art photonics
MEMBER OF THE NYNOMIC GROUP

Broad Spectra Fiber Solutions

FlexiRay® & FlexiSpec®

Made in Germany

Over the course of its development, **art photonics** has produced more than
25,000 meters of high-performance Mid IR optical fiber,
800 fiber-optic probes,
700,000 fiber pigtails,
60,000 dental fiber applicators,
25,000 custom engineered cables.

In addition, the company has manufactured a **wide range** of standard fiber optic cables and **hundreds of couplers** for spectrometers – reinforcing its position as a **trusted and innovative** manufacturer in the photonics industry.

Overview

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Broad Spectra Fiber Solutions –
Connecting Light to Life

Since 1998, Art Photonics has specialized in fiber optics for the broadest spectral range – from UV to mid-IR (0.2–18 µm) – enabling applications in spectroscopy, process analytics, and various laser technologies. Our mission is to transform light into solutions that generate tangible value for our clients, a principle that guides all our endeavors.

On these pages, you will discover our vast array of high-quality products, including FlexiRay® fibers, cables, and bundles; FlexiSpec® probes; and couplers. These products are engineered to integrate seamlessly into your systems, ensuring consistent performance. Quality and reliability remain at the core of our team's promise and commitment – because your applications demand nothing less.

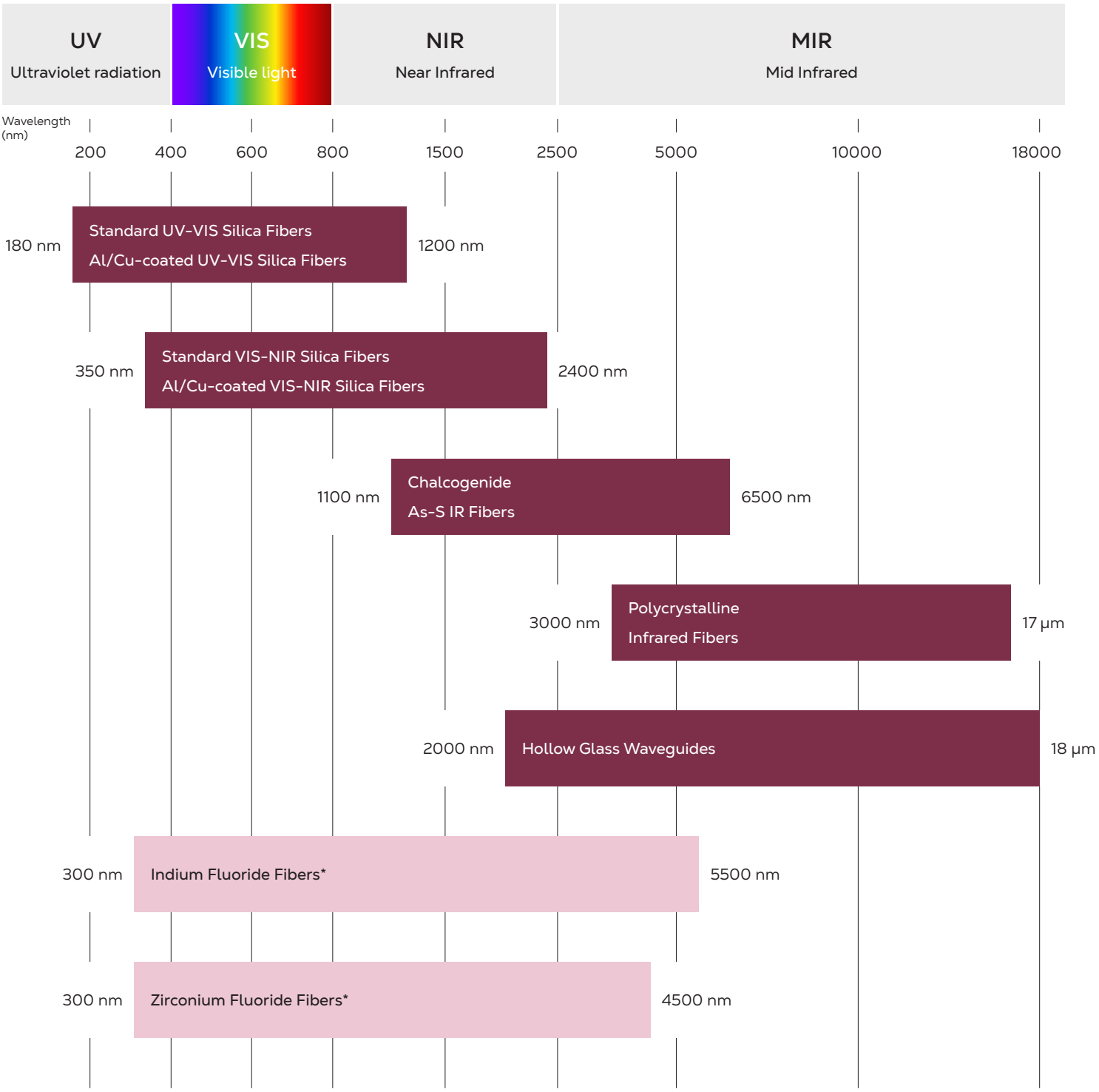
We create solutions built on our proprietary Polycrystalline InfraRed (PIR) fiber technology, complemented by specialty fibers such as hollow waveguides for high-power IR laser delivery, metal-coated silica fibers for extreme environments, and chalcogenide fibers for advanced UV to mid-IR applications. Our probes deliver best-in-class performance, and our unique ability to integrate multiple modalities – ATR, Raman, and NIR – into a single probe sets us apart worldwide. Our complete in-house production cycle ensures quality, flexibility, and a rapid transition from prototype to series production "Made in Germany."

We look forward to partnering with you – transforming light into knowledge, efficiency, and progress.

