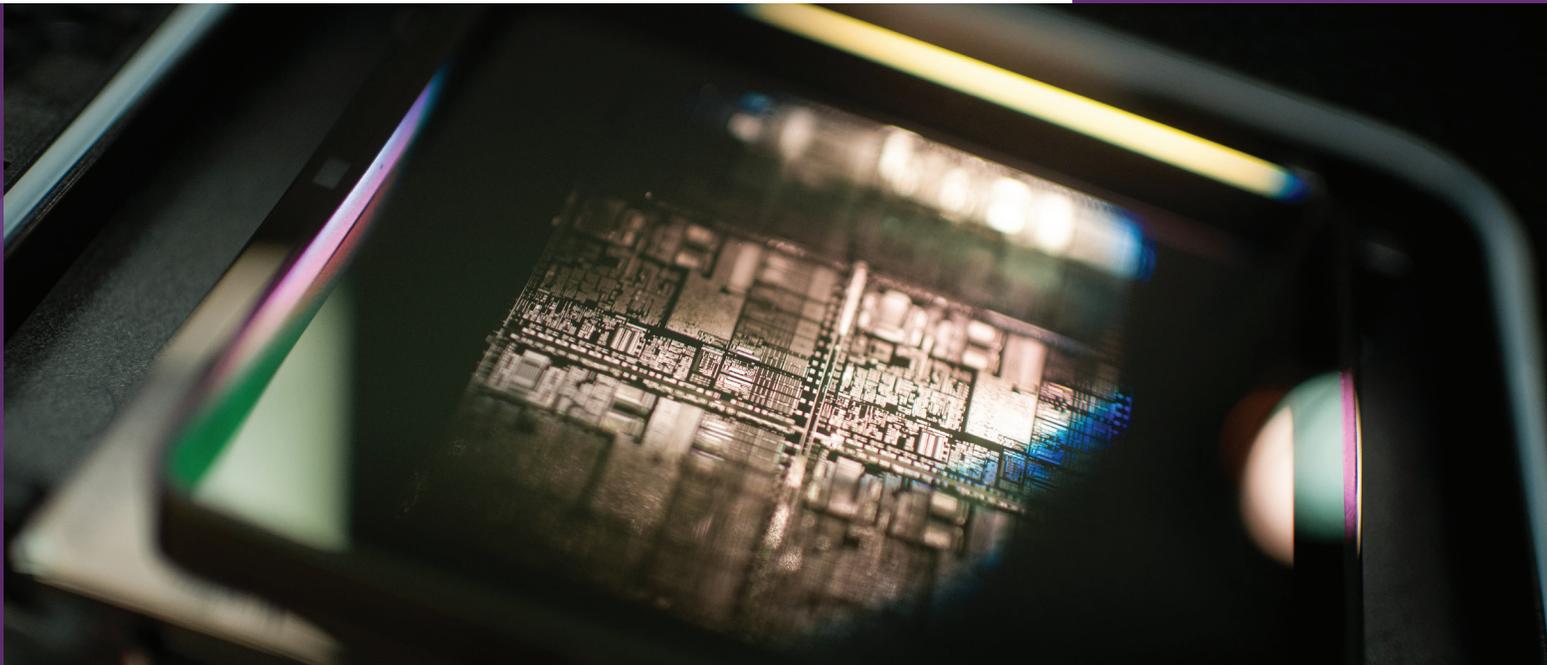


compugraphics



COMPUGRAPHICS

"The Experts Behind the Mask"

Global Photomask Supplier



compugraphics-photomasks.com

January, 2019

SEMICONDUCTOR SOLUTIONS

COMPUGRAPHICS

Business Overview

WHO WE ARE

At Compugraphics we take pride in providing the highest level of customer support regardless of the size of our customers. We are not just a photomask maker, we partner with our clients and get to know their operations to guarantee the best level of technical support is provided.

Our photomasks are of the highest quality to achieve the best possible manufacturing yield and maximum return on our customers' investment. The Compugraphics technical support team works with a variety of technologies and continues to innovate to create unique solutions for customers' needs.

We have a unique understanding of production systems which gives us flexibility to create solutions for our customers' ever changing requirements. Our award winning technical support team is available 24/7 should you require any assistance or help.

Compugraphics, along with Alpha and MacDermid Enthone, are brands in the MacDermid Alpha Electronics Solutions business. Through the innovation of specialty chemicals and materials, MacDermid Alpha provides solutions that power electronics interconnection. We serve all global regions and every step of device manufacturing within each segment of the electronics supply chain.

The experts in our Semiconductor Solutions, Circuitry Solutions, and Assembly Solutions divisions collaborate in design, implementation, and technical service to ensure success for our partner clients. Our solutions enable our customers' manufacture of extraordinary electronic devices at high productivity and reduced cycle time. Find more at MacDermidAlpha.com.



OUR MARKETS AND SECTORS

We create customer specific photomask solutions across the complete spectrum of the microelectronic industry.

