



Application packages

Optical chemical sensors for industry and research



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Online O₂ monitoring in bioreactors and fermenters

The oxygen probe for in-line measurement (OIM) consists of a fitting made of stainless steel with an optical exchange cap (OEC). The OEC is screwed to the top of the metal fitting. The OIM is connected to the instrument via an optical fiber, has a standardized thread and length and is compatible with most bioreactors and port adapters (PG13.5). The optical fiber can be removed and the sensor can be autoclaved directly in place.



Online O₂ monitoring in bioreactors and fermenters

Article number	Matchcode	Min. Order Quantity
200001478	Fibox 4	1
200001479	Fibox 4 trace	1
300000057	OXY-1 SMA	1
300000056	OXY-1 SMA trace	1
200000699	OIM-PSt3-D12/L120-L2.5	1
200000856	OIM-PSt6-D12/L120-L2.5	1
200000029	OEC-PSt3-YOP	1
200000193	OEC-PSt6-YOP	1



Fibox 4 trace



OXY-1 SMA



OIM Oxygen probe



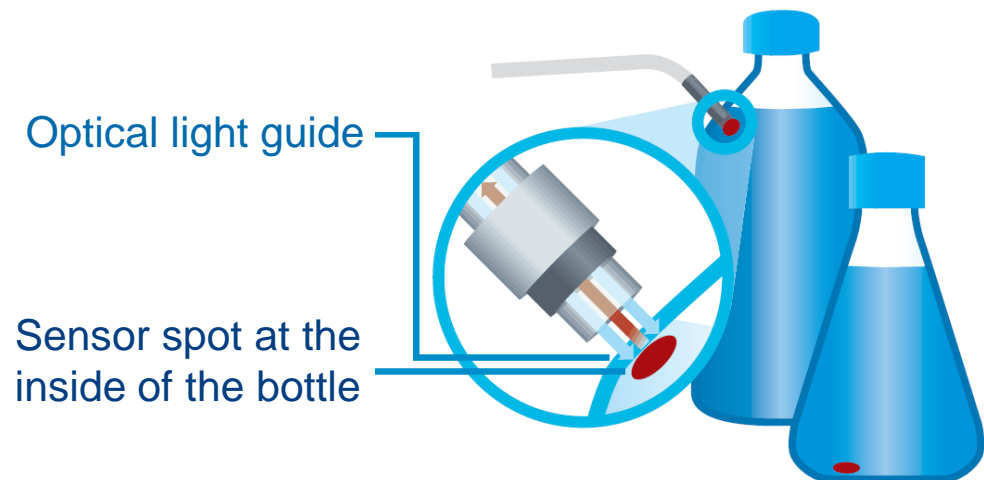
OEC Oxygen Exchange Cap

Online oxygen monitoring in different vessels

Sensor spots can be integrated inside any kind of transparent vessel – flasks, glass bioreactors, and many more. We provide oxygen sensors that can be autoclaved in place several times and therefore are perfect when sterility is a prerequisite. Capable of measuring both in gases and solutions, our oxygen sensors it is not interfering with any sample (certificated USP Class VI).



