



# TIC/TOC determination by acidification

Elemental Analysis of Soils is primarily focused on the determination of Carbon and Nitrogen content. Both elements are essential for the quality of soil but most important is their mutual relation C/N ratio. This indicator, besides allowing a better initial soil selection, can be continuously monitored and regulated by the use of manures or fertilizers, to assure an adequate level of Nitrogen, essential for plants growing.

EA3100 Elemental Analyser is the optimal instrument for C/N ratio automatic determination assuring outstanding results. *[see AN-025 EA3100 Application Note - (NC) Soils standard analysis]*

(NC) analysis provides Total Nitrogen % and Total Carbon % content in the soil sample.

INSTRUMENTATION	SAMPLE
EA3100 - NC analysis time: <3 min.	Solid
Calibration Reference Material: Acetanilide, EDTA	Weight: 15 ÷ 40 mg or more

Total Carbon content (TC) can be further investigated splitting it into Total Organic Carbon (TOC) and Total Inorganic Carbon (TIC): **TC = TOC + TIC**

The differentiation between Organic and Inorganic forms requires two consecutive runs of samples with instrument set in the same analytical conditions.

First analysis sequence provides Total Carbon TC % content.

## TYPICAL RESULTS (6 REPLICATES)

SAMPLE	N%	C%
Soil	0.054	2.385
Soil	0.052	2.366
Soil	0.052	2.379
Average	0.053	2.377
Std. Dev.	0.001	0.010





Second sequence for TOC determination requires samples pre-treatment: Inorganic Carbon is removed by acidification with HCl 15% using the Kit for TIC/TOC determination by Acidification available from EuroVector.

SAMPLE	N%	C%
Soil	0.052	0.254
Soil	0.055	0.249
Soil	0.053	0.251
Average	0.053	0.251
Std. Dev.	0.002	0.003

Total Inorganic Carbon % content in the sample is then calculated by difference:  
 $TIC = TC - TOC \rightarrow 2.377\% - 0.251\% = 2.126\% \text{ TIC}$

EuroVector maintains expertise on customer's applications for analytical support: the most representative samples have been grouped as "Samples by Category" providing a series of Application notes for each category.



Biomass,  
Biofuel,  
Wastes



Soils,  
Sediments,  
Rocks



Plants,  
Branches  
Leaves,  
Roots,  
Vegetables



Food, Feed  
Oil seeds,  
Sunflowers,  
Cereals,  
Corn,  
Brewing malt...



Coal,  
Coke,  
Peat



Petroleum,  
Lubricants



Organics,  
Synthetic,  
Compounds,  
Polymers  
textiles,  
Pharma,  
Fertilizers