



Press Release

Freeform Lens Design into Standard Single Vision Lenses

ZEISS ClearView Single Vision lenses represent a milestone in optics and aesthetics of Standard Single Vision lenses

Toronto, Canada 2022,07,07

Standard single vision (SV), whether spherical (SPH) or aspherical (AS) is the most sold ophthalmic lens type worldwide. Now ZEISS has identified a way to get many attributes of complex single vision freeform lens designs into both stock FSV lenses and standard SV surfaced lenses. The result is ZEISS ClearView Single Vision lenses. It offers high optical quality in order to provide clear vision from the lens center to the periphery and is very thin and flat at the same time.

A closer look at different single vision lens designs

To get a better understanding of this ZEISS innovation, it makes sense to take a closer look at single vision lens designs. The choice of lens design impacts the aesthetics, comfort of the lens, and optical performance. Spherical (SPH) single vision lenses, for example, are typically optimized using only one free parameter (the radii of curvature of the lens surface). Aspheric (AS) single vision lenses have a more complex shape. Typically, the lens front surface is optimized with a low number of free parameters in one meridian. Double aspherical single vision lenses are generally optimized using twice the number of free parameters. But in summary, all these lens designs do not adequately address the peripheral optics of most prescriptions.

Freeform lens design – stepping beyond spherical, aspherical, or double aspherical

In the 1990s ZEISS pioneered freeform lens design technology in surfaced lenses – which are made to order. And now it is also ZEISS that has introduced single vision freeform lens design to improve the optics and aesthetics of the SV lens category. This is possible due to a specially created freeform lens design for FSV and the new ClearForm manufacturing process that incorporates this design into the finished lens. The lens design includes point-by-point optimization with the use of around 700 free parameters across the lens. This ClearForm process utilizes the latest computer numerically controlled (CNC) generators that use special diamond cutting and polishing tools to surface the complex shaped molds for ZEISS ClearView FSV lenses. The final lens delivers, on average, a three times larger zone of excellent clear vision,¹ to provide the wearer with more clarity from the lens center to the periphery. It is therefore designed to deliver a higher

¹ Based on a visual clarity simulation on a 50 mm diameter lens area for 1.60 index ZEISS FSV ClearView lenses compared to 1.60 ZEISS AS FSV lenses. Average of +5 D, +3 D, +1 D, -1 D, -3 D, -5 D, and -7 D with and without a cylinder of -2 D. Quantitative analyses by Technology & Innovation, Carl Zeiss Vision GmbH, 2020.



level of comfort and satisfaction for the eyeglasses wearer. In addition, the complex lens shapes allow wearers to experience this vision clarity in a flatter and thinner lens than conventional SV lens designs that rely on steeper base curves to provide just acceptable optical performance. In numbers, this means: ZEISS SV ClearView lenses are on average 34 percent flatter across all prescriptions and up to 16 percent thinner compared to typical spherical single vision lenses.^{2,3}

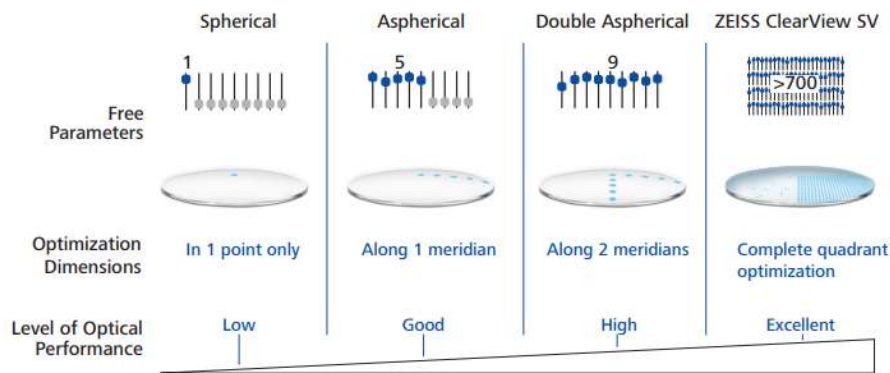


Figure 9. Overview of principles of lens design optimization for SPH, AS, DAS and ZEISS ClearView SV.

Image Caption: Principles of lens design optimization for spherical, aspherical, double aspherical and ZEISS ClearView SVs.

