Optimax Systems Inc.

Since Optimax was founded in 1991, optics have been behind enormous progress in technologies as diverse as fiber optic telecommunications, solid-state lighting, digital photography, displays, and diagnostic medicine. We have worked on key programs in aerospace, government research, and defense.

Freedom of FREEFORMS

Fewer elements | Lighter weight | Increased flexibility

Optimax specializes in Asphere, Cylinder, Sphere, Plano/Flat and now Freeform optics in sizes up to 500 mm. All parts are manufactured to customer-supplied specifications and include final inspection data.

Facility Size: 60,000 sq. ft.

Employees: 300+

Opticians: 100+

President: Michael Mandina

Founded: 1991

Compliance: ITAR (International Traffic & Arms Regulations) EAR (Export Administration Regulations)Dodd-Frank Act (conflict minerals)RoHS (Restriction of Hazardous Substances) REACH (Registration, Evaluation, Authorization and Restriction of Chemical Substances)MIL-I-45208A Quality SystemSmall Business

Registered: ISO 9001:2008 certified

US Dept of State: Registered with Directorate of Defense Trade Controls

Encryption: PGP® Desktop Email

D&B #78-706-4120 (Dunn & Bradstreet)

Payment Terms: N30 with approved credit or Credit Card

OPTIMAX®

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Optimax Systems Inc.

Optimax helps its customers prove that great people can do great things with the right technology and support.

We leverage our optics manufacturing technology for programs that benefit mankind and projects that defend our freedom. Our know-how, innovation and speed enable quicker production of precision optics to meet emerging market needs.

What is a **Freeform?**

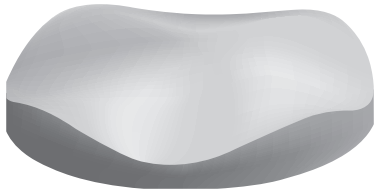
An optical surface with little to no symmetry.

Why design with freeforms?

Designing with freeforms will make your project have:

- Fewer elements
- Lighter weight
- Increased flexibility

And in the end overall better performance.



Freeform

Tolerancing Limits for Freeform Surfaces

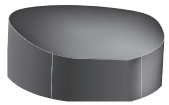
Attribute	Precision Tolerance*	Freeform Tolerancing Limit*
Diameter (mm)	+0, -0.025	+0, -0.010
Center Thickness (mm)	± 0.100	± 0.050
Irregularity – Interferometry (HeNe fringes)	0.5	0.1**
Irregularity – Profilometry (µm)	± 5.0	± 1.0
Surface Roughness (Å RMS)	20	10

**Soft tolerancing limits. **Stitching/CGH dependent. For reference only.*

Common **Freeforms**

Toroid

$$Z = \frac{C_x X^2 + C_y Y^2}{1 + \sqrt{1 - C_x^2 X^2 - C_y^2 Y^2}} \quad C_x = \frac{1}{R_x} \quad C_y = \frac{1}{R_y}$$



Atoroid/Biconic

$$Z = \frac{C_x X^2 + C_y Y^2}{1 + \sqrt{1 - (1+k_x) C_x^2 X^2 - (1+k_y) C_y^2 Y^2}} \quad C_x = \frac{1}{R_x} \quad C_y = \frac{1}{R_y}$$

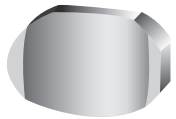
Acylinder

$$Z = \frac{C_x X^2}{[1 + \sqrt{1 - (1+k)(C_x^2 X^2)}]} + a_1 X^2 + a_2 X^4 + a_3 X^6 + a_4 X^8 + a_5 X^{10} \quad C_x = \frac{1}{R_x}$$

Off-Axis Parabola (OAP)

$$Z = \frac{C_x X^2}{[1 + \sqrt{1 - (1+k)(C_x^2 X^2)}]} + a_1 X^2 + a_2 X^4 + a_3 X^6 + a_4 X^8 + a_5 X^{10}$$

