



BOD Measurements/Respiration

Biochemical Oxygen Demand

BOD measurement according to EN 1899-1 and EN 1899-2 and for self-checks

Biochemical Oxygen Demand (BOD) is an important parameter in water resource management, to measure the quality of water and treatment results in wastewater. In addition, BOD analysis potential is used in the planning and design of wastewater treatment facilities.

In routine use BOD determination is used to check the wastewater in the inflow and discharge of wastewater treatment plants. Depending on the measurement site and type of wastewater the BOD value can lie between a few mg/l and several thousand mg/l. Several methods are available for carrying out the measurement.

WTW offers various measuring systems for these methods.

In “dilution BOD” the oxygen content of a sample is measured with a dissolved oxygen sensor before and after an incubation period of 5 days. The difference between the measurements is the BOD₅ value; this is the official EPA method.

In “BOD self-checks” with the respirometer, the reduction in oxygen causes a definite pressure difference that can be measured by a pressure sensor. This practical method is very easy to perform.

Both methods are very different, but the measurements correlate directly to the discharge seen at municipal wastewater treatment facilities. Both methods require the samples to be kept at 20 °C (68 °F) for 5 days. WTW offers a wide range of temperature controlled incubators.

Depletion/Respiration

As environmental consciousness increases, microbiological degradability tests have become increasingly important, from soil surveys from waste sites to environmental impact surveys to characterize new chemical substances. The necessary respiration measurements for anaerobic or aerobic degradation can be easily performed using the high performance OxiTop®-C systems. WTW offers a wide range of application specific packages complete with the appropriate sample vessels.



inoLab® Multi 9310 IDS & inoLab® Oxi 7310



Oxi 1970i



OxiTop® IS 12



OxiTop® Control



Biogas determination



Soil respiration

"Dilution BOD"		
According to EN 1899-1/EN 1899-2; official EPA method		<i>see page</i>
with inoLab® Multi 9310 IDS with inoLab® Oxi 7310	... securely traceable	90
	... compliant documentation	91
With ProfiLine Oxi 1970i	Recommended sensor: self-stirring dissolved oxygen sensor StirrOx® G	91

* North American version

"BOD self-check measurement"		
Worldwide approved method according to the self-check regulations		<i>see page</i>
OxiTop®	Simple routine measurement, mercury-free pressure measurement	92/94
OxiTop® Control	Routine, standard and special measurement, with automatic sample management	92/95

Depletion/Respiration		
Special measurements		<i>see page</i>
OxiTop® Control OC 110	Respiration	96/100
	Biogas determination	
	Soil respiration	
	Biodegradability	

Accessories/Incubators		
		<i>see page</i>
Upgrading and general accessories		98
Incubators/thermostat cabinets		104

 Parameter
 Multi-parameter
 pH
 ORP
 ISE
 Dissolved Oxygen (D.O.)
 Conductivity
 Data logger/flow + level
BOD/Respiration
 Photometers
 Turbidity
 Colony Counter
 Software/Printers

Dilution BOD

According to DIN EN 1899-1 and DIN EN 1899-2; official EPA method

BOD determined reliably...

... using the innovative inoLab® Multi 9310 IDS

The new inoLab® Multi 9310 IDS is ideal meter for digital measurements of optical D.O. in the laboratory. The IDS technology enables in the easiest way ideal measurements and efficient documentation. The optical D.O. sensor FDO® 925 allows precise BOD measurements.

inoLab® Multi 9310 IDS



- Measuring safety without compromises
- Digital sensor recognition
- Intelligent sensor evaluation



FDO® 925

Flexible and powerful:

- fast responding optical D.O. sensor
- no own-consumption of oxygen
- matching stirrer can be mounted easily
- universal use



StirrOx® G

Self-stirring dissolved oxygen sensor – simultaneous stirring and measurement

- Single-handed operation for series measurements
- Constant flow for high reproducibility
- Immediately ready for measuring – no polarization period required
- Extremely low self-consumption of oxygen – only $0.008 \mu\text{g h}^{-1} (\text{mg/l})^{-1}$

- Zero-current free – no zero point calibration necessary
- Calibration and storage vessel OxiCal®-ST included
- Membrane life of up to 6 months
- Temperature compensation with 2 built-in sensors
- Membrane leakage monitoring – damaged membranes are indicated



BOD documented precisely...

