

Milestone's DuoPUR Lowers Cost and Increases ROI for Water Testing Lab



Customer Empresa Portuguesa das Águas Livres (EPAL) is based in Portugal and supplies water to approximately three million people in 35 municipalities, with 34 thousand direct customers in the city of Lisbon. EPAL specializes in water supply and wastewater treatment and has two accredited labs that perform daily water quality monitoring to ensure the public supply of water for human consumption.



Challenge EPAL purchased an ICP-MS to perform trace metals analysis of water. This analysis could not be done with common analytical commercial concentrated nitric acid. As a result, the lab had to purchase expensive high-purity commercial nitric acid.

Solution The laboratory purchased Milestone's DuoPUR sub-boiling distillation system to produce their own high purity nitric acid at a dramatically reduced cost.

Background:

Dr. João Paiva works in EPAL's inorganic chemistry lab. They analyze about 300,000 samples and collect more than 1,000 sampling points each year. Before purchasing the ICP-MS, commercial nitric acid was used for all analytical methods for metals detection. After purchasing the ICP-MS, they purchased a Milestone DuoPUR to produce their own high purity nitric acid. The nitric acid produced by the DuoPUR is currently used in all of the analytical methods in the lab for the determination of metals in a variety of matrices (ICP-MS, ICP-OES and AAS-Graphite Furnace.) Approximately 10-15 liters of bi-distilled nitric acid is produced each month and used for decontamination processes, sample prep, and instrumental analysis.

Application:

The nitric acid is currently produced using the following operating conditions:

- 8 hours
- 20% power
- Bi-distillation

These conditions were optimized to achieve the best quality of the acid and volume produced each day and to ensure that the laboratory needs were met. Operating conditions should be adjusted to the requirements of each user. From our experience,



the one-step nitric acid distillation produces nitric acid that can be used in most applications. The bi-distillation step could be a solution to improve the quality of the final distilled acid.

Benefits of the DuoPUR:

The DuoPUR has proven to be an efficient, reliable instrument, producing a continuous supply of high purity acid during each run. The acid is contained in quartz vessels and inserts, which lowers blank levels and reduces reagent contamination. ***“It has been possible to lower some of our quantification limits as the quality of the acid produced decreased the metal content in the blanks of these techniques.”*** The nitric acid produced is evaluated on a routine basis and the results have shown that the quality of the produced acid is equivalent or better than the commercial acid that had previously been used.

Maintenance procedures for the DuoPUR are easy to perform. The system is cleaned once a month by distillation of laboratory grade water and a preventive maintenance is performed annually by our supplier in Portugal.

The DuoPUR also offers a high return on investment. ***“The greatest advantage of this system is the quality to cost ratio of the acid produced. From our experience, this system has a pay back within two years (routine basis).”***



“The DuoPUR system is a very easy way to have high purity nitric acid available at a low cost. EPAL considers the DuoPUR system an indispensable tool for trace analysis of metals in our laboratory.”

– Dr. João Paiva, Inorganic Chemistry Lab, EPAL

About Milestone

With over 50 patents and more than 18,000 instruments installed in laboratories around the world, Milestone has been widely recognized as the global leader in metals prep technology for the past 26 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.

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