$C_x = \frac{1}{R_x}$ *Where k= -1*



Anamorph

$$Z = \frac{C_x X^2 + C_y Y^2}{1 + \sqrt{1 - (1+K_x)(C_x^2 X^2) - (1+K_y)(C_y^2 Y^2)}} + AR[(1-AP)X^2 + (1+AP)Y^2]^2$$

$$+ BR[(1-BP)X^2 + (1+BP)Y^2]^3 + CR[(1-CP)X^2 + (1+CP)Y^2]^4 + DR[(1-DP)X^2 + (1+DP)Y^2]^5 \quad C_x = \frac{1}{R_x} \quad C_y = \frac{1}{R_y}$$

XYZ Freeforms or Solid Model

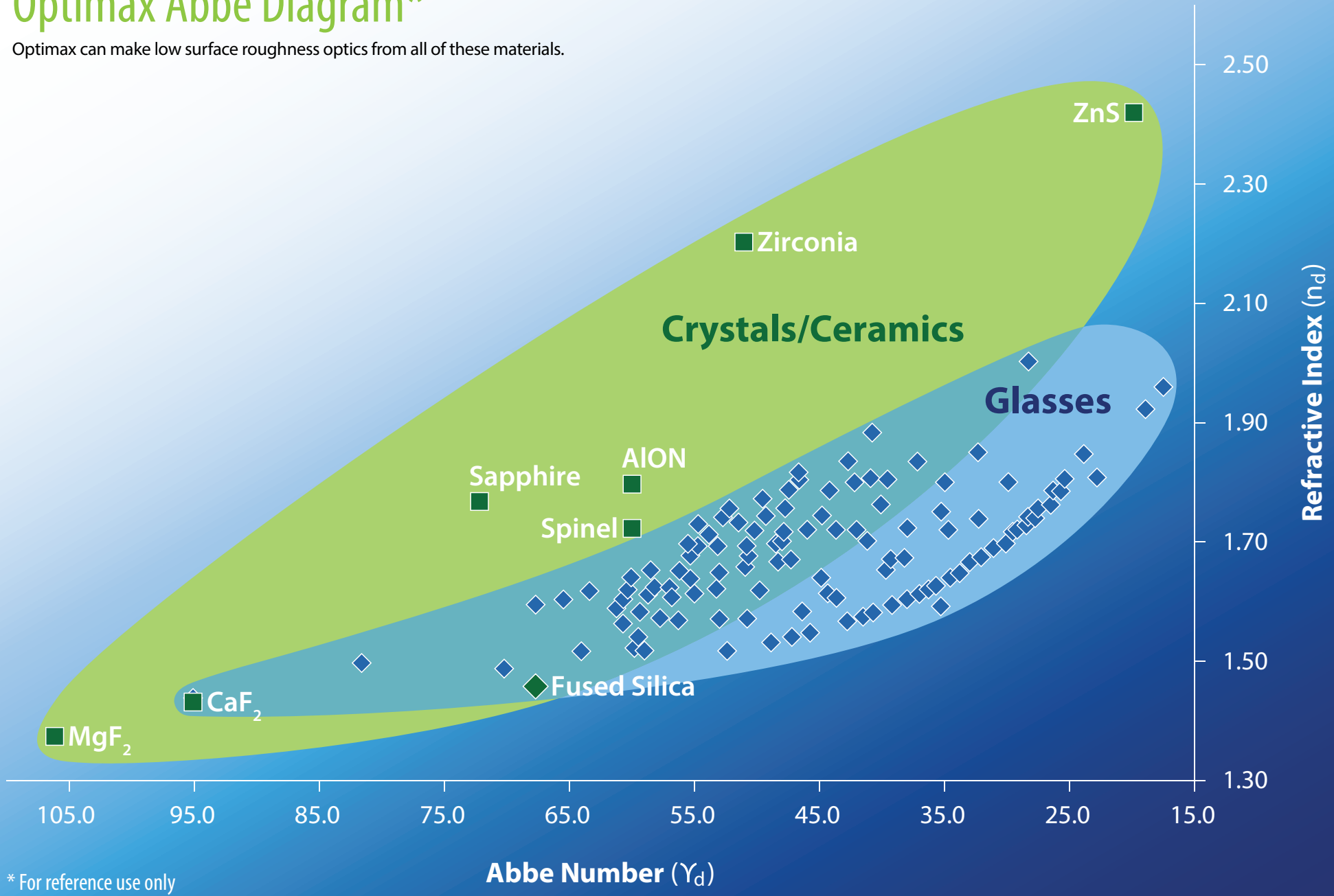
Freeform: Surface created from point cloud or solid model.