Oxygen sensor integrated inside a 10L bioreactor



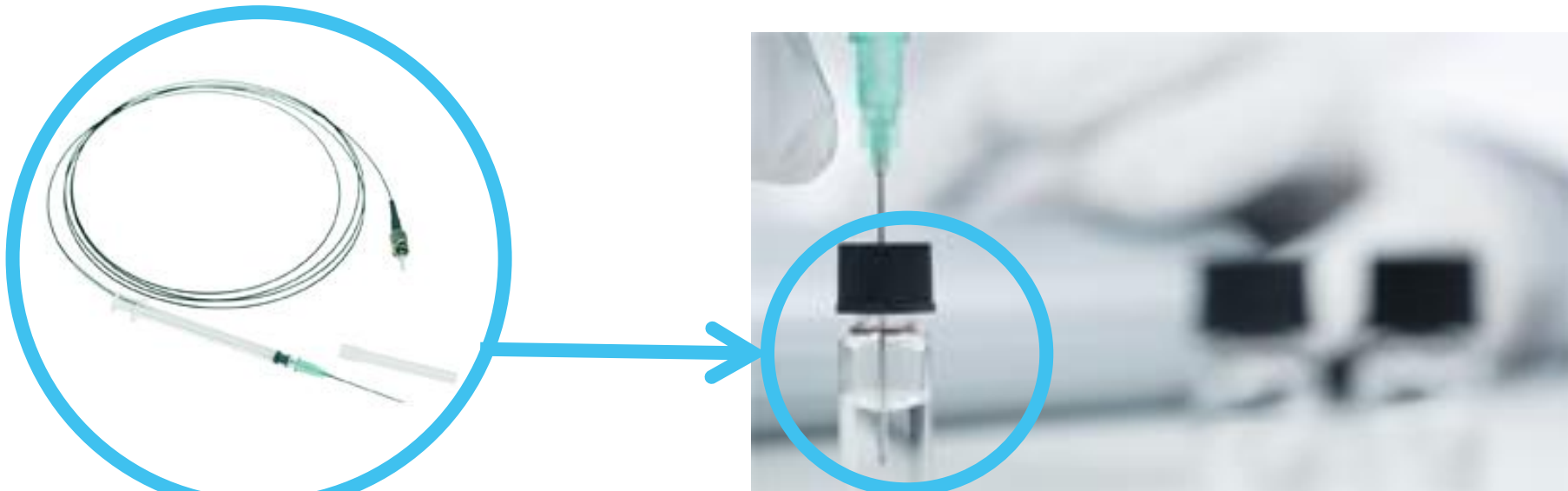
Online oxygen monitoring in different vessels

Article number	Matchcode	Min. Order Quantity
200001478	Fibox 4	1
200001479	Fibox 4 trace	1
300000057	OXY-1 SMA	1
300000056	OXY-1 SMA trace	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4 / trace, Microx 4 / Trace)	1
200000021	SP-PSt3-YAU-D5-YOP	5
200000185	SP-PSt6-YAU-D5-YOP	5
200000242	POF-L2.5-2SMA	1
200001237	SGE43 Silicone Glue	1
200001042	ARC-2-SMA-1.0- AS	1



Headspace and DO QC control in vials or blisters

Oxygen content measurement in pharmaceutical vials and blisters is a necessary step for most pharmaceutical products for QM regulations. Like with other packages, the septum of the vial or the blister is pierced with the needle of the oxygen microsensor housing. Place the tip of the needle in the headspace of the vial and extend the sensor tip to take measurements. The control of dissolved oxygen is also always possible.



Headspace and DO QC control in vials or blisters

Article number	Matchcode	Min. Order Quantity
200001505	Microx 4	1
200001506	Microx 4 trace	1
300000055	OXY-1 ST	1
300000054	OXY-1 ST trace	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4, Microx 4)	1
200001523	NTH-PSt7-02-L2.5-TF-NS40/0.8-OIW	3
200001557	NTH-PSt8-02-L2.5-TF-NS40/0.8-OIW	3



The Microx 4; Portable Oxygen transmitter with display and logging.



OXY-1 ST trace



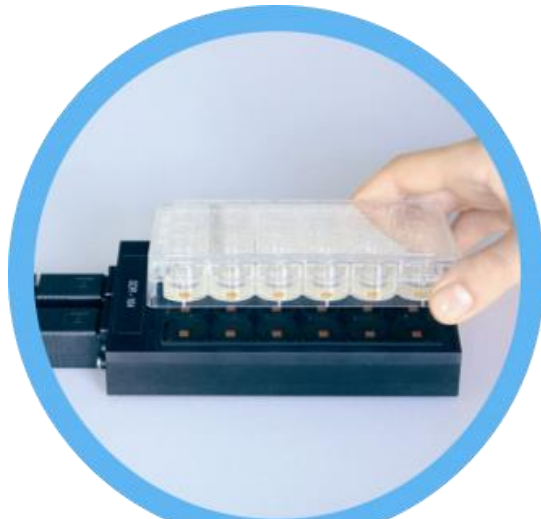
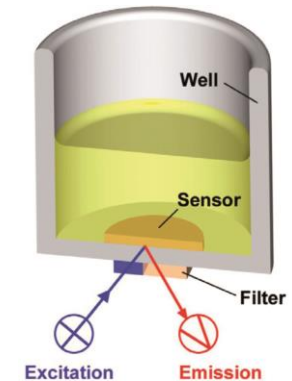
NTH oxygen sensor piercing a blister with septums



