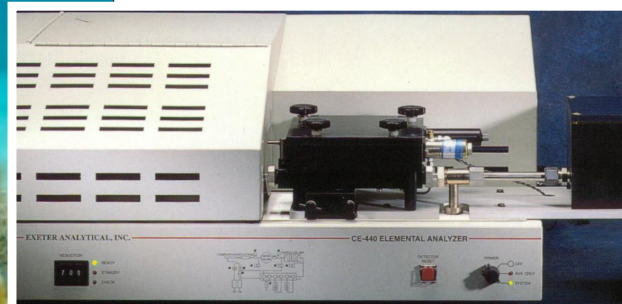




## Application Note 53

### **Environmental Analysis: Determination of total Carbon, Hydrogen & Nitrogen in filtered Oceanographic samples**

The technology for easy, direct automated elemental analysis of material retained on filters from oceanographic applications is now possible using the Exeter Analytical Model 440 Elemental Analyser. Direct determination of total CHN retained on a filter is a sensitive, precise and cost effective method that can be applied across a wide range of applications.



### **APPLICATIONS**

- Determination of particulate Carbon and Nitrogen in sea water
- Monitoring of the oceanographic food chain
- Calibration of orbiting satellites for monitoring of Algal bloom

### **METHODOLOGY**

Exeter Analytical has developed a method to analyse filter samples used in oceanographic monitoring without the need to weigh the filter sample or sub sample the filter. This is achieved by passing a known amount of water through the filter. The results from the CE440 elemental analyser are expressed as micrograms of C, H and N. If you know the amount of water passed through the filter the final result can be expressed as x micrograms per litre of water.

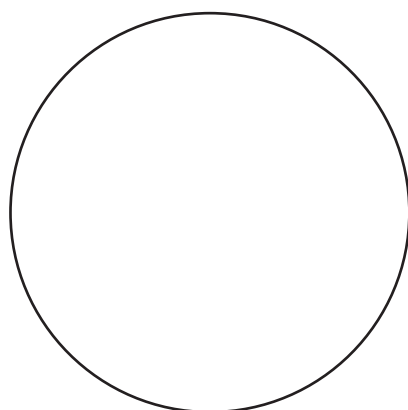
## Benefits of the Model 440 Methodology

- Horizontal furnace design facilitates easy sample residue removal between each run. With no residue build up in combustion tube, results are more precise.
- Filters up to 50mm diameter can be run with no sub-sampling. This results in enhanced data accuracy and improved sample throughput.
- Minimum consumables use i.e. no tin capsules.

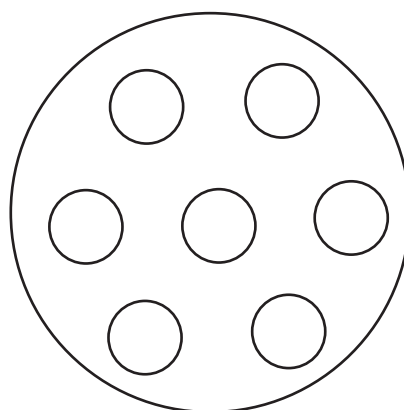
## Benefits of whole filter analysis

The Model 440 with its unique horizontal furnace can analyse up to a 50mm filter in one analysis. A vertical furnace design analyser would typically sub-sample the filter several times to try and acquire a representative sample this can quickly create residue build up problems in a vertical furnace design analyser.

Analysing a whole filter in one go is proven to give more accurate analytical data than sub-sampling and then adjusting the final analysis figures with a correction factor.



*Whole Filter*



*Filter after being sub-sampled*

Each of the small circles in the sub-sampled filter represents a separate analysis. After the analysis the final result would need to be corrected to take into account the whole filter. The sub-sampling method also assumes even distribution of deposited material over the surface of the filter, this is not always true. Using the Model 440 only one analysis (whole filter) is required, you do not have weigh the sample or be concerned if you have representative data.

## Conclusion

The Exeter Analytical Model 440 is able to analyse oceanographic filter samples without the associated problems of residue build up as is experienced with vertical combustion CHN microanalytical systems. Time savings gained by not having to weigh samples combined with improved data integrity and lower consumables costs are key reasons why the Exeter Analytical Model 440 Elemental Analyser is the number one choice for oceanographic filter analysis.

# EAI

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