... with the inoLab® Oxi 7310

The new inoLab® Oxi 7310 is the perfect laboratory meter for measuring BOD with the proven, galvanic D.O. sensors. With automatic GLP compliant documentation/AQA supports the traceability not only throughout the environmental laboratory. On demand also available with integrated printer.



inoLab® Oxi 7310

- USB interface for fast data transfer
- Data output via .csv format or using the optional integrated printer
- Connection for self-stirring oxygen sensor StirrOx® G

ProfiLine Oxi 1970i

- EPA approved method
- Accurate
- Battery and AC power operation

Laboratory dissolved oxygen meter ProfiLine Oxi 1970i with self-stirring DO sensor StirrOx® G.



Ordering Information		
BOD measurement		Order No.
inoLab® Oxi 7310 SET 4	Professional, menu-driven D.O. laboratory meter for measurements/GLP compliant documentation. Galvanic oxygen sensor included in the set. For battery or AC operation. Instrument with Universal power supply, stand, operation instructions, self-stirring oxygen sensor StirrOx® G, cleaning solution, electrolyte, polishing strip, spare membrane caps, software CD-ROM and USB cable.	1BA304
inoLab® Oxi 7310P SET 4	same as above, but with integrated thermal printer.	1BA304P
inoLab® Multi 9310 SET 4	Digital multiparameter laboratory meter in a set including IDS sensor for measuring/ documentation according to GLP/AQA. With a universal measuring channel for pH/mV, D.O. and conductivity. Instrument with universal power supply, stand, operating instructions, optical IDS D.O. sensor FDO® 925, Software CD-ROM and USB cable.	1FD354
ProfiLine Oxi 1970i	ProfiLine dissolved oxygen meter, extremely robust, waterproof (IP 67), RS 232 digital output, for AC operation or rechargeable batteries, with universal power supply with connection for self-stirring DO sensor StirrOx® G and CelloX® 325	3B30-010
StirrOx® G	Self-stirring DO sensor for oxygen determination in Karlsruhe bottles, with OxiCal®-ST calibration and storage vessel and accessory case with spare parts and maintenance supplies	201 425

inoLab® Multi 9310 IDS & Oxi 7310:



ProfiLine Oxi 1970i:



For technical data on the inoLab® Multi 9310 IDS & Oxi 7310 refer to page 57 and 59

For technical data on the ProfiLine Oxi 1970i refer to page 65

Parameter

Multi-parameter

pH

ORP

ISE

Dissolved Oxygen (D.O.)

Conductivity

Data logger/flow + level

BOD/Respiration

Photometers

Turbidity

Colony Counter

Software/Printers

BOD Self-check Measurement

Respiration/Biogas Determination with OxiTop® and OxiTop® Control

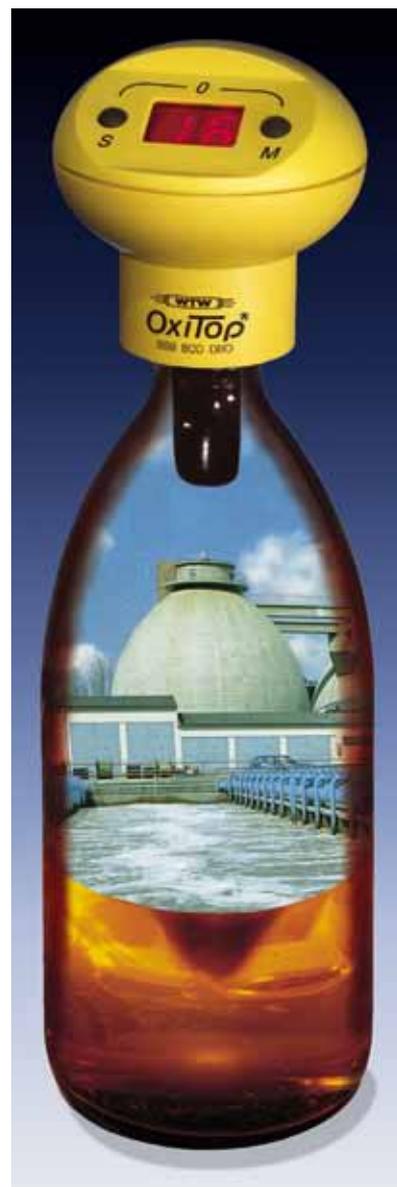
OxiTop® & OxiTop® Control

- Undiluted samples
- AutoTemp function for delayed start of cold samples
- Secure storage of measured values

Mercury-free measurement

Biochemical oxygen demand (BOD) determination is one of the most important parameters in water resource management, and is used to evaluate the impact of biodegradable substances in waters and wastewater. With its OxiTop® systems, WTW offers a unique, modular and mercury-free instrument system, suitable not only for BOD determination, but also for measuring biodegradability and depletion.

