1030S TOC Solids Module

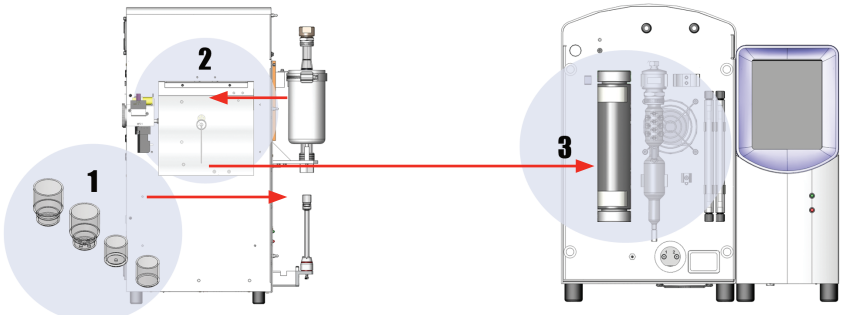
The 1030S Solids Module is a sample preparation module operated in conjunction with an Aurora 1030 TOC Analyzer that combusts solid materials for analysis of the total carbon (TC) or TOC content.

1030S Solids Module

Principle of Operation

Total organic carbon (TOC) is determined by manually transferring and weighing a solid sample into a quartz sample cup. The total inorganic (TIC) content is removed from the sample by adding acid and heating to drive off CO_2 released from inorganic carbon compounds. In the case of total carbon (TC) analysis, the pre-acidification step to remove TIC content is not required.

The sample cup with TIC-free sample is placed on the lift mechanism and raised into the into the combustion tube of the 1030S (1). The sample is heated to 500° - 900 °C inside the furnace. Organic matter in the sample is oxidized and converted to CO_2 which is collected in a one liter capacity gas sampling bag (2). When the combustion cycle is complete an aliquot of the CO_2 sample gas is transferred to the NDIR detector in the Aurora 1030 analyzer for measurement of the mass of carbon in the sample (3).



1030S Solids Module (Side View)

Aurora 1030 TOC Analyzer (Front View)

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1030S Specifications

Operating Principle	Catalytic combustion in oxygen
Sample Combustion Temperature	500 ˚C – 900 ˚C (in 1 ˚C increments)
Operating Modes	TC, TOC (requires pre-acidification and TIC bakeout)
Detection/Measurement	Non-dispersive infrared detector in Aurora 1030 TOC Analyzer
Measurement Range	0.05–mg C to 50-mg C (*determined using graphite)
Measurement Accuracy	± 10%
Sample Size (Mass)	50 µg to 2 grams (maximum) dependent upon carbon content (10 to 100 mg typical)
Sample Cup Volume	Large: 2.5 mL Small: 1.0mL
Gas Sample Bag Volume	1 liter
Gas Replicates from Sample Bag	5 maximum
Gas Sample Aliquot Volume Range (1030S + 1030W)	1 to 9 mL
Gas Sample Aliquot Volume Range (1030S + 1030C)	0.25 to 2 mL
Intra-sample Precision (Replicates from Gas Sample Bag)	< 3% RSD
Inter-sample Precision	< 10% RSD
Calibration	Single- or multi-point calibration (up to 12 points)
Sample Combustion/Analysis Cycle Time	14 minutes (typical)
Sample Preparation	TIC removal via preliminary manual, offline sample acidification step and heating @ 75-500 ˚C (250 ˚C optimal)
Standard Method Compliance	SW 846 Method 9060A, ISO 10694:1995, ASTM E1915
Certifications – Safety	Low Voltage Directive (2006/95/EC) IEC–61010-1:2001
Certifications – EMI	Directive 89/336/EEC:1989, EN61326-1:2006 CISPR 11:2003 Conducted Emissions CISPR 11:2003 Radiated Emissions
Gas Requirements	Reaction/Carrier Gas: Oxygen > 99.8% purity, 20 psi (138 kPa)
Power Requirements	115 (±10%) VAC, 50/60 Hz, 500 VA 230 (±10%) VAC, 50/60 Hz, 500 VA
Power Consumption	480 VA under maximum load conditions
Dimensions	24 in. H x 8.125 in. W x 17.25 in D (61 cm x 20.6 cm x 43.8 cm)
Weight	24 lbs (10.8 kg)
Patents	U.S. Patent No. 8,191,437

* Sample introduction, sample homogeneity, sample container cleanliness, reagent purity, gas purity, and operator skill affect the analysis range and precision.

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Aurora 1030 TOC Analyzers

The 1030S Solids Module operates with Aurora 1030W and 1030C TOC Analyzers.