



# Manufacturing Better Lenses

The design of eyeglass lenses, especially for progressive prescriptions, is a part of mathematics which involves geometry, materials science, and partial differential equations in a surprising way. It is an active area of research that affects people's lives every day (especially those of us over forty).

The smooth transition between magnification powers in a progressive lens is convenient for the user but problematic for the designer, who faces the task of combining parts of at least two different spheres in one lens.

Furthermore, the differences in the curvatures of the spheres result in distortion (astigmatism) that is reduced by a cylindrical correction—a compression of the spheres, laterally or vertically. Thus, the designer must combine flattened portions of different spheres in a way that makes the transition from one to another as seamless as possible. Advances in differential geometry, the geometry of curved surfaces, have contributed to faster and more efficient lens design, so that the optimal shape of a lens is found without tedious trial and error.

**For More Information:**

*Lens Talk*, Vol. 26, No. 13, Darryl Meister.



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