The advantages of OxiTop® and OxiTop® Control include simple operation and improved controls with measuring of up to 400 000 mg/l BOD (with OxiTop® Control OC 110). As the measured pressure is automatically converted, the values can be directly read as mg/l BOD.



Application range

	OxiTop®	OxiTop® Control OC 100	OxiTop® Control OC 110
Application	BOD routine	BOD routine, BOD standard	BOD routine, standard and BOD special, respiration/dilution, soil respiration, biodegradability, biogas determination
BOD range	0 – 4.000 mg/l	0 – 4.000 mg/l	0 – 400,000 mg/l
Measured value memory	5 days	0.5 hours – 99 days	0.5 hours – 99 days
Pressure mode	—	—	Pressure p 500 – 1.350 hPa
Sample volume	Fixed	Fixed	Definable

OxiTop® Complete Sets for 6 or 12 Measuring Vessels

These complete packages have been formulated to contain everything necessary to perform specific applications. The make up of each package depends on the application and varies by number of vessels, controllers and utensils for sample preparation.

Special stirring platforms were developed in order to maintain a constant temperature and guarantee optimum oxygen distribution in the sample. These stirrer platforms have space for either 6 or 12 standard bottles or 6 large vessels for special applications.

Applicable systems

- **BOD**
OxiTop® IS 6 / IS 12
OxiTop® Control 6 / 12
- **Soil respiration**
OxiTop® Control B6M / B6
- **OECD / aerobic applications**
OxiTop® Control A6 / A12
OxiTop® Control S6 / S12
- **Biogas determination**
OxiTop® Control AN 6 / AN 12
- **Microbial applications**
OxiTop® Control AN 6 / AN 12
OxiTop® Control A6 / A12

Composition of complete packages



	OxiTop®	OxiTop® Control				
	IS 6 / IS 12	6 / 12	B6 / B6M / B6M 2.5	A6 / A12	S6 / S12	AN6 / AN12
Accessories	IS 6 / IS 12	6 / 12	B6 / B6M / B6M 2.5	A6 / A12	S6 / S12	AN6 / AN12
Vessel with measuring head	Amber bottle, 510 ml with rubber sleeve	Amber bottle, 510 ml with rubber sleeve	Duran bottle 500 ml / 1.0 l vessel / 2.5 l vessel; with adapter	1000 ml vessel / 250 ml vessel with adapter	Amber bottle, 510 ml with rubber sleeve	1000 ml vessel / 250 ml vessel with adapter
Number	6 / 12	6 / 12	6 / 6 / 6	6 / 12	6 / 12	6 / 12
Measuring heads	OxiTop®	OxiTop®-C	OxiTop®-C	OxiTop®-C	OxiTop®-C	OxiTop®-C
Stirrer	IS 6 / IS 12	IS 6 / IS 12	—	IS 6-Var / IS 12	IS 6 / IS 12	IS 6-Var / IS 12
Controller	—	OC 100	OC 110	OC 110	OC 110	OC 110
Software + cable	—	—	●	●	●	●
CO₂ absorbent	●	●	●	●	●	●
Nitrification inhibitor	●	●	—	●	●	●
Overflow measuring flask	164 / 432 ml	164 / 432 ml	—	—	—	—
Stirrer bars	6 / 12	6 / 12	—	6 / 12	6 / 12	6 / 12
Stirrer bar remover	●	●	—	●	●	●
Blocks of chart paper	●	●	—	—	—	—
<i>see page</i>	94	95	101	102	102	103

BOD Self-check Measurement

OxiTop® IS 6, IS 12

- High-precision
- 5-day automatic storage of measured values
- Portable
- Extendable



OxiTop® IS 12

Complete packages for 6 or 12 simultaneous measurements

Measurement using OxiTop® is based on pressure measurement in a closed system: microorganisms in the sample consume the oxygen and form CO₂; the CO₂ is absorbed by NaOH, creating a vacuum that can be measured as a mg/l BOD value.

The sample volume used regulates the amount of oxygen available for a complete BOD. Measurement ranges of up to 4,000 mg/l can be measured using different volumes.

The OxiTop® heads (green and yellow for inflow/outflow differentiation) have an AutoTemp function: if the sample

temperature is too cold, the start of measurement is automatically delayed by at least 1 hour until a constant temperature has been reached.

