



**TOC
COD, BOD**

**THE OXIDATION PROCESS
THAT TOTALLY
SELF-CLEANS**

PRODUCT FEATURES AND BENEFITS

- Even lower maintenance with the NEW Mixer Reactor
- No Calibration required between 6 month service intervals
- High Reliability - Certified 99.86% Uptime
- Lower reagent consumption with the NEW Mixer Reactor
- Self Cleaning Technology - Prevents clogging & sample contamination
- Clean & Dirty water analysis (including fats, oils & greases)
- Can handle chlorides up to 30% and calcium up to 12% w/w
- No filtration
- Complete Oxidation of Representative Sample using Patented Two-Stage Advanced Oxidation (TSAO) Technology
- Multi Range feature with automatic range selection
- Single or Multi-Stream Option
- Measured Components: TOC, COD, BOD, TC, TIC, VOC
- Very Low Cost of Ownership
- Guaranteed to handle the most demanding applications

APPLICATIONS

- Control of Influent to Industrial Waste Treatment Plants
- Monitoring of Final Effluent
- Measuring Organic Carbon and Inorganic Carbon in Process
- Minimizing Waste from Process Plants
- Monitoring Cooling Water
- Monitoring Boiler Condensate & Feed Water
- Monitoring Municipal Waste Treatment Plant - Influent & Effluent
- Monitoring De-icing runoff in Airports
- Monitoring Process Breakthrough and Spills
- Monitoring River Water
- Monitoring Surface Water
- Monitoring Landfill sites
- Special Applications

BioTector liquid analyzers are specifically developed for continuous analysis in the harsh online environment. BioTector's patented self-cleaning oxidation technology (TSAO) has overcome the traditional problems associated with online measurement and can reliably measure samples containing salts, particulates, fats, oils and greases. BioTector products are regarded by major international users as the most reliable online liquid analyzers on the market. Since 1995 BioTector analyzers have proven their ability on a wide variety of clean and dirty applications throughout the world.

THE MEASUREMENT PROCESS CAN BE DESCRIBED IN FIVE STAGES

- SAMPLING:** A representative unfiltered sample from the stream to be measured is pumped into the analyzer. The sample injection valve automatically selects the appropriate sample volume for the optimum measuring range.
- TIC DETECTION:** Acid is added to lower the pH so that inorganic carbon is sparged off as CO₂. This is measured to ensure Total Inorganic Carbon (TIC) is not carried over into the TOC.
- OXIDATION:** BioTector's patented oxidation method (TSAO) achieves total and complete oxidation of the sample, including organic carbon to CO₂, nitrogen compounds to nitrate and phosphorous compounds to phosphate. TSAO utilises hydroxyl radicals generated within the analyzer by combining oxygen, which passes through the ozone generator, with sodium hydroxide.
- TOC MEASUREMENT:** To remove the CO₂ from the oxidized sample, the pH of the sample is lowered again. The CO₂ is sparged and measured by the specially developed NDIR CO₂ analyzer. The result is displayed as Total Organic Carbon (TOC).
- CLEANING:** The entire system is automatically self-cleaned by the reaction process during every cycle. No additional cleaning solution is required.

MAINTENANCE

Normal service frequency is 6 months. Ready-made service kits are available.

GENERAL INFORMATION

Designed to withstand corrosive environments, the BioTector TOC Analyzer is housed in a FRP enclosure with dual compartments to keep all electronic components separate from the "wet" or analysis section. The BioTector TOC Analyzer has an in-built microcontroller and is operated through a membrane keypad. An SD/MMC Card allows easy software & configuration updates, downloading of the data from the microcontroller and storage of reaction data for the lifetime of the analyzer.

ALSO AVAILABLE FROM BIOTECTOR ANALYTICAL SYSTEMS LIMITED

*NEW BioTector System-C Online TOC Analyzer for Clean Water Applications **

*BioTector Ultra Low TOC Online Analyzer **

*BioTector TOC & TN Online Analyzer **

*BioTector TOC, TN & TP Online Analyzer **

BioTector Vacuum Samplers

* Also utilizing BioTector's Patented Two-Stage Advanced Oxidation (TSAO). See separate brochures or website for further details.





