

# Spherical Lenses Lead the Way

Schott manufactures high-quality spherical lenses in series for the scanning heads of optical data storage systems. Working closely with its client Philips, Schott has been able to capture for the first time a mass market for optical glass.

One of the most promising techniques for obtaining additional memory capacity is to store data optically on discs – either on compact discs (CDs) or digital versatile discs (DVDs). Currently, two important trends are gradually becoming apparent in this product area: On the one hand, there is a strong demand for devices that are not only capable of reading CDs but also of writing and re-writing them. On the other hand, the storage capacity of those products that will eventually follow CDs (the DVDs and DVRs) is expected to increase. Both developments place increased demands on the optical systems of scanning heads, which explains why Philips uses objective lenses made of optical glass produced by Schott.

## “Spectacles” for the scanning head

The most important and complex component of an optical data storage system is the drive. Its heart, the scanning head, is made of glass components that must meet the extremely high demands that high tech applications place on them.

As the digital writing on discs becomes smaller, the scanning head has to be closer to the surface. The job of the objective lens consists in focusing the laser beam with extreme precision on the pattern being scanned, which consists of information written in the form of peaks and pits. If the reading distance is shortened – which is the case if a DVD is read – then it can only be done if the lens has a high numerical aperture. The “stronger spectacles” needed must be made of special glass with a high refractive index or manufactured using a patented lens production technique.

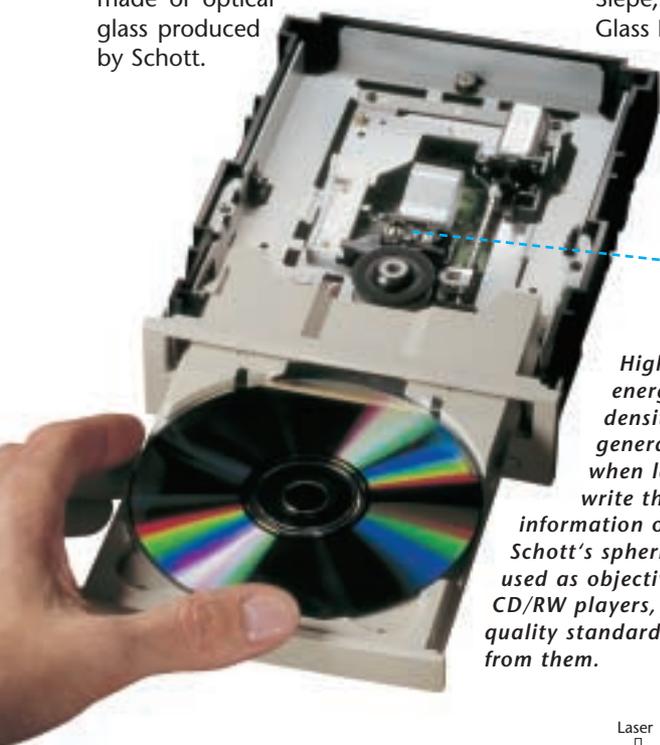
“Glass enables us to react with extreme flexibility to the increased demands placed on the material,” explains Ulrich Siepe, logistics director of the Optical Glass Division. With this product, Schott has an important trump in its hands, needed in the tough rules that govern the consumer

mass market, where the innovation cycles are short and the cost pressure is unusually high. This is the reason Schott and Philips have joined forces in the manufacture of scanning heads. Thanks to the regular exchange of their development potential, both partners have achieved a gradual and continuous drop in production costs.

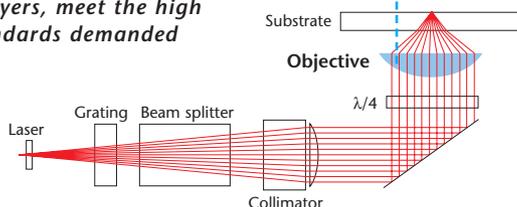
## Off to new markets

Schott’s current annual production of spherical lenses (7.5 million pieces) is used for manufacturing objective lenses for CD/RW players, the devices made for rewritable CDs. For “burning” the information on the CD, it is necessary to use laser beams of a significantly higher energetic density than the conventional ones needed for reading purposes. Optical special glass is ideally suited for this purpose. The next step in the cooperation with Philips will be a new generation of DVD-based reading and writing devices, the DVD+RW players.

The successful cooperation with Philips encourages Schott to seek other applications for spherical lenses in other branches (telecommunications, for example). The first negotiations with potential new clients have already taken place ■



High energy densities are generated when lasers write the information on CDs. Schott’s spherical lenses, used as objective lenses in CD/RW players, meet the high quality standards demanded from them.



## Extremely precise focusing

First of all, the laser beam is widened and then aligned as a parallel luminous beam in the collimator. A directional mirror reflects the beam to the objective lens, shaped like a “halved” spherical lens, which in turn focuses the beam with utmost precision on the information-carrying layer of the CD or DVD.

to the **M A S S M A R K E T**

*Schott presently supplies about 7.5 million lenses per year for the scanning systems of optical data storage systems. Demand is expected to keep increasing.*



*The quality control of spherical lenses.*

**INTERVIEW****Power for Philips****What are the capabilities you value at Schott?**

**Van Gerwen:** *First, Schott's know-how in the manufacturing of raw glass and pre-forms. We were extremely successful when we started implementing the first steps of our process at Schott back in 1999. Furthermore, we are also impressed by how much "power" Schott brings into this project – both in terms of investment and work force.*

**How do you assess the cooperation?**

**Van Gerwen:** *The cooperation is characterized by an openness that is very rare in this branch. From the very beginning, in December 1998, we worked together in a win-win situation: For Schott it was the opening-up of new markets and for Philips the concentration on its core business.*

**Will you expand the cooperation?**

**Van Gerwen:** *Yes, we are planning to transfer the subsequent production steps of the spherical lens process to Schott as well. Regarding future cooperation in the optical glass manufacturing for CDs/DVDs, we have planned to start negotiating with other Philips plants.*

**How do you judge the future of DVD and DVR?**

**Van Gerwen:** *By all means positive for DVDs. Philips is counting on an annual increase in demand that will more than double. As far as DVRs are concerned, right now we can't assess how the market will develop.*



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