Dr. Stefanie Foerster
Chief Executive Officer

Overview of transmission ranges

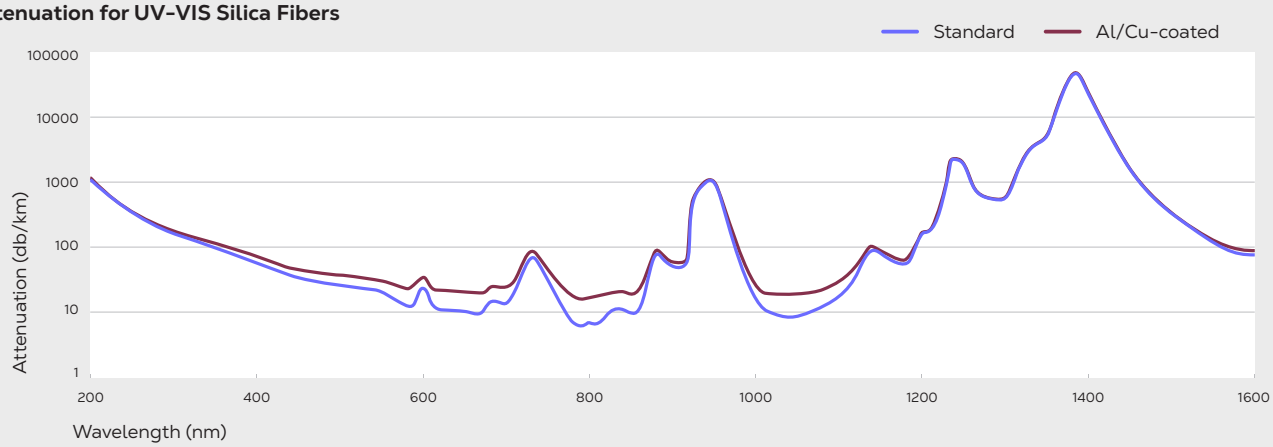
Find fibers to match your application



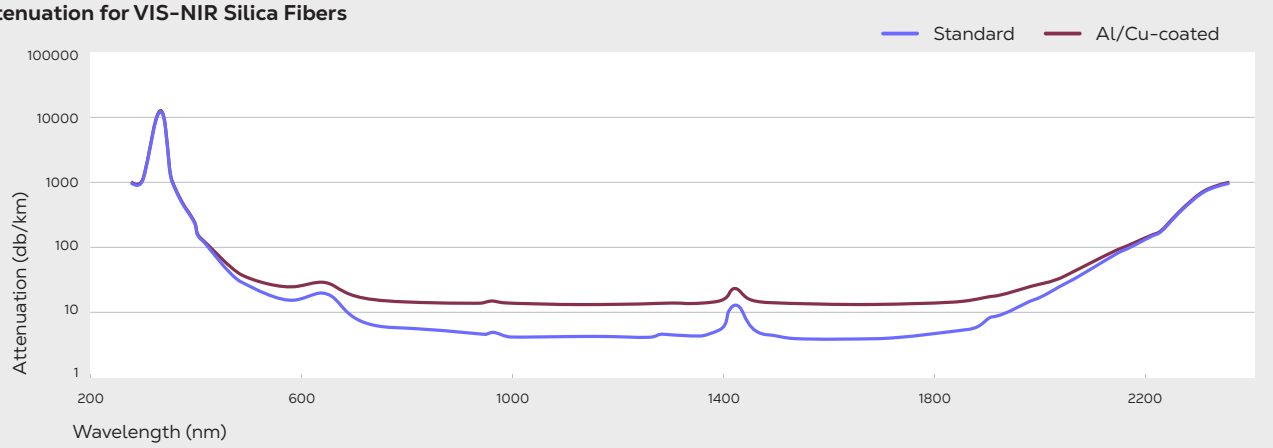
* in partnership with Le Verre Fluoré
www.leverrefluore.com

