

## Plastic Coated Silica/Silica (Standard OH)

Fiberguide Industries

Superguide™ SFS

### Technical Data

#### REFERENCE SUMMARY

**Product Category:**  
Fiber

**Mode:**  
Step Index, Multimode

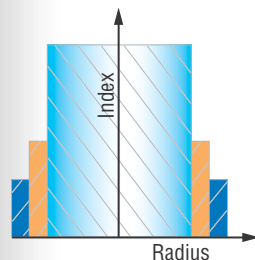
**Type:**  
Plastic Coated Silica/Silica  
(Standard OH)

**Trade Name:**  
Superguide™ SFS  
UV-VIS

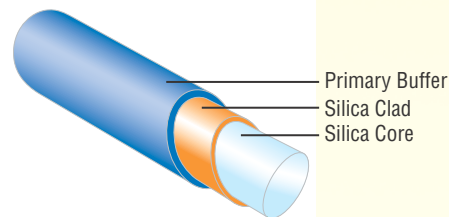
#### DESCRIPTION

When looking for a high quality, general purpose, fiber with superior transmission and a numerical aperture (N.A.) of 0.22 for efficient light coupling, the Superguide™ SFS is the fiber of choice. The pure fused silica used in the core of the Superguide™ fiber is coated with uniform fluorine doped silica layers. Oxyhydrogen torches prepare the reaction compounds from  $\text{SiCl}_4$ ,  $\text{O}_2$ , and fluorine containing gas. Due to its ultra-high purity this fiber has excellent ultraviolet (UV) transmission, compared to its companion product Anhydroguide™, which has superior visible to infrared (VIS-IR) transmission.

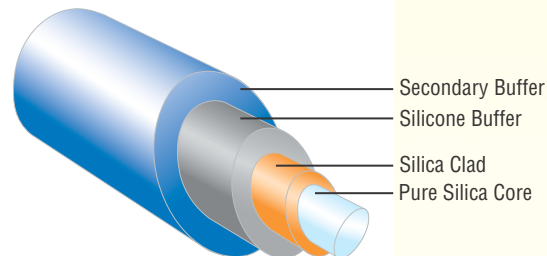
#### FIBER CROSS SECTION



##### Polyimide and Acrylate Coated



##### Nylon and Tefzel Coated



#### FEATURES

- Low loss and the finest fiber for ultraviolet (UV) through visible (VIS) applications.
- Specialty coatings available for extreme temperatures, high vacuum, and harsh chemical environments (see Gold/Aluminum data sheets).
- Highest laser damage resistance for Nd:YAG, HeNe, Argon-Ion, and Excimer laser delivery.
- High core to clad ratios available for high efficiency bundles (see Bundle data sheets).
- Core diameters up to 1500 $\mu\text{m}$  for Nylon and Tefzel™ buffers.
- Sterilizable ETO, steam, e-beam, gamma radiation.
- Radiation resistant.
- All dielectric, non-magnetic construction.
- Polyimide buffer resists most organics, solvents and acid.
- 12 $\mu\text{m}$  to 15 $\mu\text{m}$  thick Polyimide buffer allows for the manufacture of high packing efficiency arrays and bundles (please see Fiber Optic Assembly data sheet).
- Polyimide buffer is heat sterilizable (autoclave).

**Note:** If the buffer/jacket material has a lower refractive index than the cladding, as is the case for silicone coated silica/silica fibers, then optical energy can be guided within the cladding. The high refractive index of Polyimide and Acrylate effectively strips out these "cladding modes".



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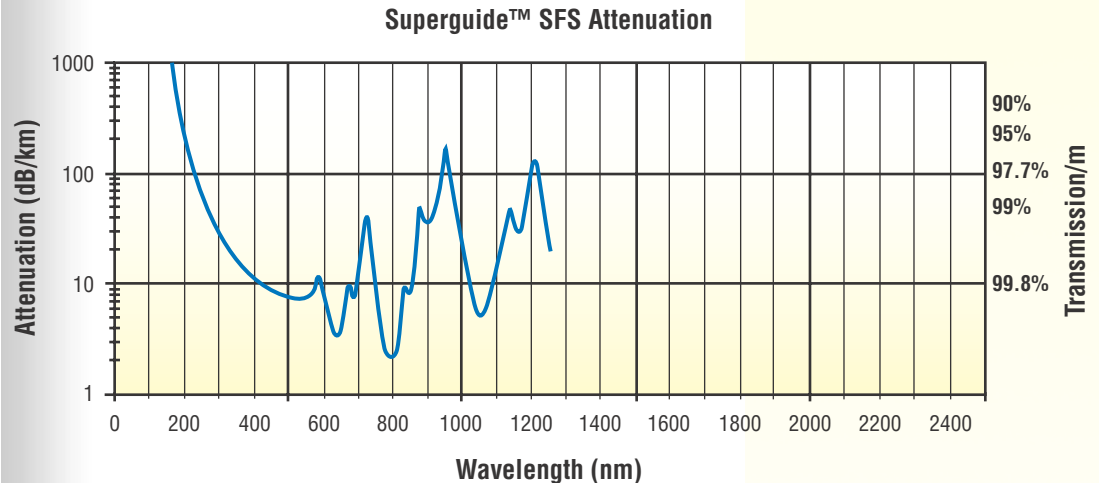
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#### APPLICATIONS

