
# Flexispec®
# Fiber Probes for Process Spectroscopy
## Catalog 2026

art photonics
MEMBER OF THE NYNOMIC GROUP

# Fiber Optic Probes
## when accuracy and accessibility matter

Fiber optic probes are the ideal solution for monitoring real-time chemical reactions, analyzing large or irregularly shaped samples, measuring in vivo, and any other application where bringing the sample to the spectrometer is difficult. Due to their flexibility and user-friendliness, fiber optic probes have become one of the most widespread tools in modern spectroscopy.

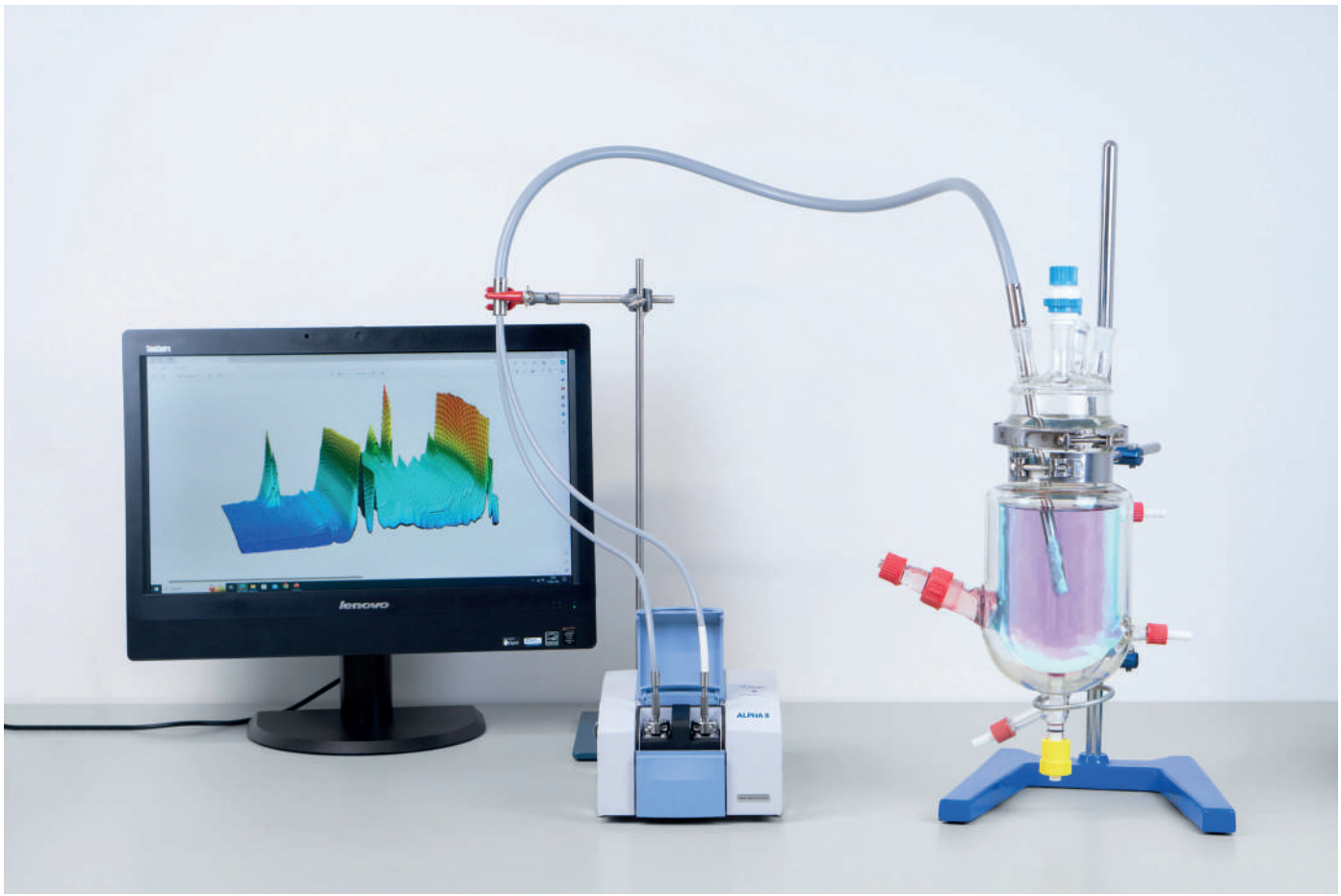
Probe is perfect tool for substance spectrum measurements (pastes, pulver, solid, liquid or gaseous solutions) aimed to determine their composition as well as change of composition during chemical reaction. The measurements are carried out by the system „Probe + Spectrometer". The probe can be attached to the spectrophotometer directly or via a coupler and mounted on a clamp or flange to measure the analyzed mixture inside a reactor vessel.

Fiber Optic probes utilize optical fibers to transmit and receive light to and from a sensitive element, enabling precise non-invasive measurements especially in challenging environments. The core function of fiber optic probes involves delivering light to a target area and collecting the resulting signal for analysis.

A large array of parameters per unit time is a result of the measurements. This data show a broader picture of the chemical reaction comparing with data obtained from sensors.

We offer a comprehensive range of fiber optic probes designed to meet the needs of both laboratory research and industrial process monitoring. For laboratories focused on analyzing process changes and optimizing product or composite formulations, Mid-IR range probes are the preferred choice, delivering precise, real-time data for accurate decision-making. In industrial environments, fiber optic probes are a game-changer for process monitoring. They deliver critical real-time reaction data that drives smarter decisions—saving energy and raw materials, boosting production efficiency, and supporting sustainability by reducing harmful emissions. With fiber optic technology, you achieve better results while caring for the environment.

Resistance to harsh environments and immunity to electromagnetic interference are another advantages of this kind of probes.



# Intelligent Solutions
## or optical analytics and process control

### About us

Founded in 1998, art photonics GmbH is a global leader in fiber optic technologies, delivering intelligent solutions for a wide range of applications — from process monitoring to spectroscopy in both industrial and medical fields. Our unique technology for producing Polycrystalline Mid-Infrared (PIR) fibers positions us at the forefront of innovation, making us a world leader in the development and manufacturing of specialized fiber products. With the expertise of our Research & Development team, we create tailored solutions to meet your specific requirements — from simple fiber cables to advanced fiber optic systems and new technology concepts. Our services include consulting and product desig, prototype development, OEM fiber product manufacturing and complete fiber optic systems solutions.
art photonics GmbH is your ideal partner for advanced fiber solutions in:

- **Chemical and Petrochemical Industry**
- **Pharmacy and Life Science**
- **Food Industry**
- **Polymers production process monitoring**

### Our core competence

- R&D of customized Fiber Optic Systems in a broad spectral range from 190 nm to 17 µm, including feasibility tests
- R&D of customized fiber delivery systems for Diode, Solid State, CO- and $CO_2$-lasers used in medical and industrial applications, including fiber bundle combiners
- R&D of customized spectroscopic fiber probes for all key spectroscopy methods: ATR-absorption, UV-Vis-NIR Transmission & Diffuse Reflection, Raman and Fluorescence, including customized combi-probes for multi-spectral applications and probe couplers to match various spectrometers

### Technological capabilities

Development & production of customized Mid-IR fiber cables, probes and bundles for scientific, medical, industrial and space applications in the range from 2 to 17 µm

### Our Service Solutions

art photonics GmbH provides a full range of professional services to support your fiber optic applications:

- Customer sample analysis in our spectral lab or at your site
- Spectroscopy fiber probes and couplers installation and calibration at the customers location
- Maintenance and repair of fiber optic products
- Rental and leasing of standard spectroscopy fiber probes and probe couplers
- Professional training on fiber product usage — at our company or at your sitein our company or at customer site

# Building of Product Codes

Ensure that you review the encoding format used for probe names in order to correctly identify and select the appropriate product within the tables.

