

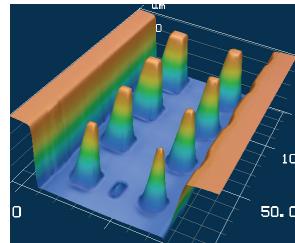
NanoSculpt™ Solution Suite

3D & Sculpted Patterning

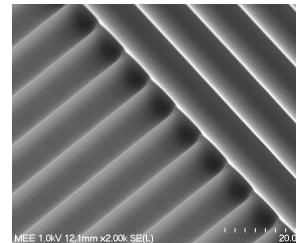
Many new products require innovative 3D patterning to create unique surface properties and textures. The IGI NanoSculpt™ Solution Suite allows you to add a wide range of micro-optic and nano-textures for diverse pattern characteristics, created using a variety of techniques, technologies, and materials. IGI will prototype your design with direct imaging, quickly transforming ideas into reality, then provide shims, molds, or stamps for volume manufacturing.



Random Diffuser



40 Micron Posts



Lenticular Lens



Rotated Lens

NanoSculpt Technology

- ▶ Laser, E-Beam, DUV, & Other Litho Processes
- ▶ Thermal & Imprint Technologies
- ▶ Unique Material Applications & Combinations
- ▶ Coatings & Oxides
- ▶ SEM, Confocal, & Other Measurement Tools

Industries that Use NanoSculpt

- | | |
|--|--|
| <ul style="list-style-type: none"> ▶ MEMS ▶ Life Sciences ▶ Security ▶ Semiconductor | <ul style="list-style-type: none"> ▶ Optics ▶ Aerospace ▶ Roll-to-Roll Materials ▶ Biotechnology |
|--|--|

NanoSculpt Applications

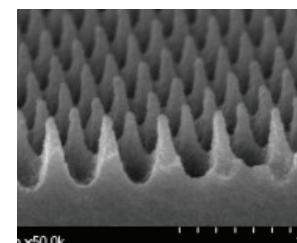
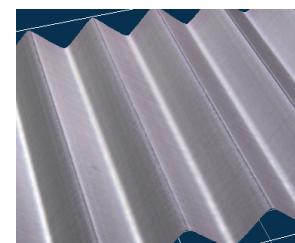
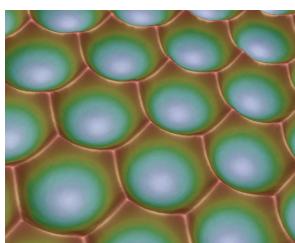
Surface Textures - anti-reflective, self cleaning, self sticking, and other textures both functional and decorative.

Micro-Optics - spherical and aspherical micro lenses, micro mirrors, light diffusers, and 100% fill factor.

Gratings - unique configurations can be achieved.

Biomimicry - imitate nature to create complex microfluidic and biological surface treatments.

Microtext - embed text in structures for tracking and security.



NanoSculpt Specifications

IGI collaborates with our customers across many industries to take advantage of the power of NanoSculpt™ technology. Your project may utilize lenses, prisms, mirrors, posts, peaks, or other structures. We can share reference designs that made seemingly impossible applications possible. IGI supplies shims, molds, inserts, and stamps, which are used for casting, embossing, injection molding, imprinting, and other applications.

The NanoSculpt Solution Suite capabilities will vary dependent upon the structure of the 3D pattern, resolution required, and materials used. The first step to effectively use NanoSculpt Solutions is to conduct a project consultation with the IGI Team.

NanoSculpt 3D Capabilities

Features	Micro-structures	Nano-structures
Minimum Structure	1µm	200nm
Structure Height	up to 100µm	up to 500nm
Surface Roughness	< 50µm	< 5nm
Deviation from Nominal Shape	< 250nm	< 25nm
Patterned Areas	up to 800mm	up to 700mm
Materials	Silicon — Nickel — Glass — Polymers of specific characteristics	
Substrates	Flat — Cylinder — Other 3D Shapes	
3D Products	Stamps & Molds — Shims — Masters — Sleeves — Rolls	

NanoSculpt Consulting

IGI works closely with our customers around the world to supplement their engineering skill sets to accelerate project schedules and reduce risk. Utilize our expertise in various project phases: ideation, product design, manufacturing of prototypes, and high volume reproduction.

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