NTH oxygen sensor piercing the septum of a vial

Online monitoring in wells

- Small 24-channel reader for 6- and 24-well multidishes
- Easy to use: pre-calibrated sensors
- Non-invasive measurement of oxygen and/or pH
- Ideally suited for microbial & cell culture (media optimization)
- Optional extensions for monitoring up to 240 samples



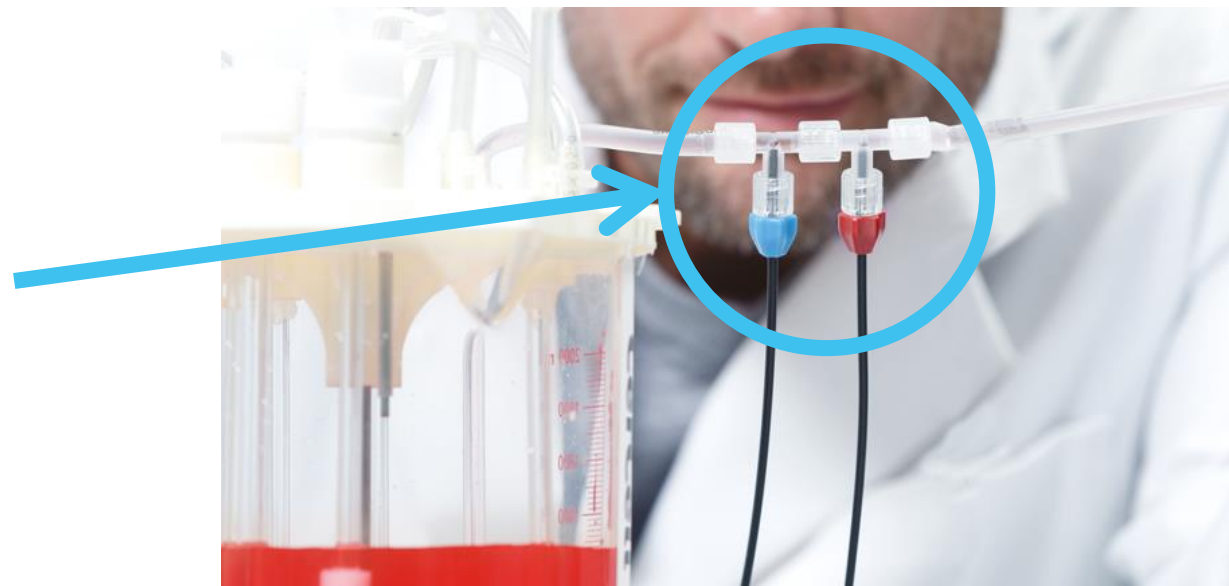
Online monitoring in wells

Article number	Matchcode	Min. Order Quantity
200001058	SDR v4 Basic Set	1
200001059	SDR v4 Extension Set	1
200000430	Oxodish OD24	1
200000431	Hydrodish HD24	1
200001132	Oxodish OD6	1
200001192	Hydrodish HD6	1



Online O₂ and pH monitoring with flow-through cells (e.g., in perfusion systems)

Miniaturized chemical optical sensors integrated in single-use flow-through cells (FTC-SU) allow non-invasive online monitoring of oxygen or pH, e.g. in perfusion systems. The sensors are fixed to color coded sticks, which can be attached to flow-through cells of different size and shape, according to your requirements. A polymer optical fiber connects the sensor inside the flow-through cell to the respective measurement device (e. g. Fibox 4, pH-1 mini). The single-use cells are made of polycarbonate and can be delivered beta-irradiated or non-irradiated.



Online O₂ and pH monitoring with flow-through cells (e.g., in perfusion systems)

○ Oxygen FTC set:

Article number	Matchcode	Min. Order Quantity
200001478	Fibox 4	1
200001479	Fibox 4 trace	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4/trace, Microx 4/trace)	1
200001614	Single-Use Flow Through Cells FTC-SU-PSt3-S (oxygen)	1
200000241	POF-L2.5-1SMA	1

