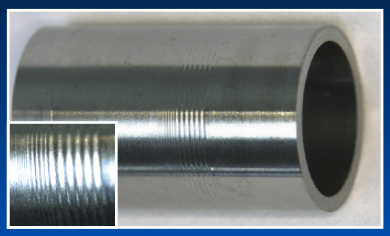
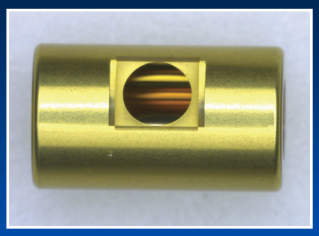
MICROMACHINING AND DIAMOND TURNING

UNIQUE MICROMACHINED TARGET COMPONENTS

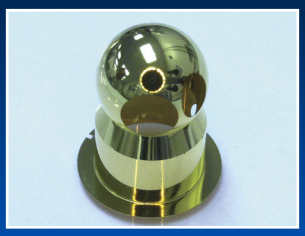


Be tube with multiple wavelength perturbations

Ag spherical hohlraum

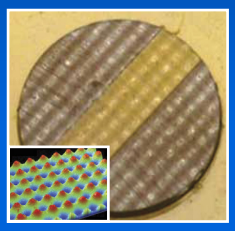


1 μm Au wall hohlraum



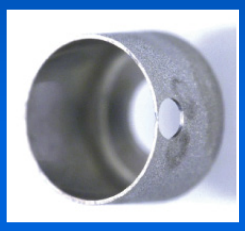
Spherical hohlraum with diagnostic ports

Al hemisphere

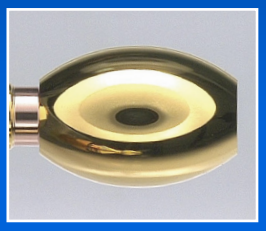


sin(x) sin(y) surface

Al spherical shield fit to hohlraum

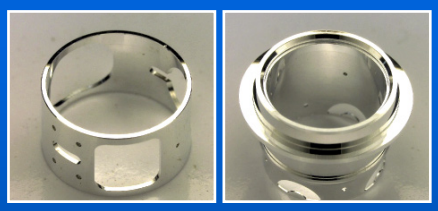


Lead (Pb) hohlraum

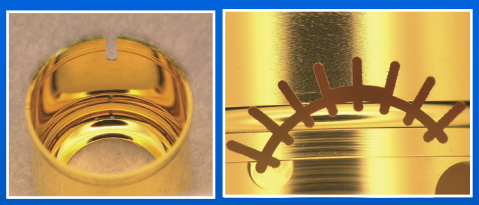


Rugby hohlraum

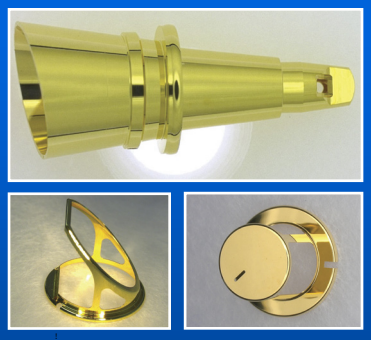
MILLED FEATURES



Al components with milled diagnostic features



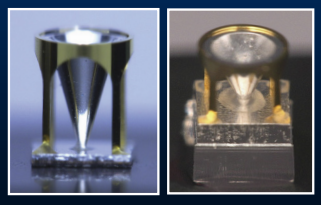
Au and depleted U hohlraums with milled features



