CeramOptec® offers fused fiber optic tapers for use from the deep UV to NIR wavelengths. Produced with Optran® silica/silica fibers, these tapers are produced with a taper length of 5 mm to 100 mm. CeramOptec Industries has developed a robust assembly by mechanically protecting the taper region in a fiber connector. The fiber core diameters that CeramOptec Industries offers are 50 µm to 1000 µm, with taper ratios of 2:1, 3:1, 4:1, and 5:1 available.

**Taper Product Features** (See Optran® UV / WF data sheet for more information)

- Broad UV / VIS / NIR spectral range
- High laser damage resistance
- Broad temperature range
- High core to clad ratio
- Biocompatible materials
- Clad to Core ratios are constant throughout the taper
- Endface Core Diameters: 50 – 1000 µm
- Radiation resistance: 109 rad. total
- Specialty coatings available for high temperatures, high vacuum, and harsh chemicals
- All dielectric, non-magnetic construction
- Sterilizable by ETO and other methods

A tapered optical fiber can be used to guide a collimated beam with a relatively large diameter into a smaller fiber for a variety of applications such as: spectroscopy, detectors and sensors, and delivery systems for laser diodes. Tapered optical fibers also create optical mode mixing, useful for applications where homogeneous power distribution is needed.

Contact us:

**Europe**
CeramOptec GmbH  
Siemensstrasse 44  
53121 Bonn  
Germany
Tel.: +49-228-97967-0  
Fax: +49-228-97967-99  
Email: info@ceramoptec.de

**North America**
CeramOptec Industries, Inc.  
515A Shaker Rd.  
East Longmeadow, MA 01028  
Phone: 800-934-2377  
Fax: 413-525-0600
Email: salesengineering@ceramoptec.com

Please visit www.ceramoptec.com for more information.

CeramOptec GmbH is a subsidiary of biolitec AG. For more information please visit www.biolitec.com
Fiber Taper Products
(Optran®UV, Optran® WF, Optran® Ultra WFGE)

<table>
<thead>
<tr>
<th>Product code (General)</th>
<th>D₁ [µm] ± 2%</th>
<th>D₂ [µm] ± 2%</th>
<th>Fiber Type</th>
<th>Maximum NA</th>
<th>Operating Wavelength [nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUV-F D₁-D₂</td>
<td>50 - 1000</td>
<td>50 - 1000</td>
<td>Optran UV</td>
<td>0.22 - 0.28</td>
<td>190-1200</td>
</tr>
<tr>
<td>TWF-F D₁-D₂</td>
<td>50 - 1000</td>
<td>50 - 1000</td>
<td>Optran WF</td>
<td>0.22 - 0.28</td>
<td>350-2500</td>
</tr>
<tr>
<td>TWFGE-F D₁-D₂</td>
<td>50 - 1000</td>
<td>50 - 1000</td>
<td>Optran Ultra WFGE</td>
<td>0.37</td>
<td>400-2400</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product codes (Examples)</th>
<th>D₁ [µm] ± 2%</th>
<th>D₂ [µm] ± 2%</th>
<th>Fiber Type</th>
<th>Maximum NA</th>
<th>Operating Wavelength [nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUV-F 1000-200</td>
<td>1000</td>
<td>200</td>
<td>Optran UV</td>
<td>0.22 - 0.28</td>
<td>190-1200</td>
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<tr>
<td>TUV-F 200-100</td>
<td>200</td>
<td>100</td>
<td>Optran UV</td>
<td>0.22 - 0.28</td>
<td>190-1200</td>
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<tr>
<td>TWF-F 800-600</td>
<td>800</td>
<td>600</td>
<td>Optran WF</td>
<td>0.22 - 0.28</td>
<td>350-2500</td>
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<tr>
<td>TWF-F 600-200</td>
<td>600</td>
<td>200</td>
<td>Optran WF</td>
<td>0.22 - 0.28</td>
<td>350-2500</td>
</tr>
<tr>
<td>TWFGE-F 300-100</td>
<td>300</td>
<td>100</td>
<td>Optran Ultra WFGE</td>
<td>0.37</td>
<td>400-2400</td>
</tr>
<tr>
<td>TWFGE-F 100-50</td>
<td>100</td>
<td>50</td>
<td>Optran Ultra WFGE</td>
<td>0.37</td>
<td>400-2400</td>
</tr>
</tbody>
</table>

A tapered optical fiber acts as a numerical aperture (and beam diameter) converter by converting the input beam NA by the following formula:

\[ NA_2 = \frac{D_1}{D_2} \times NA_1 \]

Where:

- \( NA_2 \) = Output NA (limited by NA of the used fiber, light with higher NA is lost)
- \( NA_1 \) = Input NA
- \( D_1 / D_2 \) = Taper ratio, input diameter to output diameter

CeramOptec Industries provides fused end tapered optical fibers of the highest quality. Continuous tapers are also available on request. Taper products can be tailored to meet unique customer requirements. All taper assemblies are available with standard fiber connectors or custom-designed ferrules.

Contact us:

**Europe**
CeramOptec GmbH
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Email: info@ceramoptec.de

**North America**
CeramOptec Industries, Inc.
515A Shaker Rd.
East Longmeadow, MA 01028
Phone: 800-934-2377
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