Attenuation spectra of fibers & waveguides

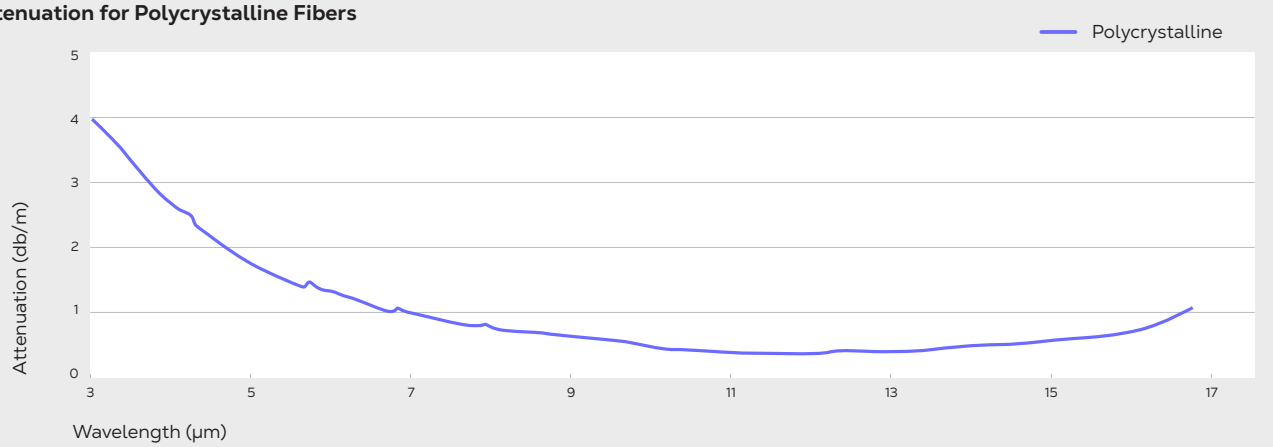
Attenuation for UV-VIS Silica Fibers



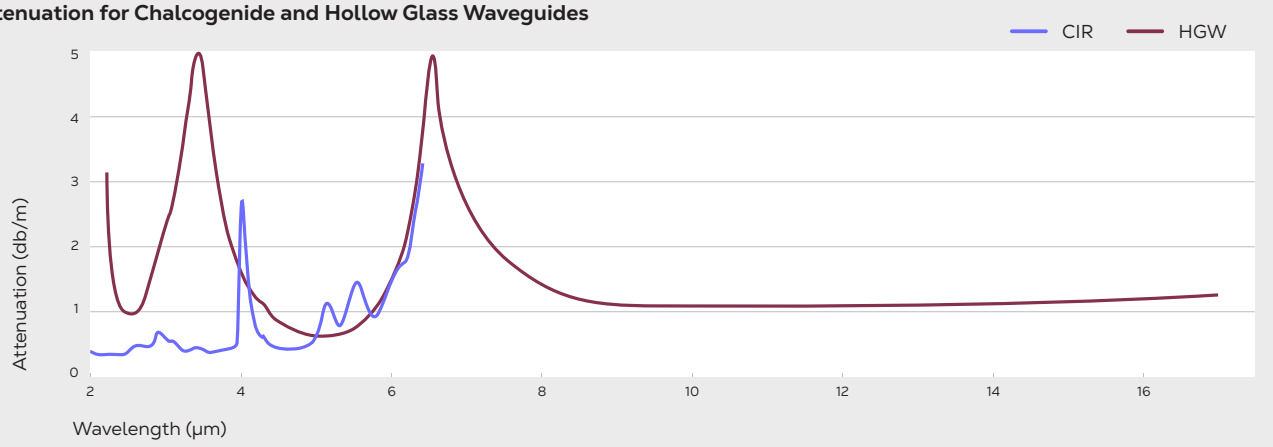
Attenuation for VIS-NIR Silica Fibers



Attenuation for Polycrystalline Fibers

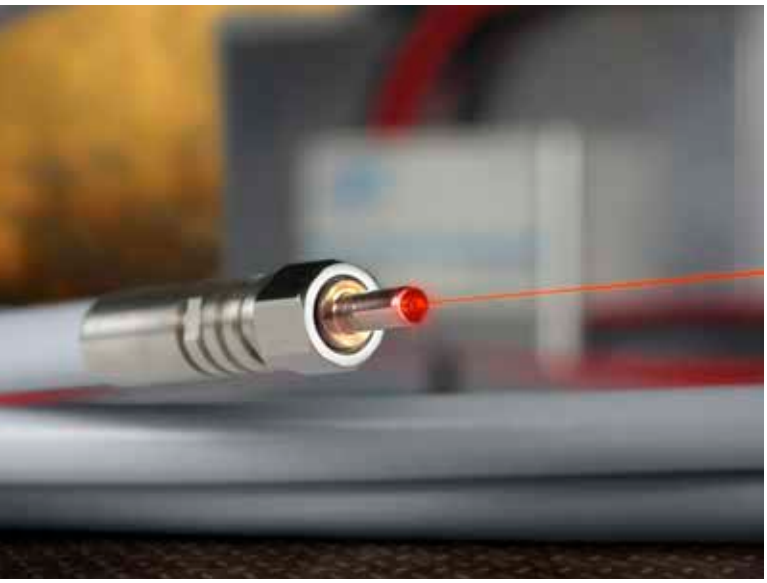


Attenuation for Chalcogenide and Hollow Glass Waveguides



FlexiRay® Silica Fiber Cables

For laser power delivery



Durable FlexiRay® laser cables ensure long-term use in industrial and medical fields. We offer high-temperature assemblies (up to 600°C) suitable for high-power and vacuum applications. These assemblies utilize FlexiRay® metal-coated silica fibers and feature high-power connectors HP-SMA and D80. Prior to shipment, each cable undergoes testing with a 100W diode laser to ensure quality for our customers.

