

Oxygen Sensor Probes

Options for a Wide Range of Sensing Environments

Oxygen sensor probes typically are available in a variety of designs and with each of our standard coating formulations (FOXY, FOSPOR and HIOXY). Custom probes and accessories are also available. In most cases, you'll need a 21-02 Splice Bushing and a BIF-BORO bifurcated optical fiber to couple your probe to the NeoFox electronics. Information on the proper care of probes is available elsewhere in this section.

Needle Probes

Needle probes are ideal for penetrating septa in packaging, vials and other vessels. We offer versions suitable for use in solutions and headspace.

Item:	Hypo Tube Oxygen Probe
Use:	Puncturing septa, packaging and other rigid materials; especially good for solutions
Core diameter:	1000 μm and 500 μm options
Outer diameter:	1.587 mm
Length:	2 m
Ferrule/jacketing:	PVC Monocoil
Reconditioning available:	Yes
Options:	FOXY-HPT-1-PNA general-purpose FOXY-HPT-0.5-PNA general-purpose FOSPOR-HPT-1-PNA high-sensitivity FOSPOR-HPT-0.5-PNA high-sensitivity HIOXY-HPT-1-PNA hydrocarbon-ready HIOXY-HPT-0.5-PNA hydrocarbon-ready



Preserving the Delicate Balance

Take control of environmental responsibility with pH and Oxygen Sensors from Ocean Optics. These patch- and probe-based sensors are ideal for monitoring the quality and safety of wastewater, agricultural runoff and freshwater drinking sources and can help ensure the oxygen and pH stability of fish farm tanks and ponds.

Ocean Optics optical oxygen and pH sensors allow you to take in situ measurements – without harming your sample.

Contact an Ocean Optics Applications Scientist for details.



Visit the new sensors website at www.oceanopticsensors.com

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Electrode-replacement Probes

Our OR125-series probes are designed to replace standard 1/8" (0.125 mm) electrode probes. We offer smooth and O-ring grooved versions.

Item:	Direct-replacement Probes for O-ring grooved electrodes
Use:	Replacement for 1/8" OD (3.175 mm) oxygen electrodes (O-ring grooved)
Core diameter:	1000 μm
Outer diameter:	3.175 mm
Length:	63.5 mm
Ferrule/jacketing:	Stainless steel, titanium and PEEK versions; smooth or O-ring grooved
Reconditioning available:	Yes
Options:	FOXY-OR125-G general-purpose FOSPOR-OR125-G high-sensitivity HIOXY-OR125-G hydrocarbon-ready FOXY-OR125-GT general-purpose FOSPOR-OR125-GT high-sensitivity HIOXY-OR125-GT hydrocarbon-ready



Item:	Direct-replacement Probes for 1/8" OD (3.175 mm) electrodes
Use:	Replacement for 1/8" OD (3.175 mm) oxygen electrodes (smooth)
Core diameter:	1000 μm
Outer diameter:	3.175 mm
Length:	63.5 mm
Ferrule/jacketing:	Stainless steel, titanium and PEEK versions; smooth or O-ring grooved
Reconditioning available:	Yes
Options:	FOXY-OR125 general-purpose FOSPOR-OR125 high-sensitivity HIOXY-OR125 hydrocarbon-ready



Polyimide Probes

Choose a polyimide probe for applications where the sample environment is hostile to metal probes. Polyimide also offers good resistance to harsh chemicals.

Item:	Polyimide Probes
Use:	Environments hostile to metallic probes
Core diameter:	200 μm (FOXY formulation) and 600 μm (FOXY and FOSPOR formulations) available
Outer diameter:	710 μm
Length:	2 m (other lengths available)
Ferrule/jacketing:	Silicone
Reconditioning available:	Yes
Options:	FOXY-PI600 general-purpose FOSPOR-PI600 high-sensitivity



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General-purpose Probes

Stainless steel 1/16" (1.587 mm) OD probes are versatile options for a range of lab and other applications.