Apart from the automatic storage of 5 measured values (1 value per day), further measured values can be read at all times during or after the period of 5 days, which permits the tracking of check values or measurements over longer periods.

Technical Data OxiTop® Measuring Head

Measuring principle	Manometric with pressure sensor
Measurement of	BOD _n
Measurement range	0 ... 40 digit corresponding to 0 ... 40 / 80 / 200 / 400 / 800 / 2000 / 4000 mg/l BOD
Accuracy	±1 digit (corresponds to ±3,55 hPa)
Pressure range	500 - 1350 hPa
Memory	For BOD ₅ : 1 value per day
Ambient temperature	Storage: -25 ... +65 °C (-13 ... 149 °F) Operation: +5 ... +50 °C (41 ... 122 °F)
Dimensions	H: 70 mm (2.8 in), Ø 70 mm (2.8 in)

Ordering Information

OxiTop® complete packages		Order No.
OxiTop® IS 6	Complete package, ready for use, for 6 simultaneous measurements, with IS 6 Inductive Stirring System, universal power supply 100-240V/50/60Hz and 6 OxiTop® measuring systems, including accessories	208 210
OxiTop® IS 12-6	Complete package, ready for use, for 6 simultaneous measurements (extendable to 12 simultaneous measurements), with IS 12 Inductive Stirring System, universal power supply 100-240V/50/60Hz and 6 OxiTop® measuring systems, including accessories	208 212
OxiTop® IS 12	Complete package, ready for use, for 12 simultaneous measurements, with IS 12 Inductive Stirring System, universal power supply 100-240V/50/60Hz and 12 OxiTop® measuring systems, including accessories	208 211



BOD Self-check Measurement – for a larger number of samples

With easy sample management

OxiTop® Control 6, Control 12

- Controller-driven
- Simultaneous measurement of up to 100 samples
- Statistical evaluation
- Automatic sample ID



OxiTop® Control 12

Complete package for 6 or 12 simultaneous measurements



OxiTop® Control system uses software-controlled functions and infrared interface to communicate with the powerful OC 100 controller. This connection enables the simultaneous, group start, management, storage and tracking of 100 measuring heads, and tracks results on a large

graphic display. Data can be transferred to the PC for evaluation and documentation via the **AK-540/B** cable (order no. 902 842) and the communication program **Achat OC** (order no. 208 990).

The OC 110 controller, in combination with the OxiTop® Control S6 / S12, is ideal when other applications in addition to BOD are required (see page 100).

Check sampling progress

The data can be called up at any time, even during sampling, thus enabling checking of the samples for errors. The display of the progress curve allows immediate detection of irregularities and interferences, such as a BOD value set too high for the volume used or undesired nitrification. Corrections can thus be made at an early stage.



Parameter

Multi-parameter

pH

ORP

ISE

Dissolved Oxygen (D.O.)

Conductivity

Data logger/flow + level

BOD/Respiration

Photometers

Turbidity

Colony Counter

Software/Printers

Controller OC 100/OC 110

Features

- Simultaneous sample management with option of grouping up to 100 OxiTop®-C measuring heads.
- Data call-up of one parallel sample with statistical evaluation and as individual data.
- Automatic calculation and graphical display of BOD value.
- Data transfer even through glass doors.
- Protocol and documentation of data via Achat OC communication program in combination with a PC
- GLP and AQS with inspection intervals for calibration with the OxiTop® PM calibration tablets
(see page 98: Accessories)



OxiTop® OC 100

OxiTop®-C Measuring Head

- Instead of the usual display and keys, the OxiTop®-C measuring head has an infrared interface with which it communicates with Controller OC 100 or OC 110. By pointing the controller at an OxiTop®-C measuring head the sample can be identified and the measurement is started. Data can be called up or deleted and sampling progress can be displayed.
- Each sample is automatically assigned a unique ID number; eliminating manual sample identification even for multiple samples. In addition, statistical evaluations can be easily performed for multiple samples.
- The OxiTop®-C measuring heads have an AutoTemp function; if the sample temperature is too cold, the start of measurement is automatically delayed, by up to 4 hours, until a constant temperature can be reached. This mode can be deactivated for BOD standard.
- The measuring heads can store up to 360 data sets. Data are automatically stored in the corresponding interval according to the interval period set (0.5 h to 99 days).
- The built-in pressure sensor can register differences in pressure ranging from 500 to 1,350 hPa.