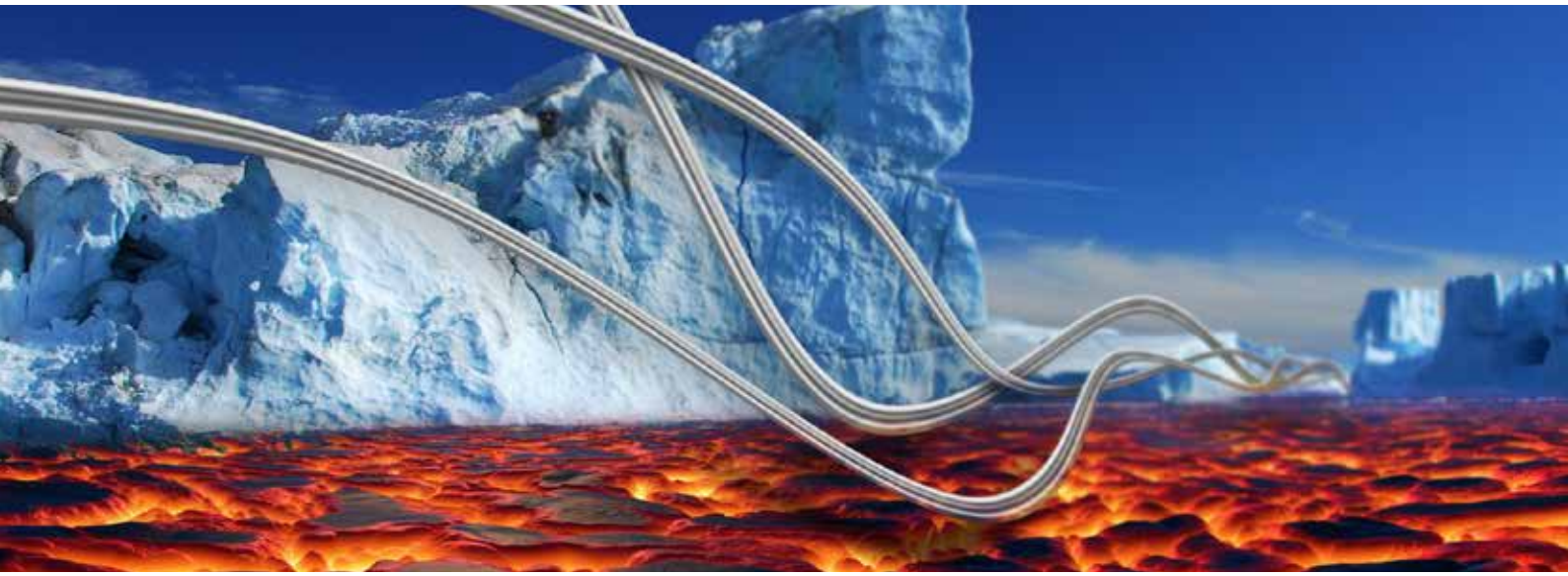
Silica cables for UV, VIS, NIR range

art photonics offers Silica Fiber cables for two spectral ranges, UV-VIS and VIS-NIR. These cables come with various cable jackets and connectors based on customer requirements. With ultra-low OH content, they allow for excellent transmission up to 300 m. You can choose from a wide selection of fibers, connectors, and protective jackets, while their standardization enable fast delivery times.

Custom Silica Fiber cables produced by art photonics feature a reinforced cladding stabilized by nylon thread, offering maximum protection against stretching damage, and fully sealed from input to output connector.

FlexiRay® Al- and Cu-alloy coated fibers

Silica fibers for UV-VIS-Near Infrared range



Aluminum- and Copper-alloy coated Silica Fibers are the optimal solution for applications in high temperature, vacuum and harsh environment conditions.
Laser cables and bundles of metal can be used in vacuum and at **temperatures up to 400°C** for Al-coated fibers and **›600°C** for Cu-alloy coated fibers.

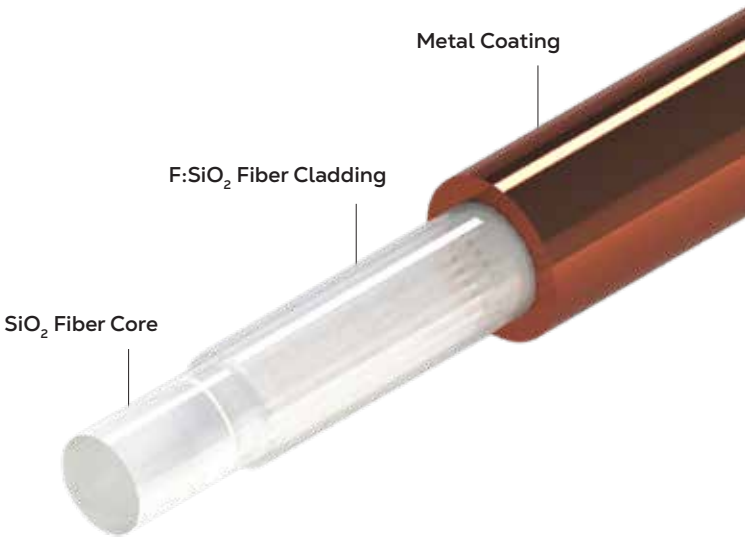
* Working temperatures range is valid for using in non-oxidizing atmospheres

Wavelength

180 to 2400 nm

Numerical aperture (NA)

0.13 - 0.22



Main features:

- Working temperatures up to 400°C
- Excellent mechanical strength and flexibility
- No outgassing under high vacuum conditions
- Solderable into connectors (epoxy-free option)
- Effective heat rejection along metal coating
- Steaming, ETO, steam, e-beam or gamma-sterilizable

FlexiRay® Polycrystalline IR-Fibers

Complete production cycle in Berlin

Pioneering extrusion technology was developed for fabrication of polycrystalline fibers from TlHal and AgHal solid solution crystals by Dr. Artyushenko >40 year ago and since 1998 it was developed by art photonics for a volume production of Core / Clad Polycrystalline Infra-Red (PIR-) fibers transparent over a broad spectral range 3–17µm.
Complete technology vertical starting from salts preparation and crystal growth provides a stable superior quality of the optical fiber.

Highest performance PIR core/clad fiber are extruded with core diameters span from 240µm to 860µm.
Low optical losses without absorption peaks over the mentioned spectral range ensure a successful use of PIR- fiber for a broad range of applications.

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Wavelength

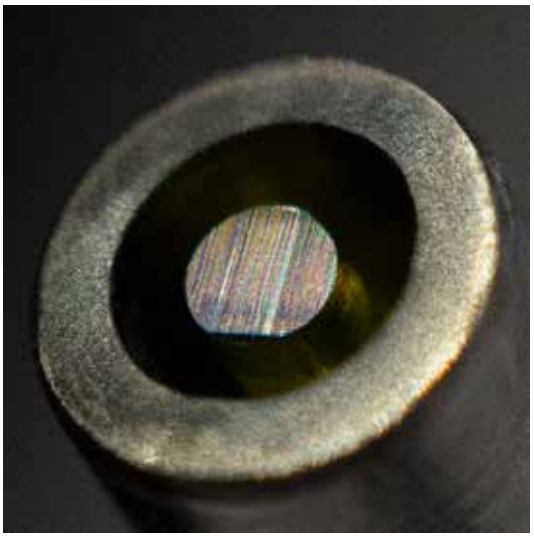
3 µm to 17 µm

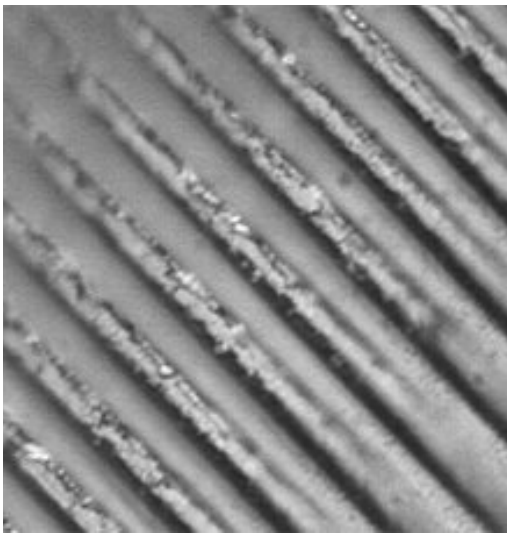
Numerical aperture (NA)