Item:	General-purpose 1.587 mm (1/16") Probes
Use:	General purpose
Core diameter:	1000 μm
Outer diameter:	1.587 mm (1/16")
Length:	152.4 mm
Ferrule/jacketing:	Stainless steel
Reconditioning available:	Yes
Options:	FOXY-R general-purpose FOSPOR-R high-sensitivity HIOXY-R hydrocarbon-ready



Item:	General-purpose 1.587 mm (1/16") Probes; short-length versions
Use:	General purpose
Core diameter:	600 μm
Outer diameter:	1.587 mm (1/16")
Length:	32 mm (other lengths available)
Ferrule/jacketing:	Titanium
Reconditioning available:	Yes
Options:	FOXY-600-32MM general-purpose FOSPOR-600-32MM high-sensitivity HIOXY-600-32MM hydrocarbon-ready



Process-ready Probes

Robust 1/4" (6.35 mm) stainless steel probes have a high pressure rating for process environments.

Item:	Process-ready 6.35 mm probes
Use:	Process environments
Core diameter:	1000 μm
Outer diameter:	6.35 mm
Length:	177.8 mm
Ferrule/jacketing:	Stainless steel
Reconditioning available:	Yes
Options:	FOXY-T1000 general-purpose FOSPOR-T1000 high-sensitivity HIOXY-T1000 hydrocarbon-ready



Technical Tip

Although our line of oxygen sensor probes is extensive, there may be applications where a different probe design is required. We can coat your custom probe with our sensor material, as long as the probe is polished at a 45° angle to ensure maximum performance. Consult an Applications Scientist for details.

Oxygen Sensor Probes

Options for a Wide Range of Sensing Environments

Small-diameter Probes

Slender, aluminum-jacketed probes work well where sampling space is limited. Standard and tissue-monitoring versions are available.

Item:	Small-diameter, Al-jacketed Probes
Use:	Fine spatial resolution applications
Core diameter:	300 μm
Outer diameter:	500 μm
Length:	1 m (other lengths available)
Ferrule/jacketing:	Aluminum
Reconditioning available:	Yes
Options:	FOXY-AL300 general-purpose FOSPOR-AL300 high-sensitivity HIOXY-AL300 hydrocarbon-ready



Item:	Small-diameter Probe for Tissue Monitoring
Use:	Tissue monitoring
Core diameter:	300 μm (fiber)
Outer diameter:	500 μm (fiber) 25.4 mm (1") at tip, body 1.6 mm (1/16") stainless steel
Length:	1 m (other lengths available)
Ferrule/jacketing:	Aluminum
Reconditioning available:	No
Options:	FOXY-AL300-TM general-purpose



Respiration Probe

This plastic probe is designed for monitoring oxygen respiration.

Item:	Respiration Probes (Standard)
Use:	Monitoring of oxygen tension in respiratory gases
Core diameter:	200 μm
Outer diameter:	6.35 mm
Length:	107.9 mm
Ferrule/jacketing:	Plastic
Reconditioning available:	No (uses replaceable glass fiber membranes)
Options:	FOXY-RESP general-purpose FOSPOR-RESP high-sensitivity



Technical Tip

Our oxygen sensor probes are very easy to maintain. Probes can be left in air indefinitely, but avoid exposing them to your excitation light source when not in use. Dropping probes could cause the optical fiber to break, and be sure not to over-tighten the SMA 905 connections. Information on sterilization options and reconditioning services is available elsewhere in this section.

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Oxygen Probe Accessories

Accessory options include a needle probe accessory for use with R-series probes and an in-line flow cell option for low-pressure liquid streams.

The flow cell is made of PEEK polymer and includes tubing barbs for 1/16" (1.587 mm) and 1/8" (3.175 mm) ID tubing. It's designed for use in a low-pressure flowing stream of liquid with a peristaltic or positive displacement pump.

Item:	Puncturing Needle Probe Accessories (two needle lengths available)
Use:	Puncturing septa or seals without damaging sensor coating; adapts to standard 1.587 mm (1/16") probes and includes Swagelok adapter
Core diameter:	1000 μm (probe)
Outer diameter:	1.587 mm (1/16")
Length:	152.4 mm (probe)
Ferrule/jacketing:	Stainless steel
Reconditioning available:	Yes (probe)
Options:	FOXY-R-PNA