## Building of Product Codes

### Building Blocks for ATR Probes

**ATR-P-ZnSeC-12-30-150/50-HT**

**Probe Type**
ATR - Attenuated Total Reflection

**Fiber Type**
UV - Silica for UV - VIS
NIR - Silica for Near-IR
C - Chalcogenide for 1-6 µm range
P - Polycrystalline for 3-17 µm range

**ATR Crystal Material**
D - Diamond
S - Sapphire
Si - Silicon
Ge - Germanium
ZnSe - Zink Selenide
ZrO2 - Cubic Zirconia
AgX - Silver Halide

**Crown (optional)**
C - Protective Crown around ATR Crystal

**Shaft Diameter, mm**

**Shaft Length, cm**

**Total Length, cm / Legs Length, cm**

**Optional**
High Temperature / Shaft-in-Shaft / Laboratory Designs

### Building Blocks for Probes

**TR-NIR-S-12-30-150/50-SS**

**Probe Type**
TR - Transflection
RS - Raman Scattering
R - Reflection
DR - Diffuse Reflection

**Fiber Type**
UV - Silica for UV - VIS
NIR - Silica for Near-IR
C - Chalcogenide for 1-6 µm range
P - Polycrystalline for 3-17 µm range

**Window Material**
S - Sapphire
Q - Fused Silica

**Shaft Diameter, mm**

**Shaft Length, cm**

**Total Length, cm / Legs Length, cm**

**Optional**
Shaft Material / Focusing Distance / Instrument Connection

# Fiber Optic Probes
# for optical analytics and process control

## ATR Fiber Probes



## Raman Probes



## UV-Vis and Vis-NIR Probes

## Chemical compatibility of ATR crystals

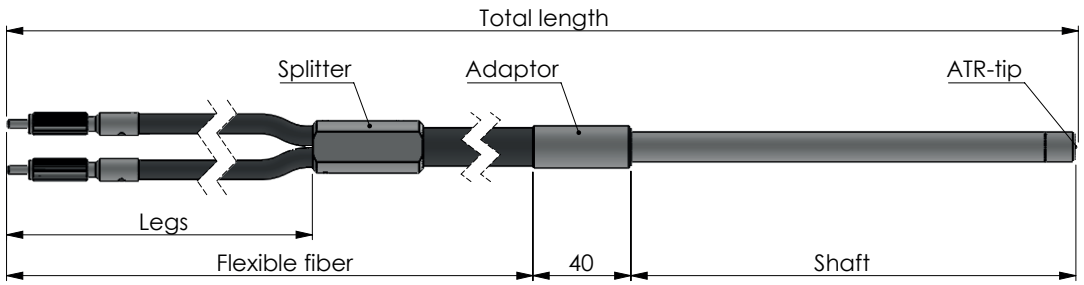
If you have any doubts, check the chemical compatibility of ATR crystals with the chemicals you use. Different crystal materials exhibit significantly different resistance levels to acids, bases, oxidizing agents, and complexing compounds. For example, diamond crystals are highly chemically inert and compatible with nearly all media, whereas ZnSe is vulnerable to both acidic and basic solutions and can degrade in the presence of complexing agents. Germanium crystals remain stable in non-oxidizing acids but are not resistant to concentrated bases or oxidizing/complexing acids. Ensuring compatibility helps prevent crystal surface degradation, spectral artifacts, or complete failure of the ATR element. We are always ready to answer your technical questions and assist in selecting the optimal crystal for your application.

| Material | Properties | Comments |
|---|---|---|
| Diamond | stable in any liquid | mind the restriction of using PEEK (sealing material) |
| Silizium | pH = 1÷10 | presence of oxidizing agents reduces stability in an alkaline medium |
| Germanium | pH= 1÷14 | presence of oxidizing agents reduces stability in an alkaline medium |
| ZnSe | pH = 5÷9 | solutions of complexing agents can damage the crystall |
| ZrO2 | any medium except concentrated alkalies | mind the restriction of using PEEK (sealing material) |
| Al2O3 sapphire | any medium except concentrated alkalies | mind the restriction of using PEEK (sealing material) |
| AgHal detachable loops | pH = 5÷9<br>no metal<br>no S2O3- and Br - groups | solutions of complexing agents can damage the crystal |

## Standard ATR Fiber Probes

| | |
|---|---|
| Probe Type | ATR-probe |
| Tip Protection | crown sized (optional) |
| Probe Shaft | L = 300 ± 5 mm |
| Shaft Material | Hastelloy C22 |
| Total Length | 1.5 ± 0.05 m |
| Flexible fiber | 1.2 m, 2 legs of 0.5 m length each |
| Terminations | 2 x SMA905 |
| Protection tubing | Stainless Steel with polymer coating |

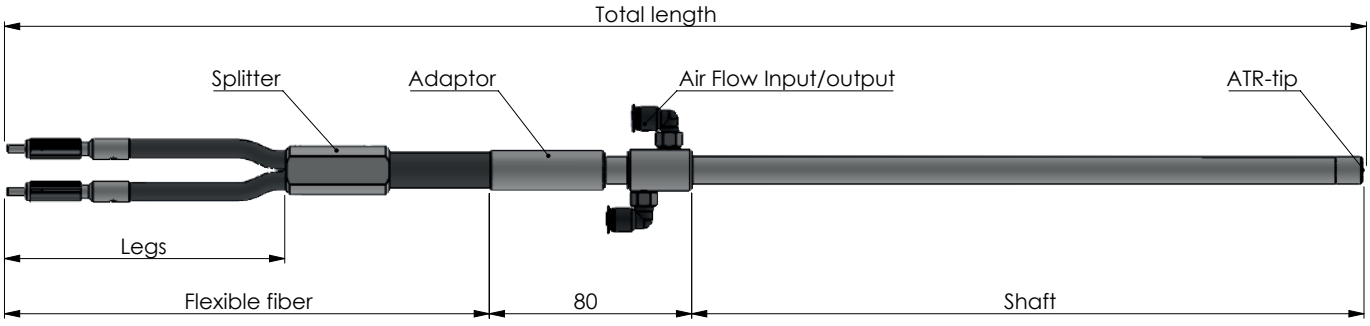
| Product Code | Article-No. | Tip Material | Shaft OD | Spectral Range | Sealing | Fiber Type | Pressure, Temperature |
|---|---|---|---|---|---|---|---|
| ATR-P-D-6-30-150/50 | AP10232 | Diamond | 6.3 mm | 600 - 1900 cm-1 | PEEK | PIR 900/1000 | 200 Bar, -150 - +140 °C |
| ATR-P-DC-6-30-150/50 | AP10705 | Diamond | 6.3 mm | 600 - 1900 cm-1 | PEEK | PIR 900/1000 | 200 Bar, -150 - +140 °C |
| ATR-P-Si-6-30-150/50 | AP10551 | Silicon | 6.3 mm | 600 - 3100 cm-1 | PEEK | PIR 900/1000 | 100 Bar, -150 - +140 °C |
| ATR-P-SiC-6-30-150/50 | AP11100 | Silicon | 6.3 mm | 600 - 3100 cm-1 | PEEK | PIR 900/1000 | 100 Bar, -150 - +140 °C |
| ATR-P-Ge-6-30-150/50 | AP10929 | Germanium | 6.3 mm | 600 - 3100 cm-1 | PTFE | PIR 900/1000 | 10 Bar, -150 - +90 °C |
| ATR-P-GeC-6-30-150/50 | AP11101 | Germanium | 6.3 mm | 600 - 3100 cm-1 | PTFE | PIR 900/1000 | 10 Bar, -150 - +90 °C |
| ATR-C-ZrO2-6-30-150/50 | AP10423 | Cubic Zirconia | 6.3 mm | 1550 - 9000 cm-1 | PEEK | CIR 500/550 | 100 Bar, -150 - +90 °C |
| ATR-C-ZrO2C-6-30-150/50 | AP11102 | Cubic Zirconia | 6.3 mm | 1550 - 9000 cm-1 | PEEK | CIR 500/550 | 100 Bar, -150 - +90 °C |
| ATR-NIR-ZrO2-6-30-150/50 | AP12xxx | Cubic Zirconia | 6.3 mm | 400 - 2200 nm | PEEK | NIR 600/660 | 100 Bar, -150 - +200 °C |
| ATR-NIR-ZrO2C-6-30-150/50 | AP12xxx | Cubic Zirconia | 6.3 mm | 400 - 2200 nm | PEEK | NIR 600/660 | 100 Bar, -150 - +200 °C |
| ATR-UV-S-6-30-150/50 | AP12xxx | Sapphire | 6.3 mm | 260 - 1300 nm | PEEK | UV 600/660 | 100 Bar, -150 - +200 °C |
| ATR-UV-SC-6-30-150/50 | AP12xxx | Sapphire | 6.3 mm | 260 - 1300 nm | PEEK | UV 600/660 | 100 Bar, -150 - +200 °C |
| **Product Code** | **Article-No.** | **Tip Material** | **Shaft OD** | **Spectral Range** | **Sealing** | **Fiber Type** | **Pressure, Temperature** |
| ATR-P-D-12-30-150/50 | AP10241 | Diamond | 12 mm | 600 - 1900 cm-1 | PEEK | PIR 900/1000 | 200 Bar, -150 - +140 °C |
| ATR-P-DC-12-30-150/50 | AP10323 | Diamond | 12 mm | 600 - 1900 cm-1 | PEEK | PIR 900/1000 | 200 Bar, -150 - +140 °C |
| ATR-P-Si-12-30-150/50 | AP10920 | Silicon | 12 mm | 600 - 3100 cm-1 | PEEK | PIR 900/1000 | 100 Bar, -150 - +140 °C |
| ATR-P-SiC-12-30-150/50 | AP10916 | Silicon | 12 mm | 600 - 3100 cm-1 | PEEK | PIR 900/1000 | 100 Bar, -150 - +140 °C |
| ATR-P-Ge-12-30-150/50 | AP10930 | Germanium | 12 mm | 600 - 3100 cm-1 | PTFE | PIR 900/1000 | 10 Bar, -150 - +90 °C |
| ATR-P-GeC-12-30-150/50 | AP10931 | Germanium | 12 mm | 600 - 3100 cm-1 | PTFE | PIR 900/1000 | 10 Bar, -150 - +90 °C |
| ATR-P-ZnSe-12-30-150/50 | AP10399 | Zinc Selenide | 12 mm | 600 - 3100 cm-1 | PTFE | PIR 900/1000 | 10 Bar, -150 - +140 °C |
| ATR-P-Z-SeC-12-30-150/50 | AP10425 | Zinc Selenide | 12 mm | 600 - 3100 cm-1 | PTFE | PIR 900/1000 | 10 Bar, -150 - +140 °C |
| ATR-C-ZrO2-12-30-150/50 | AP10400 | Cubic Zirconia | 12 mm | 1550 - 9000 cm-1 | PEEK | CIR 500/550 | 100 Bar, -150 - +90 °C |
| ATR-C-ZrO2C-12-30-150/50 | AP10424 | Cubic Zirconia | 12 mm | 1550 - 9000 cm-1 | PEEK | CIR 500/550 | 100 Bar, -150 - +90 °C |
| ATR-NIR-ZrO2-12-30-150/50 | AP12xxx | Cubic Zirconia | 12 mm | 400 - 2200 nm | PEEK | NIR 600/660 | 100 Bar, -150 - +200 °C |
| ATR-NIR-ZrO2C-12-30-150/50 | AP12xxx | Cubic Zirconia | 12 mm | 400 - 2200 nm | PEEK | NIR 600/660 | 100 Bar, -150 - +200 °C |
| ATR-UV-S-12-30-150/50 | AP12830 | Sapphire | 12 mm | 260 - 1300 nm | PEEK | UV 600/660 | 100 Bar, -150 - +200 °C |
| ATR-UV-SC-12-30-150/50 | AP12xxx | Sapphire | 12 mm | 260 - 1300 nm | PEEK | UV 600/660 | 100 Bar, -150 - +200 °C |