0.30

FlexiRay® Mid-IR fiber cables

For spectroscopy, pyrometry and more





Fiber Cables based on Polycrystalline Infra-Red (PIR-) fibers (3 – 17 µm) are used in a wide range of applications including Mid-IR light delivery, spectroscopy, remote temperature sensing, etc. PIR-fiber cables are available with a variety of standard fiber diameters, with different connectors (SMA-905, FC/PC, and FC/APC), and several types of protective sheathing.
Special treatment is developed for PIR-fiber laser cables to modify their end surface with SMART microstructure - to suppress Fresnel reflection losses for >2 times.

IR glass fiber cables from Hollow Silica IR Fibers

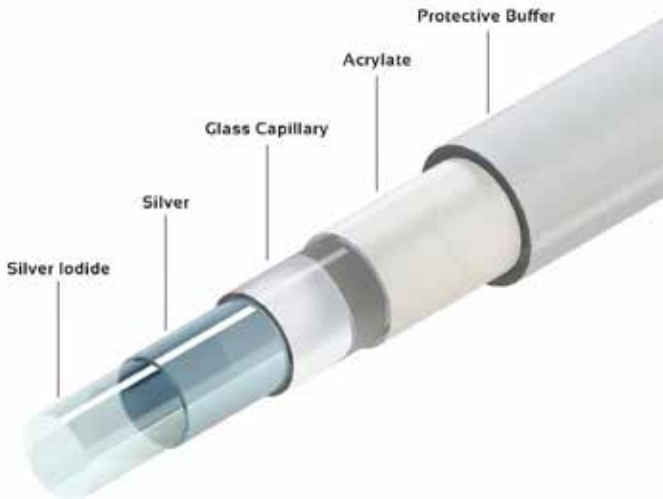
art photonics offers FlexiRay® Fiber Cables for a broad Mid-Infrared spectral range 3 – 17µm. Based on Hollow Glass IR-fibers produced in-house, FlexiRay® fiber cables are ideal for a wide range of applications including Mid-IR light delivery, spectroscopy, CO and CO2 laser delivery. HGW cables are available with a variety of standard fiber diameters and equipped with SMA-905 connectors.

Wavelength

3 µm to 17 µm

Numerical aperture (NA)

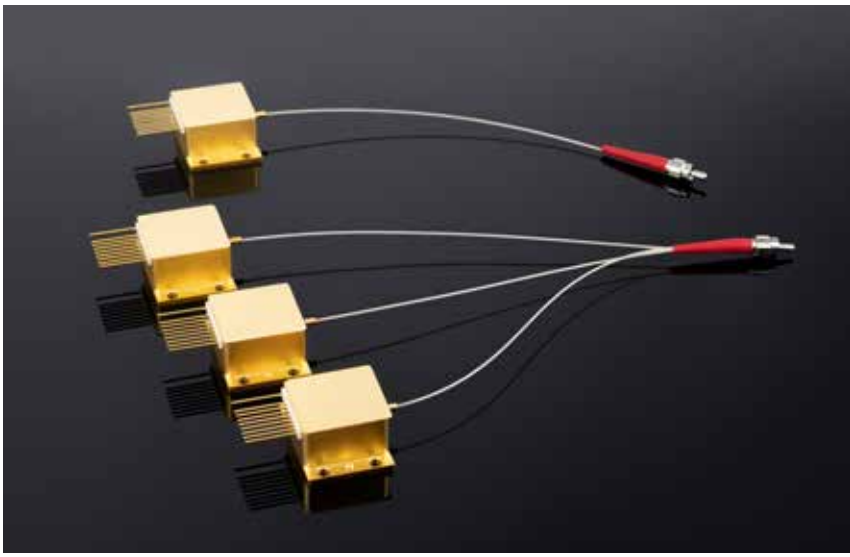
0.05+/-0.01



FlexiRay® Radiation delivery for Lasers

PIR and CIR fiber cables and combiners

Our cables made from polycrystalline and chalcogenide fibers deliver exceptional performance for coupling QC lasers, ensuring stable transmission even under bending conditions. In addition, we design and manufacture our own specially engineered QCL couplers, providing seamless integration and maximum efficiency for advanced infrared solutions.



CO and CO_2 Laser Power Delivery

Polycrystalline Mid-InfraRed (PIR-) fiber cables provide stable power transmittance under the bending that is an important advantage as compared to hollow waveguides. Special SMART treatment of PIR-fiber ends suppresses Fresnel reflection to increase output power by 10-12%.

Specialty fiber cables and pigtails,
cables for vacuum applications

art photonics' optical fiber vacuum feedthroughs provide a flexible optical path into a vacuum or high pressure chamber.

For silica fibers the vacuum feedthrough can be delivered for all fiber diameters, from single mode fiber up to 1000 µm core fiber in a UV/VIS/NIR spectral range. All feedthroughs are proved to work up to 10^{-9} Torr.

We develop and manufacture any cable design from a pigtail to 300m length from space to underwater application.