- Laser surgery
- Medical diagnostics
- Laser marking, welding, soldering, cutting
- Remote spectroscopy for pollution analysis and chemical processing
- UV photolithography
- Nuclear plasma diagnostics
- Photoinitiated chemistry
- Medical diagnostics and photo therapy
- Pharmaceutical dissolution testing
- Vacuum environments and feedthroughs
- Semiconductor manufacturing systems
- Plasma diagnostics
- Flame sensing
- Remote sensing
- Reflection/Backscattering probes, industrial and medical laser delivery systems
- Aerospace

#### SPECTRAL ATTENUATION (Typical)



#### FIBER SPECIFICATIONS

- Standard Secondary Buffer/Jacket: Nylon (suffix "N"), Tefzel® (suffix "Z")
- Standard Primary Buffer/Jacket: Acrylate (suffix "Y"), Thermocoat/Polyimide (suffix "T")
- Standard Numerical Aperture (N.A.):  $0.22 \pm 0.02$  (Full Acceptance Angle  $25^\circ$ )
- Available Numerical Apertures: 0.12 (Full Acceptance Angle  $14^\circ$ ) Utilize Prefix Designation "SFM" 0.26 (Full Acceptance Angle  $30^\circ$ ) Utilize Prefix Designation "SFH"
- Standard Core/Clad Ratio: 1.1
- Available Core/Clad Ratios: 1.2, 1.4 and 2.5
- Maximum Attenuation: 7dB/km @ 355nm / 9dB/km @ 1060nm
- Non-standard sizes available as custom run (call for details).

**Note:** The fibers in the following table carry a designation "SFS" standing for "Superguide Fluorinated Silica", followed by the core and cladding diameters (in microns) and concluding with the suffix "N" that designates natural Nylon secondary buffer, suffix "Z" that designates a clear Tefzel® secondary buffer, suffix "Y" that designates clear Acrylate buffer and suffix "T" that designates Thermocoat/Polyimide primary buffer.



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#### FIBER SPECIFICATIONS

| Product Code                | SFS50/125N       | SFS100/110N      | SFS100/140N      | SFS200/220N      |
|-----------------------------|------------------|------------------|------------------|------------------|
| Core Diameter               | 50µm ± 2%        | 100µm ± 2%       | 100µm ± 2%       | 200µm ± 2%       |
| Clad Diameter               | 125µm + 1µm/-3µm | 110µm ± 2%       | 140µm + 1µm/-3µm | 220µm ± 2%       |
| Primary Buffer              | 225µm ± 3%       | 210µm ± 3%       | 240µm ± 3%       | 320µm ± 3%       |
| Secondary Buffer (O.D.)     | 295µm ± 5%       | 280µm ± 5%       | 310µm ± 5%       | 390µm ± 5%       |
| Temperature Operating Range | -40°C to + 100°C | -40°C to + 100°C | -40°C to + 100°C | -40°C to + 100°C |
| Minimum Bend Radius         |                  |                  |                  |                  |
| -Recommended Short Term     | 12mm             | 11mm             | 14mm             | 22mm             |
| -Recommended Long Term      | 24mm             | 22mm             | 44mm             | 44mm             |
| Typical Standard Length     | 500m             | 500m             | 800m             | 800m             |

