



FreeFoam™

A Revolutionary 3D Printable Resin for Tooling-Free Production of Closed-Cell Foam Parts

FreeFoam photopolymer resins contain dispersed heat-activated foaming agents and are 3D printed into designs with Digital Light Processing (DLP), one of the most trusted and mature forms of additive manufacturing

FreeFoam eliminates expensive tooling and the waste associated with standard foam production and delivers a high strength-to-weight ratio — all while enabling new design freedoms

After printing, FreeFoam parts undergo a thermal process, inducing closed cells to expand the part to a programmable volume between 2 to 7 times its original size maintaining tight tolerances

Part of a new category of extremely strong and resilient DuraChain™ photopolymers, FreeFoam will be offered in a wide range of Shore hardness values

While 3D printers today can process standard polymers into lattice designs that simulate foams, FreeFoam produces a true foam material containing closed cells, delivering revolutionary benefits

FreeFoam is 3D printable on the ETEC Xtreme 8K (450 x 371 x 399 mm build envelope) and is post-processed in a commercial oven at 120–200°C (250–400°F)

Learn More at: desktopmetal.com/freefoam

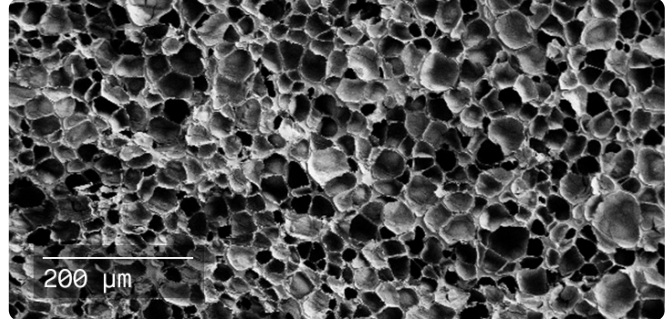


DuraChain™ FreeFoam™ Cushion

Specifications

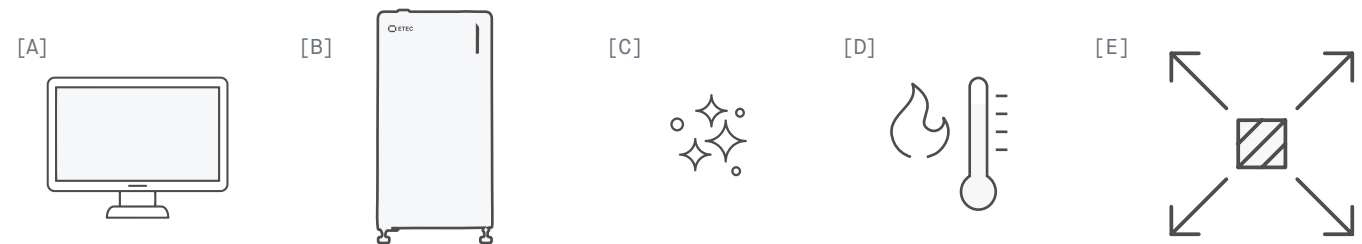
BENEFITS

- 3D print on a DLP printer; expand in an oven
- Produce foam products in any volume without tooling
- Dramatically reduce foam trimming and waste
- Produce complex foam designs with ease
- Lightweight existing foam designs
- Iterate designs as needed without tooling
- Delivers high strength-to-weight ratio



MECHANICAL PROPERTIES *	TEST METHOD	FREEFOAM CUSHION (G32023)
Hardness (Shore A, t=0)	ASTM D2240	48.6 ±1.1
Volumetric Expansion Factor (m ³ /m ³)	Internal	2.4 ±0.2
Expanded material density (g/cm ³)	Internal	0.4 ±0.03
Elongation at break (%)	ASTM D638 Type V	137 ±8
Tensile Strength (MPa)	ASTM D638 Type V	1.7 ±0.5
Toughness (MJ/m ³)	ASTM D638 Type V	1.5 ±0.5
Tear Strength (kN/m)	ASTM D624 Die C	7.1 ±0.4
Operating temperature (°C)	ASTM D4065	-40 to 160
Compression Set (%) @ 22°C, 25%, 22 hours	ASTM D395 Method B Type I Internal**	42.1 ±3.6 12.3 ±1.3
Volatile Organic Compounds (VOC) (µg/g)	GMW-15634	228
Semi-Volatile Organic Compounds (SVOC) (µg/g)	GMW-15634	160
Burning Rate (mm/min)	UL 94-HB	58.5 ±5.1
Cytotoxicity	ISO 10993-5	Pass - Grade 0

PROCESS WORKFLOW



- [A] Design foam parts on computer
- [B] 3D print parts on ETEC Xtreme 8K top-down DLP system
- [C] Clean and post-process parts
- [D] Place parts in oven at 190°C (375°F)
- [E] Parts expands 2.4 times the original volume in minutes
- [F] Foam parts are complete

* Values shown in table are from parts manufactured using recommended postprocessing guidelines
 ** Internal method derived from ISO 1856 Method C