials - Optimize for mass production - Determine filling, layering, and/or assembly operations consistent with ES&H concerns

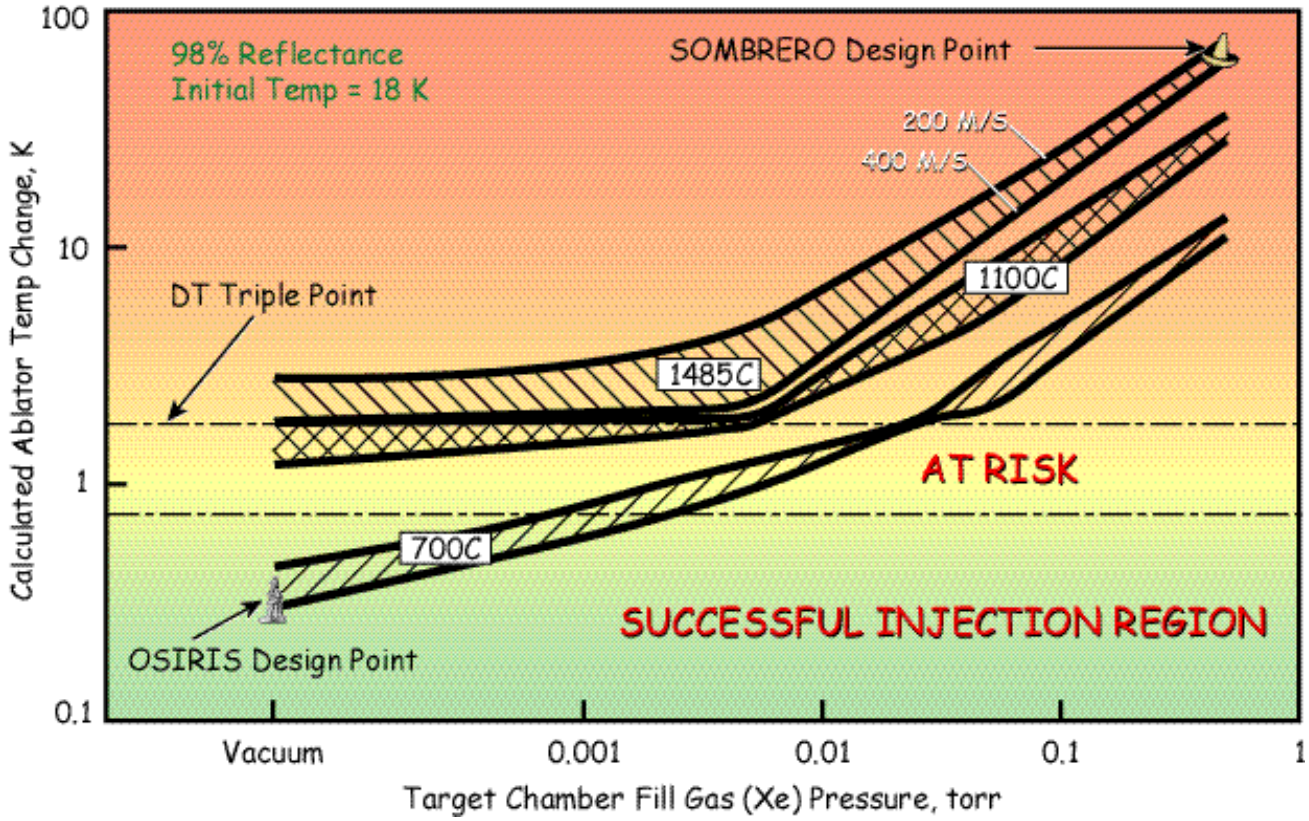
STATUS OF TARGET INJECTION

- **Close Coupled Indirect Drive Target**
  - **Hohlraum with low-density materials provides thermal insulation**
  - **Modeling of target during injection shows negligible DT heating**
  - **Injection at relatively low accelerations and velocities (~100 m/s)**



STATUS OF TARGET INJECTION - CONTINUED

- **Radiation Preheated Direct Drive Target**
  - **Unprotected Target Heated by Thermal Radiation and by Gas in Chamber**
- **Bottom Line = DT Heatup is Far Outside the Survival Range for the Reference Chamber Conditions**



PROPOSED TARGET FABRICATION, INJECTION AND TRACKING WORKSCOPES AND ACTIVITIES

- **Target Fabrication**
  - **Identify key areas for further R&D by evaluating process pathways for IFE target fabrication, filling, and layering**
  - **Integrate results of ongoing fabrication process development studies with issues of target physics and gain, target injection, and first wall protection**
  - **Evaluate proposed target designs for feasibility, cost and fabrication issues**
- **Target Injection and Tracking**
  - **Continue modeling and calculations of target heating as a function of target design, injection speed, and chamber conditions**
  - **Evaluate innovative target protection methods (sacrificial layers, sabots, etc.)**
  - **Interact with target designers on the cryogenic injection capability of new target designs**
  - **Identify key areas for development of continuous duty injectors and their support systems**
  - **Initiate dialog on the interface between target tracking and beam steering or target steering**