# High Temperature ATR Fiber Probes

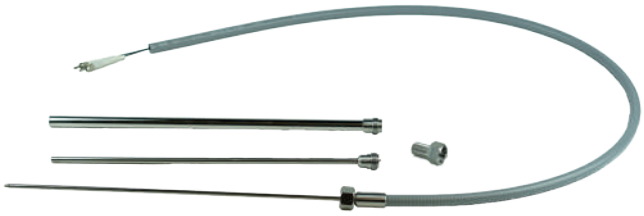
| | |
|---|---|
| Probe Type | sterilizable ATR-probe<br>Shaft-in-Shaft-Design |
| Sealing Material | PEEK |
| Tip Protection | crown sized (optional) |
| Probe Shaft | L = 300 ± 5 mm |
| Shaft Material | Hastelloy C22 |
| Total Length | 1.5 ± 0.05 m |
| Flexible fiber | 1.2 m, 2 legs of 0.5 m length each |
| Terminations | 2 x SMA905 |
| Protection tubing | Stainless Steel with polymer coating |

| Product Code | Article-No. | Tip Material | Shaft OD | Spectral Range | Fiber Type | Pressure | Temperature |
|---|---|---|---|---|---|---|---|
| ATR-P-D-6-30-200/50-HT | AP12114 | Diamond | 6.3mm | 600 - 1900cm-1 | PIR 900/1000 | 200 Bar | -150 - +230°C |
| ATR-P-DC-6-30-200/50-HT | AP12690 | Diamond | 6.3mm | 600 - 1900cm-1 | PIR 900/1000 | 200 Bar | -150 - +230°C |
| ATR-P-Si-6-30-200/50-HT | AP12129 | Silicon | 6.3mm | 600 - 3100cm-1 | PIR 900/1000 | 100 Bar | -150°- +230°C |
| ATR-P-SiC-6-30-200/50-HT | AP12664 | Silicon | 6.3mm | 600 - 3100cm-1 | PIR 900/1000 | 100 Bar | -150°- +230°C |
| ATR-C-ZrO2-6-30-200/50-HT | AP13xxx | Cubic Zirconia | 6.3mm | 1550 - 9000cm-1 | CIR 500/550 | 100 Bar | -150°- +180°C |
| ATR-C-ZrO2C-6-30-200/50-HT | AP13xxx | Cubic Zirconia | 6.3mm | 1550 - 9000cm-1 | CIR 500/550 | 100 Bar | -150°- +180°C |
| **Product Code** | **Article-No.** | **Tip Material** | **Shaft OD** | **Spectral Range** | **Fiber Type** | **Pressure** | **Temperature** |
| ATR-P-D-12-30-200/50-HT | AP10344 | Diamond | 12mm | 600 - 1900cm-1 | PIR 900/1000 | 200 Bar | -150 - +250°C |
| ATR-P-DC-12-30-200/50-HT | AP10928 | Diamond | 12mm | 600 - 1900cm-1 | PIR 900/1000 | 200 Bar | -150 - +250°C |
| ATR-P-Si-12-30-200/50-HT | AP10932 | Silicon | 12mm | 600 - 3100cm-1 | PIR 900/1000 | 100 Bar | -150 - +250°C |
| ATR-P-SiC-12-30-200/50-HT | AP10512 | Silicon | 12mm | 600 - 3100cm-1 | PIR 900/1000 | 100 Bar | -150 - +250°C |
| ATR-C-ZrO2-12-30-200/50-HT | AP10935 | Cubic Zirconia | 12mm | 1550 - 9000cm-1 | CIR 500/550 | 100 Bar | -150 - +200°C |
| ATR-C-ZrO2C-12-30-200/50-HT | AP10936 | Cubic Zirconia | 12mm | 1550 - 9000cm-1 | CIR 500/550 | 100 Bar | -150 - +200°C |

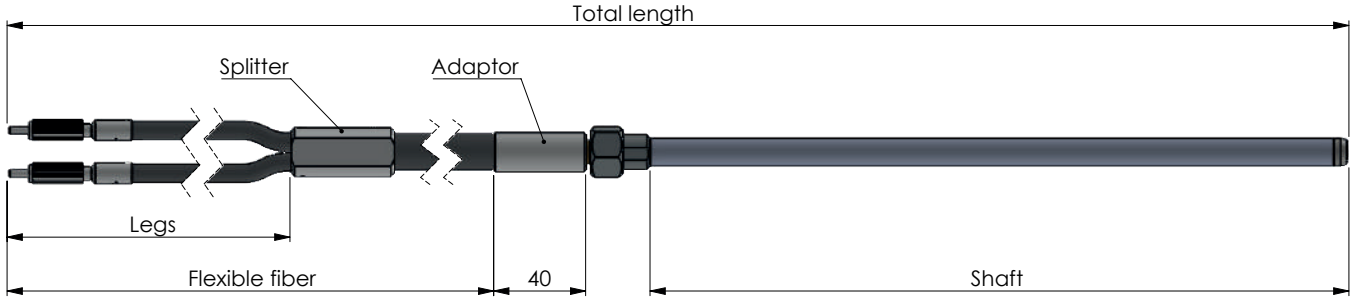


## Sterilizable ATR Fiber Probes

| | |
|---|---|
| Probe Type | ATR-probe gas cooling design |
| Sealing Material | PEEK |
| Tip Protection | crown sized (optional) |
| Probe Shaft | L = 300 ± 5 mm |
| Shaft Material | Hastelloy C22 |
| Total Length | 2 ± 0.05 m |
| Flexible fiber | 1.7 m, 2 legs of 0.5 m length each |
| Terminations | 2 x SMA905 |
| Protection tubing | Stainless Steel with polymer coating |