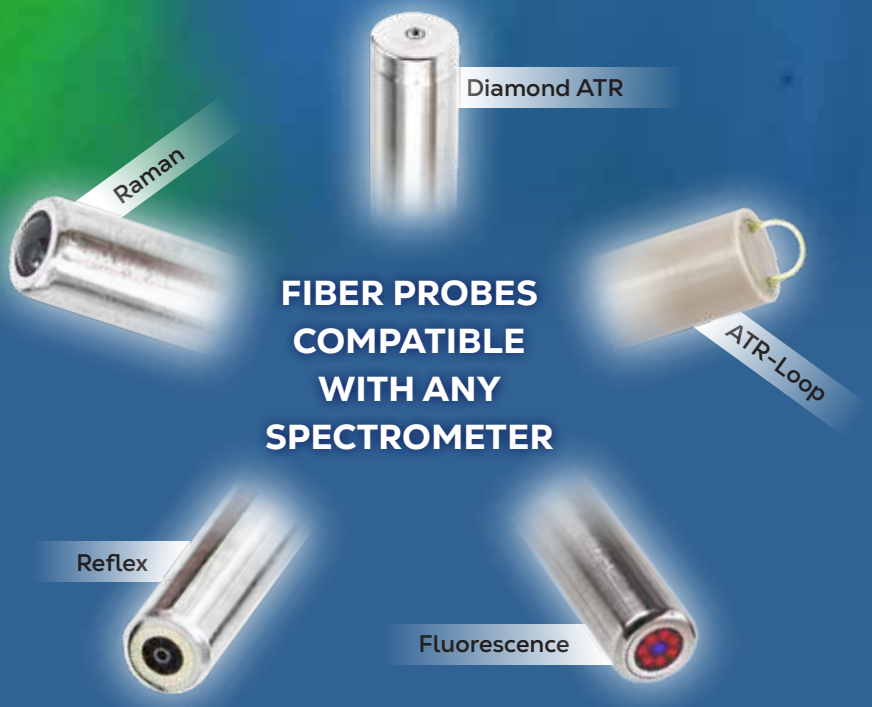
Multispectral Bundles

- Fiber bundles contain up to a thousand optical fibers
- Custom fiber arrangement
- High and Low temperature special design
- Standard or custom connectors and ferrules
- Splitting light from light source into several channels
- Combining light from several sources
- Reshaping of light beam cross section

STANDARD AND CUSTOMIZED

HIGH-PERFORMING FIBER PROBES

IN A BROAD 0.3-16 µm RANGE



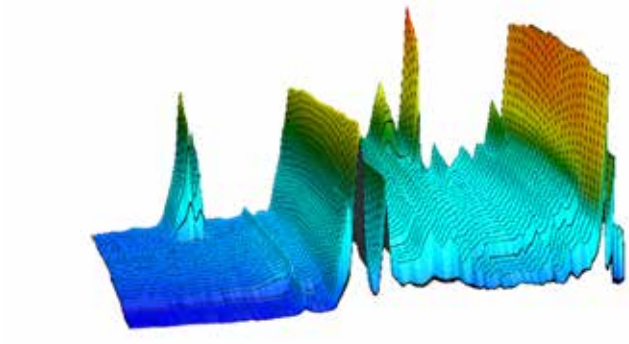
FIBER PROBES COMPATIBLE WITH ANY SPECTROMETER

FlexiSpec® ATR Probes

Standard and Customized ATR Probes

Our FlexiSpec® product line includes the latest generation of Attenuated Total Reflection UV-VIS-NIR & Mid IR-fiber ATR-Probes produced for any type of FT-NIR, FT-IR and other IR-spectrometers, photometers and IR-LED or QCL spectral sensors. Standard and High Temperature (HT) ATR immersion fiber optic probes with patented design are suitable for reaction monitoring in lab, pilot plant and for full automated process control.

Our ATR fiber Probes can be used for process-spectroscopy to monitor reactions in-line in a broad temperature range of -150 to 250°C. They can resist high pressures up to 200 bar and can be used with any FTIR or spectral sensors in automated process control and process interfaces.



FlexiSpec® ATR Probes

Attenuated Total Reflection Probes

Our Lab ATR Probes with PEEK shaft were specially designed to offer cost-effective solutions for analyzing samples in small lab reactors and open vessels, without compromising sensitivity, when our ATR-Loop PIR-fiber probes were the first in the FlexiSpec® product line, historically designed for use with FTIR or any other mid-IR spectrometer. Both Lab and Loop ATR Probes are ideal for remote analysis of liquids, pastes, or soft surfaces, with no requirement for sample preparation, making them a cost-effective option.

The ATR Loop Probe, while being a cost-effective and highly sensitive alternative to standard ATR Probes, also features easily replaceable loop tips, allowing for convenient customization or disposal of the loop when needed.

FlexiSpec® Couplers

Couplers for FTIR Spectrometers

Our Fiber Probe Couplers are the ideal solution for connecting Fiber Optic Probes to FTIR spectrometers, enabling remote analysis and reaction monitoring. With a mirror design that provides high coupling efficiency for any probe, the couplers cover a broad spectral range of 0.2-18µm. The in/out ports are compatible with SMA-terminated fiber probes and the adjustable mirrors ensure maximum coupling efficiency. The couplers are easy to install in the sample chamber, making them a convenient option for any laboratory. They allow for easy in-line process spectroscopy and reaction monitoring, eliminating the need for time-consuming sample collection and preparation.

FlexiSpec® Reflection Probes

for Industrial and Lab Applications




art photonics' FlexiSpec® Reflection Probes were designed with special angled optics to provide exceptional sensitivity and reduce unwanted signal interference. These probes are available in customized designs for various industrial applications and enable fast and precise measurements of different media, delivering reliable and accurate results every time. With a range of applications including measuring diffuse and specular reflectance, backscatter and fluorescence measurements, quality control and process monitoring in manufacturing, and non-destructive testing and inspection in materials science, Reflection Probes are an ideal choice for any laboratory or industry.

