

SPECTRO XEPOS takes lube oil analysis to the limits at Q8Oils

SPECTRO XEPOS Benefits

- ▶ Advanced QC analysis of lubricants & biolubricants
- ▶ Up to 3x lower limits of detection
- ▶ Up to 10x higher sensitivity
- ▶ Analysis as fast as 60 seconds
- ▶ Lower cost of ownership
- ▶ Single-method processing



Photo courtesy of Q8Oils. All rights reserved.

The Challenge

The Q8Oils facility in Antwerp, Belgium, is one of the largest and most advanced lubricating oils blending plants in Europe. In its busy quality control center, four QC laboratory specialists work to ensure that lubricant and biolubricant products meet specified targets for quality and consistency. A critical task: testing up to 50 samples per day to determine which chemical elements are present in each sample, in precisely what amounts.

In some cases, the lab wants to make sure elements such as calcium (Ca), zinc (Zn), and phosphorus (P) were introduced into the oil in proper proportions as part of an additive package. In other cases, such as a turbine lubricating oil, calcium or zinc would be a contaminant — so the lab must detect even trace amounts of these elements. False positives could mean off-spec product is shipped to customers; false negatives could lead to wasteful reprocessing.

For all these critical analyses, the lab had long used a pair of energy-dispersive X-ray fluorescence

(ED-XRF) devices: an iQ I and an iQ II analyzer, both from SPECTRO Analytical Instruments.

When time came to replace the iQ I, the Q8Oils team ended up evaluating two final candidates: a new SPECTRO XEPOS ED-XRF (successor to the older SPECTRO models) versus a competitor's more expensive wavelength-dispersive X-ray fluorescence (WD-XRF) spectrometer.

The most important factor was achieving the lowest possible limits of detection (LODs). The WD-XRF candidate was a midrange analyzer, with sequential processing and an LOD for most elements of at best 3 or 4 parts per million (ppm).

"If there's a small deviation, of course it's very difficult to see," says Bruno Palmaers, the lab's quality control team leader. "What was most interesting for us was the SPECTRO equipment's great precision — and it has a limit of detection less than 1 ppm for most elements!"



The Solution

After close comparison, the Q8Oils team chose the SPECTRO XEPOS ED-XRF spectrometer.

Besides its average 3x lower limits of detection compared to previous models, its quantum leap improvements in excitation, detection, and calculation help yield 3x greater precision. It can analyze more elements, and see wider ranges of sample concentrations. Up to 10x greater sensitivity allows users to either cut many analysis times from 6 minutes to 60 seconds, or choose longer analyses for better precision. Its redesigned software offers exceptional ease of use. And SPECTRO XEPOS exhibits a significantly lower cost of investment and ownership than any WD-XRF spectrometer.

The Results

The Antwerp plant's lab installed the new SPECTRO XEPOS in March 2018.

"Over the years, we've seen impressive improvements from SPECTRO — greater performance, and especially greater precision," says Palmaers.

"We are very happy with those very low detection limits."

"And its background calculations and deconvolution techniques really improved handling of matrix effects," he continues. "So when we have, for example, a low phosphorus concentration in a high sulfur environment, we are still able to measure the phosphorus quite accurately."

Ease of use was another winner. The team is pleased with the instrument's ability to analyze every element in conventional lubricants with just one method — a SPECTRO exclusive. (Biolubricants are handled with one additional method.) Additionally, as Palmaers reports, "The software is really hands-on when you know how to work with it. And training took only about an hour."

How long does the team hope to keep SPECTRO XEPOS at work in their lab? Says Bruno Palmaers, "I hope for the rest of my career!"

About Q8Oils

Q8Oils is part of the Kuwait Petroleum Corporation (KPC), the world's seventh-largest oil producer. Q8Oils uses high-quality base oils to manufacture an extensive range of lubricating oils in its blending plants. Today, Q8Oils lubricants are used by customers in more than 90 countries worldwide.

About SPECTRO

SPECTRO is one of the world's leading suppliers of analytical instruments. Its analyzers use optical emission spectrometry (arc/spark OES, ICP-OES), X-ray fluorescence spectrometry (XRF), and inductively coupled plasma mass spectrometry (ICP-MS) technologies in the elemental analysis of materials for industry, research, and academia.

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