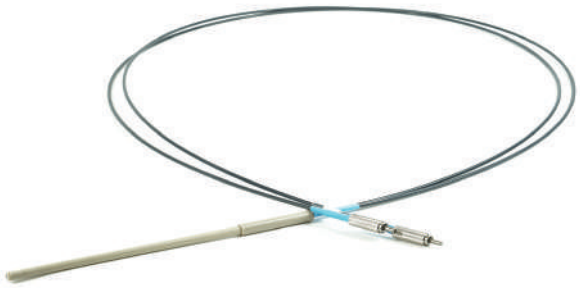


| Product Code | Article-No. | Tip Material | Shaft OD | Spectral Range | Sealing | Fiber Type | Pressure, Temperature |
|---|---|---|---|---|---|---|---|
| ATR-P-D-6-30-150/50-SiS | AP10937 | Diamond | 6.3 mm | 600 - 1900 cm-1 | PEEK | PIR 900/1000 | 200 Bar, -150 - +140 °C |
| ATR-P-DC-6-30-150/50-SiS | AP12xxx | Diamond | 6.3 mm | 600 - 1900 cm-1 | PEEK | PIR 900/1000 | 200 Bar, -150 - +140 °C |
| ATR-P-Si-6-30-150/50-SiS | AP10938 | Silicon | 6.3 mm | 600 - 3100 cm-1 | PEEK | PIR 900/1000 | 100 Bar, -150 - +140 °C |
| ATR-P-SiC-6-30-150/50-SiS | AP12xxx | Silicon | 6.3 mm | 600 - 3100 cm-1 | PEEK | PIR 900/1000 | 100 Bar, -150 - +140 °C |
| ATR-P-Ge-6-30-150/50-SiS | AP10939 | Germanium | 6.3 mm | 600 - 3100 cm-1 | PTFE | PIR 900/1000 | 10 Bar, -150 - +90 °C |
| ATR-P-GeC-6-30-150/50-SiS | AP12xxx | Germanium | 6.3 mm | 600 - 3100 cm-1 | PTFE | PIR 900/1000 | 10 Bar, -150 - +90 °C |
| ATR-C-ZrO2-6-30-150/50-SiS | AP10940 | Cubic Zirconia | 6.3 mm | 1550 - 9000 cm-1 | PEEK | CIR 500/550 | 100 Bar, -150 - +90 °C |
| ATR-C-ZrO2C-6-30-150/50-SiS | AP12xxx | Cubic Zirconia | 6.3 mm | 1550 - 9000 cm-1 | PEEK | CIR 500/550 | 100 Bar, -150 - +90 °C |
| **Product Code** | **Article-No.** | **Tip Material** | **Shaft OD** | **Spectral Range** | **Sealing** | **Fiber Type** | **Pressure, Temperature** |
| ATR-P-D-12-30-150/50-SiS | AP10798 | Diamond | 12 mm | 600 - 1900 cm-1 | PEEK | PIR 900/1000 | 200 Bar, -150 - +140 °C |
| ATR-P-DC-12-30-150/50-SiS | AP12xxx | Diamond | 12 mm | 600 - 1900 cm-1 | PEEK | PIR 900/1000 | 200 Bar, -150 - +140 °C |
| ATR-P-Si-12-30-150/50-SiS | AP10727 | Silicon | 12 mm | 600 - 3100 cm-1 | PEEK | PIR 900/1000 | 100 Bar, -150 - +140 °C |
| ATR-P-SiC-12-30-150/50-SiS | AP12xxx | Silicon | 12 mm | 600 - 3100 cm-1 | PEEK | PIR 900/1000 | 100 Bar, -150 - +140 °C |
| ATR-P-Ge-12-30-150/50-SiS | AP10941 | Germanium | 12 mm | 600 - 3100 cm-1 | PTFE | PIR 900/1000 | 10 Bar, -150 - +90 °C |
| ATR-P-GeC-12-30-150/50-SiS | AP12xxx | Germanium | 12 mm | 600 - 3100 cm-1 | PTFE | PIR 900/1000 | 10 Bar, -150 - +90 °C |
| ATR-C-ZrO2-12-30-150/50-SiS | AP10942 | Cubic Zirconia | 12 mm | 1550 - 9000 cm-1 | PEEK | CIR 500/550 | 100 Bar, -150 - +90 °C |
| ATR-C-ZrO2C-12-30-150/50-SiS | AP12xxx | Cubic Zirconia | 12 mm | 1550 - 9000 cm-1 | PEEK | CIR 500/550 | 100 Bar, -150 - +90 °C |

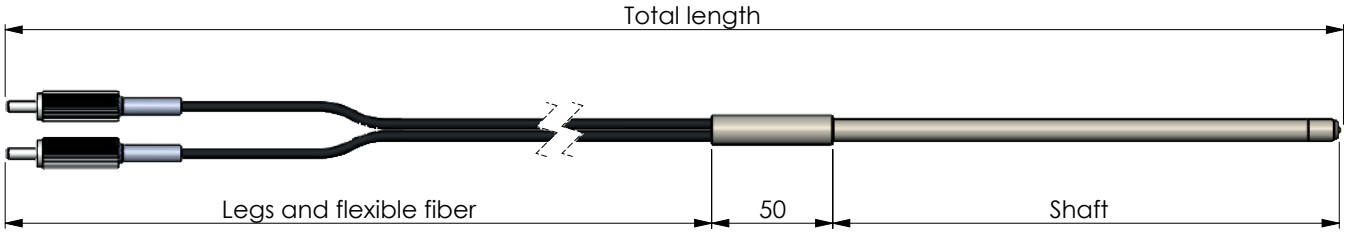


# Laboratory ATR Fiber Probes

| | |
|---|---|
| Probe Type | ATR-probe for Laboratory |
| Sealing Material | PTFE |
| Probe Shaft | OD = 6.3 mm, L = 150 ± 5 mm |
| Shaft Material | PEEK |
| Total Length | 1.5 ± 0.05 m |
| Flexible fiber | 2 legs of 1.35 m length each |
| Terminations | 2 x SMA905 |
| Protection tubing | PEEK |