GENERAL TECHNICAL DATA

Enclosure:	Fibreglass Reinforced Polyester
Standard Dimensions:	1250 x 750 x 320mm (HxWxD)
Weight:	90kg - 120kg
Power Consumption:	300 W (VA)
Mains Connection:	115V AC, 60Hz or 230V AC, 50Hz ($\pm 10\%$) Other power options available upon request

FEATURES IN DETAIL

Display:	High Contrast 40 Character x 16 Line Backlit LCD with CFL Backlight
Data Storage:	Storage of reaction data for the lifetime of the analyzer in the SD/MMC Card. 9,999 reaction events stored in the microcontroller memory.
SD/MMC Card:	Flash Memory Card, Allowing Easy Data Transfer, Software and Configuration Updates
Operation:	Microcontroller with Membrane Keyboard
Language Options:	Multiple Languages Available

INPUT & OUTPUT SIGNALS

Standard Output:	4-20mA (typically for TOC) Output Multiplex Option is available for up to 35 output signals
Digital Output:	3 Freely Programmable System Relays (Including 1 factory-set to Fault)
Data Transfer Port	SD/MMC Card and Serial RS232 Output for Printer, PC or Data Logger

OPTIONAL FEATURES

Result Output:	TIC, TC, VOC, after correlation BOD, COD
Remote Control:	Input for: Remote Start/Standby Remote Stream & Range Selection Remote Manual Sample Analysis
Industrial Interface:	Modbus, Profibus, Ethernet
Network:	For remote access over Internet or intranet connection using HTTP over TCP/IP protocol
Calibration & Cleaning:	For Automatic Calibration and Sample Line Cleaning
Multi-Stream:	Up to 6 Streams
Manual Sample:	Up to 6 Manual Grab Sample Input Points
EExp/Z Purge:	Certification options are available to EU Standards (ATEX, Zone 2) and to North American Standards (Class 1, Div 2). Other options are available on request.

CONSUMABLES

Acid & Base:	Replacement Frequency – Application Dependent Typically 5-15 weeks per 25 Liters
Oxygen:	Average consumption is 22L/hour (367 ml/min) Integrated and External Oxygen Concentrator Options Available
Service:	6 Monthly Intervals



ANALYSIS PARAMETERS

Oxidation Method:	Patented Two-Stage Advanced Oxidation Process using Hydroxyl Radicals
TOC Measurement:	NDIR Measurement of CO ₂ after Oxidation
Measured Components:	TOC (NPOC) TOC (NPOC + POC) TIC TC VOC (POC) TOC as TC-TIC COD & BOD by Correlation
Cycle Time:	TOC – Typically 6.5 minutes
Filtration Requirements:	Not required
Signal Drift:	< 5% per year
Chloride Interference:	None

SAMPLE & ENVIRONMENTAL CONDITIONS

Sample Volume:	Up to 8.0 ml
Sample Inlet Pressure:	Typically ambient (for applications with high sample pressure, sampling systems are available)
Drain Pressure:	Typically ambient (for applications with high drain pressure, optional systems are available)
Sample Inlet Temperature:	2°C – 60°C (36°F – 140°F)
Sample Particle Size:	Up to 2mm, soft particulates
Ambient Temperature:	5°C – 40°C (41°F – 104°F) Air conditioning and heating options available
Humidity:	5% to 85% non-condensing
Ingress Protection:	IP44. Optional IP54 with air purge
System Sound:	<60 dBA

TOC MONITORING RANGES

Automatic Range Selection – 3 Ranges Configurable within each range band detailed below

Standard 0-10mgC/l up to 0-20,000mgC/l

High 0-10mgC/L up to 0-40,000mgC/l

A wide combination of TOC monitoring ranges, including higher ranges, are available upon request

Repeatability: ± 3% of reading or 0.3mgC/l, whichever is greater with Automatic Range Selection

Exceedence Tracking: Full Exceedence Tracking to Maximum Range

Range Selection: Automatic or Manual

Detection Limit: 0.6mg/l with Automatic Range Selection

MEASUREMENT TERMS

TOC: Total Organic Carbon including Non-Purgeable Organic Carbon (NPOC) and Purgeable Organic Carbon (POC).
BioTector's TIC & TOC mode measures NPOC
BioTector's VOC mode measures TOC as NPOC + POC

ACCREDITATION

BioTector TOC analysis complies with the following standards:

- DIN-EN1484
- US EPA 415.1
- ASTM D5173: 97(2007) Standard Test Method for On-line Monitoring of Carbon Compounds in Water by Chemical Oxidation, by UV Light Oxidation, by both, or by High Temperature Combustion followed by Gas Phase NDIR or by Electrolytic Conductivity
- DIN 38409-H3
- ISO 8245



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12 month warranty with all BioTector Online Analyzers

BioTector Analytical Systems Limited have a continuous research and development programme. Specifications may therefore be changed without notice. For specification updates, please contact BioTector Analytical Systems Limited.



www.biotector.com