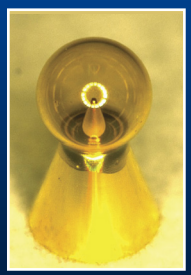
Other Au components

MULTI-COMPONENT ASSEMBLIES

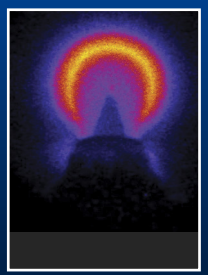
Au micromachined frame



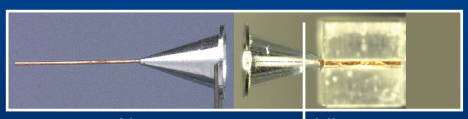
Al cone in Au frame on target package



Fast Ignition cone and shell target



Fast Ignition result



Al cone target assemblies

Shock timing cone and shell target

Cu (Al, Au) wedge

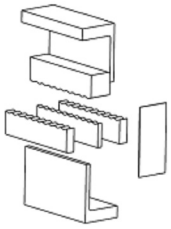
GENERAL ATOMICS

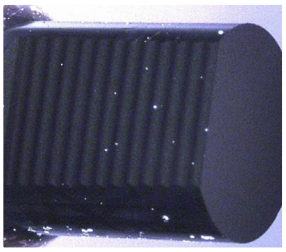
MICROMACHINING AND DIAMOND TURNING

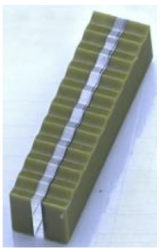
FOAM AND AEROGEL COMPONENTS

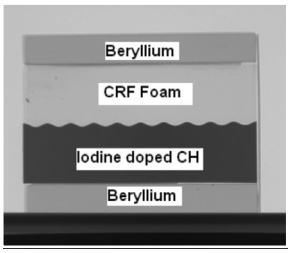
Machined CRF block matched to tri-layer CH & Iodine doped CH assembly

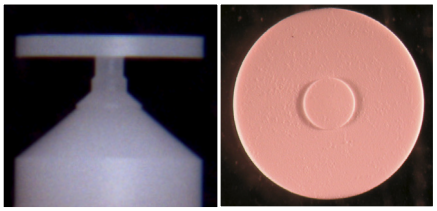
CRF Pattern: 400 µm wavelength, 3 µm peak to valley



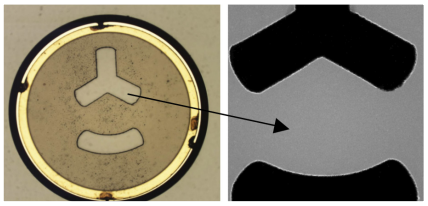


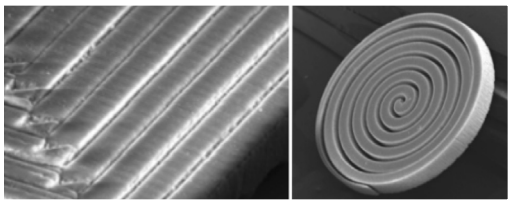






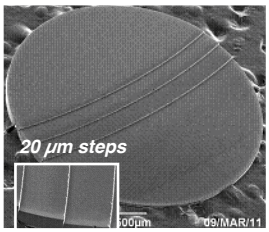
100 mg/cc polystyrene disk





aerogel with machined openings and patterns

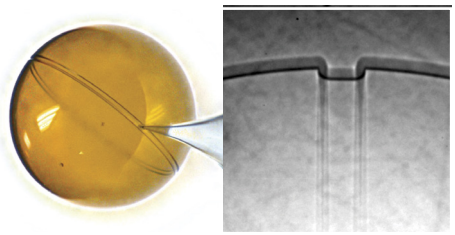
LOW Z MATERIALS



Stepped CHaRM target

Storm window washer

Epoxy hohlraum



Engineered defect capsule

General Atomics Inertial Fusion Technologies produces a wide range of routine and "first-of-a-kind" components for experiments performed by scientists at the Laboratory for Laser Energetics (LLE), Lawrence Livermore National Laboratory (LLNL), Sandia National Laboratory (SNL), Atomics Weapons Establishment (AWE) and various universities. Examples of various foams and aerogels produced by GA for the Inertial Confinement Fusion community are provided.

MICROMACHINING CAPABILITIES

Capability	Details	Difficult	Typical
Diamond Turning	– 11 Diamond turning lathes (Precitech & Moore) – Dedicated: 1 to Be, 1 to U, 1 for classified work	– Dimensional tolerance: 1-2 µm – Surface finish: < 5 nm RMS – Multiple mode patterns	– Dimensional tolerance: 3-5 µm – Surface finish: 5-10 nm RMS – Single wavelength patterns
Fast Tool Servo	– Complex patterns; sine waves with overtones, – Multiple patterns on same target		sin(x) sin(y) patterns
Precision Milling	– 3 KERN 5-axis micromills	– Dimensional tolerance: <5 µm	– Dimensional tolerance: 5-10 µm – Surface finish: 300-400 nm RMS
Laser Micromaching	– 3 laser stations (510 nm) metals, foams – 1 laser stations (266 nm) plastics, thin foils	– Dimensional tolerance: 1-2 µm	– Dimensional tolerance: 3-5 µm
Electron Discharge Machining (EDM)	– Precision EDM system	– Holes and features: 10 µm	Holes and features: 20-100 µm
Unique Materials	– Be, U, Pb, and non-carbide forming metals		
Classified Work	– Diamond turning of classified components		

Certified System
SAI GLOBAL
ISO 9001
Quality

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