FlexiSpec® Transflection Probes

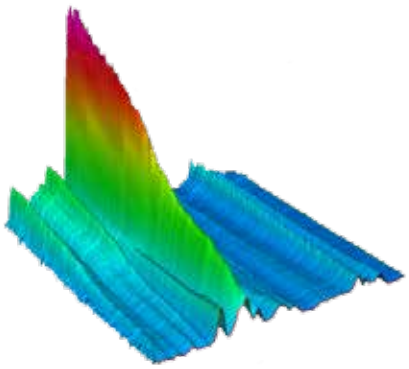
for Remote Liquid Sensing

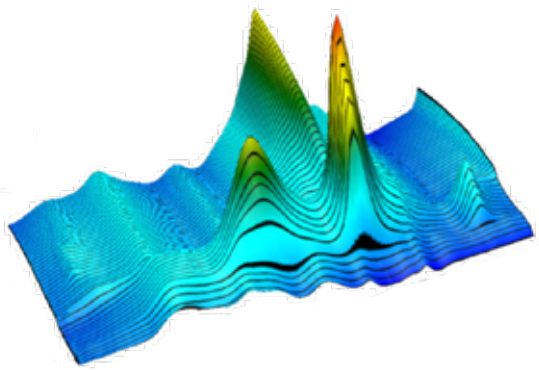
FlexiSpec® product line includes the latest generation of Transflection Dual Pass fiber optic probes to be used with any spectrometer or photometer in any part of UV - VIS or VIS - NIR spectra.

Hastelloy C22 shaft is suitable for industrial applications and for work in harsh environment. Sapphire windows and a number of removable heads with variable optical path length allow to use Transflection probe in wide range of liquids and concentrations. Upon request, more than one removable head can be included per order. Possible slit sizes range from 0.5 - 20mm.

Compatible with all spectrometers, Transflection Fiber probe with Sapphire optics provides On-line transmission spectroscopy at long distance in wide range of liquids (from transparent to poorly transparent). High throughput in any part of UV - VIS or VIS - NIR spectra allows flexible and robust applications for industrial in harsh environments.

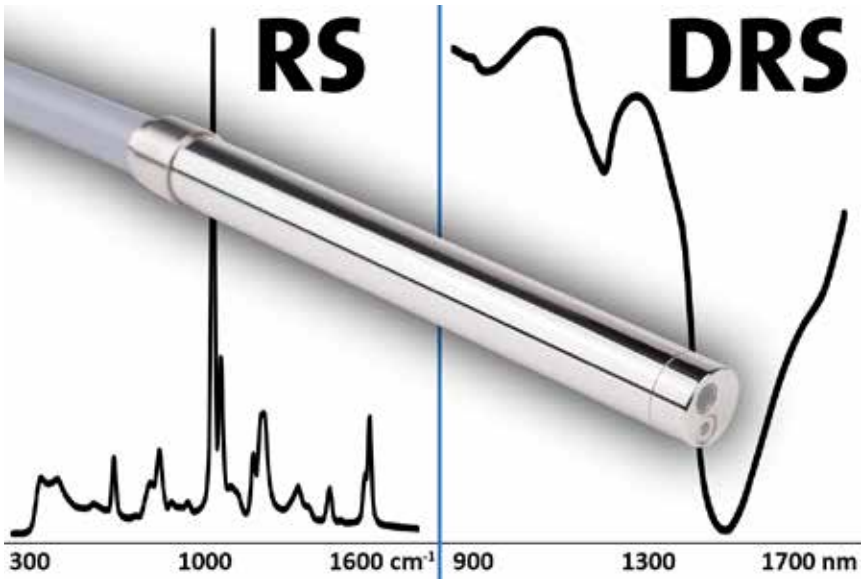
3A-certified Transflection Probe is developed by art photonics for measurements with the highest hygienic requirements in the pharmaceutical and food industries. The probe on the picture is developed for tec5USA.





FlexiSpec® Combi Probes

Multichannel Combi Probes NIR-Raman



FlexiSpec® product line includes innovating NIRaman Combi probes. Raman and NIR spectra contain qualitative and quantitative information on the chemical composition and physical properties of the substance. Both are able to provide critical product and process information during production.

Multispectral Fiber System offers a great possibility to monitor chemical reaction by key spectroscopy methods: ATR-absorption in Mid-Infrared, Near-IR Reflection, Raman scattering and Fluorescence. MSF-System helps to select the best method or their combination to enable remote analysis of media in reactor with high accuracy and to run process-control in-line.

FlexiSpec® Combi Probes

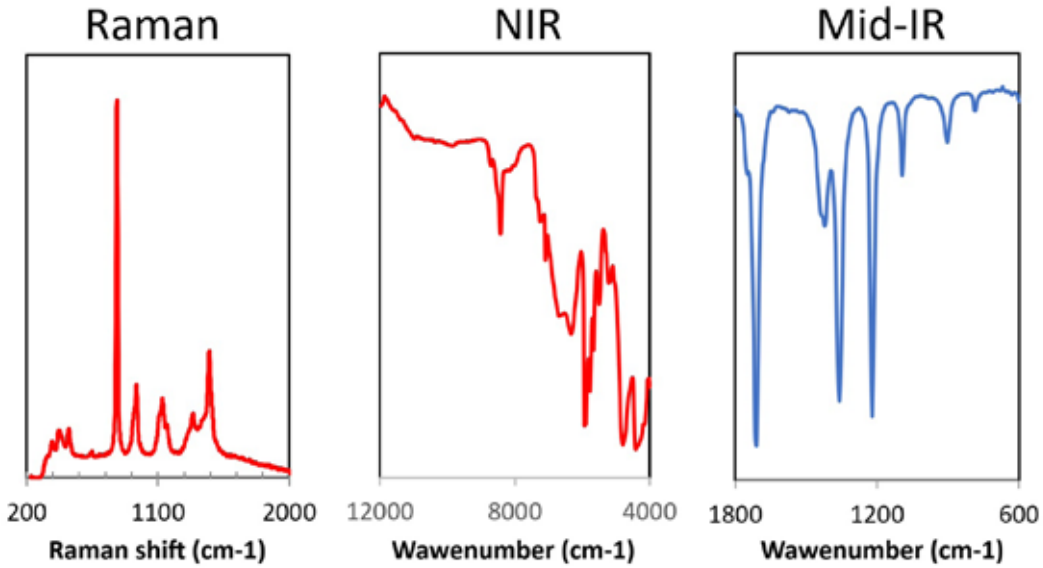
ATR-Raman-Transflection Multichannel Probe

ATR-Raman-Transflection Combi Probe

ATR-Transflection Combi Probe

The multichannel fiber-optic probe is an innovative development by art photonics, designed to enable simultaneous measurements in liquids using multiple spectroscopic techniques: Raman, NIR transflection, and ATR mid-IR.

