



### Product Features

The Seiko Super P-1 was the world's first backside progressive addition lens developed by Epson. As the first lens to fuse the progressive surface and the cylindrical surface on the back side of the lens, the Super P-1 offered far better optical performance than conventional front-side progressive designs. Epson was able to dramatically improve optical performance by sharply decreasing distortion and “skew” to the sides and bottom of the progressive corridor. Since the progressive surface was located closer to the eye by a distance equal to the thickness of the lens, the Super P-1 also offered wearers brighter, clearer vision than that provided by Epson's front-side progressive lenses. In addition, the Super P-1 offered an approximately 30% larger field of vision than front-side progressives.

The backside aspheric surface design was developed using the company's original design techniques and state-of-the-art technology. By providing individual aspheric surfaces corresponding to all combinations of powers of vision, the Super P-1 corrected astigmatisms and other vision anomalies at all prescription powers. It also successfully diminished image blurring and distortion. The amount and area of aspheric surfaces could be meticulously set in accordance with the wearer's prescription, so wearers were provided with an even clearer distance portion. In addition, the backside progressive design enabled Epson to minimize the magnification difference between the distance portion and the near portion of the lens.

### Background

Since releasing its first plastic corrective lens product in 1975, Epson has pursued functionality, one of the advantages of plastic lenses. The company's efforts resulted in the development of Japan's first progressive addition lenses in 1980. As it went on to enhance and expand its product line, Epson's development team began to focus on clearing two issues: shrinking the manufacturing cycle time of the glass molds used to produce lenses, and improving lens performance. First, to shrink lens mold cycle time, Epson developed a numerically-controlled system to produce lens molds. Volume production of progressive addition lenses using this system began in 1993. This system was later adapted so that it could directly machine the lenses themselves. From that came the idea for providing the progressive surface on the backside of lenses — and the technology for achieving it. Epson engineers set to work on developing mass production technologies for ultra-fast milling and high-precision polishing of lenses, as well as designs for combining the progressive and cylindrical surfaces. In April 1997, this work culminated in the world's first backside progressive addition lens, the Super P-1.

### Impact

The Super P-1, backside progressive addition lens was very well received by the industry and markets, and sales climbed sharply. The development of this, the world's first backside progressive addition lens, was unrivalled anywhere for a number of years thereafter, powering Epson to a place among the leading eyeglass lens manufacturers. The Super P-1 has since continued to evolve and, in the process, won the 2003-2004 Universal Design Prize among the Good Design Awards in Japan.