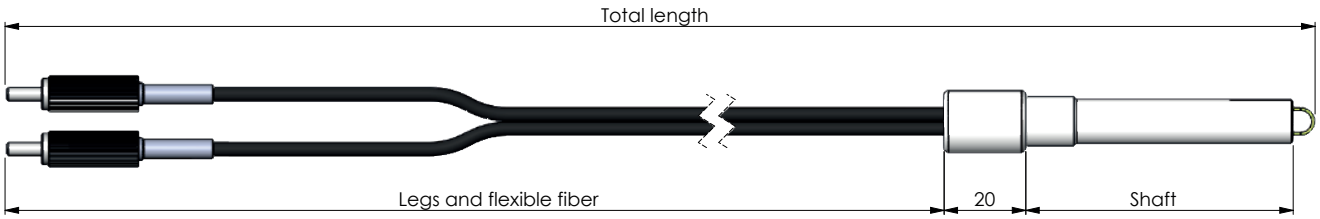
| Product Code | Article-No. | Tip Material | Shaft | Spectral Range | Fiber Type | Temperature |
|---|---|---|---|---|---|---|
| ATR-P-D-6-15-150-Lab | AP12496 | Diamond | 150 | 600 - 1900 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-DC-6-15-150-Lab | AP10xxx | Diamond | 150 | 600 - 1900 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-D-6-30-150-Lab | AP12698 | Diamond | 300 | 600 - 1900 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-DC-6-30-150-Lab | AP12756 | Diamond | 300 | 600 - 1900 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-Si-6-15-150-Lab | AP10906 | Silicon | 150 | 600 - 3000 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-SiC-6-15-150-Lab | AP13132 | Silicon | 150 | 600 - 3000 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-Si-6-30-150-Lab | AP12697 | Silicon | 300 | 600 - 3000 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-SiC-6-30-150-Lab | AP12931 | Silicon | 300 | 600 - 3000 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-Ge-6-15-150-Lab | AP10917 | Germanium | 150 | 600 - 3100 cm-1 | PIR 900/1000 | -100 - +80 °C |
| ATR-P-GeC-6-15-150-Lab | AP12xxx | Germanium | 150 | 600 - 3100 cm-1 | PIR 900/1000 | -100 - +80 °C |
| ATR-P-Ge-6-30-150-Lab | AP12696 | Germanium | 300 | 600 - 3100 cm-1 | PIR 900/1000 | -100 - +80 °C |
| ATR-P-GeC-6-30-150-Lab | AP12929 | Germanium | 300 | 600 - 3100 cm-1 | PIR 900/1000 | -100 - +80 °C |
| ATR-P-ZnSe-6-15-150-Lab | AP10812 | Zinc Selenide | 150 | 600 - 3100 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-ZnSeC-6-15-150-Lab | AP12xxx | Zinc Selenide | 150 | 600 - 3100 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-ZnSe-6-30-150-Lab | AP12695 | Zinc Selenide | 300 | 600 - 3100 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-P-ZnSeC-6-30-150-Lab | AP12xxx | Zinc Selenide | 300 | 600 - 3100 cm-1 | PIR 900/1000 | -100 - +140 °C |
| ATR-C-ZrO2-6-15-150-Lab | AP10799 | Cubic Zirconia | 150 | 1550 - 9000 cm-1 | CIR 500/550 | -100 - +90 °C |
| ATR-C-ZrO2C-6-15-150-Lab | AP12xxx | Cubic Zirconia | 150 | 1550 - 9000 cm-1 | CIR 500/550 | -100 - +90 °C |
| ATR-C-ZrO2-6-30-150-Lab | AP12692 | Cubic Zirconia | 300 | 1550 - 9000 cm-1 | CIR 500/550 | -100 - +90 °C |
| ATR-C-ZrO2C-6-30-150-Lab | AP12691 | Cubic Zirconia | 300 | 1550 - 9000 cm-1 | CIR 500/550 | -100 - +90 °C |
| ATR-NIR-ZrO2-6-15-150-Lab | AP11679 | Cubic Zirconia | 150 | 400 - 2200 nm | NIR 600/660 | -100 - +140 °C |
| ATR-NIR-ZrO2C-6-15-150-Lab | AP13072 | Cubic Zirconia | 150 | 400 - 2200 nm | NIR 600/660 | -100 - +140 °C |
| ATR-NIR-ZrO2-6-30-150-Lab | AP12xxx | Cubic Zirconia | 300 | 400 - 2200 nm | NIR 600/660 | -100 - +140 °C |
| ATR-NIR-ZrO2C-6-30-150-Lab | AP12xxx | Cubic Zirconia | 300 | 400 - 2200 nm | NIR 600/660 | -100 - +140 °C |
| ATR-UV-S-6-15-150-Lab | AP12497 | Sapphire | 150 | 260 - 1300 nm | UV 600/660 | -100 - +140 °C |
| ATR-UV-SC-6-15-150-Lab | AP12xxx | Sapphire | 150 | 260 - 1300 nm | UV 600/660 | -100 - +140 °C |
| ATR-UV-S-6-30-150-Lab | AP12xxx | Sapphire | 300 | 260 - 1300 nm | UV 600/660 | -100 - +140 °C |
| ATR-UV-SC-6-30-150-Lab | AP12xxx | Sapphire | 300 | 260 - 1300 nm | UV 600/660 | -100 - +140 °C |



## ATR Detachable Loop Fiber Probes

| | |
|---|---|
| Probe Type | ATR for Detachable-PIR-Loops |
| Probe Shaft | OD = 10 mm, L = 80 mm |
| Shaft Material | PEEK |
| Total Length | 1.1 ± 0.05 m |
| Flexible fiber | 2 legs of 1.0 m length each |
| Terminations | 2 x Ti-SMA905 |
| Protection tubing | PEEK |
| Temperature | 0 - +80°C |
| Pressure | 0 - 3 Bar |

| Product Code | Article-No. | Tip Material | Spectral Range | Fiber Type |
|---|---|---|---|---|
| ATR-P-AgX-10-8-110/100 | AP10100 | PIR-fiber loop | 600 - 3100 cm-1 | PIR 900/1000 |
| ATR-C-AgX-10-8-110/100 | AP10106 | PIR-fiber loop | 1550 - 5000 cm-1 | CIR 500/550 |




## Detachable Loop Tips

| Product Code | Quantity | Article-No. | Fiber Type | Loop length |
|---|---|---|---|---|
| Detachable Single PIR-Loops for DL-Probe | 5 pcs | AP10109 | PIR 700 | 5 ± 0,5 mm |
| Detachable Single PIR-Loops for DL-Probe | 10 pcs | AP10031 | PIR 700 | 5 ± 0,5 mm |
| Detachable Dual PIR-Loops for DL-Probe | 5 pcs | AP10110 | PIR 700 | 7 ± 0,5 mm |
| Detachable Dual PIR-Loops for DL-Probe | 10 pcs | AP10111 | PIR 700 | 7 ± 0,5 mm |
| Detachable Triple PIR-Loops for DL-Probe | 5 pcs | AP10191 | PIR 700 | 9 ± 0,5 mm |
| Detachable Triple PIR-Loops for DL-Probe | 10 pcs | AP10238 | PIR 700 | 9 ± 0,5 mm |

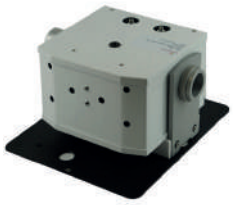
## Touch Diamond ATR Fiber Probes

| | |
|---|---|
| Probe Type | ATR-probe |
| Sealing Material | Gold |
| Probe Shaft | OD = 6.3 mm |
| Shaft Material | Hastelloy C22 |
| Total Length | 1.5 ± 0.05 m |
| Flexible fiber | 1.2 m, legs of 0.5 m length each |
| Terminations | 2 x SMA905 |
| Protection tubing | Stainless Steel with polymer coating |

| Product Code | Article-No. | Tip Material | Shaft OD | Spectral Range | Sealing | Fiber Type | Pressure, Temperature |
|---|---|---|---|---|---|---|---|
| ATR-P-DF-6-30-150/50 | AP11938 | Diamond | 6.3 mm | 600 - 1900 cm-1 | Gold | PIR 900/1000 | 100 Bar, -150 - +140 °C |

## Fiber Probe Couplers

Fiber Probe Couplers are designed to connect Fiber Optic Probes with FTIR spectrometers and to perform the remote analysis and reaction monitoring. Mirror design of FlexiSpec® Fiber Probe Couplers provides high coupling efficiency for any probe used for process-spectroscopy in broad spectral range 1.5 - 17 µm.

| Product Code | Article-No. | Compatible with | |
|---|---|---|---|
| Fiber Probe Coupler FPC-2M for iS5 | AP10285 | •Nicolet Summit FTIR<br>•Nicolet iS 5 FTIR |  |
| Fiber Probe Coupler FPC-2M for iS5N | AP11394 | •Nicolet iS 5N FTIR | |
| Fiber Probe Coupler FPC-6M | AP10307 | •Nicolet iS 10 FT-IR<br>•Nicolet iS 20 FT-IR<br>•Nicolet iS 50 FT-IR<br>•Nicolet 5700/6700<br>•Nexus 670 (ThermoFischer Scientific)<br>•Nexus 360 (ThermoFischer Scientific)<br>•Equinox 55 (Bruker)*<br>•Vector 22 (Bruker)*<br>•IFS 25, 55, 66, 66V, 88 (Bruker)* |  |
| Fiber Probe Coupler Universal Coupler | AP11380 | any FTIR spectrometer<br>•VERTEX 70v (Bruker)<br>•Tensor 27, 37 (Bruker)<br>•FP-8600 (JASCO)<br>•IRSpirit (Schimadzu)<br>•Agilent 600 Serie |  |
| Fiber Probe Coupler for Cary 630 | AP12312 | Agilent Cary 630 |  |
| Fiber Probe Coupler for Spectrum Two | AP11586 | Perkin Elmer Spectrum Two |  |
| Fiber Probe Coupler for Alpha | AP11505 | Bruker Alpha<br>Bruker Alpha II |  |