SET-UP

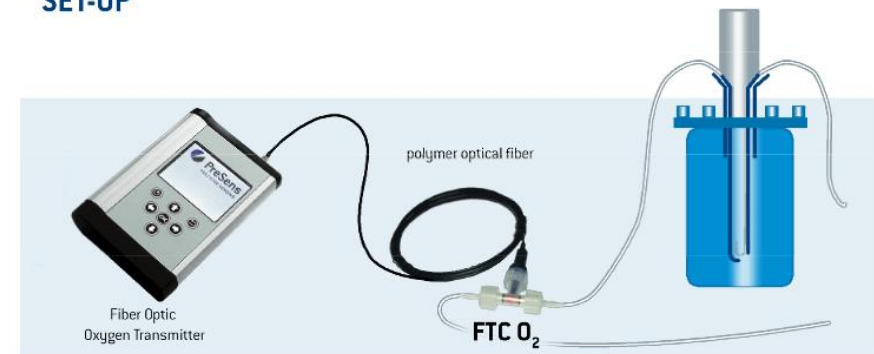


Fig. 3 Set-up for measurement with the FTC O₂

○ pH FTC set:

Article number	Matchcode	Min. Order Quantity
200001794	Single-Use Flow Through Cells FTC-SU-HP5-S (pH)	3
200000241	POF-L2.5-1SMA	1
200001206	pH-1 mini v2	1

Oxygen ingress in PET bottles

A non-invasive and non-destructive fiber optic oxygen meter determines oxygen permeability of plastic bottles and containers. Trace oxygen concentrations inside the package are measured. Ideal for development assurance, production and quality control, this system incorporates the latest state-of-the-art in chemical optical sensor technology. Permeation rates can be confirmed without piercing the bottle even in colored bottles by using special caps with integrated sensors.

- Non-invasive & non-destructive
- Real-conditions & online monitoring
- Shelf-life determination



Oxygen ingress in PET bottles

For transparent bottles:

Article number	Matchcode	Min. Order Quantity
200001282	Set for Oxygen Ingress Measurement:	1
	consists of	
	1 x 200001479 Fibox 4 trace	
	100 x 200000187 SP-PSt6-NAU-D5-YOP	
	1 x 200000241 POF-L2.5-1SMA	
	1 x 2000001237 SG-E43 Silicone Glue	
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4, Microx 4)	1

For not-transparent or dark colored bottles:

Article number	Matchcode	Min. Order Quantity
200001479	Fibox 4 trace	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4, Microx 4)	1
200000187	SP-PSt6-NAU-D5-YOP	1
200000829	POF-L2.5-1SMA-MH	1
200001161	SC-OD36-ID26.6-1G	1
200000391	Caps (different dimensions)	1

Permeation test of high barrier material

Our Ultra-trace oxygen sensor PSt9 can be used to detect extreme low oxygen concentrations, therefore being the perfect product for testing the permeation of high barrier material or to check the purity of clean gases (e.g., Ne, Ar) in processing lines.



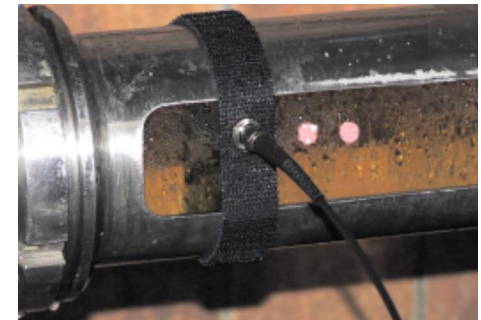
Fig.1: Measurement system set-up: The new measurement cell with two gas connectors for each of the two chambers; the sensor spot is applied to the upper chamber and read out via polymer optical fiber by the Fibox 4 trace.

Article number	Matchcode	Min. Order Quantity
200001478	Fibox 4	1
200001479	Fibox 4 trace	1
200000241	POF-L2.5-1SMA	1
200001583	OTR-PSt3, Permeation Chamber with integrated sensor PSt3	1
200001584	OTR-PSt6, Permeation Chamber with integrated sensor PSt6	1
200001585	OTR-PSt9, Permeation Chamber with integrated sensor PSt9	1

O₂ monitoring in brewing and beverage industry

Even low concentrations of oxygen influence shelf-life and the taste of certain beverages. Due to the extraordinary low detection limit and outstanding accuracy of PreSens trace oxygen sensors, the quality of oxygen-sensitive products such as beer, wine and soft drinks is secured. The optical sensors have a very fast response time and they are easy to maintain, making them a perfect solution for food & beverage processing lines.