Application Range/Technical Data OxiTop® Control		
	OxiTop® Control OC 100	OxiTop® Control OC 110
BOD routine	Individual samples up to 4,000 mg/l	Individual samples up to 4,000 mg/l
BOD standard	Multiple samples with statistical evaluation up to 4,000 mg/l	Multiple samples with statistical evaluation up to 4,000 mg/l
BOD special	—	User-defined volumes, 0.5 h – 99 days, up to 400,000 mg/l BOD
Soil respiration	—	User-defined volume determination
OECD / Aerobic applications	—	User-defined volume determination
Biogas determination	—	Pressure p 500 - 1350 hPa 10 intermediate values
Data sets per measurement	180 ... 360 (depending on duration)	
Measurement period	0.5 h ... 99 days	
Power supply	3 mignon (AA); alkaline 1.5 V	
Interface	IR (infrared); RS 232 for communication with PC	
Ambient temperature	Storage: -25 °C ... +65 °C (-13 °F ... 149 °F), Operations: +5 °C ... +40 °C (41 °F ... 104 °F)	
Dimensions	45 x 100 x 200 mm (1.7 x 3.9 x 7.9 in) (H x W x D)	
Weight	Approx. 390 g (0.86 lb)	

Technical Data OxiTop®-C Measuring Head	
Measuring principle	Manometric with pressure sensor
Measurement of	BOD _n
Pressure range	500 - 1350 hPa
Accuracy	±1% of value ±1 hPa
Resolution	1 hPa (corresponds to 0.7% of BOD _n measuring range)
Power supply	Lithium batteries (280 mAh), 2 x CR2430
Ambient temperature	Storage: -25 ... +65 °C (-13 ... 149 °F) Operation: +5 ... +50 °C (41 ... 122 °F)
Dimensions	H: 70 mm (2.8 in), Ø 70 mm (2.8 in)

Ordering Information		
OxiTop® Control		Order No.
OxiTop® Control 6	Complete package, ready for use, for 6 simultaneous measurements, with Controller OC 100 and IS 6 Inductive Stirring System, universal power supply 100-240V/50/60Hz and 6 OxiTop®-C measuring systems, including 6 sample bottles, 6 rubber sleeves, 6 stirrer bars and other accessories	208 201
OxiTop® Control 12	Complete package, ready for use, for 12 simultaneous measurements, with Controller OC 100 and IS 12 Inductive Stirring System, universal power supply 100-240V/50/60Hz and 12 OxiTop®-C measuring systems, including 12 sample bottles, 12 rubber sleeves, 12 stirrer bars and other accessories	208 204
OxiTop® Control S6/S12	Complete package with Controller OC110 and software	see page 92

OxiTop® Control:



Controller OC 100 & OC 110, OxiTop®-C Measuring Head:



For applications also refer to p. 100 – 103
Respiration/Depletion measurement

System Extensions and General Accessories

OxiTop® Measuring Heads & SETs

Expandability and flexibility

To meet growth demands and accommodate additional applications, OxiTop® and OxiTop®-C systems are flexible and expandable. Available as individual items in different combinations including:

- Individual measuring heads OxiTop®/OxiTop®-C
- A set of two OxiTop® heads (yellow and green).
- Upgrade sets for an additional 6 positions with 6 heads each and flasks, sleeves and stirring bars, as well as the stirring platform.



Stirrers

For BOD measurement

Stirrers IS 6 and IS 12 have been specially developed for BOD measurement with the OxiTop® system. Software-controlled speed regulation prevents the magnetic stirrer bar from getting caught or wobbling.

The speed is selected so that an optimal gas exchange with the sample takes place. The stirrer is maintenance-free and non-wearing as it contains no moving parts.

The IS 6-Var model has been specially developed for use with large measuring vessels and has space for 6 measuring vessels. Its outer dimensions are identical to those of the IS 12.

Stirrer IS 6 and IS 12



IS 6-Var

Testing Aids for the OxiTop® System for Quality Control

Two testing aids are available for monitoring measurement and checking system leakage, which can be called up during a corresponding time interval using the AQA function in the controller.

OxiTop® PM

These calibration tablets simulate a complete BOD and perform quantitative monitoring of measurement (approx. 308 mg/l, batch-dependent) as well as checks for leakage over the entire period.

OxiTop® PT

This testing aid performs a "quick" check for under-pressure and leakage. The OxiTop® contains the pressure table required for the individual place of installation. OxiTop®-C automatically includes these values.

General Accessories

Storage racks

For safe storage of OxiTop® measuring systems and OxiTop®-C measuring heads, for 6 measuring heads each.