## Reference Cables

| Product Code | Article No. | Termination | Fiber |
|---|---|---|---|
| Fiber Cable PIR400/500-50-TI/SMA-TI/SMA-MP37 | AP10680 | 2 x SMA 905 connector, titanium ferrule | PIR 400/500, NA = 0,30 ±0.03 |
| Fiber Cable CIR250/300-50-SMA-SMA-MP37 | AP11124 | 2 x SMA 905 connector | CIR 250/300, NA = 0,30 ±0.03 |
| Fiber Cable NIR200/220-50-SMA-SMA-MP37 | AP11140 | 2 x SMA 905 connector | NIR 200/220, NA = 0,22 ±0,02 |

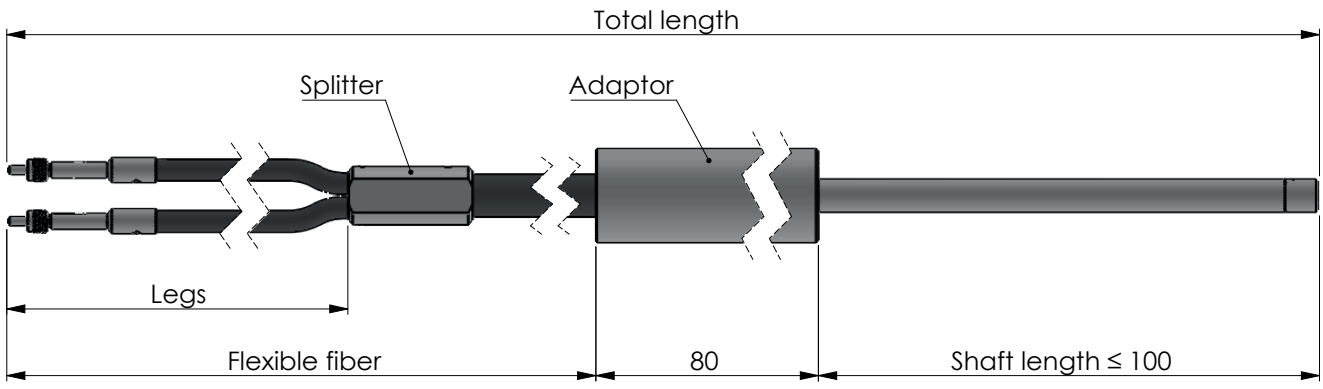
# Raman Scattering Probes

| Probe Type | Raman | Raman 3A standard |
|---|---|---|
| |  |  |
| Window Sealing Material | Epoxy glue (optionaly PTFE or PEEK or Soldering ) | Gold soldering |
| Window | Sapphire | Sapphire |
| Standard Laser Wavelengths* | 532 and 785 nm | 532 and 785 nm |
| Standard Spectral Range Cut-off** | 190 cm-1 for 532 nm; 130 cm-1 for 785 nm | 190 cm-1 for 532 nm; 130 cm-1 for 785 nm |
| Filter Efficiency | OD > 8 for Laser Rejection | OD > 8 for Laser Rejection |
| Illumination (Laser) Fiber | NIR105/125, NA = 0.22 | NIR105/125, NA = 0.22 |
| Collection (Detector) Fiber | NIR200/220, NA = 0.22 | NIR200/220, NA = 0.22 |
| Shaft Material | Stainless Steel 1.4404 / 316L | Stainless Steel 316L |
| Shaft Sealing Material | FPM | Welding |
| Total Length | 2 ± 0.05 m | 2 ± 0.05 m |
| Flexible fiber | 1.7 m incl. legs 0.5m each | 1.7 m incl. legs 0.5m each |
| Protection tubing | Stainless Steel with polymer coating | Stainless Steel with polymer coating |
| Terminations | FC/PC for Laser, SMA905 for Detector | FC/PC for Laser, SMA905 for Detector |
| Temperature | 0 - +120 °C | 0 - +120 °C |
| Pressure | 0 - 20 Bar | 0 - 20 Bar |

* on request 532, 633, 830, 1064 nm and others

** on request 70 and 150cm-1

| Product Code | Article-No. | Shaft OD | Shaft Length | Laser Spot |
|---|---|---|---|---|
| RS-785-S-12-20-200/50-FS | AP13XXX | 12 mm | 200 ± 5 mm | ~0.2mm at the tip |
| RS-532-S-12-20-200/50-FS | AP13XXX | 12 mm | 200 ± 5 mm | ~0.2mm at the tip |
| RS-785-S-6-10-200/50-FS | AP12941 | 6 mm | 100 ± 5 mm | ~0.2mm at the tip |
| RS-532-S-6-10-200/50-FS | AP12784 | 6 mm | 100 ± 5 mm | ~0.2mm at the tip |
| RS-785-S-12-10-500/50-FS-HY | AP12991 | 12 mm | 100 ± 5 mm | ~0.2mm at the tip |

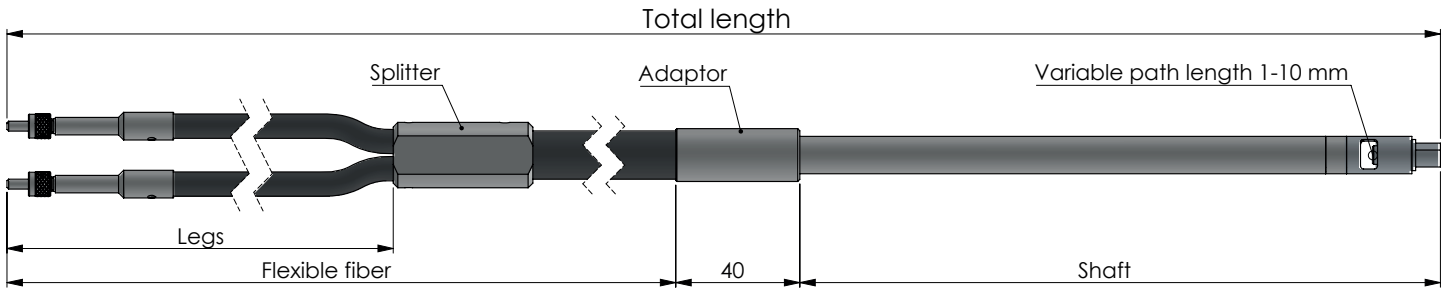


## Transflection Probes

| | | |
|---|---|---|
| Probe Type | Transflection | |
| Configuration | variable optical path | fixed optical path tips |
| Optical Path | variable 0 - 10 mm | 2; 5; 10mm gap (4; 10; 20mm path) |
| Sealing Material | PTFE | |
| Window | Sapphire | |
| Total Length | 2 ± 0.05 m | |
| Flexible fiber | 1.3 m, legs of 0.5 m length each | |
| Terminations | 2 x SMA905 | |
| Protection tubing | Metal, PVC coated | |
| Temperature | 0 - +200 °C | |
| Pressure | 0 - 50 Bar | |
| Industrial application | shaft connectection with extention cables; any type of flange | |

| Product Code | Article-No. | Shaft OD | Shaft Length | Shaft Material | Spectral Range * | Fiber Type |
|---|---|---|---|---|---|---|
| TF-NIR-S-12-20-200/50-SS | AP12406 | 12 mm | 200 ± 5 mm | Stainless Steel 316L | 400 - 2200 nm | NIR 600/660 |
| TF-NIR-S-12-20-200/50-H | AP12279 | 12 mm | 200 ± 5 mm | Hastelloy C22 | 400 - 2200 nm | NIR 600/660 |
| TF-NIR-S-25-50-200/50-SS industrial | AP13xxx | 25.4 mm | 500 ± 5 mm | Stainless Steel 316L | 400 - 2200 nm | NIR 600/660 |
| TF-NIR-S-25-50-200/50-H industrial | AP13xxx | 25.4 mm | 500 ± 5 mm | Hastelloy C22 | 400 - 2200 nm | NIR 600/660 |