| Product Code                | SFS300/330N      | SFS400/440N      | SFS600/660N      | SFS800/880N      |
|-----------------------------|------------------|------------------|------------------|------------------|
| Core Diameter               | 300µm ± 2%       | 400µm ± 2%       | 600µm ± 2%       | 800µm ± 2%       |
| Clad Diameter               | 330µm ± 2%       | 440µm ± 2%       | 660µm ± 2%       | 880µm ± 2%       |
| Primary Buffer              | 430µm ± 3%       | 540µm ± 3%       | 760µm ± 3%       | 980µm ± 3%       |
| Secondary Buffer (O.D.)     | 530µm ± 5%       | 640µm ± 5%       | 860µm ± 5%       | 1080µm ± 5%      |
| Temperature Operating Range | -40°C to + 100°C | -40°C to + 100°C | -40°C to + 100°C | -40°C to + 100°C |
| Minimum Bend Radius         |                  |                  |                  |                  |
| -Recommended Short Term     | 33mm             | 44mm             | 44mm             | 88mm             |
| -Recommended Long Term      | 66mm             | 88mm             | 88mm             | 176mm            |
| Typical Standard Length     | 200m             | 200m             | 50m              | 30m              |

| Product Code                | SFS1000/1100N    | SFS1500/1650N    |
|-----------------------------|------------------|------------------|
| Core Diameter               | 1000µm ± 2%      | 1500µm ± 2%      |
| Clad Diameter               | 1100µm ± 2%      | 1650µm ± 2%      |
| Primary Buffer              | 1200µm ± 3%      | 1800µm ± 3%      |
| Secondary Buffer (O.D.)     | 1300µm ± 5%      | 1950µm ± 5%      |
| Temperature Operating Range | -40°C to + 100°C | -40°C to + 100°C |
| Minimum Bend Radius         |                  |                  |
| -Recommended Short Term     | 110mm            | 165mm            |
| -Recommended Long Term      | 220mm            | 330mm            |
| Typical Standard Length     | 20m              | 20m              |



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#### FIBER SPECIFICATIONS

| Product Code                | SFS100/110Z      | SFS100/140Z      | SFS200/220Z      |
|-----------------------------|------------------|------------------|------------------|
| Core Diameter               | 100µm ± 2%       | 100µm ± 2%       | 200µm ± 2%       |
| Clad Diameter               | 110µm ± 2%       | 140µm + 1µm/-3µm | 220µm ± 2%       |
| Primary Buffer              | 240µm ± 3%       | 240µm ± 3%       | 320µm ± 3%       |
| Secondary Buffer (O.D.)     | 310µm ± 5%       | 370µm ± 5%       | 480µm ± 5%       |
| Temperature Operating Range | -40°C to + 200°C | -40°C to + 200°C | -40°C to + 200°C |
| Minimum Bend Radius         |                  |                  |                  |
| -Recommended Short Term     | 11mm             | 14mm             | 22mm             |
| -Recommended Long Term      | 22mm             | 28mm             | 44mm             |
| Typical Standard Length     | 1100m            | 500m             | 800m             |

| Product Code                | SFS300/330Z      | SFS400/440Z      | SFS600/660Z      |
|-----------------------------|------------------|------------------|------------------|
| Core Diameter               | 300µm ± 2%       | 400µm ± 2%       | 600µm ± 2%       |
| Clad Diameter               | 330µm ± 2%       | 440µm ± 2%       | 660µm ± 2%       |
| Primary Buffer              | 480µm ± 3%       | 590µm ± 3%       | 810µm ± 3%       |
| Secondary Buffer (O.D.)     | 720µm ± 5%       | 880µm ± 5%       | 1200µm ± 5%      |
| Temperature Operating Range | -40°C to + 200°C | -40°C to + 200°C | -40°C to + 200°C |
| Minimum Bend Radius         |                  |                  |                  |
| -Recommended Short Term     | 33mm             | 44mm             | 66mm             |
| -Recommended Long Term      | 66mm             | 88mm             | 132mm            |
| Typical Standard Length     | 800m             | 200m             | 200m             |

| Product Code                | SFS800/880Z      | SFS1000/1100Z    | SFS1500/1650Z    |
|-----------------------------|------------------|------------------|------------------|
| Core Diameter               | 800µm ± 2%       | 1000µm ± 2%      | 1500µm ± 2%      |
| Clad Diameter               | 880µm ± 2%       | 1100µm ± 2%      | 1650µm ± 2%      |
| Primary Buffer              | 1030µm ± 3%      | 1250µm ± 3%      | 1950µm ± 3%      |
| Secondary Buffer (O.D.)     | 1550µm ± 5%      | 1850µm ± 5%      | 2900µm ± 5%      |
| Temperature Operating Range | -40°C to + 200°C | -40°C to + 200°C | -40°C to + 200°C |
| Minimum Bend Radius         |                  |                  |                  |
| -Recommended Short Term     | 88mm             | 110mm            | 165mm            |
| -Recommended Long Term      | 176mm            | 220mm            | 330mm            |
| Typical Standard Length     | 50m              | 30m              | 20m              |



