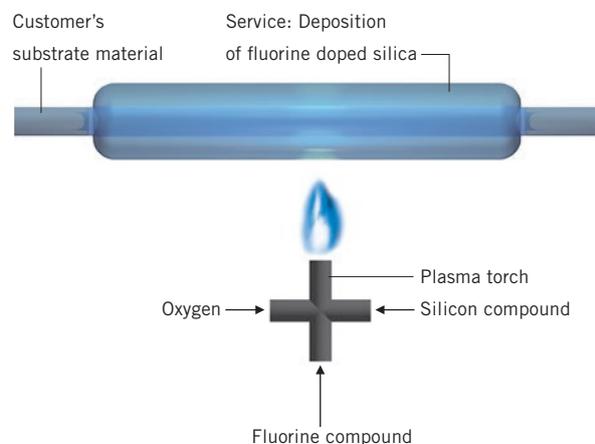


## Plasma Outside Deposition Service

Standard Fluosil® preforms are made using our Plasma Outside Deposition (POD) process. This process can also be readily utilized for depositing highly fluorine doped layers onto substrate materials, both solid and tubular. We offer this flexible process to customers who need a highly fluorine doped cladding outer layer for their own specially designed silica products such as core rods and substrate tubes. The POD service is well suited for the following applications:

- Cladding rods or substrate tubes with special cross sections such as square, hexagonal, or D-shaped
- Producing double and multi cladding structures, e.g., for fiber laser preforms
- Cladding special core materials such as rare earth doped fused silica rods and rods with very high internal stresses



## Performance of Cladding

POD

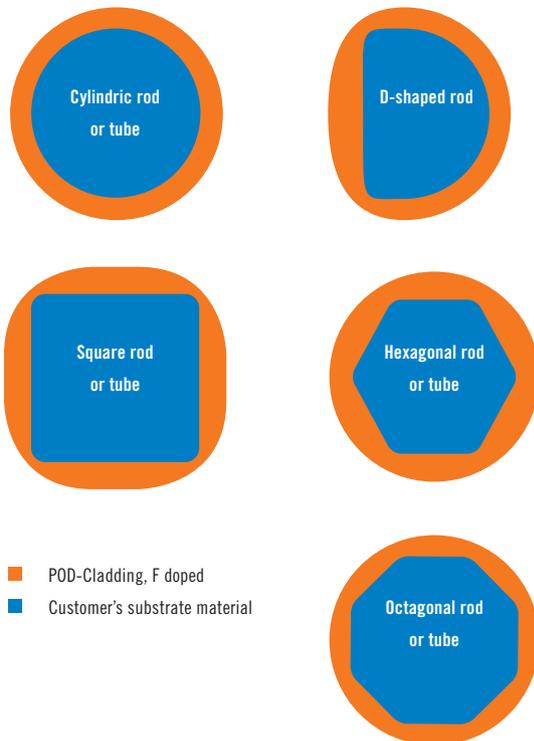
Fluorine content [ppm]	0 ... 70,000
Refractive index*	0 ... $-23 \times 10^{-3}$
Numerical aperture (NA)**	up to 0.28
Cladding to substrate diameter ratio (CCDR)	no upper limitations
Minimum diameter of substrate material	10 mm
Minimum length of substrate material	substrate diameter dependent
Maximum length of substrate material	substrate diameter dependent

\* Difference to un-doped fused silica (Heraeus Standard)

\*\* For un-doped silica substrates

The cladding to core diameter ratio (CCDR) is defined for cylindrical geometries by the ratio of the cladding outside diameter to the substrate material diameter. Though the POD process is very flexible, non-uniformity in cladding thickness for non-circular rods (D-shaped, square, etc.) has been observed. Therefore, customized cladding thickness specifications have to be defined for non-circular geometries prior to the deposition services.

## Typical Preform Cross Sections



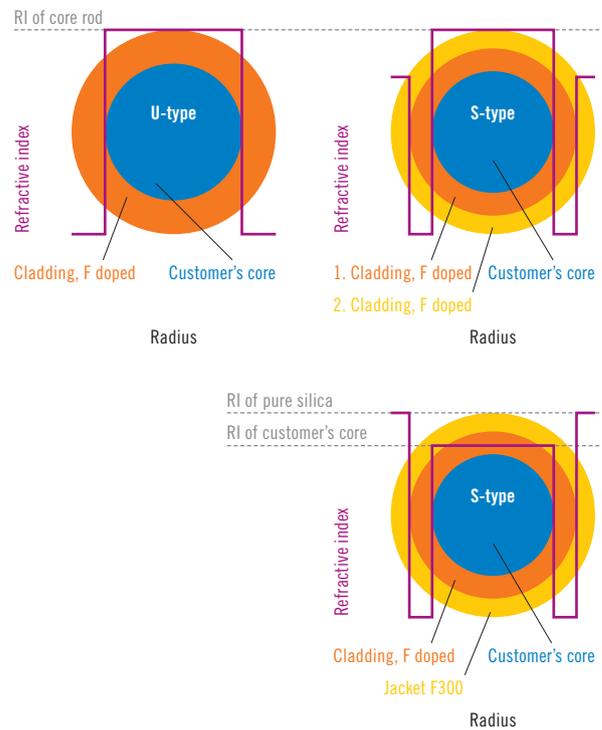
Germany  
**Heraeus Quarzglas GmbH & Co. KG**  
 Quarzstraße 8  
 63450 Hanau  
 Phone +49 (0) 6181.35-6324  
 Fax +49 (0) 6181.35-6261  
 fiber-optic-sales-de@heraeus.com  
 www.heraeus-quarzglas.com

USA  
**Heraeus Quartz North America LLC**  
 100 Heraeus Blvd.  
 Buford, GA 30518  
 Phone +1 678.804-1021  
 Fax +1 678.804-1023  
 fiber-optic-sales-us@heraeus.com  
 www.heraeus-quarzglas.com

## Flexibility in refractive index cladding profiles

Due to the flexibility of the POD process, simple or complex refractive index cladding layers can be deposited on the outer diameter of customer supplied substrate materials. A uniformly doped cladding, referred to as a “U-type”, can be applied with fluorine concentrations from 0 to 7%. In contrast, double or multiple cladding structures, referred to as “S-type”, consisting of layers of differing indices of refraction, can be deposited to create complex cladding profiles. Customer-specific substrate materials can also be overlaid either by an un-doped F300 tube or a fluorine doped Fluosil® tube.

## Cross Section and Refractive Index Profile Examples



## About us

Heraeus is the key global supplier of high purity synthetic fused silica products for optical fiber manufacturing. We have been a reliable partner in the world telecommunications industry since 1976.