***** on request for UV-Vis spectral range (260 - 1200 nm)



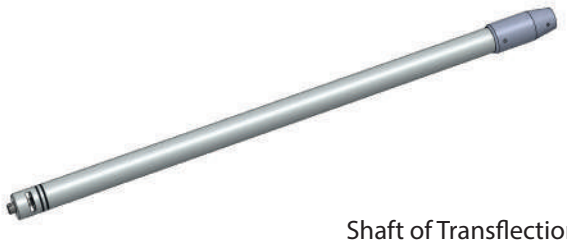

## 3A-certified Transflection Probes

| | |
|---|---|
| Probe Type | Transflection |
| Optical Path | 0.5 mm (1 mm) standard; 2; 5; 10 mm (4; 10; 20 mm) on request |
| Sealing technology | gold soldered (Au-Sn) |
| Window | Sapphire |
| Probe Shaft | OD = 20mm, L = 21mm |
| Shaft Material | electro polished stainless steel 316L |
| Total Length | 2 ± 0.05 m |
| Terminations | 2 x SMA905 |
| Protection tubing | hygienic food grade conduit and fittings |
| Temperature | 5 - +200 °C |
| Pressure | 0 - 50 Bar |

| Product Code | Article-No. | Spectral Range | Fiber type |
|---|---|---|---|
| TR-UV-S-20-7-200/30 Hygienic | AP 13xxx | 0,2 – 1,3 µm | Silica UV-VIS 600/660 µm |
| TR-NIR-S-20-7-200/30 Hygienic | AP 12965 | 0.4 - 2.2 µm | Silica VIS-NIR 600/660 µm |

## Transflection and Transmission Shafts Industrial Design

| Probe Type | Transflection | | Transmission |
|---|---|---|---|
| Configuration | variable optical path | fixed optical path tips | fixed optical path |
| Optical Path | variable 0 - 10 mm | 2; 5; 10mm gap (4; 10; 20mm path) | 2 or 5 mm |
| Sealing Material | PTFE/gold | | |
| Window | Sapphire/Silica | | |
| Shaft Length | 300-1000mm | | |
| Terminations | 2 x SMA905 adapters | | |
| Temperature | 0 - +200 °C | | |
| Pressure | 0 - 50 Bar | | |
| Features | shaft connectection with extention silica cables 2-300m length; any type of flange | | |



Shaft of Transflection Probe

Shaft of Transmission Probe

| Product Code | Article-No. | Shaft OD | Standard Shaft Length | Shaft Material | Spectral Range |
|---|---|---|---|---|---|
| TR-NIR-S-25-50-SS | AP12746 | 25 mm | 500± 5mm | Stainless Steel 316L | 400 - 2200 nm |
| TR-NIR-S-25--50-H | AP12xxx | 25 mm | 500± 5mm | Hastelloy C22 | 400 - 2200 nm |
| TF-NIR-S-25-50-SS | AP13xxx | 25 mm | 500± 5mm | Stainless Steel 316L | 400 - 2200 nm |
| TF-NIR-S-25-50-H | AP13xxx | 25 mm | 500± 5mm | Hastelloy C22 | 400 - 2200 nm |

## Extention Silica cables

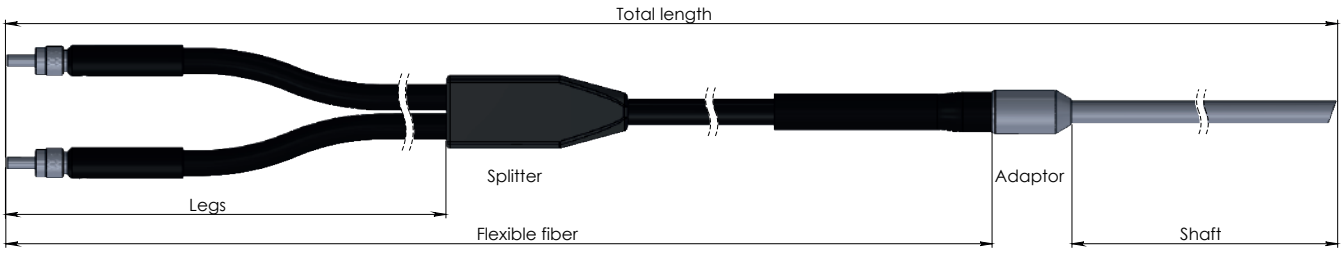
| | |
|---|---|
| Spectral ranges | 0.35–2.4µm (VIS-NIR) |
| Silica Fiber core\clad diameter | 600\660 µm |
| Numerical Aperture | 0.22 ± 0.02 |
| Protective fiber jacket | Nylon, Tefzel, Acrylate, Polyimide, Al, Cu |
| Cable protective tube | double layer PVC tubing with Kevlar strain relief, OD=5,5mm, yellow, gas tight<br>gel filling between layers |
| Connector Type | SMA 905 (hexagonal nut) |
| Cable length | 2- 320m |

| Product Code | Article-No. | Termination | Fiber type |
|---|---|---|---|
| Fiber Cable NIR600/660-xxxxx-SMA-SMA-PVC55+G | AP 1xxxx | 2 x SMA 905 connector hex | NIR600/660, NA = 0,22 ±0.02 |

## Reflection Probes

| | |
|---|---|
| Probe Type | Reflection |
| Sealing Material | Glue EPOTEK 353 ND |
| Window | Sapphire, 20° angle |
| Probe Shaft | OD = 6 mm, L = 150 mm |
| Shaft Material | Stainless Steel 316L |
| Total Length | 2 ± 0.05 m |
| Flexible fiber | 1.35 m, legs of 0.5 m length each |
| Terminations | 2 x SMA905 |
| Protection tubing | Metal, PVC coated |
| Temperature | 0 - +150 °C |
| Pressure | 0 - 10 Bar |

| Product Code | Spectrometer Type | Article-No. | Bundle Arrangement | Spectral Range | Fiber Type |
|---|---|---|---|---|---|
| R-NIR-S-6-15-200/50-FT | FTIR (FT) | AP12488 | 3 + 4 | 380 - 2500 nm | NIR 600/660 |
| R-NIR-S-6-15-200/50-DG | Diffraction Grating (DG) | AP12490 | 6 + 1 | 380 - 2500 nm | NIR 400/440 |
| R-UV-S-6-15-200/50-DG | Diffraction Grating (DG) | AP12xxx | 6 + 1 | 200 - 1200 nm | UV 400/440 |




## Diffuse Reflection Probes

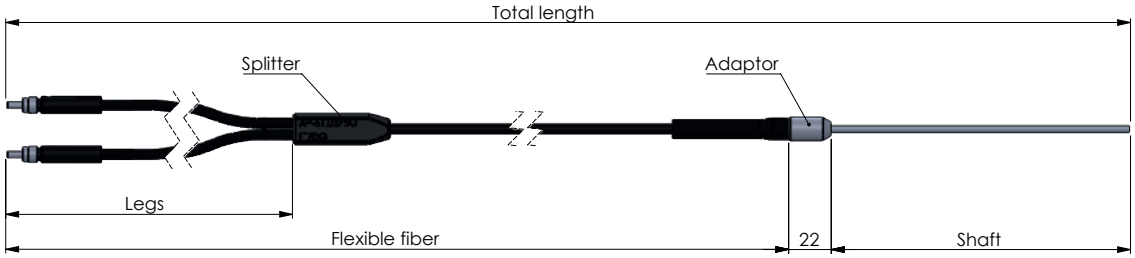
| | |
|---|---|
| Probe Type | Reflection |
| Window | Sapphire |
| Sealing Material | PTFE |
| Probe Shaft | OD = 12 mm, L = 200 mm |
| Shaft Material | Hastelloy C22 |
| Total Length | 2 ± 0.05 m |
| Flexible fiber | 1.3 m, legs of 0.5 m length each |
| Fiber Type | NIR 400/440 |
| Bundle Arrangement | 19 around 1 |
| Terminations | 2 x SMA905 |
| Protection tubing | Metal, PVC coated |
| Temperature | 0 - +200 °C |
| Pressure | 0 - 50 Bar |

| Product Code | Article-No. | Spectral Range |
|---|---|---|
| DR-NIR-S-12-20-200/50 | AP12353 | 400 - 2200 nm |
| Side Line Reflection Probe 12-20-200/50 | AP11049 | 400 - 2200 nm |
| Side Reflection Probe 12-20-200/50 | AP10017 | 400 - 2200 nm |

