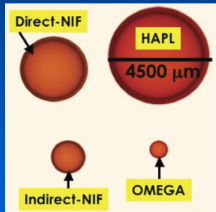
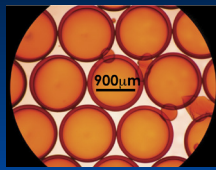
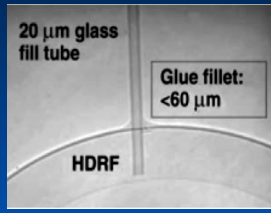


FOAMS AND AEROGELS

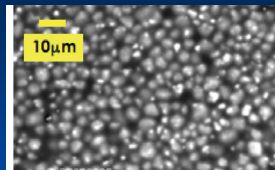
RESORCINOL FORMALDEHYDE (R/F) 30-500 mg/cc



100 mg/cc shells



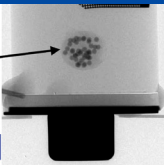
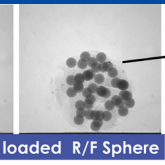
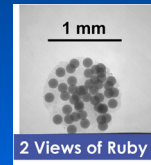
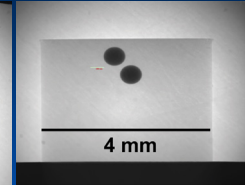
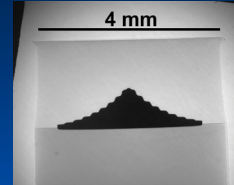
Gas-tight foam shell with tube