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UV-VIS

#### FIBER SPECIFICATIONS

| Product Code                | SFS50/125Y       | SFS100/140Y      | SFS105/125Y      | SFS200/220Y     |
|-----------------------------|------------------|------------------|------------------|-----------------|
| Core Diameter               | 50µm ± 2%        | 100µm ± 2%       | 105µm ± 2%       | 200µm ± 2%      |
| Clad Diameter               | 125µm + 1µm/-3µm | 140µm + 1µm/-3µm | 125µm + 1µm/-3µm | 220µm ± 2%      |
| Buffer Diameter             | 250µm ± 5%       | 250µm ± 5%       | 250µm ± 5%       | 320µm ± 5%      |
| Temperature Operating Range | -40°C to + 85°C  | -40°C to + 85°C  | -40°C to + 85°C  | -40°C to + 85°C |
| Minimum Bend Radius         |                  |                  |                  |                 |
| -Recommended Short Term     | 12mm             | 14mm             | 12mm             | 22mm            |
| -Recommended Long Term      | 24mm             | 28mm             | 24mm             | 44mm            |
| Typical Standard Length     | 500m             | 500m             | 800m             | 800m            |

| Product Code                | SFS50/125T        | SFS100/110T       | SFS100/120T       |
|-----------------------------|-------------------|-------------------|-------------------|
| Core Diameter               | 50µm ± 2%         | 100µm ± 2%        | 100µm ± 2%        |
| Clad Diameter               | 125µm + 1/-3µm    | 110µm ± 2%        | 120µm ± 2%        |
| Buffer Diameter             | 145µm ± 5µm       | 130µm ± 5µm       | 140µm ± 5µm       |
| Temperature Operating Range | -190°C to + 350°C | -190°C to + 350°C | -190°C to + 350°C |
| Minimum Bend Radius         |                   |                   |                   |
| -Recommended Short Term     | 12mm              | 11mm              | 12mm              |
| -Recommended Long Term      | 24mm              | 22mm              | 24mm              |
| Typical Standard Length     | 500m              | 500m              | 500m              |

| Product Code                | SFS100/140T       | SFS105/125T       | SFS200/220T       |
|-----------------------------|-------------------|-------------------|-------------------|
| Core Diameter               | 100µm ± 2%        | 105µm ± 2%        | 200µm ± 2%        |
| Clad Diameter               | 140µm + 1/-3µm    | 125µm + 1µm/-3µm  | 220µm ± 2%        |
| Buffer Diameter             | 165µm ± 5µm       | 145µm ± 5µm       | 245µm ± 5µm       |
| Temperature Operating Range | -190°C to + 350°C | -190°C to + 350°C | -190°C to + 350°C |
| Minimum Bend Radius         |                   |                   |                   |
| -Recommended Short Term     | 14mm              | 12mm              | 22mm              |
| -Recommended Long Term      | 28mm              | 22mm              | 44mm              |
| Typical Standard Length     | 500m              | 500m              | 800m              |



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UV-VIS

#### FIBER SPECIFICATIONS

| Product Code                | SFS300/330T       | SFS400/440T       | SFS600/660T       |
|-----------------------------|-------------------|-------------------|-------------------|
| Core Diameter               | 300µm ± 2%        | 400µm ± 2%        | 600µm ± 2%        |
| Clad Diameter               | 330µm ± 2%        | 440µm ± 2%        | 660µm ± 2%        |
| Buffer Diameter             | 355µm ± 10µm      | 480µm ± 10µm      | 710µm ± 15µm      |
| Temperature Operating Range | -190°C to + 350°C | -190°C to + 350°C | -190°C to + 350°C |
| Minimum Bend Radius         |                   |                   |                   |
| -Recommended Short Term     | 33mm              | 44mm              | 66mm              |
| -Recommended Long Term      | 66mm              | 88mm              | 132mm             |
| Typical Standard Length     | 800m              | 200m              | 200m              |

#### Fiberguide Industries Customization Program

Fiberguide Industries is a full service custom fiber and value-added assembly provider. If you have unique requirements, please contact us to discuss tailoring a product or design to optimize optical performance for your specific application.



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