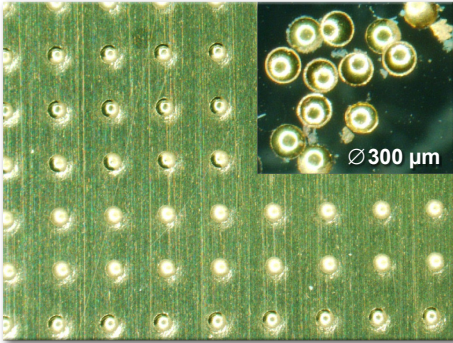


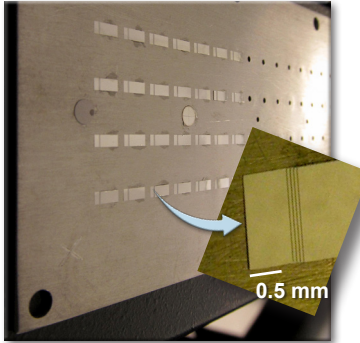
# HIGH REPETITION RATE TARGETS

*Target Production and Development for Fusion Research, Basic Science and High Energy Density Physics*

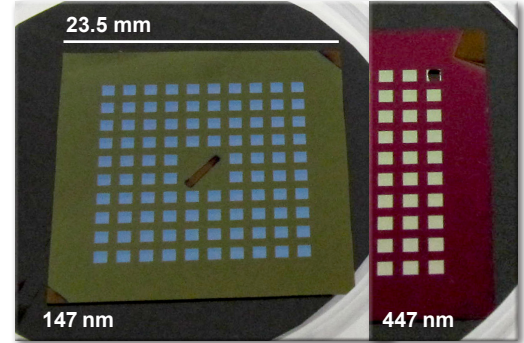
## Particle Acceleration Targets Gold Hemi-shell



## Shock Physics Targets Diamond Multi-Steps



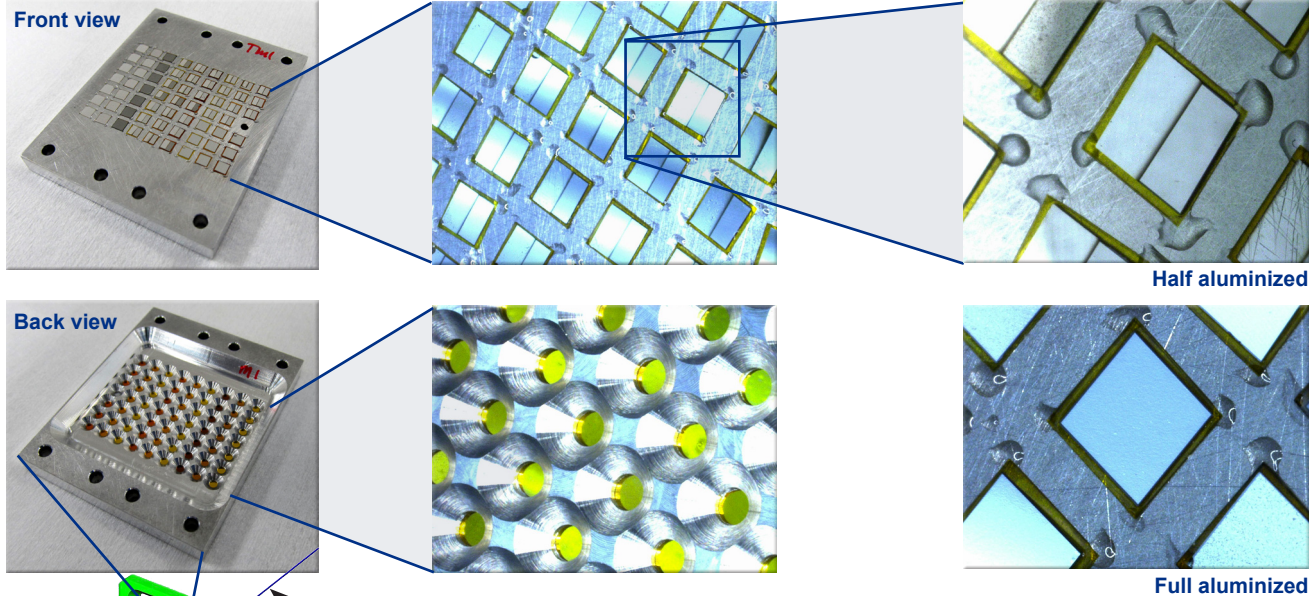
## Isochoric Heating Targets Silica Window Films



General Atomics (GA) designs and develops systems for target fabrication, assembly, metrology, and shot diagnostics. GA experts work collaboratively to design and construct systems for target fielding and insertion, producing large quantities of targets for high repetition rate laser experiments. GA has provided High Power Laser targets since 2011 for experiments using **100's to 100,000's of targets each**.

## TARGETS FIELDIED AT SLAC'S LINAC COHERENT LIGHT SOURCE (LCLS)/ MATTERS IN EXTREME CONDITIONS (MEC) EXPERIMENTAL HUTCH

184 targets, half and full aluminized diamond with polyimide ablator for LCLS target LL20



## ROBOT TARGET ASSEMBLY STATION

High throughput assembly with robotics,  
one assembly/minute

# GENERAL ATOMICS CAPABILITIES

- **Quality Assurance**

Over 25 years of experience building targets for laser experiments. ISO 9001:2008 certified.