- Sensor spots integrated in a show glass window



Article number	Matchcode	Min. Order Quantity
200001479	Fibox 4 trace	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4 / trace, Microx 4 / Trace)	1
200000185	SP-PSt6-YAU-D5-YOP	5
200000242	POF-L2.5-2SMA	1
200001237	SG-E43 Silicone Glue	1
200001240	SG-E43 Silicone Glue	1

O₂ monitoring in brewing and beverage industry

A Varivent valve fitted with an oxygen sensor is the perfect solution for an easy integration into the processing line of beverage factories. The oxygen probe is extremely robust and can withstand steam sterilization up to 130°C at 1.5 atm. By monitoring online the oxygen content in oxygen-sensitive products such as beer, wine and soft drinks the quality of the product can be tested directly in the process line.

- Oxygen sensor integrated in a Varivent valve



Varivent valve with
integrated oxygen sensor



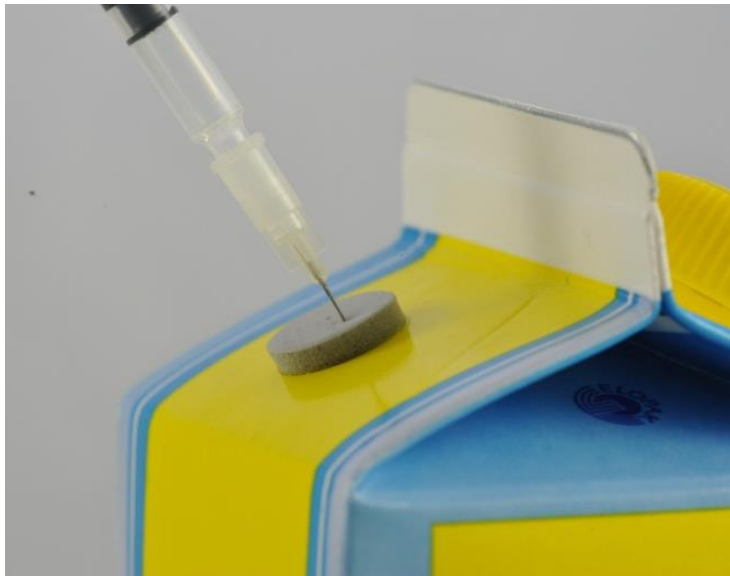
Fibox 4 trace



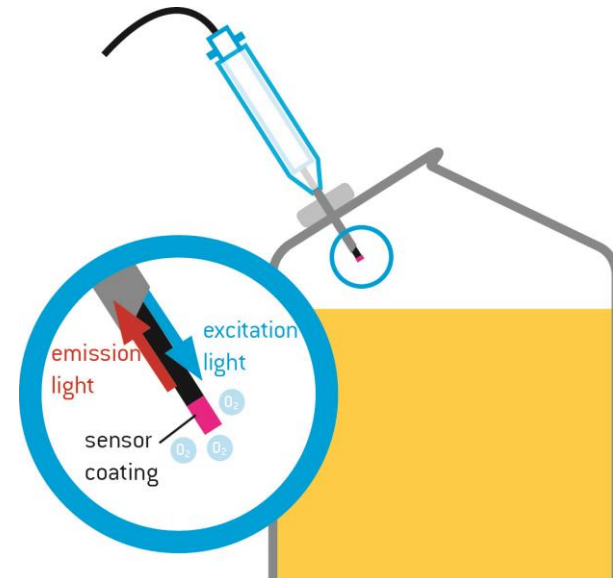
Article number	Matchcode	Min. Order Quantity
200001479	Fibox 4 trace	1
200001025	OIM-PSst6-Var/N69-L2.5	1

Packaging & Food Quality control

Our micro-invasive needle-type oxygen microsensors offer a simple tool to determine residual oxygen both in food and beverage packages. As the measurement is made inside the package no error-prone and time consuming sampling is necessary. These oxygen microsensors are ideal tools for quality control for food, beverage and packaging application.



NTH oxygen sensor piercing a juice package with septum



Packaging & Food Quality control

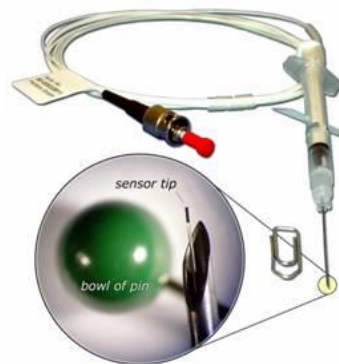
Article number	Matchcode	Min. Order Quantity
200001505	Microx 4	1
200001506	Microx 4 trace	1
300000055	OXY-1 ST	1
300000054	OXY-1 ST trace	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4, Microx 4)	1
200001523	NTH-PSt7-02-L2.5-TF-NS40/0.8-OIW	3
200001557	NTH-PSt8-02-L2.5-TF-NS40/0.8-OIW	3