## Reflection Fluo Probes

| | |
|---|---|
| Probe Type | Reflection |
| Sealing Material | Glue EPOTEK 353 ND |
| Window | No |
| Probe Shaft | OD = 3.5 mm, L = 150 mm |
| Shaft Material | Stainless Steel 316L |
| Total Length | 2 ± 0.05 m |
| Flexible fiber | 1.55 m, legs of 0.3 m length each |
| Terminations | 2 x SMA905 |
| Protection tubing | KSP-4N, OD = 7 mm |
| Temperature | 0 - +150 °C |
| Pressure | 0 - 10 Bar |

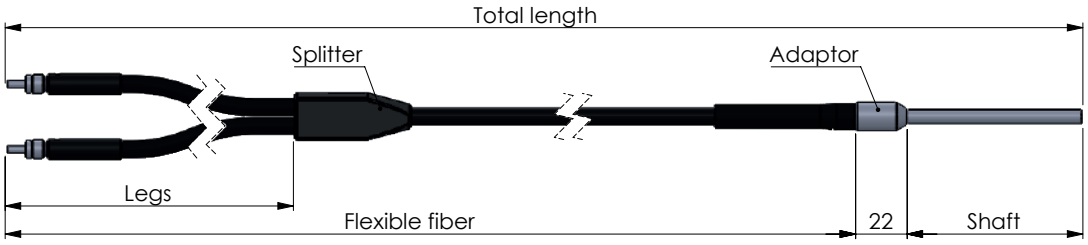
| Product Code | Article-No. | Bundle Arrangement | Spectral Range | Detection Fiber Type | Illumination Fiber Type |
|---|---|---|---|---|---|
| R-NIR-3-15-200/30 | AP10773 | 1 + 7 | 380 - 2500 nm | 1 x NIR400/440 | 7 x NIR 400/440 |
| R-UV-3-15-200/30 | AP12xxx | 1 + 7 | 200 - 1200 nm | 1 x UV-VIS/AL 400/440 | 7 x UV-VIS400/440 |




## Reflection Mid-IR Probes

| | |
|---|---|
| Probe Type | Mid-IR Reflection |
| Sealing Material | No |
| Probe Shaft | OD = 6.3 mm, L = 75 mm |
| Shaft Material | Stainless Steel 316L |
| Total Length | 1.5 ± 0.05 m |
| Flexible fiber | 0.9 m, legs of 0.5 m length each |
| Terminations | 2 x SMA905 |
| Protection tubing | Stainless Steel, OD = 7 mm |
| Temperature | 0 - +80 °C |
| Pressure | 1 Bar |

| Product Code | Article-No. | Bundle Arrangement | Spectral Range | Detection Fiber Type | Illumination Fiber Type |
|---|---|---|---|---|---|
| R-C23-6-7-150/50 | AP12661 | 1 + 7 | 1600 - 7000 cm-1 | 1 x CIR 500/550 | 7 x CIR 250/300 |
| R-P67-6-7-150/50 | AP12xxx | 1 + 7 | 600 - 2500 cm-1 | 1 x PIR 900/1000 | 7 x PIR 600/700 |
| R-P45-6-7-150/50 | AP12317 | 1 + 7 | 600 - 2500 cm-1 | 1 x PIR 900/1000 | 7x PIR 400/500 |



## Reflection Probes Extruder design

| | |
|---|---|
| Probe Type | Reflection |
| Sealing Material | PEEK |
| Window | Sapphire |
| Probe Shaft | 1/2-20 UNF |
| Shaft Material | Stainless Steel 316L |
| Total Length | 2 ± 0.05 m |
| Flexible fiber | 1.8 m, legs of 0.3 m length each |
| Terminations | 2 x SMA905 |
| Protection tubing | KSP-4N, OD = 7 mm |
| Temperature | 0 - +230 °C |
| Pressure | 0 - 100 Bar |

| Product Code | Article-No. | Bundle Arrangement | Spectral Range | Detection Fiber Type | Illumination Fiber Type |
|---|---|---|---|---|---|
| R-NIR-10-15-200/30 | AP12xxx | 1 + 1 | 380 - 2500 nm | 1 x NIR 1000/1100 | 1 x NIR 1000/1100 |

## NIRaman Multichannel CombiProbes

| | |
|---|---|
| **Probe Shaft** | |
| Sealing Material | Glue EPOTEK 353 ND |
| Window | Sapphire |
| Probe Shaft | OD = 19 +0/-0.1 mm, L = 170 mm |
| Shaft Material | Stainless Steel 316L |
| Total Length | 3 ± 0.05 m |
| Protection tubing | Liquid Tight Protection (LTP) |
| Temperature | 0 - +150 °C |
| Pressure | 0 - 10 Bar |
| **NIR Diffuse Reflectance Channel** | |
| Illumination Bundle | 19 x NIR400/440, NA=0.22 ± 0.02 |
| Detection Fiber | 1 x NIR400/440, NA=0.22 ± 0.02 |
| Terminations | 2 x SMA905 |
| **Raman Channel** | |
| Laser Wavelength | 785 nm |
| Excitation Fiber | 1 x NIR105/125, NA=0.22 ± 0.02 |
| Detection Fiber | 1 x NIR200/220, NA=0.22 ± 0.02 |
| Terminations | FC/PC, SMA905 |

| Product Code | Article-No. |
|---|---|
| NIRaman Combi Probe | AP12242 |

# ATR-Raman-Transflection Multichannel Combi Probes

| | |
|---|---|
| **Probe Shaft** | |
| Sealing Material | FFKM O-Rings |
| Probe Shaft | OD = 25 +0/-0.1 mm, L = 505 ±5 mm |
| Shaft Material | Hastelloy C22 |
| Total Length | shaft + fiber = 6.5±0.05m |
| Protection tubing | PVC coated steel tubing |
| Temperature | 0 - +120 °C for shaft 0 - +60 °C for legs |
| Pressure | 0 - 10 Bar |
| **NIR Transflection Channel** | |
| Spectral Range | 900-2500 nm (12000-4000cm-1) |
| Fiber Type | low OH Fused Silica NIR600/660µm |
| Tip material | Sapphire Window |
| Optics | Hastelloy C22 mirror; Optical pathlength: 2mm; Gap: 1mm |
| Terminations | 2 x SMA905 |
| **Raman Channel** | |
| Spectral Range | 100-3200cm-1 @785nm laser |
| Fiber Type | low OH Fused Silica: NIR105/125µm for illumination<br>NIR300/330 for collection |
| Tip material | Sapphire Window |
| Optics | Optical filters and mirrors for Raman setup with 785nm excitation laser |
| Terminations | 2 x FC/PC |
| **Silicon ATR Channel\ Diamond ATR Channel** | |
| Spectral Range | 3.2-17µm (3100 - 600cm-1) / 5.2-17µm (1900-600cm-1) |
| Fiber Type | silver halide AgClBr fibers 900/1000µm |
| Tip material | Silicon / Diamond |
| Optics | Silicon or Diamond |
| Terminations | 2 x SMA905 |

ATR-Transflection 2 channels version

| Product Code | Article-No. |
|---|---|
| ATR Raman Transflection NIR Combi Probe | AP12571 |
| ATR Transflection NIR Combi Probe | AP12570 |

# art photonics – your global partner

Discover more:

**optical fiber solutions**

sales@artphotonics.com

www.artphotonics.com

https://www.youtube.com/channel/UCZ0Xqw1xDD-t1zoN7wbuFXw?

https://www.linkedin.com/company/art-photonics-gmbh/

**art photonics GmbH**
Rudower Chaussee 46
12489 Berlin
Germany
Telefon +49 (0) 30-6779 887-0
Telefax +49 (0) 30-6779 887-99
E-Mail sales@artphotonics.com