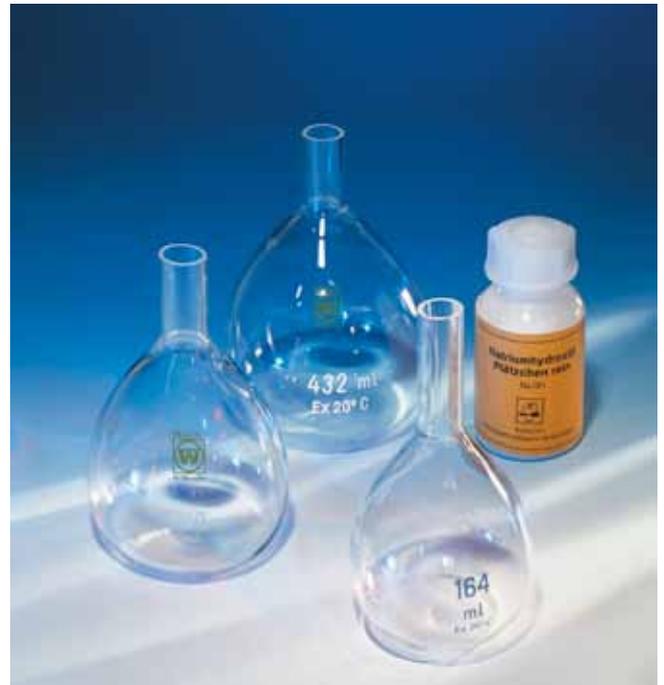
Marking rings

For identification of BOD bottles for OxiTop® instruments.

Overflow measuring flasks

In different standard sizes for OxiTop®

In addition to the standard 164 ml and 432 ml overflow measuring flasks, 22.7 ml, 43.5 ml, 97 ml, 250 ml, 365 ml are also available.



Technical Data Stirrers

Model	IS 6	IS 12	IS 6-Var
No. of stirring positions	6	12	6
Stirrer speed	Program-controlled 180 ... 450 min ⁻¹		
Ambient temperature	Storage: -25 °C ... +65 °C (-13 °F ... 149 °F) Operation: +5 °C ... +40 °C (41 °F ... 104 °F)		
Dimensions (H x W x D)	67 x 265 x 181 mm (2.64 x 10.43 x 7.13 in)	67 x 266 x 350 mm (2.64 x 10.47 x 13.78 in)	70 x 350 x 266 mm (2.76 x 13.78 x 10.47 in)
Power supply	Universal power supply 100-240V/50/60Hz		

Please refer to the WTW Product Details for a precise listing of all available components

Depletion/Respiration with OxiTop® Control OC 110

With the global expansion of wastewater treatment, soil remediation, and waste treatment, the study and monitoring of biological cleaning treatments becomes increasingly important.

Biological tests are an important component, in addition to the usual physical-chemical measuring methods. In order to determine the microbial activity in and biodegradability of foodstuffs, pollutants, harmful substances or waste substances, respiration (depletion) measurements are often performed. In these measurements the respiration of the organisms is determined under defined conditions as the oxygen uptake or release of carbon dioxide.

Measurements are carried out via closed systems using the OxiTop®-C in combination with the OC 110 controller. Depending on the application, specially adapted measuring vessels are available, all of which are equipped with the necessary connection thread and some are autoclavable. Specialty packages are available with everything needed for a particular application.

For the incubation of larger measuring vessels, WTW offers the TS 1006-i thermostat cabinet as well as the IS 6-Var stirrer platform, to accommodate large diameter vessels.



Depletion/Respiration		
	Applications and Procedures	Measuring
Soil respiration	Soil analysis/ biodegradability of pollutants: laboratory method according to DIN ISO 16072	Aerobic using CO ₂ absorption, quantitative CO ₂ determination possible
Biodegradability	Determination according to OECD 301 F / DIN EN 29 408 / ISO 9408	Aerobic using CO ₂ absorption
Biogas determination	Determination of anaerobic degradation processes	Anaerobic, determination of CO ₂ + Methane
Microbiology	Growth and stress investigations: determination of the respiration rate	Aerobic, warning pressure possible

Determination of Soil Respiration

Laboratory method for determining the microbial soil respiration according to DIN ISO 16072.

OxiTop® Control B6/B6M

- Simple and precise
- Cost-efficient
- Optimum measuring vessels for subsequent quantitative determination of CO₂

Soil respiration measurements are used for forecasting, surveying and checking remediation work, for biodegradability measurements of substances (pesticides, fungicides, fertilizers, etc.) and for carrying out toxicity tests.