Microx 4 trace



OXY-1 ST

Needle-type housing
oxygen microsensor

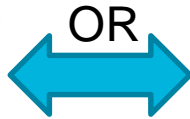
NTH piercing a coffee package with septum

Packaging & Food Quality control

PreSens oxygen sensors can be easily integrated in packages, containers or directly held into samples to test the quality of products and of packaging. Complete freedom and multiple options to check the quality and shelf-life of different products in different stages of the production and packaging process are invaluable assets to the modern production industry.



Dipping probe to insert
into samples



Oxygen sensor spots



Sensor spots integrated in food packaging

Article number	Matchcode	Min. Order Quantity
200001478	Fibox 4	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4 / trace)	1
200000021	SP-PS _t 3-YAU-D5-YOP	5
200000242	POF-L2.5-2SMA	1
200001237	SG-E43 Silicone Glue	1
200001042	ARC-2-SMA-1.0- AS	1
200000046	DP-PS _t 2-L2.5-SMA-YOP	1

Quality control of packages and foods

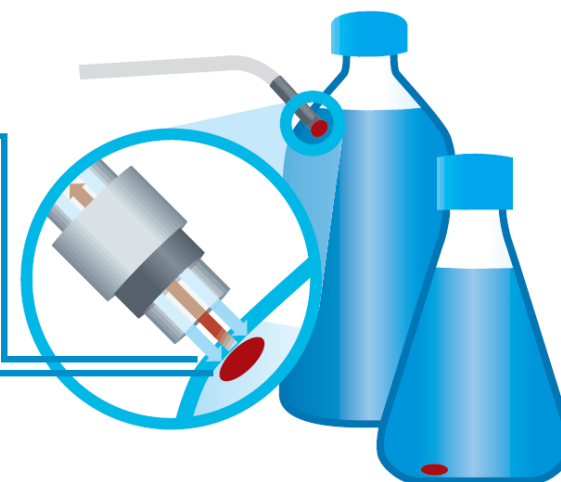
Article number	Matchcode	Min. Order Quantity
200001478	Fibox 4	1
200001479	Fibox 4 trace	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4 / trace, Microx 4 / Trace)	1
200000021	SP-PSt3-YAU-D5-YOP	5
200000185	SP-PSt6-YAU-D5-YOP	5
200000242	POF-L2.5-2SMA	1
200001237	SG-E43 Silicone Glue	1
200001042	ARC-2-SMA-1.0- AS	1
200000016	DP-PSt3-L2.5-St10-YOP	1
200000407	DP-PSt6-L2.5-St10-YOP	1



Dipping probe to insert into samples

Optical light guide

Sensor spot at the
inside of the vessel





Oxygen profiling

Due to the extraordinary high spatial resolution ($< 50 \mu\text{m}$) our oxygen microsensors are ideally suited for recording profiles, e.g. in sea-floor sediments, biofilms, plant physiology and animal physiology. By combining our microsensors with our brand new micromanipulator it is now possible to obtain precise oxygen profiles in lots of different sample.



Oxygen profiling in sediments



Oxygen profiling directly in soil

Oxygen profiling

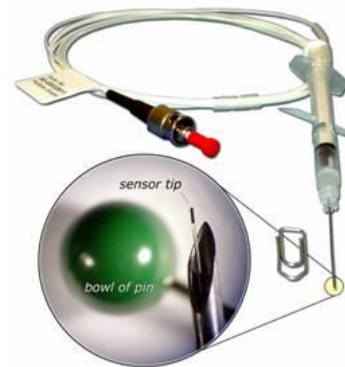
Article number	Matchcode	Min. Order Quantity
200001505	Microx 4	1
200001506	Microx 4 trace	1
300000055	OXY-1 ST	1
300000054	OXY-1 ST trace	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4, Microx 4)	1
200001523	NTH-PS7-02-L2.5-TF-NS40/0.8-OIW	3
200001557	NTH-PS8-02-L2.5-TF-NS40/0.8-OIW	3



Microx 4 trace



OXY-1 ST

Needle-type housing
oxygen microsensor

Micromanipulator

Oxygen profiling

An alternative to oxygen microsensors, SensorVials are 20mL glass vials with an integrated optical oxygen sensor stripe. The vial adapter holds the optical fiber used to read the oxygen sensor in place and can be used to displace the fiber along the sensitive sensor strip, thus effectively measuring oxygen gradients in the sample.