"ZEISS is transforming the single vision market by bringing many aspects of freeform lens design to the SV lens category," explains Bryan Rossi, the President of Zeiss Vision Care Canada. "Freeform lens design combined with the ClearForm technology used in ZEISS ClearView SV enables complex lens shapes that were previously only possible in surfaced single vision lenses. ZEISS now offers premium quality optics in finished single vision lenses, combined with fast delivery and affordable pricing to ensure everyone can access the benefits of ZEISS optics," adds Maryam Karbalaee, the Marketing Manager of Zeiss Vision Care Canada.

To learn more, click [HERE](#)

ZEISS ClearForm is a registered trademark of Carl Zeiss Vision GmbH.

² Measurements of lens flatness (base curve) on 1.60 ZEISS ClearView FSV lenses compared to ZEISS Spherical FSV lenses. Average of -5, -3, -1, +1, +3, +5 D with and without cyl -2 D. Maximum reduction of 49% of -5.00 D with and without -2 D cyl for minus lenses. Maximum reduction of 25% of 5.00 D with and without 2 D cyl for plus lenses. Quantitative analyses by Technology & Innovation, Carl Zeiss Vision GmbH, DE, 2020.

³ Measurements of lens thickness on 1.60 ZEISS ClearView FSV lenses compared to ZEISS spherical FSV lenses over a range of prescriptions (-5, -3, -1, +1, +3, +5 D with and without cyl -2 D). Maximum reduction of 16% for center thickness of +5.00/-2.00. Quantitative analyses by Technology & Innovation, Carl Zeiss Vision GmbH, DE, 2020.



La technologie Freeform dans les verres simple vision traditionnels.

Les verres simple vision ClearView de ZEISS représentent une étape importante dans l'optique et l'esthétique des verres simple vision traditionnels.

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Le verre simple vision (SV) traditionnel, qu'il soit sphérique (SPH) ou asphérique (AS), est le type de verre ophtalmique le plus vendu dans le monde. Aujourd'hui, ZEISS a trouvé un moyen d'intégrer de nombreux attributs des conceptions complexes de verres Freeform à la catégorie des verres simple vision, surfacés et finis (stocks). Le résultat est le verre simple vision ClearView de ZEISS. Il offre une qualité optique élevée afin de fournir une vision claire du centre du verre jusqu'à la périphérie et est à la fois très mince et plat.

Un regard plus attentif sur les différents modèles de verres simple vision

Pour mieux comprendre cette innovation de ZEISS, il convient d'examiner de plus près la conception des verres simple vision. Le choix de la conception du verre a un impact sur l'esthétique, le confort du verre et les performances optiques. Les verres simple vision sphériques (SPH), par exemple, sont généralement optimisés en utilisant un seul paramètre (le rayon de courbure de la surface du verre). Les verres simple vision asphériques (AS) ont une forme plus complexe. En général, la surface frontale du verre est optimisée avec un faible nombre de paramètres dans un méridien. Les verres simples vision double asphériques sont généralement optimisés en utilisant deux fois plus de paramètres. Mais en résumé, toutes ces conceptions de verres ne répondent pas de manière adéquate à l'optique périphérique de la plupart des prescriptions.

La conception Freeform– au-delà de la sphère, asphérique ou double asphérique.

Dans les années 1990, ZEISS a été le pionnier de la technologie de conception des verres Freeform dans les verres surfacés - qui sont fabriqués sur commande. Aujourd'hui, c'est également ZEISS qui a introduit la conception de verres Freeform pour les verres simple vision afin d'améliorer l'optique et l'esthétique de la catégorie des verres SV. Cela est possible grâce à un design de verres Freeform spécialement créé pour les verres stocks et au nouveau procédé de fabrication ClearForm qui intègre ce design dans le verre surfacé. La conception du verre comprend une optimisation point par point avec l'utilisation d'environ 700 paramètres sur l'ensemble du verre. Ce processus ClearForm fait appel aux générateurs à commande numérique par ordinateur (CNC) les plus récents qui utilisent des outils spéciaux de coupe et de polissage au diamant pour surfacer les moules de forme complexe pour les verres ClearView stock de ZEISS. Le verre final offre, en



moyenne, une zone d'excellente vision claire 3 X plus grande, afin de fournir au porteur une plus grande clarté du centre du verre jusqu'à la périphérie. Il est donc conçu pour offrir un plus haut niveau de confort et de satisfaction au porteur de lunettes. En outre, les formes complexes des verres permettent aux porteurs de bénéficier de cette clarté de vision dans un verre plus plat et plus mince que les verres SV conventionnels qui s'appuient sur des courbures de base plus cambrées pour offrir des performances optiques tout juste acceptables. En chiffres, cela signifie que les verres SV ClearView de ZEISS sont en moyenne 34 % plus plats pour toutes les prescriptions et jusqu'à 16 % plus minces que les verres simples sphériques classiques.