SEM of 1%Sn doped R/F

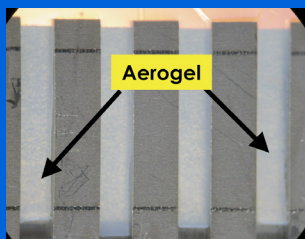


SnO₂ doped R/F

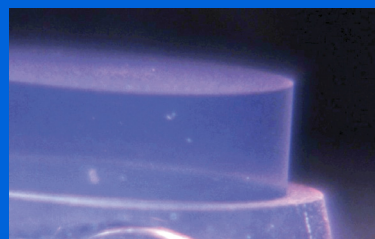


Precision-placed objects in aerogel cylinders

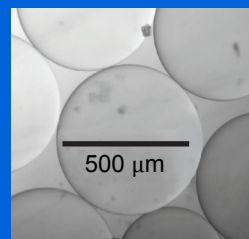
SILICA AEROGEL (SiO₂) 1-400 mg/cc



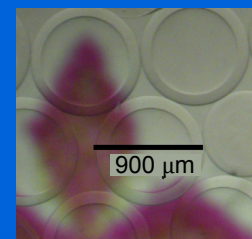
3 mg/cc SiO₂ in comb frame



50 mg/cc machined disk

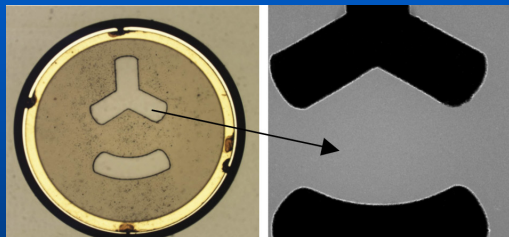


100 mg/cc bead

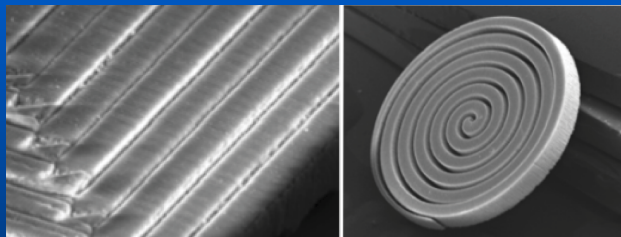


100 mg/cc shell

TANTALUM AEROGEL (TA205) 150-700 mg/cc

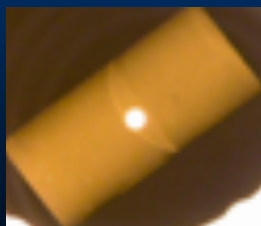


400 mg/cc disks with machined openings

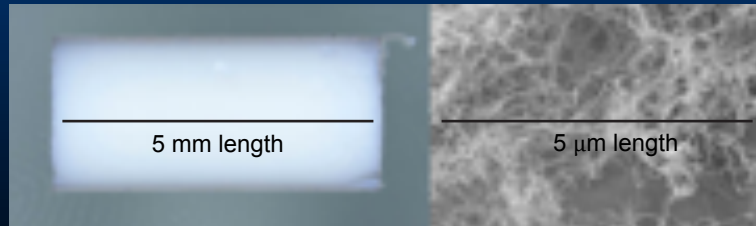


400 mg/cc Ta₂O₅ with machined patterns

GA-CH AEROGEL (CH) 4-300 mg/cc



Glass bead in GA-CH



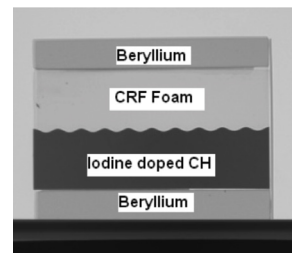
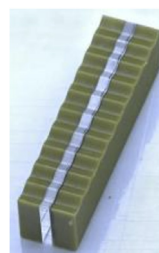
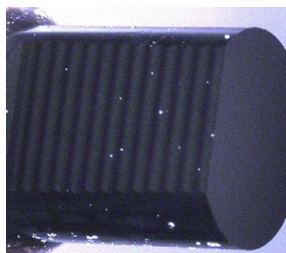
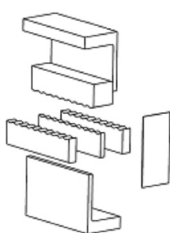
GA-CH monolith and microstructure

FOAMS, AEROGELS, AND PLASTICS

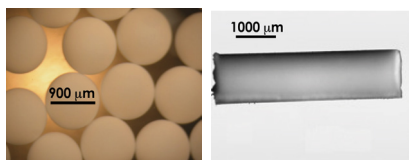
CARBONIZED RESORCINOL FORMALDEHYDE (CRF) 40-500 mg/cc

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

CRF Pattern: 400 μm λ with 3
 μm peak to valley

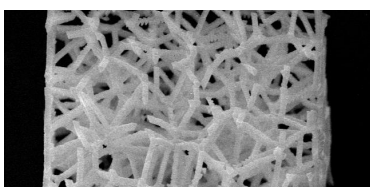


DIVINYL BENZENE FOAM (DVB)



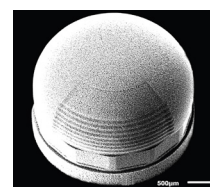
100 mg/cc DVB shells 50 mg/cc filled parylene tube

ADDITIVE MFR STOCHASTIC FOAM



10-50 mg/cc CH Foam

Cu FOAM



12% Dense Cu Foam

DOPED PLASTICS (Synthesized metal doped plastics for warm dense matter spectroscopy)

21 44.955910 Sc Scandium 	22 47.867 Ti Titanium 	23 50.9415 V Vanadium 	24 51.9961 Cr Chromium 	25 54.938045 Mn Manganese 	26 55.845 Fe Iron 	27 58.933200 Co Cobalt 	28 58.6934 Ni Nickel 	29 63.546 Cu Copper 	30 65.409 Zn Zinc 	32 72.64 Ge Germanium 
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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), Atomic Weapons Establishment (AWE) and various universities. Examples of various foams and aerogels produced by GA for the Inertial Confinement Fusion community are provided.

Foam/Aerogel Material	Foam Density	Dopants Demonstrated by GA	Foam Composition
Resorcinol Formaldehyde Aerogel (R/F)	30-500 mg/cc	Al ₂ O ₃ & SnO ₂ Nanoparticles	C, H, O
Carbonized Resorcinol Formaldehyde Aerogel/foam (CRF)	40-500 mg/cc		C, H
SiO ₂ Aerogel	1-400 mg/cc		Si, O
Al ₂ O ₃ Aerogel	30-130 mg/cc		Al, O
Ta ₂ O ₅ Aerogel	150-700 mg/cc		Ta, O
Divinyl Benzene (DVB)	30-500 mg/cc	Al ₂ O ₃ & SnO ₂ Nanoparticles, Br	C, H
HIPE (polystyrene), deuterated polystyrene	15-700 mg/cc	Al ₂ O ₃ & SnO ₂ Nanoparticles, Br, Deuterated (90%)	C, H
GA-CH Aerogel	4-300 mg/cc	Au, Cu, Al Nanoparticles, Br	C, H

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