

Unilever counts on Milestone's UltraWAVE to reach very low detection limits



Customer

Unilever is a Dutch-British global company co-headquartered in Rotterdam, Netherlands and London, UK. Unilever manufactures a wide range of consumer products, owning over 400 brands around the World like Knorr, Lipton, AXE, Dove, Clears, Wall's and many other food, beverages, cleaning agents and personal care products.



Challenge

"We could not reach the detection limit needed to obtain good results with our ICPMS analyzer because of the cross-contamination during the sample preparation step."

Solution

The UltraWAVE replaced their existing closed vessel microwave system and doubled their sample digestion capacity without increasing the hours of labor associated with the current sample prep. With the UltraWAVE they are able to digest any difficult sample while obtaining very low blanks and no evidence of cross contamination.

Background

Unilever has six Research & Development facilities - UK (two), the Netherlands, China, India and the USA.

The Vlaardingen R&D facility in the Netherlands is the research centre for Unilever's foods brands, and also the development centre for Spreads and Dressings brands and Food Solutions. In addition it houses the regional development centre for Home Care and Personal Care. Employing more than 900 people, Vlaardingen is home to Unilever's global research expertise in Structures and Structuring and Advanced Process Science; Nutrition and Health; Taste and Flavour; Microbiology and Analytical.



Implementation

The R&D Lab is equipped with two high-resolution ICP-MS units for ultra-trace metals analysis and an ICP-OES trace-metal analyzer. They have developed their own method that allows them to prepare successfully the wide variety of sample types they need to analyze. The number of samples they digest is between 660 and 1100 per month.



Prior to the acquisition of the first UltraWAVE in 2016, they were using a closed-vessel microwave system with a 12-position rotor. The main challenge with this instrument was the contamination in the vessels during the sample preparation step. Consequently they could not reach the very low detection limits they wanted to achieve. This was true especially for reactive samples like oil, cheese and other high fat content samples that led to a lot of problems in obtaining low blanks.

The UltraWAVE is employed to prepare difficult samples that are analyzed with ICP-MS and the conventional microwave unit remains for some easy sample dissolutions then analyzed with ICP-OES.

The UltraWAVE

"Before choosing the UltraWAVE, we also evaluated other systems from our current suppliers, like the sequential mode system.

The first reason we finally chose the UltraWAVE system is that it is 'clean'. We tested it in our own laboratory using the most challenging sample types and it could easily cope with them allowing us to reach the low detection limits we wanted. Reaching low detection limits was our main issue.

Second reason is that it is so easy to use and very quick: you put your samples in and half an hour later they are ready for analysis."

Thanks to its unique high temperature and pressure capabilities, the UltraWAVE could achieve a complete digestion with all their sample types, even the most difficult ones, such as digestion of up to 0.5g of Edible Oil in 15 positions simultaneously with dilute nitric acid (4mL HNO₃ + 1 mL H₂O).

"We use the 15 position rack for simultaneous digestion of reactive and non-reactive samples, using concentrated or diluted acids, the latter requiring less dilution after digestion which is ideal for trace metal analysis."

With the UltraWAVE, any combination of sample types and weights with different acid chemistries can be digested at the same time so there is no need to batch samples of the same type into separate runs.

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marketing@milestonesrl.com or +39 035 573857

"Everyone in the lab now uses the UltraWAVE because of its ease of use and the possibility to use disposable vials that saves a lot of time over conventional microwave systems. Also, the overall digestion run is shorter due to the very fast cool down time of the water cooled digestion chamber."

Future Plans

"Needless to say, we are very happy with the way the UltraWAVE is eliminating our sample prep bottleneck." Juliën says.

"We also have a traceCLEAN from Milestone, the acid steam cleaning system, to clean various items used in ultra-trace analysis. This work is critically important for our laboratory routine."



"To date, I haven't found any sample I cannot digest in the UltraWAVE"

– Juliën Boelhouwer, Research Scientist,
Unilever R&D Center, Vlaardingen

About Milestone

With over 50 patents and more than 20,000 instruments installed in laboratories around the world, Milestone has been widely recognized as the global leader in metals prep technology for the past 30 years. Committed to providing safe, reliable and flexible platforms to enhance your lab's productivity, customers worldwide look to Milestone for their metals digestion, organic extractions, mercury analysis and clean chemistry processing needs.