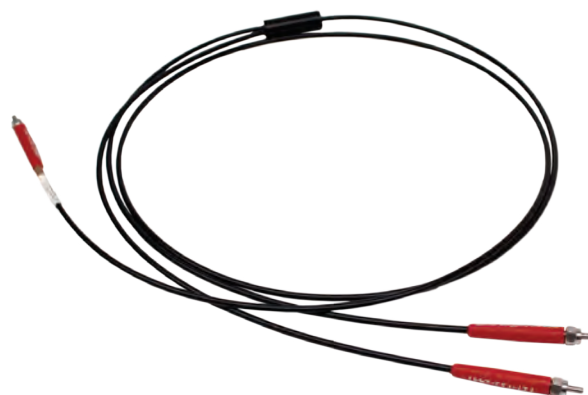
Item:	In-line Flow Cell Accessories for General-purpose Probes
Use:	Low-pressure liquid flow streams
Core diameter:	1000 μm (probe)
Outer diameter:	1.587 mm (1/16")
Length:	32 mm (probe)
Ferrule/jacketing:	PEEK (flow cell)
Reconditioning available:	Yes
Options:	FOXY-FLOW-CELL



Bifurcated Assemblies for Your Probe Setups

Our BIF-BORO bifurcated optical fibers are designed for optimizing the connection between your oxygen probe and the NeoFox electronics. You'll also need a 21-02 SMA Splice Bushing, which mates SMA-terminated optical fibers and connects the oxygen probe to the bifurcated optical fiber assembly. Both fibers and splice bushings are required for most probe setups and are priced separately.

Item:	Bifurcated borosilicate optical fiber assembly couples to sensor probe
Use:	For sensor probes of applicable size and sensitivity
Core diameter:	1000 μm , 600 μm , 300 μm
Length:	2 m or 3 m
Ferrule/jacketing:	Black PVC Monocoil
Reconditioning available:	NA
Options:	BIFBORO-1000-2 BIFBORO-600-2 BIFBORO-300-2



Sensor Probe Care and Chemical Compatibility

How to Get the Most out of Your Oxygen Probe

Our oxygen sensor probes are both robust and simple to maintain. Probe lifetime is typically one year before reconditioning may be necessary, providing that users are careful in handling the probe and ensure that it's not exposed to the excitation source energy for lengthy periods. Some sensor coatings are more appropriate for specific sample environments, so be sure to check the coating compatibility chart on the next page or consult with an Applications Scientist.

Oxygen Sensor Probe Cleaning and Sterilization Guide

Proper maintenance of your oxygen sensor probes may include occasional cleaning and sterilization, which is often required in biological applications. These guidelines apply to probes only and may vary as sensor formulations and other variables change. Please check our website for the most up-to-date information available. Sterilization is a more thorough probe maintenance method than cleaning. Cleaning is useful for removing inclusions, oil and the like, while sterilization refers to any process that eliminates (removes) or kills all forms of life, including transmissible agents that may contaminate the probe.

Cleaning Methods

	FOXY Formulation	FOSPOR Formulation	HIOXY Formulation	Comments
H2O2 (hydrogen peroxide at 30%)	Safe	Safe	Safe	FOXY requires single-point recalibration after each cleaning; also, frequent cleaning will shorten FOXY probe lifespan
Isopropanol	Safe	Safe	Safe	FOXY requires single-point recalibration after each cleaning; also, frequent cleaning will shorten FOXY and HIOXY probe lifespan
Ethanol	Safe	Safe	Safe	FOXY requires single-point recalibration after each cleaning; also, frequent cleaning will shorten FOXY probe lifespan
Methanol	Not recommended	Safe	Not recommended	

Sterilization for Probes

	FOXY	HIOXY	FOSPOR	Comments
Autoclaving	No	Yes	No	HIOXY Probes require single-point reset after autoclaving
Ethylene Oxide	Yes	Yes	Yes	Signal intensity decreases after EtO exposure; recalibration or single-point reset is required
Gamma Radiation	Yes	Not Tested	Not Tested	FOXY Probes require single-point reset after gamma radiation

Sterilization for Patches

RedEye Patches	FOXY	HIOXY	Comments
Ethylene Oxide	Yes	Yes	The signal intensity decreases, reducing the lifespan of the sensor; single-point reset is required
Gamma Radiation	Yes	Not Tested	The signal intensity decreases, reducing the lifespan of the sensor; single-point reset is required

Oxygen Sensor Probe Reconditioning

Good maintenance practices and protection from harsh environments, biofouling, physical abrasion and photobleaching will ensure optimum probe life. If the sensor coating on your oxygen probe is damaged or wears out, recoating services for most of our probe options are available. This reconditioning also includes a recalibration of the probe.

