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Optical Fused Silica Large-Core Fibers: The Influence of Design and Material on Fiber Performance

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Presented by

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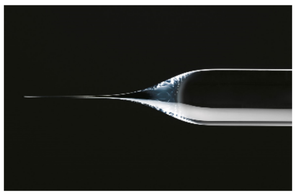
.: About This Webinar



Optical fibers made of fused silica have many applications, including communications, manufacturing, medical care and diagnostics, and research. These applications are as varied as the requirements for the fibers involved. Peter Bauer of Heraeus Conamic elaborates on step-index multimode fibers made of fused silica with a large core — a common fiber type used in industrial high-power lasers and in minimally invasive medical and spectroscopic applications. Bauer presents fundamental guidelines to consider when designing optical fibers for these applications.

One of the main factors influencing fiber performance is the fused silica material used. For example, trace impurities and hydroxyl groups in fused silica can cause absorption, and color centers created by strong ultraviolet (UV) radiation can decrease fiber performance over time. The choice of the right material is pivotal for achieving performance.

Depending on the application wavelengths and performance requirements, different fused silica materials are recommended and can be tailored to the application. Bauer provides essential background about the optical properties of different fused silica materials to help identify the best solution for specific applications. He also explains the effects of layer thickness and numerical aperture on fiber performance and how to negotiate these parameters with cost. Finally, he shows how the cross-section design of fibers can be used to adapt beam profiles. The webinar concludes with an open Q&A, for which Bauer is joined by colleague Andreas Langner.

This webinar is intended to provide basic principles and is not a class on academic design software. For many optical fiber applications, the basic rules shared in this presentation are all that are needed to create a cost-efficient, high-performing fiber — or even better, to guide one toward the appropriate off-the-shelf, standard fiber that fits best with specific application requirements.

Pictured: A large-core optical fiber preform made with fused silica. Courtesy of Heraeus Conamic (Heraeus Quarzglas GmbH & Co. KG).

Who should attend:
Optical fiber designers, engineers, research scientists and purchasing agents who are interested in optimizing the performance of their optical systems that contain optical fibers. Users of optical fibers can learn how to perfect their fiber design and material used for best optical fiber performance.

About the presenter:
Peter Bauer is product manager for specialty fiber at Heraeus Conamic in Kleinostheim, Germany. He has a background in physics and marketing and started his career in fused silica fiber optics more than 20 years ago in R&D for telecom fibers at Heraeus. He was the project manager at Heraeus in a European Union (EU)-funded project on photonic crystal fibers, and he received a Heraeus Innovation Award in 2003. He holds nine patents in the field of optical fibers.

Andreas Langner, Ph.D., is head of the Specialty Fiber Optics R&D team at Heraeus Conamic in Hanau, Germany. He has a background in physics. He started his career in specialty fiber optics in 2005 as project leader of multiple, funded projects dedicated to the development of a rare earth-doped, bulk silica for laser fibers. For this development, he earned first prize in the Heraeus Innovation Awards in 2013.

About Heraeus Conamic (Heraeus Quarzglas GmbH & Co. KG):
Heraeus, the technology group headquartered in Hanau, Germany, is a leading international family-owned portfolio company. The Heraeus group includes businesses in the environmental, electronics, health, and industrial applications sectors. Heraeus Conamic is a global business unit of the Heraeus group and is a technology leader and a leading-edge material specialist for the manufacturing and processing of the industry's highest-purity fused silica and other high-end materials such as ceramics and composites.

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