Thanks to specially designed, test-proven vessels, these measurements are made accurate and simple with the OxiTop® Control System. A cost effective alternative compared to conventional methods.

Soil respiration measurements can be carried out in 2 different vessel types.

For actively respiring soils with strong CO₂ development, the MG 1.0 measuring vessel is recommended: its large opening (approx. 100 mm / 3.9 in dia.) easily fits large-volume CO₂ absorber vessels for later quantitative CO₂ determination.



Example of application using PF/45... sample vessels



Example of application using MG/... measuring vessels

Ordering Information		
OxiTop® Control	Complete soil respiration package	Order No.
OxiTop® Control B6M	Package for soil respiration (aerobic) with 6 MG 1.0 measuring vessels, 1000 ml, with stopper adapters for OxiTop®-C	208 232
OxiTop® Control B6	Package for soil respiration (aerobic) with 6 PF 45/500 sample vessels, 500 ml, Duran and 6 OxiTop® AD/SK adapters, autoclavable	208 230

- Parameter
- Multi-parameter
- pH
- ORP
- ISE
- Dissolved Oxygen (D.O.)
- Conductivity
- Data logger/flow + level
- BOD/Respiration**
- Photometers
- Turbidity
- Colony Counter
- Software/Printers

Determination of Biodegradability

Laboratory procedures for determination of biodegradability according to DIN EN 29 408 / ISO 9408 / OECD 301 F

OxiTop® Control A6/A12

OxiTop® Control S6/S12



The determination of the biodegradability should be checked before new chemicals are used for the first time, not only for environmental reasons but to minimize disposal charges.

The sample and a blank are stirred at a constant temperature for 28 days in closed bottles.

The CO₂ produced is removed by means of an absorber, the resulting negative pressure is a measure of the biodegradability.

The OxiTop®-C continuous value recording guarantees proper documentation.

The measuring bottles and adapters can be autoclaved at 121 °C (249.8 °F).

Ordering Information

Model	Complete OECD packages	Order No.
OxiTop® Control A6	Package for aerobic applications with 6 x 1000 ml measuring units	208 220
OxiTop® Control A12	Package for aerobic applications with 12 x 250 ml measuring units	208 222
OxiTop® Control S6	Package for aerobic applications with 6 x 510 ml measuring units	208 196
OxiTop® Control S12	Package for aerobic applications with 12 x 510 ml measuring units	208 198

Biogas Determination

Determination of anaerobic degradation processes: biogas determination

OxiTop® Control AN6/AN12

Anaerobic degradation processes take place in the absence of oxygen. A septum sealed bottle nozzle fills the head space above the sample with inert gas. When anaerobic degradation has taken place, the dissolved CO₂ can be driven off and then removed from the head space by means of a CO₂ absorber. The resulting pressure difference is proportional to the CO₂ concentration; the remaining overpressure is proportional to the methane concentration.

The degradation process can be conveniently observed in the "pressure" operating mode.



Determination of the Respiration Rate

Microbiological growth and stress investigations: determination of the respiration rate (aerobic/anaerobic measurements)

OxiTop® Control AN6/AN12

OxiTop® Control A6/A12

The use of special measuring bottles with a septum sealed nozzle allows the interference-free addition of substrates and solutions.

Pressure alterations could indicate a reduction in oxygen concentration, which could necessitate the addition of oxygen, air, or other gases.

It is possible to set a "warning pressure" or a pressure limit so adjustments can be made.



The momentary pressure can be stored so the adjustments are fully documented. The recording of these measured values (max. 10 values) permits long-term measurement.

Ordering Information		
Model	Complete packages for microbiology	Order No.
OxiTop® Control AN6	Package for aerobic or anaerobic applications with 6 x 1000 ml measuring units	208 225
OxiTop® Control AN12	Package for aerobic or anaerobic applications with 12 x 250 ml measuring units	208 227
Model	Complete packages for aerobic measurements	Order No.
OxiTop® Control A6	Package for aerobic applications with 6 x 1000 ml measuring units	208 220
OxiTop® Control A12	Package for aerobic applications with 12 x 250 ml measuring units	208 222

Incubators

OxiTop® Box

- Compact
- Precise
- Uniform temperature distribution

Thermostat box with forced air circulation for 20 °C (±0.5 °C / 68 °F, tolerance 67.1 - 68.9 °F)

OxiTop® Box with hinged, non-corrosive, clear-view cover accommodates a maximum of either 12 OxiTop® simultaneous measurements or 20 Karlsruhe bottles.