Other Equation Based Freeforms

Zernike Polynomials, XY Polynomials, etc.

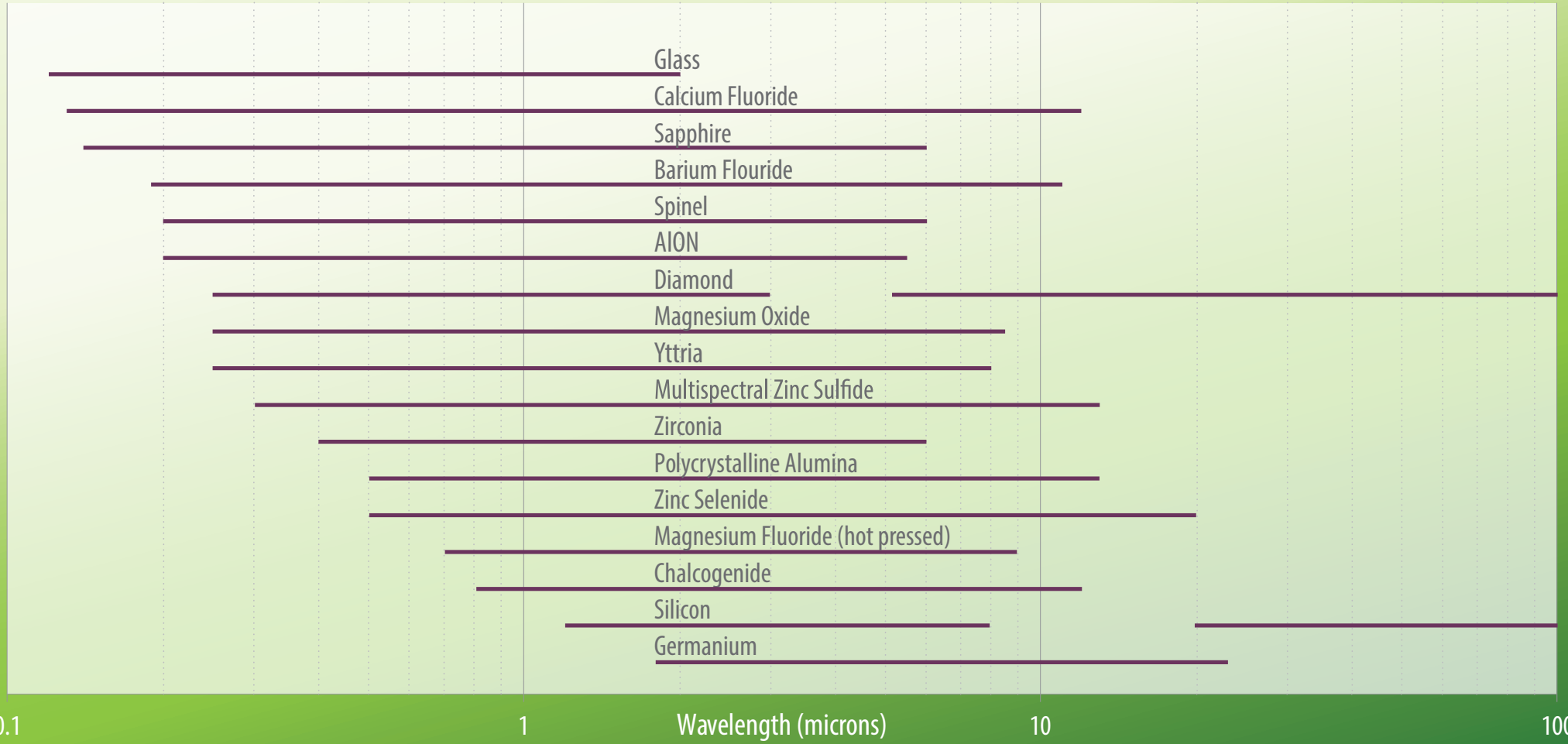
Optimax Abbe Diagram*

Optimax can make low surface roughness optics from all of these materials.



* For reference use only

Transmission Bands of UV, Visible and IR Materials*



* For reference use only