Article number	Matchcode	Min. Order Quantity
200001478	Fibox 4	1
300000057	OXY-1 SMA	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4 / trace, Microx 4 / Trace)	1
200001469	SensorVial SV-PSt3-20mL-NST (no stirring)	1
200001470	SensorVial SV-PSt3-20mL-YST (yes stirring)	
200000242	POF-L2.5-1SMA	1
200001468	Vial Adapter VA-20mL-Single	1



O₂ measurements in biological samples

Oxygen microsensors can be used even for small animals and plants. New insights in the physiological aspects can be obtained. Due to the small size of the probes only a minimal disturbance will occur.



Micro-invasive measurement in living organisms



Micro-invasive measurement in plants and vegetables

O₂ measurements in biological samples

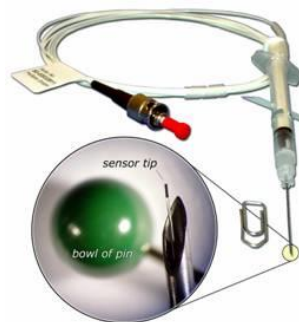
Article number	Matchcode	Min. Order Quantity
200001505	Microx 4	1
200001506	Microx 4 trace	1
300000055	OXY-1 ST	1
300000054	OXY-1 ST trace	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4, Microx 4)	1
200001523	NTH-PS7-02-L2.5-TF-NS40/0.8-OIW	3
200001557	NTH-PS7-02-L2.5-TF-NS40/0.8-OIW	3



Microx 4 trace



OXY-1 ST

Needle-type housing
oxygen microsensor

Micromanipulator

Oxygen probes in gaseous, liquid or solid samples

PreSens offers oxygen dipping probes that can be used to monitor the oxygen content inside a large number of different samples. Thanks to our portable stand-alone oxygen transmitters it is possible to monitor oxygen outdoor in a safe and precise way, both in liquid, gaseous and solid samples.

Due to their small dimension and to their robustness dipping probes can be placed in soil or sand to measure the in-situ oxygen level for long periods of time – a useful information e.g. for ecological and environmental studies.



Investigation in soil filters



Oxygen measurements in a lake



Soil aeration analysis

Oxygen probes in gaseous, liquid or solid samples

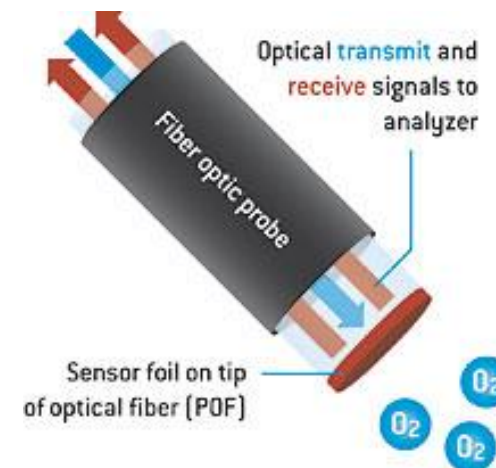
Article number	Matchcode	Min. Order Quantity
200001478	Fibox 4	1
200001479	Fibox 4 trace	1
300000057	OXY-1 SMA	1
300000056	OXY-1 SMA trace	1
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4 / trace, Microx 4 / Trace)	1
200000016	DP-PSt3-L2.5-St10-YOP	1
200000407	DP-PSt6-L2.5-St10-YOP	1



Dipping probe to insert into samples



OXY-1 SMA



Respiration of micro-organisms

PreSens SensorDish Reader can fitted to measure in tight glass vials with oxygen sensor spots to measure the respiration of a large number of micro-organisms without disturbing the organism itself thanks to the non-invasive measuring principle.



