

Aurora 1030C TOC Analyzer

Combustion Total Organic Carbon Analyzer



- Wide operational range (50 ppb–30,000 ppm C)
- Supports TC/TIC/TOC/NPOC analysis techniques and standard measurements
- Advanced ACT II combustion reactor technology (patent pending) enhances performance, extends catalyst life, and reduces maintenance
- Optional analysis module for total nitrogen (TNb)
- Upgradable to a platform capable of performing both combustion and wet heated persulfate TOC analysis techniques

Principal Applications

- Wastewater
- Seawater
- Industrial process water
- Drinking water
- Groundwater
- Cooling water

Methods

- ASTM D2579
- Standard Method 5310B
- ISO 8245
- USEPA 415.1, 415.3, 9060, (D/DBPR)
- DIN/ISO/CEN EN 1484
- EU PH 2.2.44
- USP 23 <643>

Description and Function

The Aurora 1030C TOC Analyzer processes aqueous samples for analysis of the total organic carbon (TOC), total inorganic carbon (TIC), and non-purgeable organic carbon (NPOC) content of the samples. Samples containing 50 ppb to 30,000 ppm of organic carbon can be analyzed. The Aurora 1030C supports USEPA-approved methods, Standard Methods, ASTM, DIN/ISO/CEN, and EU Methods. Depending upon the protocol employed, up to 300 samples per 24-hour period can be analyzed, and in excess of 100,000 samples per year.

Operating Principle

The Aurora 1030C employs a multi-step analysis technique to distinguish and quantify different forms of carbon present in sample matrices and determine TOC content. The value reported as TOC is the non-purgeable organic carbon (NPOC) content. NPOC is derived by first determining, or sparging, the TIC content of a sample and then introducing the TIC-free sample into the combustion reactor to oxidize organic compound constituents.

TIC concentration is determined by acidifying a sample to a pH less than 2. Carbonates and bicarbonates in the sample dissociate, forming CO₂, which is measured by a non-dispersive infrared (NDIR) detector and reported in mass and concentration values.

TIC-free samples are injected into the ACT II reactor to perform high temperature (680°C) combustion over a platinum catalyst. Organic compounds are oxidized and converted into CO₂, which is then quantified by the NDIR detector. The result is reported as the TOC content in both mass and concentration of carbon.

The Aurora 1030C also supports other analytical approaches—including TC, TOC by subtraction (TC-TIC), and simultaneous determination of total bound nitrogen (TNb) using the optional TNb analysis module.



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Specifications

Method compliance	USEPA, CEN, USP, EUP, ASTM, ISO, DIN, STD methods
Measurement range (ppm)	50 ppb C–30,000 ppm C
Method TC	680°C with platinum catalyst, 900°C with alternate noncatalyst packing
Method TIC	Acidification and sparging
Method TOC	NPOC, combustion of TIC-free sample, TOC by subtraction (TC–TIC)
Furnace temperature	Adjustable, 680°–950°C in 1°C increments
Measuring time	From three minutes
Oxidation technique	High temperature combustion, liquid samples
Options available	TN _p , EFC, A _{TOC} software for data viewing and reporting, and advanced security and auditing
High salt tolerance	Up to 26%
Reproducibility	3.0%
Accuracy	±2% FS or 2% relative
Sample pathway	Color-coded Teflon® with automatic cleaning in all injection modes
Sample injection and sample handling	Injection: manual syringe, sipper, autosampler, or at-line Handling: automatic syringe with isolation loop
Sample injection volume	10 µL–1.8 mL
IC pretreatment	Available with autosampler
Certifications	CE, EMC, EN50082-1, and EN55011 Group 1 Class A
Operation mode	Standalone (Windows CE) or networked via PC software (Windows 2000 Pro or XP Pro)
Operating interface	Touchscreen LCD or Windows PC (optional)
Basic software	Single instrument operation and simple data transfer to PC (included)
Optional ATOC Software	Network LAN/LIMS operation, data management, custom reports, 21 CFR 11 compliance
PC Specifications	Pentium® 4, 512 MB RAM, 40 GB HD (1GB HD for TOC), 1024 x 768, CD-ROM
Reagent purge	Yes
Reagents required	Hydrochloric acid, rinse/chase water
Automatic dilution and beginning point	Serial/autodilution 1:1,000, over the range of the calibration curve
Communications	Parallel and serial communications (RS-232-C), Ethernet
Input and output relays	Two user-programmable inputs, two user-programmable outputs (IR/MS)
Analog outputs (optional)	Four, 4–20 mA, user-programmable outputs
Relay output (optional)	Four user-programmable outputs
Multistream/autocalibration	Four streams; automated sequencer with automated four-point calibration
Ambient temperature range, humidity	10°–45°C, <90% noncondensing
Printer (optional)	Serial from the analyzer and/or PC from A _{TOC} software
Power supply	Variable voltage input, 100–240 V, 50/60 Hz
Benchspace with autosampler, PC	Rotary <46 cm (18"); XYZ <95 cm (38")
Gas type, grade, and consumption	Zero-grade air, 99.998% O ₂ (345–415 kPa)
Dimensions	43 cm H x 46 cm W x 61 cm D (17" H x 18" W x 24" D)
Weight	17.2 kg (38 lbs), 36.3 kg (80 lbs) with rotary autosampler option
Warranty	12 months on parts and labor

Aurora 1030C TOC (ACT II) Combustion Reactor



The ACT II combustion reactor design has a two stage heated chamber. Samples are first introduced in a chamber containing a bed of quartz before entering the second chamber containing a platinum catalyst. The quartz bed protects the platinum catalyst from damage that can occur with direct sample introduction on to the catalyst. Thermal and physical affects are mitigated, and noncombustible constituents (e.g. salts) do not accumulate on catalyst surfaces degrading catalyst performance and life.

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