All three measurement channels are integrated into a single housing and positioned 10 mm apart. This configuration ensures more accurate characterization of both qualitative and quantitative aspects of the chemical composition of liquids.
Additionally, a two-channel version of the probe – combining ATR and transflection – is available for applications where Raman measurements are not required.

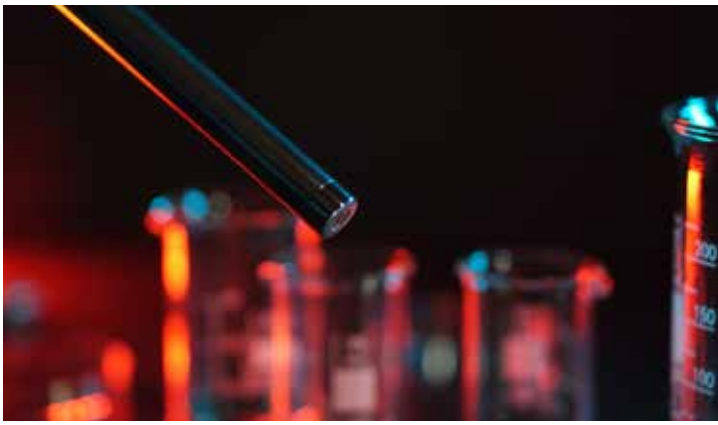


Applications

Where our technology is implemented

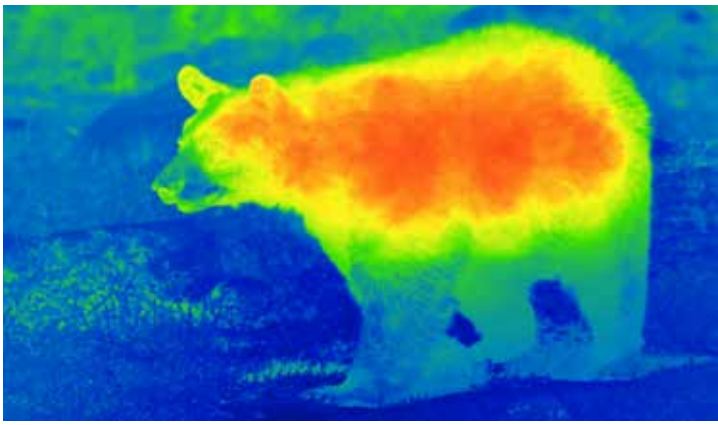
Spectroscopy in Industry: To simplify Reaction Analysis, we recommend using flexible light guides in your laboratory setup for spectroscopic measurements in-line without sampling. Real-time analysis of the process in lab reactors provides a continuous data flow, saving you time and revealing process details for perfect research results.

Spectroscopy in Lab: Modern chemical production requires process analytics that can be organized remotely. We at art photonics offer to equip your production site with flexible fiber optic probes for remote in-line process monitoring without sampling, thus saving time and optimizing workflow.



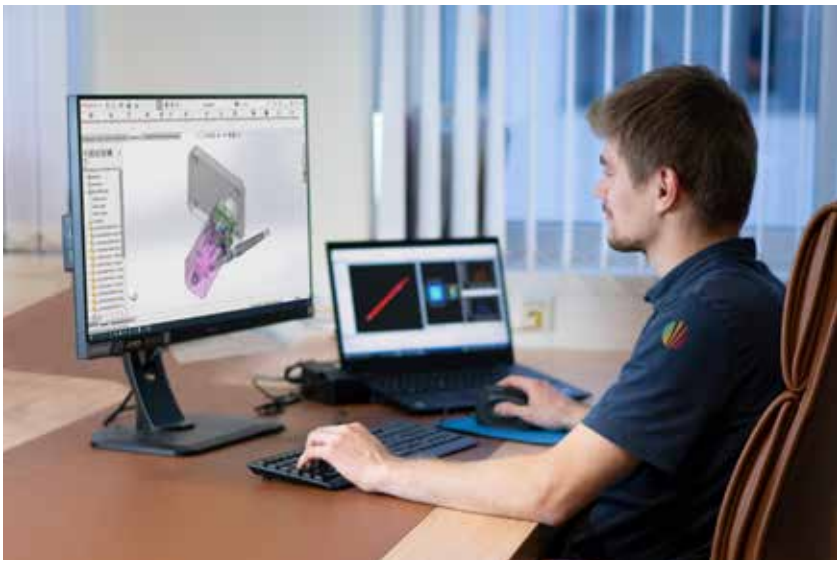
Laser beam delivery: Profit from our novel strategy based on flexible beam delivery for any laser (including QCL) to position sample and system as conveniently as possible and perform the desired research safely, avoiding open laser beams in the workspace.

Imaging and Thermosensing: Remote temperature sensing is an important task for many research areas. art photonics offers unique flexible fiber optic solutions for NIR and mid IR ranges.
IR imaging is still a challenging and developing task which can often be solved easier using flexible solutions such as fiber optics.



Our Services

Consulting, development, installation, renting, testing, repairs



We are right here
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