Item codes: FOXY-RECOV, FOSPOR-RECOV and HIOXY-RECOV



Technical Tip

Our oxygen-sensitive RedEye patches are designed primarily for benign gas and liquid environments. The patches are not compatible with chemicals that may attack acrylates and polyester adhesive polymers.

Patches are semi-disposable and do not lend themselves well to cleaning, although some sterilization methods (gamma radiation) may extend their use in biological and other environments. Please consult an Applications Scientist for details.

Sensor Probe Care and Chemical Compatibility

How to Get the Most out of Your Oxygen Probe

Some chemicals and gases may interfere with oxygen sensor performance by attacking the coating or deteriorating the fluorescence signal. The tables below list observed effects of chemicals and gases on coated test slides and on probes immersed in liquids. Up-to-date compatibility charts are available at our website.

Visual Observation of Sol-Gel Coating on Slides			Probes Without Overcoat Immersed in Chemicals		
Chemical / Gas	FOXY and FOSPOR	HIOXY	FOXY and FOSPOR	HIOXY	Comments
Acetone (Reagent® Plus, > 99%)	No	No	No	No	Lifetime not reproducible
Acetonitrile	No	Yes	No	No	The lifetime of the probe fluctuates and is not stable in the solution
Acetonitrile Headspace	No	Yes	No	Yes	Needs additional conditioning in acetonitrile headspace before use
Acrylonitrile (99+%)	No	No	No	No	Lifetime not reproducible.
Benzene (99%, AVS Reagent)	No	Yes	No	Yes	The probe has a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical.
Cyclohexane	No	Yes	No	Yes	The HIOXY probe has a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical. The FOXY probe has decreases in both signal level and lifetime.
DichloroMethane	No	Yes	No	Yes	The HIOXY probe has a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical. The FOXY probe has decreases in both signal level and lifetime.
Diesel Fuel	No	Yes	No	Yes	
Ethanol (Reagent, Denatured)	No	Yes	No	Yes	The probe has a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical. The probe needs to be cured in ethanol for lifetime to stabilize.
Ethlyn Glycol	Yes	Yes	No	Yes	HIOXY Probe: The probe has a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical.
Gasoline	No	Yes	No	Yes	
Glacial Acids (Acrylic, Acetic)	No	No	No	No	
Heptane	Yes	Yes	Yes	Yes	FOXY probes have a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical.
Hexane (95+%, HPLC grade)	Yes	Yes	No	No	Lifetime not reproducible.
Hydrogen Peroxide (3% H2O2 USP)	Yes	Yes	No	Yes	HIOXY Probe Signal level has a very small decay over a long period of time. Bubbles form on the tip of the probe.
Isopropyl Alcohol	No	Yes	No	Yes	The probe has a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical. The signal level decreases every time the probe is immersed in ethanol and has a limited lifespan.
JP8 (Jet fuel)	No	Yes	No	Yes	
Methanol (98% Histological grade)	No	Yes	No	Yes	The probe has a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical.
Methyl Methacrylate (99%)	Yes	No	No	No	Lifetime not reproducible
Mineral Oil	No	Yes	No	Yes	The probe has a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical.
Sodium Hypochlorite Solution	No	No	No	No	Lifetime not reproducible
Sodium Hydroxide	No	Yes	No	No	Signal level and lifetime not reproducible
Styrene (Reagent plus, > 99%)	No	Yes	No	Yes	HIOXY Probe: The probe has a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical.
Sulfur Dioxide Solution, purris. p.a. 4.5-5.5% in H ₂ O	Yes	Yes	No	No	FOXY Probe: Signal level in the chemical is low and varies from 55 to 20 counts. Signal level and lifetime decrease each time the probe is dipped in the chemical.
Tetrahydrofuran (99+%)	No	No	No	No	Lifetime not reproducible
Toluene (99%)	No	No	No	Yes	HIOXY Probe: The probe has a one-time permanent decrease in lifetime when immersed in chemicals. Therefore, it needs to be calibrated in the chemical.
Xylene (Isomers plus ethyl benzene, Reagent plus)	No	Yes	No	No	Lifetime not reproducible