SDR fitted with 24 tight glass vials

Article number	Matchcode	Min. Order Quantity
200001058	SDR v4 Basic Set	1
200001059	SDR v4 Extension Set	1
200001369	SensorVial SV-PSt5-4ml	4





Oxygen imaging

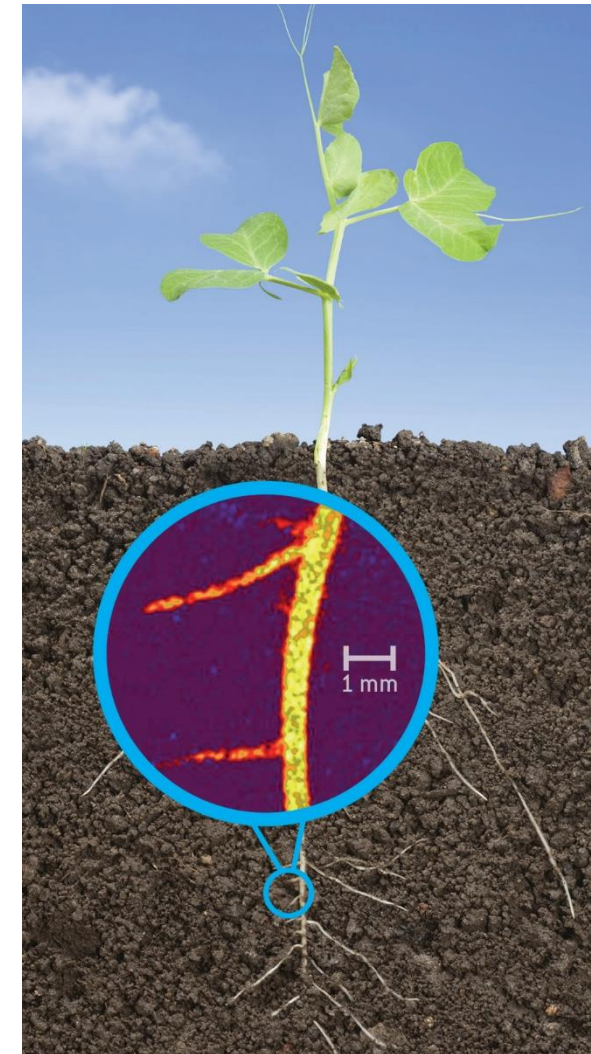
Fluorescent chemical optical sensor foils combined with imaging technology allow easy 2D visualization of oxygen distributions in heterogeneous samples.

With VisiSens changes in oxygen distribution can be monitored over time, providing a cutting edge tool for research in lots of different fields:

- Microfluidics
- Plants and animals physiology
- Soil and sediments
- Cell culture
- Environmental research




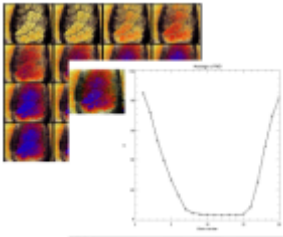

VisiSens connected to a notebook



Oxygen imaging in plant roots



Oxygen imaging

Picture	Name / Description	Article number
	Detector Unit for VisiSens A1 (G2) Device for 2D Oxygen Imaging Detector unit for spectral 2D read-out of fluorescent optical sensor foils consists of - 2D detector unit, USB powered & portable - adapter tubus - plastic box (for storing small parts and foils) - reference foils (red and green, for test purposes) - transparent scale (for focus adjustment) - clamp for laboratory stand - box for device	200001846
	Software VisiSens AnalytiCal 1 VA1.15 Software for the VisiSens A1 Oxygen Imaging System VisiSens AnalytiCal 1 VA1.11 on USB stick consists of - Software VisiSens AnalytiCal 1 VA1.11 (WinXP, WinVista, Win7) - Instruction Manual IM_VA1_11_dv1	200001845
	SF-RPSu4-NAU-L4/W4-OIW Oxygen sensor foil set pack of 4 foils, each 4cm x4cm SF: Sensitive Foil RPSu4: Oxygen coating; measuring range 0-100% air saturation NAU: support material is a 125µm polyester foil L4/W4: foil size is 4 x 4 cm OIW: optical isolation white	200001456

Software has
to be listed on
sales docs

Min. 1 sensor
set has to be
ordered with a
Detector Unit



Accessories

Fibox 4 & Microx 4



Temperature sensor



Adapter for Round
Containers (ARC)



Polmer Optical Fiber (POF)

Article number	Matchcode	Min. Order Quantity
200001486	TEP-L5-ST62-OD5.4/3.3 (for Fibox 4 / trace, Microx 4 / Trace)	1
200000242	POF-L2.5-2SMA	1
200001237	SG-E43 Silicone Glue	1
200001042	ARC-2-SMA-1.0- AS	1