The chamber is equipped with a connection for an IS 6 or IS 12 stirrer.

A special compartment is provided for 6 methylene blue samples.

A cross ventilation fan ensures uniform temperature distribution and automatic defrosting system with condensate evaporation, plus the compressor is CFC-free.



Example of an application:
OxiTop® Box with OxiTop® Control 12

Technical Data

Model	OxiTop® Box
Temperature control	20 °C ±0.5 °C / 68 °F (tolerance 67.1 - 68.9 °F)
Ambient temperature	Storage: 25 °C ... +50 °C (-13 ... +122 °F) Operation: +10 °C ... +32 °C (+50 ... 89.6 °F)
Power consumption	200 W
Dimensions (H x W x D)	375 x 425 x 600 mm 14.76 x 16.73 x 23.62 in
Weight	Approx. 30 kg (66.139 lb)

Ordering Information

BOD thermostat boxes		Order No.
OxiTop® Box	BOD OxiTop® Box, thermostat box with temperature-controlled forced ventilation for 230 V 50 Hz AC power supply	208 432



Note: For versions for 115 V / 60 Hz, see WTW Product Details.

Thermostat Cabinets

- Versatile
- Powerful
- Cost-effective

To incubate samples at a constant, desired temperature during the reaction period, a thermostat cabinet is necessary. WTW offers thermostat cabinets in various sizes with a variably adjustable temperature range of 10 °C - 40 °C (50 °F - 104 °F) and a power supply of 230 V/50 Hz. Temperature accuracy lies at ±1 °C deviation from the set temperature.

Because the samples must be stirred, the thermostat cabinets are fitted with internal power sockets. 2 – 4 shelves are available, according to the thermostat cabinet size, thus enabling simultaneous temperature control of up to 48 standard BOD samples, or 4 IS 12 or IS 6-Var stirrer platforms.

The largest model, TS 1006-i is especially suited for special applications, as the space between the 4 shelves allows for 1.5 l vessels or flasks with side nozzles.

The sizes TS 606/2-i a TS 606/4-i are available with transparent insulating glass doors and are especially suited for use with



the OxiTop® Control system. Data can be recalled through the closed glass door, to avoid temperature fluctuations caused by opening the door.

Technical Data

Model	TS 606/2-i	TS 606/3-i	TS 606/4-i	TS 1006-i	
Shelves	2	3	4	4 widely spaced	
Number of samples	2 x 12 BOD standard	3 x 12 BOD standard	4 x 12 BOD standard	4 x 12 BOD standard 4 x 6 special vessels	
Glass door	Optional	—	Optional	—	
Temp. control range	+10 °C ... +40 °C (50 °F ... 104 °F) ±1 K; adjustment interval: 1 °C				
Ambient temperature	Operation: +10 °C ... +32 °C (50 °F ... 89.6 °F) (Climate class SN); Storage: -25 °C ... +65 °C (-13 °F ... 149 °F)				
Gross contents	180 l	260 l	360 l	500 l	
Dimensions (H x B x D)	outside	850 x 602 x 600 mm 33.47 x 23.70 x 23.62 in	1215 x 602 x 600 mm 47.84 x 23.70 x 23.62 in	1589 x 602 x 600 mm 62.56 x 23.70 x 23.62 in	1515 x 755 x 715 mm 59.65 x 29.72 x 28.15 in
	inside	734 x 513 x 433 mm 28.90 x 20.20 x 17.05 in	1047 x 513 x 433 mm 41.22 x 20.20 x 17.05 in	1418 x 513 x 433 mm 55.83 x 20.20 x 17.05 in	1338 x 646 x 516 mm 52.68 x 25.43 x 20.32 in
Weight	37 kg (81.571 lb)	45 kg (99.208 lb)	50 kg (110.23 lb)	72 kg (158.73 lb)	

Ordering Information

BOD thermostat cabinets – only available for 230 V/50 Hz		Order No.
TS 606/2-i	Thermostat cabinet for 2 BOD OxiTop® systems	208 380
TS 606/3-i	Thermostat cabinet for 3 BOD OxiTop® systems	208 382
TS 606/4-i	Thermostat cabinet for 4 BOD OxiTop® systems	208 383
TS 1006-i	Thermostat cabinet for 4 BOD OxiTop® systems	208 385



For other thermostat cabinets, see WTW Product Details.