- Semiconductor & integrated circuits
- Optoelectronic devices
- MEMS & nanotechnology
- Compound semiconductor
- Discrete
- Renewable energy
- Genomics
- Image sensors
- Sensors manufacturers
- MEMS manufacturers
- R&D/Prototyping- Ideal for Universities



COMPUGRAPHICS

Business Overview

WHAT ARE PHOTOMASKS?

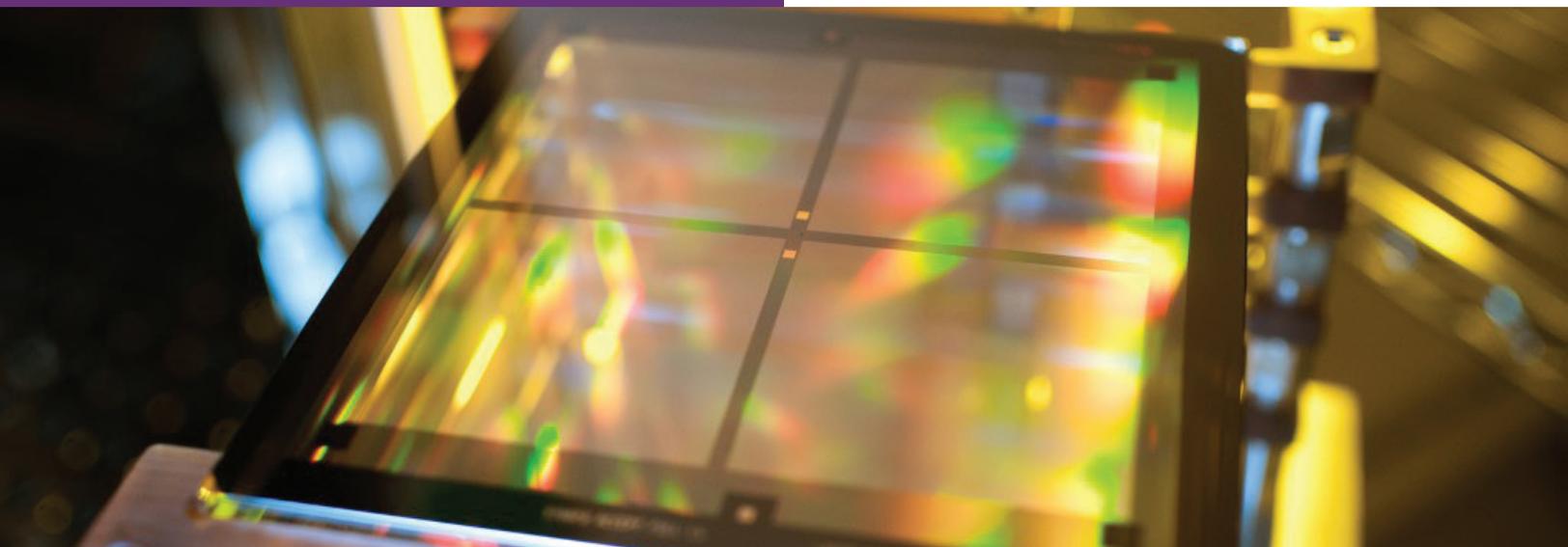
Many electronic devices are produced by photolithography and the masks, produced by Compugraphics, perform a similar function to a negative in conventional photography. Photomasks are high precision plates made out of Quartz or Soda Lime glass with a chrome layer on one side. They contain microscopic pictures of electronic circuits. The design of the electronic circuit is etched into the chrome layer. As the master image for many complex manufacturing processes, these photomasks are produced with tolerances down to atomic scale.

PHOTOMASK PRODUCTS

- Stepper Reticles: 1x, 2x, 2.5x, 4x and 5x
- Ultratech 1X Reticles
- 1x Masters: Quartz, Sodalime, Chrome & Iron Oxide - 3" to 9"
- Large Area Photomasks: Up to 20"
- 1X Submasters & Copyplates 3" to 7"
- Optical Proximity Corrections (OPC)
- MPT™ Coating (Mask Protection Technology)
- OPC and 248nm EAPSM
- Wet-Etch & Dry-Etch Processing
- Grayscale

CAPABILITIES

Blank Sizes:	4", 5", 6", 7", 9", 14", up to 20"
Minimum Address Grid:	5nm(0.005µm)
Minimum Feature Size:	Lines 0.40µm Holes 0.60µm
CD Tolerance:	±25nm (0.025µm)
CD Range / Uniformity:	25nm(0.025µm)
Registration:	±0.035µm
Minimum Defect Size:	0.20µm
Plasma Etch:	Anisotropic Profile



COMPUGRAPHICS

Business Overview



GLOBAL REACH

From world-class manufacturing facilities in Scotland, the USA, and Germany, we provide photomask solutions for companies, universities and R&D Institutes around the globe. These sites are supported by a strategically located, world-class reticle repair and recertification facility in Austin, Texas.

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CERTIFICATIONS



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