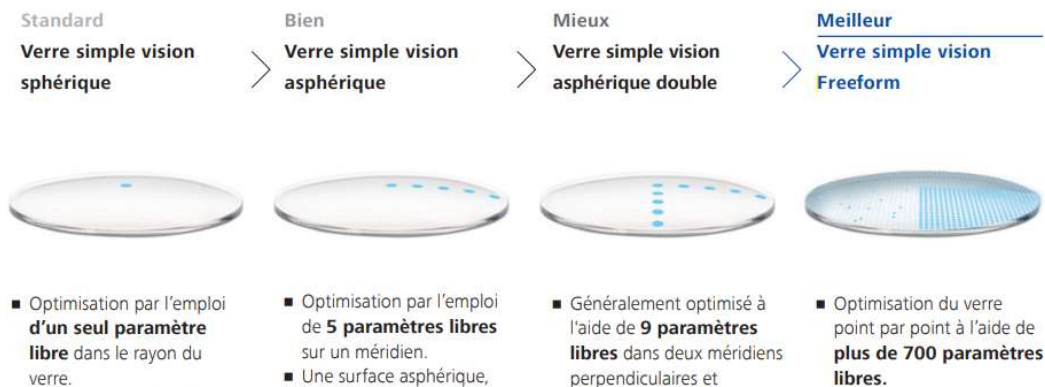


Image Caption: Principles of lens design optimization for spherical, aspherical, double aspherical and ZEISS ClearView SVs.

"ZEISS transforme le marché des verres simple vision en apportant de nombreux aspects de la conception des verres Freeform à la catégorie des verres SV", explique Bryan Rossi, le président de Zeiss Vision Care Canada. " La conception de verres Freeform, combinée à la technologie ClearForm utilisée dans ZEISS ClearView SV, permet d'obtenir des formes de verres complexes qui n'étaient auparavant possibles que pour les verres simple vision surfacés ". ZEISS offre maintenant de l'optique de qualité supérieure dans des verres simple vision stocks, combinés à une livraison rapide et à des prix abordables, afin que tout le monde puisse profiter des avantages de l'optique ZEISS ", ajoute Maryam Karbalaei, directrice du marketing de Zeiss Vision Care Canada.

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ZEISS ClearForm est une marque déposée de Carl Zeiss Vision GmbH.,

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About ZEISS

ZEISS is an internationally leading technology enterprise operating in the fields of optics and optoelectronics. In the previous fiscal year, the



ZEISS Group generated annual revenue totaling 7.5 billion euros in its four segments Semiconductor Manufacturing Technology, Industrial Quality & Research, Medical Technology and Consumer Markets (status: 30 September 2021).

For its customers, ZEISS develops, produces and distributes highly innovative solutions for industrial metrology and quality assurance, microscopy solutions for the life sciences and materials research, and medical technology solutions for diagnostics and treatment in ophthalmology and microsurgery. The name ZEISS is also synonymous with the world's leading lithography optics, which are used by the chip industry to manufacture semiconductor components. There is global demand for trendsetting ZEISS brand products such as eyeglass lenses, camera lenses and binoculars.

With a portfolio aligned with future growth areas like digitalization, healthcare and Smart Production and a strong brand, ZEISS is shaping the future of technology and constantly advancing the world of optics and related fields with its solutions. The company's significant, sustainable investments in research and development lay the foundation for the success and continued expansion of ZEISS' technology and market leadership. ZEISS invests 13 percent of its revenue in research and development – this high level of expenditure has a long tradition at ZEISS and is also an investment in the future.

With over 35,000 employees, ZEISS is active globally in almost 50 countries with around 30 production sites, 60 sales and service companies and 27 research and development facilities. Founded in 1846 in Jena, the company is headquartered in Oberkochen, Germany. The Carl Zeiss Foundation, one of the largest foundations in Germany committed to the promotion of science, is the sole owner of the holding company, Carl Zeiss AG.

Further information at www.zeiss.com

ZEISS Vision Care

ZEISS Vision Care is one of the world's leading manufacturers of eyeglass lenses and ophthalmic instruments. The unit is allocated to the Consumer Markets segment and develops and produces offerings for the entire eyeglass value chain that are distributed globally under the ZEISS brand.