- **Fabrication capabilities**

Large in-house suite of target production and calibrated metrology equipment to control and maintain quality production.

- *Micro-machining: multi-axis milling and turning*
- *Laser machining, marking, and micro-drilling*
- *Thin film coating: polymers, metals, and alloys*
- *Target assembly: manual and automated robotic*
- *Electro-plating and electro-forming*
- *Lithography: DUV mask alignment, reactive ion etching*
- *Chemical synthesis: polymer, metal, metal oxide foams & aerogels*
- *Extensive characterization: dimensional, density, areal density, composition, micro-structure, surface properties*

- **Characterization data**

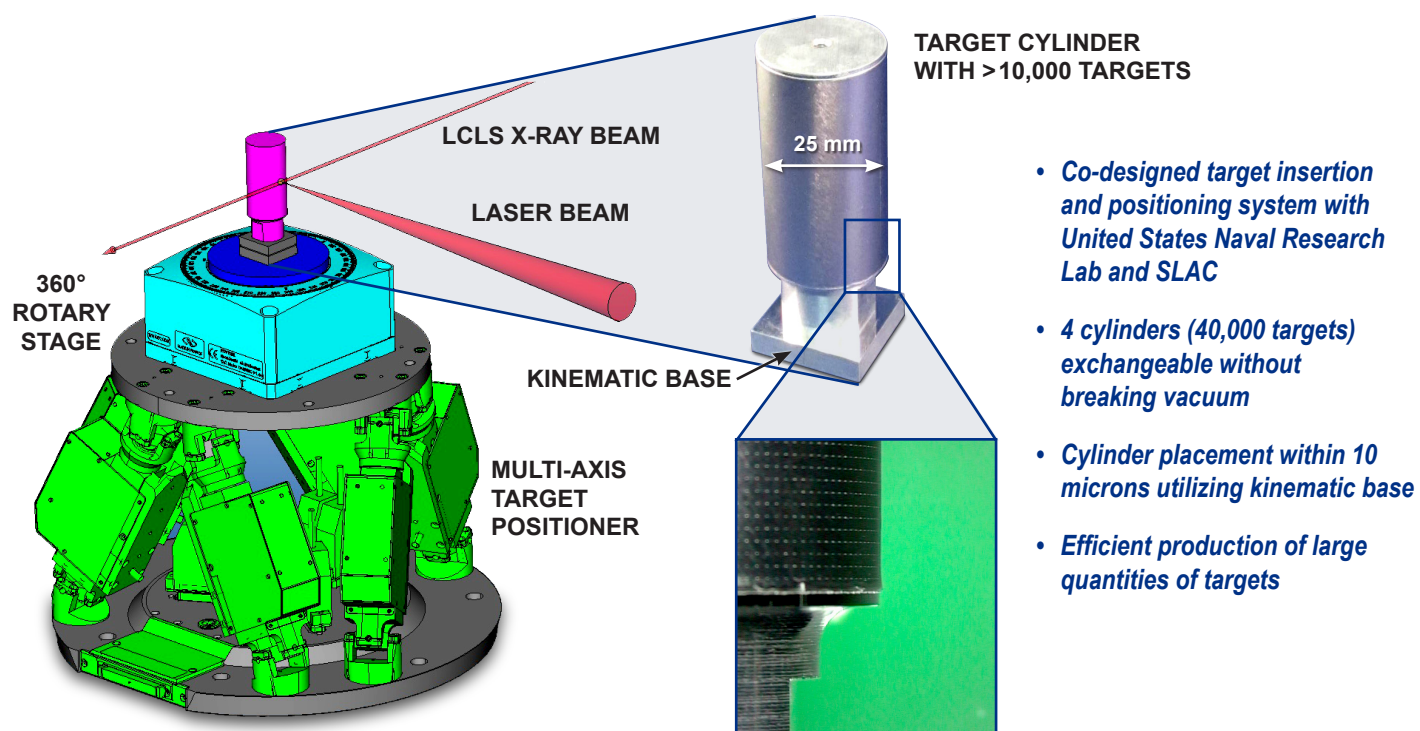
GA collects target data using ISO-17025 calibrated equipment, traceable to national standards. GA scientists have developed new techniques (e.g. X-ray Absorption Edge spectroscopy for absolute areal density measurement).

- **Experiment simulation**

GA utilizes target physics codes (FLASH, FLYCHK, ITS, VISRAD) for design and data interpretation.

## LCLS 2011 SOFT X-RAY (SXR) EXPERIMENT FIELDING 200,000 TARGETS

20 cylinders each with over 10,000 lithographically defined target locations (200,000 targets)



GA researchers frequently work with investigators drawing from past experience to improve target designs in regards to manufacturing and fielding. With a team of 100+ uniquely qualified scientists, engineers, and technicians focused on target production, GA offers unparalleled expertise applicable to target design needs.

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